

COURSE DESCRIPTIONS

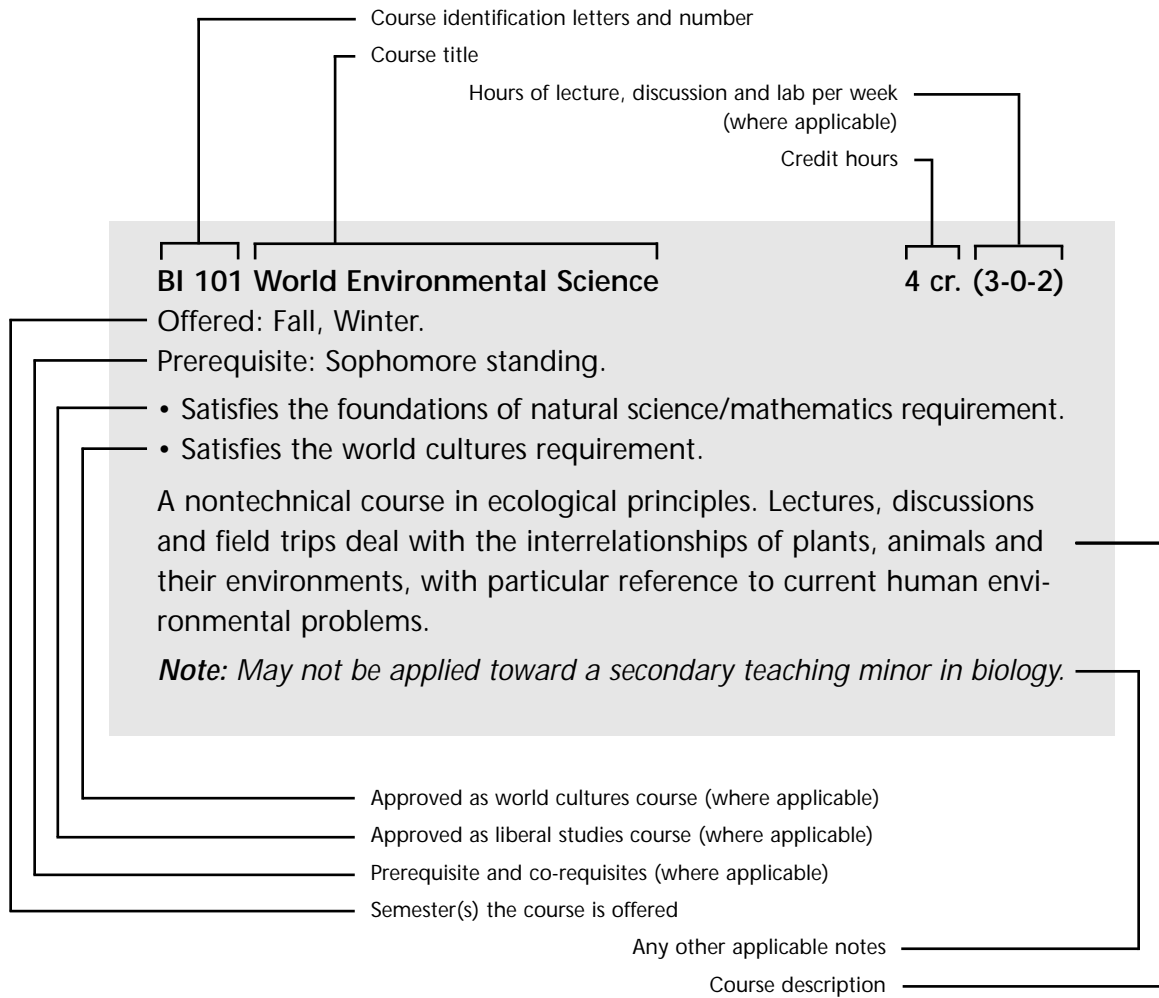
This section lists updated descriptions for all university courses; the descriptions appear in alphabetical order according to their course letter designations. These descriptions include any pre-requisites (requirements students must satisfy before registering for the course), co-requisites (requirements students must satisfy while taking the course), the amount of credit hours applied for each course, and, where relevant, the hours devoted to lecture, discussion, and laboratory (see applicable department sections for the total credits required for each major or program). If no indication exists for lecture, discussion and laboratory hours, then the course is considered a lecture.

The courses listed here are subject to change. Many courses are regularly offered in the fall, while others are offered in the win-

ter or summer. However, semester enrollment, course demand, changes in faculty and other factors will sometimes affect the offering of courses. In addition, new courses may have been added and changes in existing courses may have occurred since the printing of this bulletin.

When planning a semester program, students should contact the applicable departments for information regarding course offerings.

Some of the upper-level courses listed here can also apply toward graduate credit. See the *Northern Michigan University Graduate Bulletin* or contact the College of Graduate Studies for more information.



2003-2004 COURSE DESCRIPTIONS

Course Abbreviation Listing

Accounting	ACT	Industrial Technologies	IT
Allied Health	AH	Information Systems	IS
Anthropology	AN	International Studies	IP
Art and Design	AD	Japanese	JP
Astronomy	AS	Labor Studies	LSP
Athletic Training	ATR	Languages	LG
Aviation Maintenance Technology	AMT	Liberal Studies	LB
Biology	BI	Mathematics	MA
Broadcasting	BC	Mathematics/Science Education	MSED
Chemistry	CH	Manicurist	HR
Chinese	CHN	Manufacturing Technology	MF
Clinical Laboratory Science	CLS	Mechanical Engineering Technology	MET
Commencement and Graduation	CA	Management	MGT
Communication Disorders	CD	Marketing	MKT
Computer Information Systems	CIS	Military Science	MS
Cosmetology	COS	Music	MU
Cosmetology Instructor	HR	Native American Studies	NAS
Criminal Justice	CJ	Nursing	NE
Collision Repair Technology	CRT	Occupational Studies	OC
Computer Science	CS	Office Information Systems	OIS
Construction Systems	CN	Paraprofessional Instructor's Aid	PIA
Drawing and Design	DD	Philosophy	PL
Economics	EC	Physical Education	PE
Education	ED	Physics	PH
Electrical Line	EL	Public Safety/Law Enforcement	PSLE
Electronic Technology	ET	Public Safety/Local Corrections	PSCR
English	EN	Political Science	PS
Environmental Science	ENV	Portuguese	POR
Entertainment and Sports Promotion	ESPR	Power and Transportation	PT
Finance	FIN	Practical Nursing	PN
French	FR	Psychology	PY
Geography	GC	Public Relations	PR
German	GR	Recreation	RE
Gerontology	GRN	Social Work	SW
Health	HL	Sociology	SO
Health Promotion	HP	Spanish	SN
Heating and Ventilation	HV	Speech	SP
History	HS	Surgical Technology	ST
Honors	HON	Technical Education	TE
Hospitality Management	HM	Theatre	TH
Human Nutrition	HN	Traffic Safety	TS
Industrial Maintenance	IM	University Studies	UN
		Welding	WD
		Wood Technology	WT

ACT-ACCOUNTING

College of Business

ACT 201 Practical Accounting Procedures 4 cr.
Offered: Fall, Winter

Study of basic principles and procedures in clerical, technical, or secretarial fields. This course will emphasize recording business transactions and completion of the accounting cycle, uses of special journals, and preparation of financial statements, worksheets, payroll and other records.

Note: Not acceptable as an elective for students who complete ACT 230 and ACT 240.

ACT 202 Accounting Concepts for Management 4 cr.
Offered: Contact department for information.

Introduction to accounting concepts and the utilization of accounting in the decision-making process.

Note: Not acceptable as an elective for students who complete ACT 230 and ACT 240.

ACT 230 Principles of Accounting I 3 cr.
Offered: Fall, Winter, Summer
Prerequisite: MA 103 or equivalent.

Study of basic accounting principles and recording procedures with in-depth analysis of income and expense recognition and the non-owners' equity portions of the balance sheet.

ACT 240 Principles of Accounting II 3 cr.
Offered: Fall, Winter, Summer
Prerequisite: ACT 230

Further study of financial accounting topics, including owners' equity concepts, income tax accounting, statement of changes in financial position, statement analysis and interpretation. Managerial accounting topics are introduced: cost accounting systems, responsibilities in accounting, budgeting concepts, cost-volume-profit analysis and capital budgeting.

ACT 301 Financial Accounting I 4 cr.
Offered: Fall, Winter
Prerequisite: ACT 240 and junior standing.

Intensive study of the accounting cycle and the asset section of the balance sheet.

ACT 302 Financial Accounting II 4 cr.
Offered: Fall, Winter
Prerequisite: ACT 301 and junior standing.

Intensive study of the liability and owners' equity sections of the balance sheet and the treatment of special problem areas in accounting.

ACT 311 Cost Accounting 4 cr.
Offered: Fall, Winter
Prerequisite: ACT 240 and junior standing.

Development of an understanding of cost accounting as an information system designed to provide data for inventory valuation and income determination, planning and controlling routine operations and non-routine decisions.

ACT 321 Federal Income Taxation 4 cr.
Offered: Fall, Winter
Prerequisite: ACT 240 and junior standing.

This course studies the basics of federal income taxation for individuals. Tax policy considerations and historical developments are studied to the extent that they aid comprehension of current law. Many of the basic rules apply to corporations, partnerships and trusts as well. This course explores the major topical areas: basic tax model, gross income, deductions, alternative minimum tax, basics of property, nontaxable exchanges, capital gains and losses, depreciation recapture and deferred compensation.

ACT 325 Financial Management for Entrepreneurship 3 cr.
Offered: Every other Fall
Prerequisites: Completion of the business core, relevant business experience or approval of the Entrepreneurship Development Program Committee and junior standing.

Builds upon the basic introductory material of Principles of Accounting I and II. Topics include business taxes, cash flow forecasting and cost analysis.

Note: This course is not an appropriate elective for an accounting major.

ACT 403 Accounting III 4 cr.
Offered: Fall
Prerequisites: ACT 302, ACT 311, and ACT 321 and junior standing or instructor's permission.

The third course in the financial accounting sequence (ACT 301, 302, 403), covering special problem areas in accounting and introducing students to accounting principles and procedures for governmental units, hospitals, colleges and universities. Also included: accounting for business combinations, partnerships, branch accounting and multinational accounting problems.

ACT 412 Advanced Cost Accounting 3 cr.
Offered: Contact department for information.
Prerequisites: ACT 311 and junior standing or instructor's permission.

Study of managerial accounting as an information system designed to provide data for (1) non-routine decisions, (2) policy making and (3) long-range planning.

ACT 422 Advanced Federal Taxation 3 cr.
Offered: Winter
Prerequisites: ACT 321 and junior standing or instructor's permission.

This course applies the basics of income taxation learned in the first tax course to corporations, partnerships, estates and trusts. Topics also include professional tax practice considerations and family tax planning. Practical experience in the preparation of tax forms will also be gained.

ACT 431 Accounting Information Systems 3 cr.
 Offered: Fall
 Prerequisites: ACT 240, CIS 110 or equivalent IS courses and junior standing or instructor's permission.

Study of the concepts of information and the systems approach as well as the techniques and tools of systems analysis and design. Emphasis upon transaction processing, controls, flow charting techniques and accounting situations involving electronic computing systems. Many problems and cases are adapted from CPA and CMA examinations.

ACT 441 Auditing 4 cr.
 Offered: Winter
 Prerequisites: ACT 302, ACT 311 and junior standing or instructor's permission.

Review of audit concepts, standards and procedures; ethics and legal requirements; scope, objectives and nature of an audit; management of an audit; and modern audit techniques. Statistical sampling in auditing, audits of electronic systems, auditors' role in tax, and management advisory services.

ACT 443 Fraud Examination 4 cr.
 Offered: Contact department for information.
 Prerequisite: ACT 441 and junior standing or instructor's permission.

To raise the student's awareness of the accountant's opportunities in fraud investigation and detection and to bring the student to the point where he or she can make an informed decision whether or not they want to pursue a career as a certified fraud examiner.

ACT 482 Accounting for Non-Profit Enterprises 3 cr.
 Offered: Winter
 Prerequisites: ACT 301 and junior standing or instructor's permission.

Accounting principles and procedures for governmental units, hospitals, colleges and universities.

ACT 484 Current Developments in Accounting 3 cr.
 Offered: Contact department for information.
 Prerequisites: Senior standing accounting major or instructor's permission.

Historical and current developments in accounting research and theory. Controversial topics related in contemporary literature.

ACT 488 CPA/CMA Problems 3 cr.
 Offered: Contact department for information.
 Prerequisites: Senior standing accounting major and College of Business permission.

Selected problems from CPA examinations; analysis and revision of statements, partnerships, corporations, quasi-organizations, mergers and conglomerates; financial accounting theory, ethics, auditing, law, advanced cost and marginal analysis, and federal taxation programs.

ACT 491 Internship in Accounting 1-4 cr.
 Offered: Fall, Winter, Summer
 Graded S/U
 Prerequisites: College of Business permission and junior standing.

Professional experience for qualified accounting and finance students. Working relationships will be established with accounting firms and other business organizations. Students are required to write a paper and will be evaluated by their faculty supervisor in consultation with the employer.

Credit hours are over and above any existing catalog requirements for the accounting degree.

ACT 495 Variable Topics in Accounting 1-4 cr.
 Offered: Contact department for information.
 Prerequisites: Junior standing or instructor's permission.

Variable topics of current interest.

Note: May be repeated if topic differs.

ACT 498 Directed Study in Accounting 1-4 cr.
 Offered: Contact department for information.
 Prerequisites: Junior standing or instructor's permission.

Independent study of some special problem in accounting under the guidance of a faculty member. This study is limited to students with superior grade point averages.

AD-ART AND DESIGN

Art and Design Department

Cognate Courses

AD 160 Physical Structures and Concepts 4 cr.
 Offered: Fall, Winter

Introduction to the methods of construction and production of art forms within a societal context. The course includes the study of materials, tools, assembly procedures and the application of such forms.

AD 175 Visual Structures and Concepts 4 cr.
 Offered: Fall, Winter

Study of pattern and color in relation to visual perception and communication. Visual patterns, color qualities and their application are examined.

AD 270 Social Structures and Concepts 4 cr.
 Offered: Fall, Winter
 Prerequisites: AD 160 and AD 175

Comparative study of cultural products, social structures and visual conditioning and its evolution in contemporary society. Students are required to participate in a class field trip to Chicago or Minneapolis which involves a substantial fee to cover travel expenses.

AD 360 Methodology and Visual Form 4 cr.
 Offered: Fall
 Prerequisites: AD 203 and AD 270
 Examination of mechanics, optics and material characteristics and their relationship to the physical form of objects.

AD 375 Perception and Visual Form 4 cr.
 Offered: Winter
 Prerequisites: AD 203 and AD 270
 Examination of the interaction of psychological and social psychological data and how this applies to visual communication. Students analyze concepts of color, form and social meaning in relation to their major studio area and production of studio work.

AD 470 Value and Visual Form 4 cr.
 Offered: Winter
 Prerequisites: AD 203, AD 270 and junior standing.
 The identification of personal and social values as they relate to the production of art derived from critical, theoretical and philosophical sources.

Art History Courses

AD 200 Native American Art and Architecture 4 cr.
 Offered: Fall
 Prerequisite: EN 111 recommended.
 • Satisfies the foundations of visual and performing arts requirement.
 • Satisfies the world cultures requirement.
 A study of the issues current in the field dealing specifically with objects and artifacts that express cultural concepts in visual form and the built environment from pre-contact times to the present. A contextual approach will be used to analyze traditional and contemporary material produced by the Anishinabe and Haudenosaunee as well as other indigenous groups in the United States and Canada.

AD 250 History of Western Art and Architecture 4 cr.
 Offered: Fall, Winter, Summer
 • Satisfies the foundations of visual and performing arts requirement.
 Surveys the history of the visual arts in the Western world from prehistoric times through the first half of the nineteenth century. The social contexts of art, aspects of form, the possible intentions of artists and the theoretical underpinnings of artistic activity are examined.

AD 260 Why America Looks This Way 4 cr.
 Offered: Fall, Winter
 • Satisfies the foundations of visual and performing arts requirement.
 Survey of the ideas and events determining the appearances of our cities, countryside, industrial products and homes.

AD 265 Art and Architecture of Japan 4 cr.
 Offered: Every other Fall
 • Satisfies the foundations of visual and performing arts requirement.
 • Satisfies the world cultures requirement.

A chronological survey of the visual arts in Japan from prehistory to the twentieth century. The course is organized according to the periods of Japanese political and cultural history. Covers the styles, media and artists in Japanese art history and introduces the core aesthetic, religious and ethical values that are expressed through Japanese art and architecture.

AD 300 Japan and the West: Crosscurrents in Art and Architecture 4 cr.
 Offered: Every other Fall
 Prerequisites: Completion of the foundations of communication requirement and junior standing.

• Satisfies the foundations of visual and performing arts requirement.
 • Satisfies the upper division liberal studies requirement.
 • Satisfies the world cultures requirement.
 Investigates the mutual influence of Japanese and western art during the nineteenth and twentieth centuries. Considers technical, formal and philosophical dimensions of this influence. The focus of the course is Japan's impact on European and American modernist art. The course will lead to a general understanding and appreciation of intercultural processes in art.

AD 355 Twentieth Century Art and Architecture 4 cr.
 Offered: Winter
 Prerequisites: Completion of the foundations of communication requirement and junior standing.

• Satisfies the foundations of visual and performing arts requirement.
 • Satisfies the upper division liberal studies requirement.
 Survey of the visual arts and built environment in the Western world from the second half of the 19th century through the present decade. The conceptual basis of the arts and their place in society is examined within a historical framework.

AD 365 History of Modern Craft and Design 4 cr.
 Prerequisites: Completion of the foundations of communication requirement and junior standing.

Considers the course of progressive design in the applied arts (graphic design, illustration, product and furniture design, wood, fibers, glass, ceramics and metal work) from the mid-nineteenth century to the present. Major movements in craft and design history including the Arts and Crafts Movement, Art Nouveau, Modernism and Postmodernism are investigated within a chronological framework. Social issues affecting design including the relationship between design and consumerism and design and national identity are considered within their historical context.

Areas of Concentration

Ceramics

AD 122 Ceramics: Handbuilding Techniques 4 cr.
Offered: Fall, Winter

Introduction to the methods and techniques of producing ceramic objects covering the various forming, finishing and firing techniques. Students experience techniques ranging from pinch, coil and slab construction.

AD 222 Ceramics: Wheel Forms 4 cr.
Offered: Fall

Development of the traditional skills of throwing, along with glazing and firing procedures. Supporting information is derived from historical and contemporary wheel thrown forms.

AD 322 Ceramics: Seminar 4 cr.
Offered: Winter
Prerequisites: AD 203, AD 122 and AD 222.

Production of a collection of ceramic pieces that combine traditional and experimental techniques to develop a personal approach toward the ceramic material. The emphasis is on finishing and technical concerns related to clay/glaze formulation and firing procedures.

AD 422 Ceramics: Seminar 4 cr.
Offered: Fall
Prerequisites: AD 322 and junior standing or instructor's permission.

Production of a body of work that supports the student's personal concern for form. Individual solutions for construction and finishing are stressed with a focus on current trends and issues in ceramics.

AD 459 Ceramics: BFA Seminar 4 cr.
Offered: Fall, Winter
Prerequisites: AD 303, AD 422 and junior standing or instructor's permission.

Continuation of the study of the ceramic process to develop a body of work representing a personal approach supported by ideological and theoretical sources.

Digital Cinema

AD 121 Digital Cinema: Introduction 4 cr.
Offered: Fall

Introduction to the physical aspects of digital video production. Screenings emphasize narrative features and shorts. Equipment is provided.

AD 221 Digital Cinema: Animation 4 cr.
Offered: Winter

Continued development of digital video production skills and knowledge emphasizing animation forms. Equipment is provided.

AD 321 Digital Cinema: Seminar 4 cr.
Offered: Fall
Prerequisites: AD 203 and AD 221.

Continued development of digital video production skills and knowledge emphasizing documentary forms. Students must have access to a camcorder.

AD 421 Digital Cinema: Seminar 4 cr.
Offered: Winter
Prerequisites: AD 321 and junior standing or instructor's permission.

Continued development of digital video production skills and knowledge emphasizing a seminar project. Students must have access to a camcorder.

AD 458 Digital Cinema: BFA Seminar 4 cr.
Offered: Fall, Winter
Prerequisites: AD 303, AD 421 and junior standing or instructor's permission.

Development of a portfolio presentation and an ideological statement.

Drawing and Painting

AD 114 Painting 4 cr.
Offered: Fall

Introduction to relevant concepts and techniques. A body of work is produced exploring several painting media, with an emphasis on oils.

AD 120 Drawing/Illustration 4 cr.
Offered: Fall, Winter

Introduction to methods and knowledge needed to create various types of spatial illusions and to provide cognate support for drawing.

AD 220 Drawing/Painting 4 cr.
Offered: Fall, Winter
Prerequisite: AD 120.

Development of techniques and skills related to all aspects of spatial illusions. Emphasis is placed on the importance of drawing as a basis for visual growth.

AD 320 Drawing/Painting/Papermaking: Seminar 4 cr.
Offered: Fall
Prerequisites: AD 203 and AD 220.

Production of a body of works demonstrating the student's understanding of psychological and social aspects. Students may produce work in any combination of drawing, painting or papermaking.

AD 420 Drawing/Painting/Papermaking: Seminar 4 cr.
Offered: Winter
Prerequisites: AD 320 and junior standing or instructor's permission.

Development of a body of work using a personal approach to image construction and emphasizing the ideological sources supporting the activity.

AD 457 Drawing/Painting: BFA Seminar 4 cr.

Offered: Fall, Winter

Prerequisites: AD 303, AD 420 and junior standing or instructor's permission.

Production of a body of work that continues the development of ideological concerns.

Electronic Imaging**AD 134 Electronic Imaging: Introduction** 4 cr.

Offered: Fall, Winter, Summer

Introduction to computer graphics hardware and software with the development of knowledge and skill in electronic image production. No previous computer experience required.

AD 234 Electronic Imaging: Digital Photography, Animation and Desktop Video 4 cr.

Offered: Fall, Winter

Prerequisites: AD 134 and AD 175.

Development of concepts and methods for electronic imaging using a variety of software. Techniques using resources from traditional media such as graphic design, illustration, painting, photography and video are incorporated. Ideological issues concerning electronic imaging are presented.

AD 334 Electronic Imaging: Modeling, Rendering and Animation 4 cr.

Offered: Fall

Prerequisites: AD 203 and AD 234.

Development of concepts and methods for the modeling and animation of three-dimensional forms. Industry uses of modeling such as gaming, real-time rendering and time-based narrative will be presented.

AD 434 Electronic Imaging: Interactive Multimedia and Web Site Design 4 cr.

Offered: Fall, Winter

Prerequisites: AD 203, AD 234 and junior standing or instructor's permission.

Development of concepts and methods for interactive multimedia and Web site design using a variety of software. Considerations for navigation, interactivity and visual communication will be presented.

AD 467 Electronic Imaging: BFA Seminar 4 cr.

Offered: Winter

Prerequisites: AD 303, AD 430, AD 434 and junior standing or instructor's permission.

Development of electronic imaging portfolio presentation and ideological statement. Self promotion with an emphasis on job search will be explored through the development of interactive media such as a Web site.

Environmental Design**AD 129 Environmental Design: Image Basis** 4 cr.

Offered: Fall

Introduction to methods and techniques of environmental and social goods design. Ideation and presentation procedures are stressed in studio work with an introduction to cognate aspects of interior and commercial design presented through lecture and discussion.

AD 229 Environmental Design: Physical Basis 4 cr.

Offered: Winter

Development of environmental and product problem solving techniques and the synthesis of sense impressions for personal and specialized public environments, interiors and products. Studio work is oriented toward model building techniques and the basis of form presentations.

AD 329 Environmental Design: Seminar 4 cr.

Offered: Fall, Winter

Prerequisites: AD 129, AD 203 and AD 229.

Application of ideological and theoretical concepts to a contracted body of work. A written document of support is required.

AD 429 Environmental Design: Seminar 4 cr.

Offered: Fall, Winter

Prerequisites: AD 329 and junior standing or instructor's permission.

Production of interior, environmental or commercial site design solutions as an individual portfolio.

AD 466 Environmental Design: BFA Seminar 4 cr.

Offered: Fall, Winter

Prerequisites: AD 303, AD 429 and junior standing or instructor's permission.

Continued development of ideological concerns and preparation of selected work for the professional portfolio.

Furniture Design**AD 124 Woodworking: Joinery and Greenwood** 4 cr.

Offered: Fall

Introduction to traditional hand tool joinery and greenwood process through the production of social goods and the identification of a personal mode of practice.

AD 224 Woodworking: Turning and Bending 4 cr.

Offered: Winter

Introduction to wood turning and bending through the production of social goods and the identification of a personal mode of practice.

AD 326 Furniture Design: Seminar 4 cr.

Offered: Fall

Prerequisites: AD 124, AD 203 and AD 224.

Development of a professional portfolio and a written support paper. Emphasis is placed on understanding the various parameters of usefulness, cost and appearance that form the design program.

AD 426 Furniture Design: Seminar 4 cr.
 Offered: Winter
 Prerequisites: AD 326 and junior standing or instructor's permission.
 Continued development of a professional portfolio and written support paper from AD 326. Emphasis is placed on the application of ideology and theory.

AD 463 Furniture Design: BFA Seminar 4 cr.
 Offered: Fall
 Prerequisites: AD 303, AD 426 and junior standing or instructor's permission.
 Continued development of ideological and theoretical concerns. Emphasis is placed on preparing a selection of work as a professional portfolio and writing a paper supporting the activity.

Graphic Communication

AD 118 Introduction to Graphic Communication 4 cr.
 Offered: Fall, Winter
 Introduction to graphic communication concepts with the development of hand skills. Emphasis is placed on the use of process, pattern and color concepts.

AD 218 Graphic Communication: Studio Practices 4 cr.
 Offered: Winter
 Prerequisite: AD 118.
 Introduction to the use of typography. Emphasis is placed on the use of process, letterform, layout and computer skills.

AD 318 Graphic Communication: Seminar 4 cr.
 Offered: Fall
 Prerequisites: AD 203 and AD 218.
 A study of layout and design. Emphasis is placed on the use of process, design concept, complex layout and computer skills.

AD 418 Graphic Communication: Seminar 4 cr.
 Offered: Fall
 Prerequisites: AD 303, AD 318 and junior standing or instructor's permission.
 A study of client-based graphic problems. Emphasis is placed on the use of process, market research, design concept, advanced layout and computer skills.

AD 455 Graphic Communication: BFA Seminar 4 cr.
 Offered: Fall
 Prerequisites: AD 303, AD 318 and junior standing or instructor's permission.
 A study of self-promotion. Emphasis is placed on portfolio, job search and exhibition preparation.

Illustration

AD 120 Drawing/Illustration 4 cr.
 Offered: Fall, Winter
 Introduction to methods and knowledge needed to create various types of forms and spatial illusions.

AD 219 Illustration Forms 4 cr.
 Offered: Winter
 Study of illustration concepts and techniques. The focus is on studio production in book, magazine advertising, television and film illustration with an emphasis on color and linear perspective using a variety of media including computer imaging.

AD 319 Illustration: Seminar 4 cr.
 Offered: Fall
 Prerequisites: AD 203 and AD 219 with a "B" or better.

Development of a competitive professional portfolio with assignments that closely parallel illustration problems encountered in the profession. Two areas of illustration are chosen by the student stressing the interaction of image, color typography and social meaning.

AD 419 Illustration: Seminar 4 cr.
 Offered: Fall, Winter
 Prerequisites: AD 319 with a "B" or better and junior standing or instructor's permission.

Completion of a competitive professional portfolio focusing on one area of illustration with students choosing the concepts, themes and techniques. Illustration markets and career opportunities are investigated.

AD 456 Illustration: BFA Seminar 4 cr.
 Offered: Fall, Winter
 Prerequisites: AD 303, AD 419 with a "B" or better and junior standing or instructor's permission.

Study of image, color, typography and social meaning for the visual communication media. Students complete a professional portfolio demonstrating mastery of illustration problems in their chosen area.

Jewelry, Metalsmithing and Blacksmithing

AD 123 Jewelry/Metalsmithing 4 cr.
 Offered: Fall

Introduction to methods, techniques and materials used to construct metal objects and jewelry. The course covers forming, soldering, cutting, forging, casting, fabricating metal and other materials in the production of jewelry/art.

AD 223 Blacksmithing/Metalsmithing 4 cr.
 Offered: Winter

Development of skills and knowledge of basic blacksmithing in the production of utilitarian and non-utilitarian forged objects. Beginning through advanced techniques of forging hot steel are covered.

<p>AD 323 Metalsmithing: Seminar 4 cr. Offered: Fall Prerequisites: AD 123, AD 175 and AD 223.</p> <p>Production casting and mold-making techniques. Individualized research of casting processes in the production of jewelry and metal objects.</p>	<p>AD 454 Photography: BFA Seminar 4 cr. Offered: Fall, Winter Prerequisites: AD 303, AD 417 and junior standing or instructor's permission.</p> <p>Preparation of a professional portfolio by each student.</p>
<p>AD 423 Metalsmithing: Seminar 4 cr. Offered: Winter Prerequisites: AD 203, AD 323 and junior standing or instructor's permission.</p> <p>Sheet metal forming techniques: raising, sinking, folding and construction. Production of a collection of work using these techniques as the foundation of the structures designed by each student.</p>	<p>Printmaking</p> <p>AD 115 Printmaking: Serigraphy and Intaglio 4 cr. Offered: Winter</p> <p>Introduction to the techniques of screen printing and the intaglio process (etching). Emphasis is placed on skill development and the creation of original prints.</p>
<p>AD 460 Metalsmithing: BFA Seminar 4 cr. Offered: Fall, Winter Prerequisites: AD 303, AD 423 and junior standing or instructor's permission.</p> <p>Continued development of ideological concerns in the production of studio art work as contracted with the instructor.</p>	<p>AD 215 Printmaking/Papermaking: Forms 4 cr. Offered: Fall Prerequisites: AD 115 or instructor's permission.</p> <p>Development of skills and techniques necessary in the creation of an original print. Emphasis is placed on one process: intaglio, screen, relief or lithography. Students may also explore hand papermaking emphasizing sheetmaking, beater techniques, coloring, casting or three-dimensional approaches.</p>
Photography	
<p>AD 117 Photography: Black and White 4 cr. Offered: Fall, Winter, Summer</p> <p>Introduction to the use of the camera, film processing, printing procedures and print presentation using black and white materials. Assignments and critiques introduce students to ideology and problem-solving techniques. Each student must have access to a single reflex camera.</p>	<p>AD 315 Printmaking/Papermaking: Seminar 4 cr. Offered: Winter Prerequisites: AD 203 and AD 215.</p> <p>Continued development of studio skills using one process, with an emphasis on creating editions.</p>
<p>AD 217 Photography: Color 4 cr. Offered: Fall Prerequisite: AD 117</p> <p>Introduction to color photography using film and electronic media. Light and film, additive and subtractive color, print forms and print presentation are emphasized.</p>	<p>AD 415 Printmaking/Papermaking: Seminar 4 cr. Offered: Fall Prerequisites: AD 315 and junior standing or instructor's permission.</p> <p>Production of a body of work using one process, with an emphasis on development of a personal ideology.</p>
<p>AD 317 Photography: Seminar 4 cr. Offered: Winter Prerequisites: AD 203 and AD 217.</p> <p>Introduction of studio lighting (including tungsten and strobe lights) using black and white materials. Application of the 4 x 5 view camera for studio work is introduced. An emphasis is made on refinement of black and white print quality.</p>	<p>AD 452 Printmaking/Papermaking: BFA Seminar 4 cr. Offered: Fall, Winter Prerequisites: AD 303, AD 415 and junior standing or instructor's permission.</p> <p>Production of a body of work and a support paper that continue the development of ideological concerns.</p>
<p>AD 417 Photography: Seminar 4 cr. Offered: Fall Prerequisites: AD 317 and junior standing or instructor's permission.</p> <p>Advanced studio application of the 4 x 5 view camera using color transparency. Utilization of the computer with photographic image making is presented. Students develop portfolios with an emphasis on continuity.</p>	<p>Product Design</p> <p><i>Note: 100 and 200 level product design courses are not available; courses established through advisement.</i></p> <p>AD 327 Product Design Seminar 4 cr. Offered: Fall Prerequisite: AD 203</p> <p>Design and construction of full size working products as a portfolio and the writing of a support paper. Emphasis is placed on understanding the various parameters of usefulness, cost and appearance that form a design problem.</p>

AD 427 Product Design: Seminar 4 cr.
 Offered: Winter
 Prerequisites: AD 327 and junior standing or instructor's permission.
 Continued development of a professional portfolio and written support paper from AD 327. Emphasis is placed on the application of ideological and theoretical knowledge.

AD 464 Product Design: BFA Seminar 4 cr.
 Offered: Fall
 Prerequisites: AD 303, AD 427 and junior standing or instructor's permission.
 Continued development of ideological and theoretical concerns. Emphasis is placed on preparing a selection of work as a professional portfolio and writing a paper supporting the activity.

Sculpture

AD 116 Sculpture 4 cr.
 Offered: Fall
 Introduction to methods and techniques of sculpture and its cognate support.

AD 216 Sculpture: Bronze and Aluminum Casting 4 cr.
 Offered: Winter
 Development of skills and concepts in the production of sculpture using bronze and aluminum casting. Concentration is on learning the operation of production casting and mold making.

AD 316 Sculpture 4 cr.
 Offered: Winter
 Prerequisites: AD 116, AD 203, AD 216 and WD 140.
 Development of skills and concepts in the production of welded steel sculpture within the context of architecture and the environment. Ideations are directed toward large scale operations and productions.

AD 416 Sculpture: Seminar 4 cr.
 Offered: Fall
 Prerequisites: AD 316 and junior standing or instructor's permission.
 Production of a group of artwork focusing on multi-media assemblage, found objects and combined technologies.

AD 453 Sculpture: BFA Seminar 4 cr.
 Offered: Fall, Winter
 Prerequisites: AD 303, AD 416 and junior standing or instructor's permission.
 Continued development of ideological concerns in the production of studio art work as contracted with the instructor.

Woodworking

AD 124 Woodworking: Joinery and Greenwood 4 cr.
 Offered: Fall
 Introduction to traditional hand tool joinery and greenwood process through the production of social goods and the identification of a personal mode of practice.

AD 224 Woodworking: Turning and Bending 4 cr.
 Offered: Winter
 Introduction to wood turning and bending through the production of social goods and the identification of a personal mode of practice.

AD 324 Woodworking: Seminar 4 cr.
 Offered: Fall
 Prerequisites: AD 124, AD 203 and AD 224.
 Development of a professional portfolio and a written support paper. Emphasis is placed on understanding the various parameters of usefulness, cost and appearance that form the design problem.

AD 424 Woodworking: Seminar 4 cr.
 Offered: Winter
 Prerequisites: AD 324 and junior standing or instructor's permission.
 Continued development of a professional portfolio and written support paper from AD 324. Emphasis is placed on the application of ideology and theory.

AD 461 Woodworking: BFA Seminar 4 cr.
 Offered: Fall
 Prerequisites: AD 303, AD 424 and junior standing or instructor's permission.
 Continued development of ideological and theoretical concerns. Emphasis is placed on preparing a selection of work as a professional portfolio and writing a paper supporting the activity.

**Art Elementary Education
 (for elementary education majors)**

AD 310 Art for the Elementary Classroom Teacher 2 cr.
 Offered: Fall, Winter, Summer
 Prerequisite: Admission to teacher education.

A survey of a variety of teaching strategies to implement concepts of knowledge, values and skills in the art classroom. Special emphasis is placed on art criticism, aesthetics, art history, art production, child development, drawing, painting, paper, crayons, printmaking, fibers and lesson planning.

Art Secondary Education**(for secondary certification K-12)****AD 248 Introduction to Art Education**

4 cr.

Offered: Fall

Prerequisites: AD 175, AD 270, a minimum grade point average of 2.70 in the department and admission to a teacher education program. Students must have either a portfolio review of previous work or have satisfactorily completed AD 203.

An introduction in which a variety of teaching strategies is explored to implement concepts of knowledge, values and skills with different media in the art classroom. Special emphasis is placed on comprehensive art education, audiovisual productions, planning and organization of an art room and the writing of lesson plans.

AD 302 Media and Methodology for Art Education

4 cr.

Offered: Fall

Prerequisites: ED 201, ED 231, ED 301, PPST/basic skills test and AD 248.

To explore a variety of media used in the art classroom and to gain knowledge, values and skills in writing comprehensive art education lessons. To implement lesson plans in the schools/museums for practical application.

AD 350 Curriculum Theory and Objectives for Art Education

4 cr.

Offered: Winter

Prerequisites: Admission to the methods phase of teacher education, AD 248 and AD 302 with a minimum grade of "B" and a minimum GPA of 2.70 in the department. Transfer or post-baccalaureate students must have a portfolio of their work approved by the department.

An examination of how the history of art education influences art curricula today. Special emphasis is placed on a written fifteen week curriculum, discussion of creative problem solving, discipline, motivation, evaluation and a pre-student-teaching experience in the public schools. Other instructors must be informed of this commitment to avoid conflict of obligations.

Note: May not be applied toward a non-teaching major or any minor in art and design. The art education courses listed above must be taken sequentially.

Individual Art Review Courses**AD 103 Individual Art Review**

1 cr.

Offered: Fall, Winter

Graded S/U

Introduction to the profession's requirements and the range of opportunities in the visual arts. Students begin the development of the portfolios required for their application to the upper division in the department.

AD 203 Individual Art Review

2 cr.

Offered: Fall, Winter

Graded S/U

Prerequisites: AD 103 (with a grade of "S") and instructor's permission (of selected concentration), AD 160 and AD 175 (or concurrent enrollment) and 200-level seminar. Students must also attain a "B-" (2.7) average in their selected studio concentration to enroll.

Preparation of portfolios and resumes for evaluation before full-time faculty of the Department of Art and Design. Concurrent enrollment in a 300-level studio course is possible only with the adviser's consent, since a passing grade in AD 203 is generally considered a requirement for enrollment in the department's upper division. This course may be repeated, but students receiving one or more grades of Unsatisfactory or Withdrawal will not be allowed to continue in the program.

AD 303 Individual Art Review

2 cr.

Offered: Fall, Winter

Graded S/U

Prerequisites: AD 203 (with a grade of S), AD 270 and 300-level seminar (or concurrent enrollment), plus permission of the instructor of the particular studio area. Students must also attain a "B-" (2.7) average in their selected studio concentration to enroll.

Students identify the characteristics of professionalism and the ability to discuss their art work with small groups of faculty. Students are expected to develop resumes, statements about their intent with an emphasis on the social, visual and ideological aspects of the visual arts, color transparencies of work and a professional portfolio presentation. This course may be repeated, but students receiving one or more grades of Unsatisfactory or Withdrawal will not be allowed to continue in the program.

AD 403 Individual Art Review

2 cr.

Offered: Fall, Winter

Graded S/U

Prerequisites: AD 303 (with a grade of S) and acceptance of the AD 403 Portfolio Review Application.

Preparation of a collection of work to demonstrate the student's professional competence for exhibit presentation in a departmentally approved gallery.

Special Courses**AD 291 Studio Workshop**

1-4 cr.

Offered: On demand.

Prerequisite: Freshman or sophomore standing.

A course designed to develop specific studio skills of students who are interested in enhancing the classroom studio experience.

AD 295 Special Topics in Art and Design

1-4 cr.

Offered: On demand.

Prerequisite: Freshman or sophomore standing.

A course providing art and design experiences not emphasized in regular course offerings.

Note: May be repeated if topic differs.

AD 298 Directed Study 1-4 cr.
Offered: On demand.
Prerequisite: Freshman or sophomore standing and instructor's permission.

A course arranged by contract with the instructor of a particular studio area.

AD 299 Associate Research 4 cr.
Offered: Fall
Prerequisite: Open to associate degree candidates only.

Individual study with an instructor of a particular studio concentration exploring and using techniques, materials and processes. It must be taken at the hours for regularly presented studio classes in the concentration.

AD 450 Studio Practice 2-4 cr.
Offered: On demand.

Prerequisites: Junior standing and department head permission. Open only to those students who, through transfer or departmental evaluation, do not have enough credits for graduation from a particular area of studio concentration.

A course arranged by contract with the instructor of a particular studio concentration.

AD 491 Studio Workshop 1-4 cr.
Offered: On demand.
Prerequisites: Junior, senior or graduate standing.

A course designed to develop specific studio skills of students who are interested in enhancing the classroom studio experience.

AD 492 Internship in Art and Design 1-4 cr.
Offered: On demand.
Graded S/U

Prerequisites: AD 160, AD 175, AD 203, AD 303, AD 270, GPA 2.7, junior standing and approval of the major professor.

The object of this course is to provide Art and Design majors with professional work experience in their chosen area of concentration.

AD 495 Special Topics in Art and Design 1-4 cr.
Offered: On demand.
Prerequisites: Junior standing and instructor's permission.

A course providing art and design experiences not emphasized in regular course offerings.

Note: May be repeated if topic differs.

AD 498 Directed Study 1-4 cr.
Offered: On demand.
Prerequisites: Junior standing and instructor's permission.

A course arranged by contract with the instructor of a particular studio area.

AIS-ACADEMIC INFORMATION SERVICES

AIS 101 Introduction to Information Resources 1 cr.
Offered: Fall, Winter

A practical introduction to the organization of information. The course includes instruction and practice in the use of the library, basic reference materials, the online catalog, CD-ROMs, periodical indexes and government documents. Open to all students, it is especially recommended for first year students.

AIS 295 Special Topics 1-4 cr.
Offered: On demand.

Investigation of a significant topic. Content varies.

AIS 296 Special Topics 1-4 cr.
Offered: On demand.
Graded S/U

Investigation of a significant topic. Content varies.

AIS 330 Management and Use of Archival Information 4 cr.
Offered: Every other Winter

Examination of the knowledge, theory and related skills required to manage archival information. This course will review the nature of information, records, historical documentation, research methodologies and the role of archives in modern society. Students will learn and apply in practicum exercises the theories and skills necessary to understand and implement archival functions and research methodologies.

AIS 435 Research Using Digital Information Resources 2 cr.
Offered: Fall
Prerequisites: Junior standing or instructor's permission.

A theoretical and practical study of digital information resources. Hands-on practice with searching digital information resources (Internet, online databases, e-journals) is an integral part of the course. Issues such as access, copyright, preservation, authorship, ownership, organization, citation formats and content evaluation will be discussed as they apply to locating and using digital information resources.

AIS 491 Workshops and Seminars in Library and Information Science 1-4 cr.
Offered: On demand.
Graded S/U

Prerequisites: Junior standing or instructor's permission.

Opportunities for the concentrated study of selected library and information topics.

Note: May be repeated if topic differs.

AIS 495 Special Topics in Library and Information Science 1-4 cr.
Offered: On demand.
Prerequisites: Junior standing or instructor's permission.

An opportunity to study resources and issues in library and information science that are not part of established courses.

AIS 496 Special Topics in Library and Information Science 1-4 cr.
 Offered: On demand.
 Graded S/U
 Prerequisites: Junior standing or instructor's permission.
 Investigation of significant topic. Content varies.

AH-ALLIED HEALTH

AH 102 Growth and Development 3 cr.
 Offered: Fall, Winter

Developing a concept of human life from birth to death. Emphasis is on the normal stages of growth and development of the human being, incorporating the particular nutritional requirements of each stage. This course serves as a framework within which students (1) explore their own feelings concerning the life process and (2) develop a philosophy concerning the appreciation of that process.

AH 125 Clinical Assistant Skills 3 cr. (2-0-2)
 Offered: Winter

This course introduces the clinical assistant to the basic skills that are required to carry out select patient interventions in varied health care settings. The student practices and then performs select clinical skills on patients in health care settings.

AMT-AVIATION MAINTENANCE TECHNOLOGY

Technology and Occupational Sciences Department

AMT 101 Introduction to Aviation Maintenance 6 cr.
 Offered: Fall

A study of fundamentals of aviation maintenance. Topics include: aircraft familiarization, nomenclature, physics of flight, flight-line safety, aviation math, physics and basic electricity.

AMT 102 Aircraft Basic Science 6 cr.
 Offered: Fall

Identification, selection and use of FAA publications related to aircraft maintenance, determination of authority to return to service, mechanic's privileges and limitations, use of aircraft records, familiarization with aircraft drawings and aircraft weight and balance.

AMT 103 Aviation Shop Practices 6 cr.
 Offered: Fall

A study of the use of basic hand tools and power equipment, shop safety, fluid lines and fittings, materials and processes, cleaning and corrosion control, the use and care of precision measuring tools and the use and interpretation of various non-destructive inspection methods.

AMT 104 Aircraft Electrical Systems 6 cr.
 Offered: Winter

A study of the reading and interpretation of aircraft electrical diagrams and schematics, theory of operation and repair of aircraft electrical generation and regulation systems, airframe and power plant warning and control systems.

AMT 200 Aircraft Sheet Metal/Non-Metallic Structures 6 cr.
 Offered: Winter

Prerequisites: AMT 101, AMT 102, AMT 103, AMT 104 or instructor's permission.

A study of aircraft sheet metal structural fabrication and repair methods, wood, fabric, composite and plastic aircraft components construction and repair.

AMT 201 Reciprocating Engines and Propellers 6 cr.
 Offered: Winter

Prerequisites: AMT 101, AMT 102, AMT 103, AMT 104 or instructor's permission.

An in-depth study of the theory of operation of reciprocating engines and their systems, propeller systems, construction, operation, maintenance and repair.

AMT 202 Aircraft Flight Control Systems 6 cr.
 Offered: Fall

Prerequisites: AMT 101, AMT 102, AMT 103, AMT 104 or instructor's permission.

A detailed study of aircraft flight control system installation, rigging and requirements for methods of aircraft inspection. Helicopter aerodynamics, assembly, rigging and components.

AMT 203 Reciprocating Engine Overhaul 6 cr.
 Offered: Fall

Prerequisites: AMT 101, AMT 102, AMT 103, AMT 104, AMT 201 or instructor's permission.

The study of overhaul practices of reciprocating aircraft engines. Includes removal/reinstallation, inspection, overhaul, maintenance, repair and troubleshooting of aircraft reciprocating engines and systems.

AMT 204 Turbine Engines and Systems 6 cr.
 Offered: Fall

Prerequisites: AMT 101, AMT 102, AMT 103, AMT 104 or instructor's permission.

The study of the theory of operation of aircraft turbine engines and their associated systems.

AMT 205 Aircraft Fluid Power and Landing Gear 6 cr.
 Offered: Winter

Prerequisites: AMT 101, AMT 102, AMT 103, AMT, 104 or instructor's permission.

A detailed study of aircraft hydraulic, pneumatic and landing gear system operation, maintenance and repair.

AMT 206 Cabin Atmosphere and Information Systems 6 cr.

Offered: Winter

Prerequisites: AMT 101, AMT 102, AMT 103, AMT 104 or instructor's permission.

The study of aircraft cabin atmospheric control systems including heating, cooling, cabin pressurization systems and oxygen systems. Also aircraft instruments, ice and rain control, communication and navigation system installation, maintenance and repair.

AMT 207 Turbine Engine Maintenance and Inspection 6 cr.

Offered: Winter

Prerequisites: AMT 101, AMT 102, AMT 103, AMT 104, AMT 204 or instructor's permission.

The study of overhaul and repair procedures for aircraft gas turbine engines. The course provides the hands-on practical experience necessary to inspect, overhaul, maintain and repair turbine engines.

AN - ANTHROPOLOGY

Sociology and Social Work Department

AN 100 Introduction to Socio-Cultural Anthropology 4 cr.

Offered: Fall

- Satisfies the foundations of social sciences requirement.
- Satisfies the world cultures requirement.

The significance of culture and society as means of adapting to a varied and changing environment. Adaptation and cultural evolution are examined through a cross-cultural study of economic, social, political and ideological institutions. Art, music and language are also discussed.

AN 101 Introduction to Physical Anthropology and Archeology 4 cr.

Offered: Contact department for information.

An introduction to current evidence for human evolution. The fossil record, genetics, primate studies and archaeological evidence are inter-related to provide a complete understanding of our present status as homo sapiens.

AN 210 People, Culture and Nature 4 cr.

Offered: Every other Fall

- Satisfies the foundations of social sciences requirement.
- Satisfies the world cultures requirement.

Study of the impact of society, culture and environment on the way people live. The elements of socio-cultural systems of various types of tribal and modern societies are compared. Broad trends and relationships are stressed; the course utilizes knowledge from biology, social science, psychology and ecology.

AN 295 Special Topics in Anthropology 1-4 cr.

Offered: Contact department for information.

Development of anthropological topics not addressed in regular courses, depending on faculty expertise and student needs.

Note: May be repeated if topic differs.

AN 320 Native Peoples of North America 4 cr.

Offered: Every other Fall

Prerequisites: AN 100 or instructor's permission. If taken as upper division liberal studies course, completion of foundations of communication requirement and sophomore standing also are required.

- Satisfies the foundations of social sciences requirement.
- Satisfies the upper division liberal studies requirement.
- Satisfies the world cultures requirement.

Analysis of the cultural variability of the North American Indians and Inuit's prior to European contact, as well as the effects of this contact on the indigenous peoples. Concludes with a discussion of contemporary problems of the native peoples of North America.

AN 330 Indians of the Western Great Lakes 4 cr.

Offered: Contact department for information.

Prerequisites: AN 100 or AN 210.

An introduction to the cultures of the native peoples of the Western Great Lakes. The course focuses on a comparative examination of the life ways of the Indians before European contact and an assessment of the impact of European contact on these cultures. Particular attention is given to how the different environments of the Western Great Lakes Region influenced the particular Indian lifestyles and how people at various times adapted to these differing environments. Special attention is given to the Indians of Michigan.

AN 355 Seminar in Archaeological Field Methods 2-10 cr.

Offered: Contact department for information.

Prerequisites: AN 101 or instructor's permission.

Introduction to archaeological field methods through participation in actual site survey and excavation. Instruction is given in excavation procedures, survey techniques, recording, photography, preservation, cataloging and preliminary analysis.

Note: May be repeated if the experience differs. No more than 10 credits may be applied toward the minor in anthropology.

AN 382 Health, Society and Culture 4 cr.

Offered: Every other Fall.

Prerequisites: SO 101 or AN 100 or instructor's permission.

Cross listed as SO 382.

Analysis of behavioral science dimensions of health systems and health institutions at a national level, with special emphasis on the United States. The behavioral science approach to problems of health and disease is discussed, along with social and cultural factors relating to the occurrence and distribution of disease. American medical systems and institutions are analyzed in terms of political and economic factors, types of practitioners, the distribution of health services and personnel and in comparison with medical systems in other societies.

AN 495 Special Topics in Anthropology 4 cr.

Offered: Contact department for information.

Prerequisites: AN 100 or AN 210 for cultural anthropology topic; AN 101 for physical anthropology and archaeology topic; junior standing or instructor's permission.

Topic to be announced.

Note: May be repeated if topic differs.

AN 498 Directed Study in Anthropology 1-4 cr.

Offered: Contact department for information.

Prerequisites: Two anthropology courses, junior standing and instructor's permission.

A course for students desiring work in areas not covered in existing courses.

AS - ASTRONOMY**Physics Department****AS 103 Observational and Solar System Astronomy** 4 cr. (3-0-3)

Offered: Fall, Summer

Prerequisites: High school algebra or MA 100.

- Satisfies the foundations of natural sciences/mathematics requirement.
- Satisfies the laboratory course graduation requirement.

History of astronomy; observational astronomy; basic science principles and how they relate to astronomy; the celestial sphere and coordinate systems; star charts; telescopes; formation and evolution of the solar system; planetary characteristics (internal structure, surfaces, atmospheres); and comets and asteroids.

Note: This course may not be taken for credit toward the physics major or minor.

AS 104 Stellar/Galactic Astronomy and Cosmology 4 cr. (3-0-3)

Offered: Winter

Prerequisites: High school algebra or MA 100.

- Satisfies the foundations of natural sciences/mathematics requirement.
- Satisfies the laboratory course graduation requirement.

The nature and life cycle of stars including nova and supernova, black holes, white dwarfs and neutron stars; characteristics of the sun; basic scientific principles and how they relate to stellar characteristics; formation and evolution of galaxies; stellar and galactic distance determination methods; spectroscopy; models of formation, evolution and expansion of the universe (cosmology).

Note: This course may not be taken for credit toward the physics major or minor.

AS 495 Special Topics 1-4 cr.

Offered: On demand.

Prerequisites: Junior standing or instructor's permission.

A course devoted to a particular topic in astronomy that is not included in the regular courses or to meet the special needs of a group of students.

Note: This course may be repeated if the topic is different.

ATR - ATHLETIC TRAINING**Health, Physical Education and Recreation Department****ATR 110 Introduction to Athletic Training** 1 cr.

Offered: Fall, Winter

An introduction to the field of athletic training including professional organizations, certification information, job employment settings and basic prevention and care techniques. National Athletic Trainers Association's (NATABOC) domains of athletic training will be used to provide students with an understanding of the profession.

ATR 241 Prevention and Care of Athletic Injury 3 cr. (2-0-2)

Offered: Winter

Prerequisite: BI 201

An introduction to basic injury recognition, prevention and evaluation procedures. Focus will be on, but not limited to, internal athletic injuries, head and neck injuries, heat related illnesses and basic emergency procedures. Along with "hands-on" experience, students will obtain an understanding of basic anatomy, injury evaluation, and recognition and treatment of many athletic injuries.

ATR 292A: Introduction to Practicum I 1 cr.

Prerequisites: Admission into the Athletic Training Program, ATR 110 and ATR 241.

This clinical lab and clinical athletic training experience will focus on the development of and competence in lower extremity palpation, taping and wrapping techniques and emergency procedures. Students will be required to successfully complete all course competencies before moving on to the next practicum.

ATR 292B: Introduction to Practicum II 1 cr.

Prerequisite: ATR 292A

This clinical and clinical athletic training experience will focus on the development of and competence in upper extremity palpation, taping and wrapping techniques, custom padding and non-theoretical modality usage. Students will be required to successfully complete all course competencies before moving on to the next practicum.

ATR 320 Advanced Assessment Techniques in Athletics Training I (Lower Quadrant) 3 cr. (2-0-2)

Prerequisites: ATR 110, ATR 241 and BI 201.

This course is designed to explore in depth, the modern techniques used in the evaluation of athletic injuries to the lower region of the body, including the foot, ankle, knee, hip and lower spinal region. Particular emphasis will be placed on taking a medical history, performing a medical observation, physical palpation, functional testing and special testing. This course will also include an emphasis on injury pathology and a unit on general medical conditions common to athletics.

ATR 321 Advanced Assessment Techniques in Athletics Training II (Upper Quarter) 3 cr. (2-0-2)
Prerequisite: ATR 320

This course is designed to explore in depth, the modern techniques used in the evaluation of athletic injuries to the upper region of the body, including the hand, wrist, elbow, shoulder, neck, head and trunk. Particular emphasis will be placed on taking a medical history, performing a medical observation, physical palpation, functional testing and special testing. The student will be made aware of the key signs and symptoms that indicate specific athletic-related injuries and conditions. This course will also focus on injury pathology. A unit on pharmacology will also be included.

ATR 360 Therapeutic Exercise and Rehabilitation Techniques 4 cr.
Prerequisites: ATR 241, ATR 292A and 292B.

The student will be exposed to a wide variety of rehabilitation techniques, including aquatic therapy, plyometrics, stretching, etc. Students will learn basic guidelines of injury rehabilitation including goals, progression, functional testing, return to play and referral, etc. Certain specific rehabilitation protocols will also be discussed.

ATR 380 Therapeutic Modalities 2 cr.
Prerequisites: ATR 110, ATR 241, ATR 320, ATR 321 and ATR 360.

This course is designed to provide information in regards to utilizing various therapeutic modalities into rehabilitation programs. Theory, indication, contraindications and precautions in areas of ultrasound, electrical stimulation, cryotherapy, thermotherapy and manual therapy will be covered.

ATR 392A Intermediate Practicum 2 cr.
Prerequisites: ATR 241, ATR 292A and ATR 292B.

This clinical athletic training experience will involve student participation at one of the ATR programs established on campus or affiliated athletic training sites. Students will work under the direct supervision of an ATC and will be expected to utilize skills, in which they have demonstrated competence. Students will also be expected to develop and become competent in lower extremity manual muscle testing techniques, goniometric assessments and complete evaluation methods.

ATR 392B Intermediate Practicum 2 cr.
Prerequisites: ATR 292A/B and admission to athletic training program.

Continuation of ATR 392A with emphasis on upper extremity.

ATR 410 Athletic Training Policies and Procedures 2 cr.
Prerequisites: ATR 110, ATR 241, admission to the athletic training program, junior standing or instructor's permission.

This course is designed to expose students to the many management and administrative duties for which athletic trainers are responsible. This includes, but is not limited to, managing a budget, staffing, developing and implementing policies, and communicating with athletes, coaches, parents and others. Record keeping and organization will also be stressed.

ATR 490 Seminar in Athletic Training 2 cr.
Prerequisites: ATR 110, ATR 241, ATR 320, junior standing or instructor's permission.

Students will be exposed to current topics of interest and issues in athletic training. Continuing education will be stressed. Developing discussion skills in athletic training will also be reinforced. In addition, a unit on counseling and a unit on research will be included in this course.

ATR 492A Advanced Practicum in Athletic Training 2 cr.
Prerequisites: ATR 292, ATR 392, admission to athletic training program, junior standing or instructor's permission.

This clinical athletic training course is designed to allow students, under direct supervision, to utilize all skills in which they have achieved competence. Particular emphasis in the areas of record keeping, development of the relationship of the sports medicine team and decision making skills.

ATR 492B Advanced Practicum in Athletic Training 2 cr.
Prerequisites: ATR 292, ATR 392, admission to athletic training program, junior standing or instructor's permission.

A continuation of the clinical athletic training course designed to allow students, under direct supervision, to utilize all skills in which they have achieved competence. Particular emphasis in the areas of record keeping, development of the relationship of the sports medicine team and decision making skills.

ATR 499 Internship in Athletic Training 2-8 cr.
Graded S/U
Prerequisites: instructor's permission only.

The internship in athletic training is a course designed specifically for upper level athletic training students who have completed a majority of program competencies and proficiencies and are ready to apply their skill in the field. This course is also appropriate for graduate level students who are pursuing a career in the field of athletic training.

BC - BROADCASTING

Communication and Performance Studies Department

BC 165 Introduction to Mass Media 4 cr.
Offered: Fall, Winter

Examination of contemporary mass media in the United States, including the press, movies, radio, television and new mass communication technologies. These will be studied from several perspectives – historical, economic, social and political.

BC 245 Radio-TV Performance 4 cr.
Offered: Infrequently

Introduction to the basic verbal and visual elements for students interested in performance for radio or television. Audio elements include diction, enunciation, pronunciation and microphone techniques. Visual elements include posture, movement and expression. Students will perform announcements, news, commercials, interviews and drama.

<p>BC 265 Writing and Announcing for Broadcast 4 cr. Offered: Fall, Winter</p> <p>Introduction to the basic planning, writing and performance elements in electronic media production. Students write scripts for a variety of program formats, including commercials, public service announcements, news, interviews and documentaries. Performance elements include diction, enunciation, pronunciation, script interpretation, microphone techniques, posture, movement and expression.</p>	<p>BC 320 Electronic Media Management 4 cr. Offered: Every 5th semester</p> <p>Contemporary problems faced by managers of radio, television and cable TV stations are studied. Solutions to those problems and the decision-making process are analyzed.</p>
<p>BC 271 Audio Production 4 cr. (2-0-4) Offered: Fall</p> <p>Introduction to skills used in audio recording and program production. Covers the theoretical background of the field and extensive applied laboratory experiences.</p>	<p>BC 325 Communication and Performance in Africa 4 cr. Offered: Fall, Winter Prerequisites: Completion of the foundations of communications requirement and sophomore standing or instructor's permission.</p> <ul style="list-style-type: none"> • Satisfies the foundations of visual and performing arts requirement. • Satisfies the upper division liberal studies requirement. • Satisfies the world cultures requirement. <p>This course examines a range of different performance genres in Africa and the relationship of those performance genres to social process. The course reviews pre-colonial performance genres including African storytelling, African oratory and praise poetry, and African rites and rituals—all of which incorporate music and dance traditions. The course also examines modern and post-modern African performance genres including popular theatre, radio and television broadcasts, music, cinema, and indigenous video production.</p>
<p>BC 272 Studio Television Production 4 cr. (2-0-4) Offered: Fall, Winter</p> <p>Introduction to the theory and practice of producing contemporary studio television programs. Includes program aesthetics, production planning, visual design, scripting, rehearsing and directing.</p>	<p>BC 365 Broadcast News Writing and Reporting 4 cr. Offered: Fall Prerequisite: BC 265</p> <p>An opportunity to study the craft of writing and field reporting for television news. Instruction on writing, story structure, source development, news judgment, ethics and law is put into practice as students shoot, edit and write six local news reports that will be aired on <i>Public Eye News</i>, the student newscast on Public TV 13. Students in BC 365 will also serve as associate producers one day each week for <i>Public Eye News</i>.</p>
<p>BC 273 Electronic Field Production 4 cr. Offered: Infrequently</p> <p>Basic theories and techniques of single camera electronic field production. Includes program aesthetics, production planning, scripting, shooting, sound recording, video tape editing and post-production processes. Students produce several projects.</p>	<p>BC 410 The Documentary 4 cr. Offered: Every 5th semester Prerequisites: Junior standing or instructor's permission.</p> <p>Examination of the documentary genre with emphasis on its application and form in radio and television. Topics considered are the historical development of the documentary form, definitions of "documentary," the current role and future potential of the documentary.</p>
<p>BC 291 Broadcast Practicum 1-4 cr. Offered: On demand. Prerequisite: Instructor's permission.</p> <p>Practice in operational positions in broadcasting under the supervision of media professionals and a faculty member.</p> <p><i>Note: May be repeated for up to 4 credits in combination with BC 491.</i></p>	<p>BC 415 Intercultural Communication 4 cr. Offered: Fall Prerequisites: BC 165 and SP 110, junior standing or instructor's permission.</p> <ul style="list-style-type: none"> • Satisfies the world cultures requirement. • Does not satisfy the upper division liberal studies requirement. <p>This course examines cultural differences in communication styles and systems across a variety of national and American sub cultural groups. Communication studied includes both interpersonal and mass mediated message systems.</p>
<p>BC 295 Special Topics in Broadcasting 1-4 cr. Offered: On demand.</p> <p>Intended for underclassmen. Investigation of a significant topic or theme.</p> <p><i>Note: May be repeated if topic differs.</i></p>	
<p>BC 310 Sports and Special Events Programming 4 cr. Offered: Every 5th semester Prerequisites: BC 165 and ESPR 260 or instructor's permission. BC 265 is recommended, but not required.</p> <p>Students work as a team to produce and promote sports and entertainment programming for television. Productions may include local high school and college sporting events. Students will learn the basics of live announcing, pre-event research, recording sports statistics and creating promotional broadcast announcements. Students will participate as a technical crew member for productions. Course work will include lecture and field experience.</p>	

<p>BC 420 Global Communication 4 cr. Offered: Winter Prerequisites: BC 165, junior standing or instructor's permission.</p> <p>The term "globalization" as applied to mass media refers to the convergence of the world's formerly diversely organized media systems into profit-making enterprises, mostly owned or controlled by giant multinational firms. This course will introduce students to the phenomenon of media globalization through a review of its economic and policy foundations. It will then examine some of the effects of media globalization on information flow and on the framing of world issues.</p>	<p>BC 473S Advanced Media Production-Studio Television Production 4 cr. Offered: Infrequently Prerequisites: Corresponding 200 level production course, junior standing or instructor's permission.</p> <p>Study of advanced production theory, method and technique. Students put theory into practice through extensive laboratory work.</p> <p><i>Note: May be repeated if topic differs.</i></p>
<p>BC 470 Mass Communication Law 4 cr. Offered: Fall, Winter Prerequisites: BC 165, junior standing or instructor's permission.</p> <p>Analysis of the legal parameters within which the print and electronic media must operate including First Amendment freedoms, libel, copyright and Federal Communication Commission rules and regulations.</p>	<p>BC 473W Advanced Media Production-Script Writing 4 cr. (3-0-2) Offered: Every 5th semester. Prerequisites: Corresponding 200 level production course, junior standing or instructor's permission.</p> <p>Study of advanced production theory, method and technique. Students put theory into practice through extensive laboratory work.</p> <p><i>Note: May be repeated if topic differs.</i></p>
<p>BC 471 Mass Communication and Society 4 cr. Offered: Winter Prerequisites: BC 165 and senior or graduate standing or instructor's permission.</p> <p>Study of the social, legal and economic basis of radio, television, newspapers and film in the United States, with emphasis on the roles played by the media, the government and the public in the process of mass communication.</p>	<p>BC 485 Radio and Television Utilization 2 cr. (1-0-2) Offered: Infrequently</p> <p>Introduction to the process of producing radio and television programs. Includes production planning and operation of studio laboratory equipment. Specifically designed for those who desire a knowledge of these two media for application in other fields. Laboratory production directing experience under faculty supervision.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>BC 473A Advanced Media Production-Audio 4 cr. Offered: Winter Prerequisites: Corresponding 200 level production course, junior standing or instructor's permission.</p> <p>Study of advanced production theory, method and technique. Students put theory into practice through extensive laboratory work.</p> <p><i>Note: May be repeated if topic differs.</i></p>	<p>BC 490 Senior Seminar in Broadcasting 4 cr. Offered: Contact department for information. Prerequisites: Junior standing or instructor's permission.</p> <p>A course for broadcasting and mass communication majors designed to stimulate students to unify all areas of their disciplines.</p>
<p>BC 473F Advanced Media Production-Field Television Production 4 cr. Offered: Winter Prerequisites: Corresponding 200 level production course, junior standing or instructor's permission.</p> <p>Study of advanced production theory, method and technique. Students put theory into practice through extensive laboratory work.</p> <p><i>Note: May be repeated if topic differs.</i></p>	<p>BC 491 Broadcast Practicum 1-4 cr. Offered: On demand. Prerequisites: Junior standing and instructor's permission.</p> <p>Practice in creative production and directing aspects of broadcasting under the supervision of media professionals and a faculty member.</p> <p><i>Note: May be repeated for up to four credits in combination with BC 291.</i></p>
<p>BC 473M Advanced Media Production-Multi-Media 4 cr. Offered: Infrequently Prerequisites: Corresponding 200 level production course, junior standing or instructor's permission.</p> <p>Study of advanced production theory, method and technique. Students put theory into practice through extensive laboratory work.</p> <p><i>Note: May be repeated if topic differs.</i></p>	<p>BC 492 Internship in Broadcasting 1-8 cr. Offered: On demand. Prerequisites: Junior standing and recommendation of selection committee. Available only to outstanding students as an elective.</p> <p>Practical, applied experience involving placement in a broadcast or mass media job situation.</p>

BC 495 Special Topics in Broadcasting 1-4 cr.

Offered: On demand.

Prerequisites: Junior standing or instructor's permission.

Special problems in broadcasting and mass communication such as mass communication research, station relations and promotion, satellite and CATV systems, international communication, media advertising, and telecom policy.

*Note: May be repeated if topic differs.***BC 498 Directed Studies in Broadcasting** 1-4 cr.

Offered: On demand.

Prerequisites: Junior standing, instructor and department head permission.

Independent study by undergraduates in an area of broadcasting and/or mass communication to be specified by the student and the instructor.

*Note: May be repeated for up to eight credits.***BI-BIOLOGY****Biology Department****BI 100 Biological Science** 4 cr. (3-0-2)

Offered: Fall, Winter

- Satisfies the foundations of natural sciences/mathematics requirement.

Study of fundamental concepts of biology that relate to problems confronting individuals and society. Topics include methods and limitations of science; human dependence on other organisms; problems related to food production, human reproduction, inheritance and disease; biological implications of modern technology; and biological problems likely to confront society in the future.

*Note: May not be applied toward a major or minor in biology.***BI 104 Human Anatomy and Physiology** 4 cr. (3-0-2)

Offered: Fall, Winter

- Satisfies the foundations of natural sciences/mathematics requirement.

Structure and function of the various systems of the human body. Laboratory includes models and specimens of human material and the collection and analysis of physiological data.

*Note: May not be applied toward any biology major or the biology education minor.***BI 111 Introductory Biology: Principles** 4 cr. (3-0-2)

Offered: Fall, Winter

- Satisfies the foundations of natural sciences/mathematics requirement.

An introduction to the major principles of biology. Topics include chemistry of life, structure and function of cells, photosynthesis and respiration, mitosis and meiosis, heredity, molecular biology, evolution, and ecology.

BI 112 Introductory Biology: Diversity 4 cr. (3-0-2)

Offered: Fall, Winter

Prerequisite: BI 111

- Satisfies the foundations of natural sciences/mathematics requirement.

A survey of biological diversity including viruses, prokaryotes, protists, fungi, plants, and animals. Attention is also given to the structure and function of plant and animal organ systems.

BI 201 Human Anatomy 3 cr. (2-0-2)

Offered: Fall, Winter

Study of human anatomy, supplemented by laboratory work on models.

BI 202 Human Physiology 5 cr. (3-1-2)

Offered: Fall, Winter

Prerequisites: CH 105, CH 107 or CH 111. Recommended: a course dealing with anatomy. Highly recommended: completion of BI 201 or BI 221.

Studies of all systems of human physiology, supplemented by laboratory work which demonstrates basic physiological phenomena. Previous knowledge of anatomy and chemistry is required.

BI 203 Medical Microbiology 5 cr. (3-0-4)

Offered: Fall, Summer

Prerequisites: BI 100 or BI 104 or BI 112 or BI 202.

Introduction to medically important microorganisms; the role of microbes in human health, infection and immunity. Laboratory focuses on the experimental approach to microbiology.

BI 206 Human Genetics 3 cr.

Offered: Fall

Prerequisites: Sophomore standing or instructor's permission.

A non-technical course designed to introduce fundamentals of variation and inheritance in humans. May not be applied toward any biology major or the biology secondary teaching minor.

BI 210 Principles of Ecology 4 cr. (3-0-3)

Offered: Fall, Winter

Prerequisite: BI 111 and BI 112.

Lectures, field and laboratory studies dealing with the relationships between plants, animals, humans and the ecosystem.

BI 218 Introduction to Cell and Molecular Biology 4 cr. (3-0-3)

Offered: Winter

Prerequisites: BI 111, CH 105, CH 107 or CH 111, CH 112.

Introduction to the structure and function of prokaryotic and eukaryotic cells, including membrane structure and transport, organelle structure and function, cytoskeletal proteins, cell division, gene structure, mechanisms of gene regulation, and the role of gene expression in producing cell structures and in regulating cell function. Students will gain an understanding of recombinant DNA technology and how it is used to investigate the function of cells and genes. Laboratory work will include DNA isolation, restriction digestion and electrophoresis, PCR, Southern Blotting, bacterial transformation, microscopy, differential centrifugation, and spectrophotometry.

<p>BI 221 Comparative Anatomy 4 cr. (2-0-4) Offered: Fall Prerequisites: BI 111 and BI 112.</p> <p>Structural characteristics of representative chordates. Lectures deal with the evolution of body form, skeleton and organ systems as indicated by anatomical relationships. Laboratory work is devoted largely to dissection.</p>	<p>BI 305 Ecology of the Northern Forest 3 cr. (2-0-3) Offered: Fall Prerequisites: Completion of the foundations of communication requirement, sophomore standing and BI 111. Junior standing recommended.</p> <ul style="list-style-type: none"> • Satisfies the foundations of natural sciences/mathematics requirement. • Satisfies the upper division liberal studies requirement. <p>Study of the interactions of physical features, vegetation, animal life and human influences in the northern forests of North America, Europe and Asia through lectures, laboratories and field trips.</p> <p><i>Note: May not be applied toward any major in biology.</i></p>
<p>BI 222 Animal Physiology 4 cr. (3-0-3) Offered: Fall Prerequisites: BI 111, BI 112 and CH 220 or CH 321.</p> <p>Physiological functions and processes at the level of organs and organ systems, oriented primarily toward vertebrates. Energy relations, temperature effects, movement, circulation, respiration, water and solute regulation, membranes, nerve and muscle physiology.</p>	<p>BI 310 Ecology Theory and Methods 4 cr. (3-0-3) Offered: Fall Prerequisites: BI 210 or instructor's permission.</p> <p>Lectures, field and laboratory studies on advanced concepts relating plants and animals to their environment. This course expands on principles taught in BI 210.</p>
<p>BI 225 Physiology of Aging 3 cr. Offered: Contact department for information. Prerequisites: BI 104 or BI 111 or BI 202 or instructor's permission.</p> <p>This course is designed to introduce students to physiological changes associated with aging or age-related pathology. The roles of heredity, diet, exercise and lifestyle in the aging process as well as current theories of aging will be discussed.</p>	<p>BI 312 Genetics 4 cr. (3-0-2) Offered: Fall, Winter Prerequisites: BI 111, BI 112 or BI 202.</p> <p>Basic Mendelian laws, the nature of genes, and population genetics, with emphasis on genetics as a rapidly unfolding science. Genetics is related to theories concerning organic evolution.</p>
<p>BI 230 Plant Kingdom 4 cr. (2-0-4) Offered: Winter Prerequisites: BI 111 and BI 112.</p> <p>A treatment of form, life cycles and evolutionary relationships of algae, fungi, bryophytes and vascular plants. Laboratory work uses both living and preserved material.</p>	<p>BI 313 Cell Biology 4 cr. (3-0-3) Offered: Winter Prerequisites: BI 111 and BI 112, or BI 201, or BI 221 and CH 220, or CH 321, or instructor's permission.</p>
<p>BI 240 Conservation Biology 4 cr. Offered: Winter Prerequisite: BI 210</p> <p>Introduction to the basic scientific principles and concepts concerning the field of Conservation Biology. Topics include causes of extinction, genetic risks of small populations, habitat fragmentation and edge effects, metapopulations, threats of exotic species, nature preserve and corridor design, and strategies for protecting and restoring endangered species and ecosystems.</p>	<p>BI 315 Evolution 4 cr. Offered: Fall, Winter Prerequisites: BI 312 or instructor's permission.</p> <p>Evolution is the process by which heritable characteristics of species change. This course will emphasize evolutionary theory rather than evolutionary history. Topics include evolutionary genetics, adaptation and natural selection, speciation and evolution of higher taxa.</p>
<p>BI 295 Special Topics in Biology 1-4 cr. Offered: Contact department for information. Prerequisite: Instructor's permission.</p> <p>Variable content, depending on specialties of visiting staff and needs of students. For freshmen, sophomores and non-biology majors.</p> <p><i>Note: May be repeated if topic differs.</i></p>	<p>BI 321 Embryology 4 cr. (2-0-4) Offered: Winter Prerequisites: BI 221 or BI 201.</p> <p>Reproduction and development in animals, with particular emphasis on vertebrates. Laboratory work is based largely on the frog and chick.</p>
<p>BI 303 General Microbiology 5 cr. (3-0-4) Offered: Winter Prerequisites: BI 111 and BI 112 or CLS 204 and CLS 214 and CH 220 or CH 321; BI 312 recommended.</p> <p>Study of morphology, physiology, genetics and taxonomy of microbes and related laboratory techniques.</p>	

<p>BI 322 Vertebrate Zoology 4 cr. (4-0-0) Offered: Every other Winter. Prerequisites: BI 112, BI 315 recommended.</p> <p>Phylogeny, taxonomy, anatomy, physiology and behavior of vertebrates. Emphasis on the evolutionary history of major vertebrate taxa.</p>	<p>BI 410 Ecology of the Great Lakes 4 cr. Offered: Winter Prerequisites: BI 111, BI 112, BI 210, junior standing or instructor's permission.</p> <p>Lectures on the ecology of the Laurentian Great Lakes. Core subjects include biogeochemistry, community ecology and the ecological consequences of human activities including exotic species introductions, environmental pollution and natural resource management practices.</p>
<p>BI 390 Field Experience 1-2 cr. Offered: On demand. Graded S/U Prerequisites: Permission of supervising faculty member and department head. Can be repeated for up to six credits if topic varies.</p> <p>Practical experience in field biology under supervision of a faculty member engaged in research. A written report of the field experience will be required and placed on file in the department office.</p> <p><i>Note: A course subtitle on the student's transcript will describe the content of this course, e.g., BI 390 Field Experience in Woodcock Ecology.</i></p>	<p>BI 411 Limnology 4 cr. (3-0-3) Offered: Fall Prerequisites: BI 210 and CH 112, junior standing or instructor's permission.</p> <p>Physical, chemical and biological aspects of lakes and streams. Laboratory work includes methods and instruments of field studies.</p>
<p>BI 391 Laboratory Experience 1-2 cr. Offered: On demand. Graded S/U Prerequisites: Permission of supervising faculty member and department head.</p> <p>Practical experience in laboratory biology under supervision of a faculty member engaged in research. A written report of the laboratory experience will be required and placed on file in the department office.</p> <p><i>Note: May be repeated for up to six credits if topic differs. A course subtitle on the student's transcript will describe the content of this course, e.g., BI 391 Laboratory Experience in Genetics.</i></p>	<p>BI 412 Biometrics 4 cr. (3-2-0) Offered: Fall Prerequisites: MA 105 or equivalent, junior standing or instructor's permission.</p> <p>Design and classification of experiments, methods of estimation and testing of hypotheses related to experiments. Desk calculators are used to solve simple problems involving data available from the student's field of study.</p>
<p>BI 402 Microbial Ecology 3 cr. (2-0-2) Offered: Every other Fall, even years. Prerequisites: BI 111, BI 112, CH 112, junior standing or instructor's permission.</p> <p>A survey of aspects of microbes, especially bacteria that influence or are influenced by the environment. The ubiquitous organisms are studied in varied habitats.</p>	<p>BI 413 Biochemistry of Development 4 cr. (2-2-0) Offered: Every other Fall, even years. Prerequisites: BI 312 and either BI 313, BI 321, or CH 450, junior standing or instructor's permission.</p> <p>The biochemical and genetic events accompanying and influencing embryonic development, with emphasis on pertinent literature and techniques.</p>
<p>BI 404 Virology 3 cr. Offered: Every other Fall, odd years. Prerequisites: BI 203 or BI 303, or CLS 204 and CLS 214, and CH 220 or CH 322, junior standing or instructor's permission.</p> <p>An introductory course in virology integrating some of the biochemical, genetic and medical implications of viruses with general virology.</p>	<p>BI 416 Experimental Cytogenetics 2-3 cr. Offered: Winter Prerequisites: BI 206 or BI 312, junior standing or instructor's permission.</p> <p>A course designed to develop competence in the preparation, recognition and presentation of karyotypes with emphasis on the human karyotype. Three credits may be earned by students who prepare a term paper. Students may enroll for three credits only with instructor's permission.</p>
<p>BI 405 Immunology 3 cr. Offered: Winter Prerequisites: BI 203 or BI 303, or CLS 203 or CLS 213, and CH 220 or CH 322, junior standing or instructor's permission.</p> <p>Introduction to immunology, considering basic immunological mechanisms including humoral and cell-mediated immunity, immunity of infectious disease, immunogenetics and tumor immunology.</p>	<p>BI 418 Molecular Biology 4 cr. (2-0-4) Offered: Fall Prerequisites: BI 312 (or BI 206 with instructor's permission) and CH 220 or CH 322, and credit or enrollment in CH 450, junior standing or instructor's permission.</p> <p>Prokaryotic and eukaryotic gene structure and expression. Laboratories explore some of the techniques used for manipulating genes in vitro, including DNA isolation, DNA electrophoresis, subcloning and work with the bacteriophage. This course covers some of the theory and applications of biotechnology.</p>

- BI 419 Biology of Cancer** 4 cr. (4-0-0)
 Offered: Every other Fall, odd years.
 Prerequisites: BI 312, BI 313 or CH 450, junior standing or instructor's permission.
 Introduction to the cellular and genetic changes that cause cells to begin dividing in an uncontrolled fashion and to subsequently spread throughout the body. Cell cycle regulation, cell growth, apoptosis and cell adhesion in normal and tumor cells will be compared. Genes altered in tumors, including oncogenes and tumor suppressor genes will be studied. Pertinent literature will be examined.
- BI 421 Invertebrate Zoology** 4 cr. (3-0-2)
 Offered: Winter
 Prerequisites: BI 111, BI 112, junior standing or instructor's permission.
 Identity and habits of invertebrates, excluding parasites and insects, with emphasis on observation, collection and recognition of local fauna.
- BI 423 Parasitology** 3 cr. (2-0-3)
 Offered: Winter
 Prerequisites: BI 111 and BI 112 or CLS 204 and CLS 214, junior standing or instructor's permission.
 Life histories, ecology, physiology and host-parasite relationships. Laboratory includes examination of hosts for parasites and preparation of specimens for study.
- BI 424 General Entomology** 4 cr. (2-0-4)
 Offered: Every other Fall, odd years.
 Prerequisites: BI 111, BI 112, junior standing or instructor's permission.
 Structure, physiology, taxonomy, ecology and economic importance of insects and their near relatives. Techniques of collecting, preserving and mounting specimens for study.
- BI 425 Endocrinology** 3 cr.
 Offered: Every other Fall, odd years.
 Prerequisites: BI 202 or BI 222, and CH 220 or equivalent, junior standing or instructor's permission.
 Structure and physiology of endocrine glands, biological actions and biochemistry of hormones, emphasizing their role (at the systems level) in homeostasis, intermediary metabolism, reproduction and behavior of mammals.
- BI 426 Human Histology** 4 cr. (2-0-4)
 Offered: Fall
 Prerequisites: BI 111 and BI 112, or CLS 201, and BI 201 or BI 221, junior standing or instructor's permission.
 Study of the microscopic anatomy of human tissues and organs at the light microscope level.
- BI 427 Ecological Animal Physiology** 4 cr.
 Offered: Every other Winter, odd years.
 Prerequisites: BI 210, and BI 222 or BI 202, junior standing or instructor's permission.
 The course emphasizes physiological adaptations of animals to their environment. It covers topics such as thermoregulation, nutrition and digestion, osmoregulation, nitrogen metabolism, sensory physiology and reproductive physiology.
- BI 428 Behavioral Ecology** 4 cr.
 Offered: Every other Fall, even years.
 Prerequisites: BI 111, BI 112, BI 210, BI 312 and BI 315, junior standing or instructor's permission.
 Behavior, just like any phenotype, is shaped by selection associated with various environments and ecological interactions. Course considers the diversity of behavior exhibited in natural populations, how it evolves under various ecological conditions and approaches to testing hypotheses about behavioral evolution and adaptive functions.
- BI 430 Plant Anatomy** 4 cr. (2-0-4)
 Offered: Every other Winter, even years.
 Prerequisites: BI 230 junior standing or instructor's permission.
 Structure and development of higher forms of plant life. Techniques of selecting and staining plant tissues are practiced.
- BI 431 Plant Physiology** 4 cr. (3-0-3)
 Offered: Fall
 Prerequisites: BI 111, BI 112, CH 112, junior standing or instructor's permission.
 Principles of plant nutrition, metabolism, plant water relations, transport of materials in plants and physiological aspects of plant growth and development. Methods of studying plant functions are emphasized in the laboratory.
- BI 433 Local Flora** 2 cr. (1-0-3)
 Offered: Summer
 Prerequisites: BI 111, BI 112, junior standing or instructor's permission.
 Lecture, field and laboratory studies dealing with recognition, collection and preservation of herbaceous plants.
- BI 434 Plant Ecology** 4 cr. (2-0-4)
 Offered: Every other Winter, odd years.
 Prerequisites: BI 210, BI 310 recommended, junior standing or instructor's permission.
 Field oriented study of terrestrial and aquatic vegetation, covering topics in population, community and landscape ecology. Laboratories emphasize research approaches, sampling techniques, data analysis and technical writing skills.

BI 441 Fisheries Management 3 cr. (2-0-2)

Offered: Every other Winter, odd years.
Prerequisites: BI 210 or BI 322, and MA 104 or MA 105 or MA 171, junior standing or instructor's permission.

Philosophy and objectives of managing the North American fisheries; implementation of management techniques. Laboratory instruction includes collection and analysis of data.

BI 442 Wildlife Management 4 cr. (3-0-2)

Offered: Fall
Prerequisites: BI 210, junior standing or instructor's permission.

Application of ecological principles and technical knowledge to the management of populations of wildlife.

BI 460 Ichthyology 3 cr. (2-0-3)

Offered: Every other Winter, even years.
Prerequisites: BI 111, BI 112, junior standing or instructor's permission.

Identification, ecology and behavior of local fishes.

BI 461 Herpetology 3 cr. (2-0-3)

Offered: Every other Winter, odd years.
Prerequisites: BI 111, BI 112, junior standing or instructor's permission.

Field oriented study of amphibians and reptiles emphasizing identification and habits of local fauna.

BI 462 Ornithology 3 cr. (2-0-3)

Offered: Summer, odd years.
Prerequisites: BI 111, BI 112, junior standing or instructor's permission.

Lectures, laboratories and field trips dealing with evolution systematics, morphology, ecology, behavior and identification of birds with emphasis on local species.

BI 463 Mammalogy 3 cr. (2-0-3)

Offered: Every other Winter, odd years.
Prerequisites: BI 111, BI 112, junior standing or instructor's permission.

Lectures, laboratories and field trips dealing with evolution systematics, morphology, ecology, behavior and identification of mammals with emphasis on the Great Lakes region.

BI 465 Aquatic Insects 4 cr. (2-0-4)

Offered: Every other Fall, even years.
Prerequisites: BI 111, BI 112, junior standing or instructor's permission.

Emphasis on the recognition of major taxa of aquatic insects, especially from the local area, through the use of technical reference materials.

BI 491 Seminar 1 cr.

Offered: On demand.
Prerequisites: instructor's permission and junior standing. Course prerequisites and a minimum grade point average may be required for some topics.

Variable content, depending on instructor. Students read extensively from periodical literature and meet weekly for reports and discussion.

Note: May be repeated once if topic varies.

BI 492 Research in Water Science 2 cr. (0-0-4)

Offered: Fall, Winter.
Prerequisites: Water science majors with junior standing or instructor's permission.
Cross listed as CH 492.

A course to introduce students to environmentally related research. Projects are pursued in cooperation with a faculty research adviser. The research adviser and research problem must be selected a semester prior to registration. A written and oral final report is required.

BI 495 Special Topics in Biology 1-4 cr.

Offered: Contact department for information.
Prerequisites: instructor's permission and junior standing.

Variable content, depending upon the competencies of staff and special needs of students.

Note: May be repeated if topic differs.

BI 498 Directed Studies in Biology 1-4 cr.

Offered: Contact department for information.
Prerequisites: The core courses in biology, junior standing and instructor's permission at least one month before beginning of course.

An opportunity for qualified junior and senior students to conduct independent study and investigative work.

Note: May be repeated for up to four credits.

BI 499 Internship 1-6 cr.

Offered: Contact department for information.
Graded S/U
Prerequisites: Senior status in good standing with a minimum grade point average of 2.50 and a major in biology, botany or zoology; appropriate background for subject of internship; adviser, department head and cooperating agency supervisor permission.

Practical experience under the supervision of an experienced biologist, in an academic, governmental or private setting. Application for internship must be made at the Biology Department office at least four weeks before the start of the internship. A written report incorporating an evaluation and critique of the internship experience will be required. A course subtitle on the student's transcript will describe the particular content of this course.

CD - COMMUNICATION DISORDERS

Communication Disorders Department

CD 150 Survey of Communication Disorders 4 cr.

Offered: Fall, Winter
A survey of the normal communication process and an introduction to a variety of communication disorders that affect a person's ability to communicate effectively in our society. Etiologies and treatments of the various disorders are also discussed.

<p>CD 160 Anatomy of the Speech and Hearing Mechanism 4 cr. (3-0-2) Offered: Winter</p> <p>Study of the anatomical structures and the physiological function of the head, neck and thorax and their relationship to speech and voice production, laboratory exercises and activities.</p>	<p>CD 357 Fluency Disorders 3 cr. Offered: Fall</p> <p>Study of normal dysfluency, stuttering and cluttering. The development, measurement and treatment of stuttering are emphasized.</p>
<p>CD 200 Phonetics 3 cr. Offered: Fall</p> <p>Study of the acoustic and physiological phonetic information necessary for making phonetic transcriptions of normal and disordered speech. Instruction in phonology and articulation of sounds of general American speech are also presented in lecture and through laboratory experience.</p>	<p>CD 359 Organic Disorders of Communication 4 cr. Offered: Winter Prerequisites: CD 160 or instructor's permission.</p> <p>Organic disorders of communication with emphasis on aphasia, cleft palate and cerebral palsy.</p>
<p>CD 210 Introduction to Voice and Articulation 3 cr. Offered: Winter</p> <p>An introduction to normal parameters of voice and articulation processes, their disorders, assessment and remediation.</p>	<p>CD 370 Observation 2 cr. Offered: Fall, Winter</p> <p>Supervised observation of therapy and diagnostic sessions within the department's Speech and Hearing Clinic. Students are required to complete 25 hours of observation.</p>
<p>CD 220: Speech and Voice Science 3 cr. Offered: Fall</p> <p>The study of speech production systems in terms of their anatomy, physiology and acoustic parameters of voice, articulation and resonance, as well as acoustic correlates relative to speech perception.</p>	<p>CD 400 Phonological Disorders 3 cr. Offered: Winter Prerequisites: CD 200 and CD 210, junior standing or instructor's permission.</p> <p>The nature, etiology, assessment and remediation of phonological disorders in children.</p>
<p>CD 252 American Sign Language I 4 cr. Offered: Fall, Winter, Summer</p> <p>Simple expressive and receptive vocabulary building and basic conversational skill in the ASL. Introduces basic information about the deaf community and its culture.</p>	<p>CD 454 American Sign Language III 2 cr. Offered: On demand. Prerequisites: CD 253 with a grade of "C" or higher, junior standing or instructor's permission.</p> <p>Combination of basic and advanced knowledge of CD 452 and CD 453 and expansion of grammar and vocabulary development of ASL. Emphasis is placed on using the language in short stories, narratives and conversations using learned expressive and receptive skills.</p>
<p>CD 253 American Sign Language II 4 cr. Offered: Fall, Winter, Summer Prerequisites: CD 252 with a grade of "C" or higher.</p> <p>More emphasis on the development of receptive and expressive skills involving structured communication situations that require the use of ASL.</p>	<p>CD 456 Language and Learning Disabilities in Children 4 cr. Offered: Fall, Winter Prerequisites: Senior standing or instructor's permission.</p> <p>A review of the literature regarding language and learning disabilities in children. Biological and linguistic aspects of these disturbances are stressed.</p>
<p>CD 351 Audiology I 3 cr. Offered: Winter Prerequisites: CD 160 or instructor's permission.</p> <p>The basic physics of sound, anatomy of the ear, pure tone testing and pathologies of the ear.</p>	<p>CD 459 Neuroscience for Communication Disorders 4 cr. (3-0-2) Offered: Fall Prerequisite: CD 160 and CD 359, junior standing or instructor's permission.</p> <p>The structure and organization of the human central and peripheral nervous systems with particular emphasis on their functional relationship to normal speech and language processes, laboratory exercises and activities.</p>
<p>CD 355 Language Development 3 cr. Offered: Fall</p> <p>Theories and conceptual models of language development in the young normal child. The roles of syntax, semantics and phonology are discussed in relationship to various conceptual models and theories.</p>	<p>CD 460 Cognition and Aging 3 cr. Offered: Winter Prerequisite: CD 150, CD 355, junior standing or instructor's permission.</p> <p>Examination of basic cognitive processes such as attention, perception and memory within the context of adulthood and aging. Pathological conditions which affect cognition such as traumatic brain injury and dementia will also be discussed.</p>
<p>CD 356 Language Disorders 3 cr. Offered: Winter Prerequisites: CD 355 or instructor's permission.</p> <p>The theoretical foundations for the management of language disorders in children with a focus on the practical aspects of assessment and treatment.</p>	

CD 464 Methods of Diagnosis 4 cr.

Offered: Fall

Prerequisite: CD 200, junior standing or instructor's permission.

Instruction and practice in the clinical procedures relative to the evaluation, measurement and treatment of communication disorders in children and adults.

CD 465: Methods of Treatment 2 cr.

Offered: Fall

Prerequisites: Communication disorders major and senior standing or instructor's permission.

Instruction and practice in the clinical procedures relative to the treatment of communication disorders.

CD 492 Workshop in Speech Pathology and Audiology 1-6 cr.

Offered: On demand.

Prerequisites: Junior standing or instructor's permission.

Short, intensive workshop regarding new developments in speech pathology and audiology; presented periodically.

CD 495 Special Topics in Speech Pathology and Audiology 1-4 cr.

Offered: On demand.

Prerequisites: Junior standing or instructor's permission.

Topics of special interest are presented periodically as the opportunity arises.

CD 496 Special Topics in Speech Pathology and Audiology 1-4 cr.

Offered: On demand.

Graded S/U

Prerequisites: Junior standing or instructor's permission.

Topics of special interest are presented periodically as the opportunity arises.

CD 497 Directed Pre-professional Experience 3 cr.

Offered: Fall, Winter, Summer

Prerequisites: Senior status, minimum cumulative grade point average of 3.00 and instructor's permission.

An optional clinical experience designed for exceptional students desiring to begin their clinical practice prior to entering graduate school. Students apply to the Clinic Director for consideration.

CD 498 Directed Study in Speech Pathology and/or Audiology 2-4 cr.

Offered: On demand.

Prerequisites: Junior standing or instructor's permission.

An intensive study of some special problem under the guidance of a faculty member in the speech pathology or audiology area.

CH - CHEMISTRY**Chemistry Department****CH 105 Chemical Principles** 4 cr. (3-0-2)

Offered: Fall, Winter

Prerequisites: Proficiency in algebra (one year of high school algebra is recommended).

- Satisfies the foundations of natural sciences/mathematics requirement.

Introduction to chemistry including contemporary applications and problems. Topics include states of matter, atomic and molecular structure, electrochemistry, energy, nuclear chemistry, organic and polymer chemistry. The fundamentals of these topics are discussed as well as their relationship to technology and consumer uses. Does not count toward a major or minor in chemistry.

CH 107 Introductory Chemistry I 4 cr. (3-1-2)

Offered: Fall

Prerequisites: Proficiency in algebra (one year of high school algebra or MA 100 is recommended) and one year of high school chemistry is recommended.

- Satisfies the foundations of natural sciences/mathematics requirement.

Fundamental laws and generalizations of inorganic chemistry and introduction to nomenclature, structure, functional groups and reactions of organic chemistry.

Note: Does not count toward a major or minor in chemistry. Primarily for students preparing for a career in nursing or a related profession.

CH 108 Introductory Chemistry II 4 cr. (3-1-2)

Offered: Winter

Prerequisites: CH 107 or equivalent.

- Satisfies the foundations of natural sciences/mathematics requirement.

Continuation of CH 107. An introduction to biochemistry, with emphasis on structure of biochemical compounds and their functions in living systems.

Note: Does not count toward major or minor in chemistry.

CH 111 General Chemistry I 5 cr. (3-1-3)

Offered: Fall, Winter

Prerequisites: Proficiency in algebra (two years of high school algebra or MA 104 or MA 105 is recommended) and one year of high school chemistry.

- Satisfies the foundations of natural sciences/mathematics requirement.

Survey of atomic structure, bonding, stoichiometry and the states of matter.

CH 112 General Chemistry II 5 cr. (3-1-3)

Offered: Winter, Summer

Prerequisite: CH 111.

- Satisfies the foundations of natural sciences/mathematics requirement.

Study of chemical equilibria and kinetics, thermodynamics, solution reactions, survey of the chemistry of the common elements and nuclear chemistry.

- CH 215 Chemistry of the Elements** 4 cr. (3-0-3)
Offered: Fall
Prerequisite: CH 112
Descriptive chemistry of elements and their compounds with relation to the periodic table. Emphasis is placed on chemical behavior, bonding and structure as well as spectral, thermodynamic and electrochemical properties. Laboratory work consists of the synthesis and characterization of common elements and their compounds, including simple salts, complexes, covalent and volatile compounds, and salts of oxyacids.
- CH 220 Introductory Organic Chemistry** 5 cr. (4-0-3)
Offered: Fall
Prerequisite: CH 112
A one-semester comprehensive course covering all aspects of organic chemistry including nomenclature, structure, optical activity, functional groups, spectra, syntheses and polycyclic, polyfunctional, heterocyclic, organosulfur and organophosphorus compounds. Emphasis on the organic compounds and reactions important to the function of living systems.
Note: Credit cannot be earned in both CH 220 and CH 321.
- CH 241 Chemical Equilibrium** 3 cr.
Offered: Fall, Winter
Prerequisite: CH 112
Study of chemical equilibrium in water including ionization, solubility, acid-base phenomena, complex ion formation and oxidation-reduction reactions.
- CH 242 Quantitative Analysis** 2 cr. (0-0-6)
Offered: Fall, Winter
Prerequisite: CH 112
The principles and methods of quantitative analysis, including titrimetry, spectrophotometry and potentiometry are used to determine the composition of various materials and the physical constants of substances.
- CH 295 Special Topics in Chemistry** 1-4 cr.
Offered: On demand.
Prerequisite: Instructor's permission.
Topics reflecting the special interests of students and staff. Designed for freshmen, sophomores and non-majors.
Note: May be repeated if topic differs.
- CH 296 Special Topics in Chemistry** 1-4 cr.
Offered: On demand.
Graded S/U
Prerequisite: Instructor's permission.
Topics reflecting the special interests of students and staff. Designed for freshmen, sophomores and non-majors.
Note: May be repeated if topic differs.
- CH 297 Directed Studies in Chemistry** 1-4 cr.
Offered: On demand.
Graded S/U
Prerequisite: Instructor's permission.
Independent study and investigative work. Adviser and research problem must be selected a semester prior to registration.
Note: May be repeated if topic differs up to four credit hours.
- CH 298 Directed Studies in Chemistry** 1-4 cr.
Offered: On demand.
Prerequisite: Instructor's permission.
Independent study and investigative work. Adviser and research problem must be selected a semester prior to registration.
Note: May be repeated if topic differs up to four credit hours.
- CH 321 Organic Chemistry I** 4 cr. (3-0-3)
Offered: Fall
Prerequisite: CH 112
The chemistry of the aliphatic and aromatic hydrocarbons and their derivatives, the significance of the various groups in the molecule and the nature of organic reactions.
Note: Credit cannot be earned in both CH 220 and CH 321.
- CH 322 Organic Chemistry II** 4 cr. (3-0-3)
Offered: Winter
Prerequisite: CH 321
A continuation of CH 321. The chemistry of carbonyl compounds and other groups, and some special topics are covered.
- CH 340 Environmental Chemistry** 5 cr. (3-0-6)
Offered: Every other Winter, odd years.
Prerequisites: CH 241 and CH 242.
A study of chemical interaction in natural and perturbed systems. Emphasis is placed on physical and analytical aspects with an introduction to the mathematics of data utilization.
- CH 341 Physical Chemistry I** 4 cr. (3-0-3)
Offered: Fall
Prerequisites: CH 241, CH 242, one year of calculus and physics, or instructor's permission.
Theory, problems and experiments concerning the structure of atoms and molecules and the gaseous, liquid and solid states.
- CH 342 Physical Chemistry II** 4 cr. (3-0-3)
Offered: Winter
Prerequisites: CH 241, CH 242, one year of calculus and physics, or instructor's permission.
Theory, problems and experiments concerning chemical thermodynamics, chemical kinetics and the phase rule.

- CH 415 Inorganic Chemistry** 4 cr. (3-0-3)
Offered: Winter
Prerequisites: CH 341 and CH 342 or CH 341 and concurrent enrollment in CH 342, junior standing or instructor's permission.
Comparative study of the chemical elements and their compounds with emphasis on periodic relations, principles of structure and bonding, kinetics of reactions and spectral and thermodynamic properties. Topics include complex ions, defect crystals, electron deficient compounds, organometallic and bio-inorganic chemistry. A variety of inorganic compounds are prepared and studied.
- CH 435 Gas and Liquid Chromatography** 2 cr. (3-0-6)
Offered: Fall
Prerequisites: CH 322, junior standing or instructor's permission.
A study of the principles, instrumentation and analytical applications of gas and liquid chromatography and mass spectrometry. GC, GC/MS and HPLC techniques are presented in the laboratory.
Note: This course is taught for one half of the semester.
- CH 436 Modern Spectrometry** 3 cr. (2-0-3)
Offered: Winter
Prerequisites: CH 341, junior standing or instructor's permission.
A study of principles, instrumentation and analytical applications of modern spectroscopic methods including Mass, Infrared, UV/Visible and NMR spectroscopy. The theoretical basis for each type of spectroscopy, basic instrument design and spectral analysis will be discussed with particular emphasis on the use of a combination of these methods in structural elucidation. Modern NMR experiments including 2-D spectroscopy will be discussed. Laboratory exercises will focus on instrument operation and data interpretation.
- CH 437 Atomic Absorption Spectrometry** 1 cr. (2-0-3)
Offered: Fall
Prerequisites: CH 341 or concurrent enrollment in CH 341, junior standing or instructor's permission.
A study of principles, instrumentation and analytical applications of atomic absorption spectroscopy techniques. Lecture material will cover sample collection and preparation, sample atomization, optical instrumentation, spectral interferences and data analysis. Atomic absorption techniques will be compared to inductively coupled plasma techniques. Laboratory exercises will focus on sample preparation, instrument operation and data analysis.
Note: This course is taught for one half of the semester.
- CH 450 Introductory Biochemistry** 4 cr. (3-0-3)
Offered: Fall, Winter
Prerequisites: CH 220 or CH 322, junior standing or instructor's permission.
A study of the fundamental concepts of biochemistry, including the chemical and physical properties of biomolecules and the chemical basis of the major metabolic pathways. Laboratory experiments teach basic biochemical techniques.
- CH 452 Intermediary Metabolism** 4 cr.
Offered: Winter
Prerequisites: CH 450, junior standing or instructor's permission.
A course designed to follow Introductory Biochemistry, emphasizing metabolic processes and exposing students to current biochemical literature. Topics include the biosynthesis of lipids, amino acids, nucleic acids and the study of gene expression and protein synthesis. Abnormalities in metabolic processes that result in disease will be considered.
- CH 454 Biochemical Techniques** 4 cr. (0-0-12)
Offered: Winter
Prerequisites: CH 450, junior standing or instructor's permission.
A laboratory course applying instrumental techniques to biochemical problems. Experiments include immunological assay, electrophoresis, radioisotope labeling and purification and analysis of DNA.
- CH 456 Protein Structure and Function** 3 cr.
Offered: Every other Fall (3rd year)
Prerequisites: CH 450, junior standing or instructor's permission.
An investigation of the structure of proteins enhanced by the use of computer software with three dimensional images. The relationship between protein structure and function will be explored by studying enzymatic reaction mechanisms and kinetics.
- CH 460 Nuclear Chemistry** 4 cr. (3-0-3)
Offered: Every other Fall, odd years.
Prerequisite: Four courses in chemistry and consent of instructor.
The basic nuclear physics necessary for understanding the practical use of radiation and radionuclides is covered. Emphasis is given to properties of radioactive substances (formation and decay), effects of radiation (radiation chemistry and radiobiology), detection and measurement of radiation and radioisotope methodology.
- CH 490 Senior Research and Seminar I** 2-4 cr.
Offered: Fall
Prerequisites: Biochemistry or chemistry major and senior standing or instructor's permission.
Some aspects of chemical research, pursued in cooperation with a research adviser. Oral and written reports and attendance at a weekly seminar are required. Adviser and research problem must be selected a semester prior to registration.
Note: May be repeated if topic differs up to four credit hours.
- CH 491 Senior Research and Seminar II** 2-4 cr.
Offered: Winter
Prerequisites: Biochemistry or chemistry major and senior standing and instructor's permission.
A continuation of CH 490. Open to students who have demonstrated exceptional competencies.
Note: May be repeated if topic differs up to four credit hours.

CH 492 Research in Water Science 2 cr.
 Offered: Fall, Winter
 Prerequisites: Water science major, junior standing or instructor's permission and CH 242. CH 340 is strongly recommended.
 Cross listed as BI 492.

A course to introduce students to environmentally related research. Projects are pursued in cooperation with a faculty research adviser. The research adviser and research problem must be selected a semester prior to registration. A written and final oral report are required.

CH 495 Special Topics in Chemistry 1-4 cr.
 Offered: Winter
 Prerequisites: instructor's permission and junior standing.

Variable content, depending upon the specialties of the staff and special needs of the students.

Note: May be repeated if topic differs.

CHN - CHINESE

Modern Languages and Literatures Department

CHN 101 Elementary Chinese I 4 cr.
 Offered: Every other Winter, odd years.

An Introductory course in the Chinese language and culture. Students learn rudimentary "survival" skills such as social etiquette, telling time and directions, talking about family, school and work, and writing and recognizing written characters.

CIS - COMPUTER INFORMATION SYSTEMS

College of Business

All CIS courses numbered above 110 are invalid after seven years.

CIS majors and minors must earn a minimum grade of "C-" in each CIS/IS course applying to their CIS major/minor.

CIS 110 Principles of Computer Information Systems 4 cr.
 Offered: Fall, Winter, Summer

- Satisfies the formal communication studies requirement.

A course intended to establish basic computer literacy applicable to students' continuing education and career goals. Students in the class make extensive use of the university computer facilities, using microcomputers and commercial software for word processing, spreadsheet analysis and database management. Computer terminology and programming are also introduced. Topics for lecture and reading include: computer systems (hardware and software), systems analysis, data communication, management information systems, and issues related to computers in society.

Note: CIS 110 is the equivalent of IS 100, IS 101, IS 102 and IS 104.

CIS 155 Software Development 1 2 cr.
 Offered: Fall, Winter
 Prerequisite: IS 120 (may be taken concurrently).

Study and practice of a visually-based programming language and application generator. Course involves screen creation, logic development for event-driven screen operations, and object-orientation.

CIS 220 Network Concepts 2 cr.
 Offered: Fall, Winter
 Prerequisites: IS 120 or instructor's permission.

The course covers the detailed descriptions and workings of network hardware and software components, as well as the operation and management of a LAN. Hands-on demonstration and various hands-on assignments will be given. Students set up NIC's, hubs and wiring for Ethernet and other topologies.

CIS 228 Concepts of Help Desk/Call Center Operations 2 cr.
 Offered: Fall

This course provides an overview of Help Desk and Call Center operations including the different types of help desks/call centers and career paths, and the knowledge, skills and abilities needed to be successful. Students examine the people, processes, technology and information required for successful support operations.

CIS 230 Novell Operating Systems 2 cr.
 Offered: Fall
 Prerequisites: CIS 220 or concurrent enrollment, or instructor's permission.

In a laboratory setting students install a Novell LAN including servers and workstations. Students set up user directories, security, print servers and application software. The course has both a lecture/discussion and a lab component.

CIS 234 Microsoft Network Operating Systems 2 cr.
 Offered: Fall
 Prerequisites: CIS 220 or concurrent enrollment or instructor's permission.

The primary aim of this course is to help students learn to use the desktop interface and tools necessary for implementing an industrial strength workstation that will administer a small or large network. A second purpose is to help prepare students for the implementing and supporting Microsoft network certification credential. The course provides hands-on training in the following areas: planning, installation and configuration, managing resources, connectivity, running applications, monitoring and optimization, and troubleshooting.

CIS 250 Systems Development I 4 cr.

Offered: Fall, Winter
Prerequisites: CIS 155 and CIS 220 (may be taken concurrently). CIS 255 must be taken in subsequent semester.

The first of a two-course sequence provides students with a basic understanding of the systems development process using prototyping, iterative, rapid application development approach. Emphasis is on the early stages of the system development process presenting the concepts, tools and methodologies used by the professional analyst. Students are exposed to the issues and decisions associated with the rigors of managing a systems development project.

CIS 255 Systems Development II 4 cr.

Offered: Fall, Winter
Prerequisites: CIS 250 (must be taken in prior semester) or instructor's permission.

The second of a two-course sequence is designed to provide students with an in-depth understanding of the systems development process using a prototyping, iterative, rapid application development approach. Emphasis is on the refinement and implementation of the system development process presenting the concepts, tools and methodologies used by the professional analyst. Students are exposed to the issues and decisions associated with the rigors of managing a systems development project.

CIS 291 Internship in Computer Information Systems 1-8 cr.

Offered: Fall, Winter, Summer
Graded S/U
Prerequisites: Completion of the College of Business prerequisite courses and 48 semester hours and approval of internship coordinator.

Appropriate professional work experience at a computer installation. Students are required to document their work experience and fulfill requirements stipulated upon approval of the internship.

CIS 295 Special Topics in Computer Information Systems 1-4 cr.

Offered: Contact department for information.
Designed for freshmen and sophomores and as a service course. If topic differs, may be repeated for credit with instructor's permissions. Topics dependent on the special interests of students and staff.

CIS 297 Directed Studies in Computer Information Systems 1-4 cr.

Offered: Contact department for information.
Graded S/U
Prerequisite: College of Business permission.
Individual investigations of a special topic in information systems.

CIS 298 Directed Studies in Computer Information Systems 1-4 cr.

Offered: Contact department for information.
Prerequisite: College of Business permission.
Individual investigations of a special topic in information systems.

CIS 330 Novell Certification Preparation 3 cr.

Offered: Winter
Prerequisites: CIS 230 or instructor's permission.

This course is designed as an in-depth study of the most complex functions and features of installing, configuring and maintaining the latest Novell Netware based local area network system with the main goal being preparation for the CNA Exam. The course makes extensive use of practice exam software that simulates the testing environment on which students must perform actions according to a given scenario.

CIS 334 Microsoft Certification Preparation 3 cr.

Offered: Winter
Prerequisites: CIS 234 or instructor's permission.

This course is designed as an in-depth study of the most complex functions and features of installing, configuring and maintaining the latest Windows Operating System with the main goal being preparation for the Microsoft Certified Professional Exam. The course makes extensive use of practice exam software that simulates the testing environment, including a mock interface on which students must perform actions according to a given scenario.

CIS 355 Web Applications Programming 3 cr.

Offered: Contact department for information.
Prerequisites: CIS 155 or other programming course and CIS 255, junior standing, or instructor's permission.

This course teaches students how to program client/server applications for the Web, focusing on database integration using SQL. Topics cover scripting languages such as JavaScript, VBScript or other current alternatives, and using them to read input from Web forms, store and retrieve data from databases, and produce Web output. Emphasis is on business-oriented applications for the Web.

CIS 415 Systems Development Project 3 cr.

Offered: Fall
Prerequisites: CIS 255, CIS 464 (CIS 464 may be a co-requisite with instructor's permission) and junior standing or instructor's permission.

A capstone course whose emphasis is on the development of a computer application by student project teams assigned to local businesses or university departments. Depending upon the project, the entire system development life cycle may occur in one semester, or students may only accomplish one phase per semester. Project teams learn project management skills through job assignments and weekly status meetings with the instructor. Class time is arranged by project.

CIS 416 Advanced Systems Development Project 1-3 cr.

Offered: Contact department for information.
Prerequisites: CIS 415 and junior standing or instructor's permission.
Additional experience with computer application development and implementation. The structure of the course is identical to CIS 415.

- CIS 428 Help Desk/Call Center Management** 4 cr.
 Offered: Winter
 Prerequisites: CIS 228, MGT 228, MGT 240, junior standing or instructor's permission.
 This course serves as a capstone experience for students who are interested in management positions in the help desk/call center industry. Techniques for developing and managing a customer support center will be the focus of the course. Students will gain experience with the unique tools and technologies utilized in the support environment and learn how the information is applied to make more effective decisions.
- CIS 430 Data Communication** 3 cr.
 Offered: Contact department for information.
 Prerequisites: CIS 155, CIS 250 and junior standing or instructor's permission.
 The course covers the theories and technical prerequisites of data communication. Subjects include hardware, fundamental communication concepts, voice communication, configurations, common carrier service offerings, network design, protocols and software, microcomputers and communication, local area networks, network management and network security.
- CIS 440 Management Information Systems** 3 cr.
 Offered: Fall, Winter
 Prerequisites: MKT 230, MGT 240 and FIN 351 junior standing or instructor's permission.
 A course designed to provide students with majors in the College of Business with adequate background to be able to keep abreast of current developments in the use of computer information systems in supporting management functions. Information systems have become essential for creating competitive firms, managing global corporations and providing useful products and services to customers. This course considers the needs of organizations from an information systems standpoint.
- CIS 464 Database Management Systems** 3 cr.
 Offered: Fall, Winter
 Prerequisites: CIS 250 and junior standing or instructor's permission.
 This course provides a broad survey of all of the major topics in the field of database systems from an applied perspective. The initial emphasis will be on relational database concepts, logical design, physical design and SQL access but the course will also consider hierarchical and network models and the advanced object-oriented and object/relational models. Supporting topics will include the entity-relationship model, database administration, data dictionaries and catalogs, backup and recovery, concurrency control and database security. Also covered will be such contemporary topics as distributed database, client/server database, data warehousing and data mining.
- CIS 470 E-Commerce and E-Business** 3 cr.
 Offered: Winter
 Prerequisites: Junior standing or instructor's permission.
 This course explores the impact of information technology concepts and advances on the ways in which business is conducted in electronic commerce arena, as well as information technology's impact on business activity in more traditional business markets. This exploration is designed to give students an appreciation for the scope and performance characteristics exhibited by current information technology as it relates to business and some insight into current changes in the way business strategy is being implemented by E-Commerce firms.
- CIS 490 Seminar on Information Systems and Information Technology** 3 cr.
 Offered: Contact department for information.
 Prerequisites: Junior standing or instructor's permission.
 This course provides students with an opportunity to cover the latest and emerging topics in the area of information systems and information technology. The course is directly aimed to keep students up-to-date with the changes in the information systems and information technology area. The course covers wide-ranging topics from all concentrations of information systems.
- CIS 491 Internship in Computer Information Systems** 1-8 cr.
 Offered: Fall, Winter, Summer
 Graded S/U
 Prerequisites: Junior standing or instructor's permission.
 Appropriate professional work experience at a computer installation. Students are required to document their work experience and fulfill requirements stipulated upon approval of the internship.
- CIS 495 Special Topics in Computer Information Systems** 1-4 cr.
 Offered: Contact department for information.
 Prerequisites: Junior standing or instructor's permission.
 Variable topics of current interest.
Note: May be repeated if topic differs.
- CIS 496 Special Topics in Computer Information Systems** 1-4 cr.
 Offered: Contact department for information.
 Graded S/U
 Prerequisites: Junior standing or instructor's permission.
 Designed for juniors and seniors and as a service course. Topics dependent on the special interests of students and staff.
Note: May be repeated if topic differs.
- CIS 497 Directed Studies in Computer Information Systems** 1-4 cr.
 Offered: Contact department for information.
 Graded S/U
 Prerequisites: Junior standing and College of Business permission.
 Individual research in computer information systems. Work is supervised through conferences with an adviser.

CIS 498 Directed Studies in Computer Information Systems 1-4 cr.
 Offered: Contact department for information.
 Prerequisite: Junior standing and College of Business permission.

Individual research in computer information systems. Work is supervised through conferences with an adviser.

CJ-CRIMINAL JUSTICE

Criminal Justice Department

CJ 110 Introduction to Criminal Justice 4 cr.
 Offered: Fall, Winter

An introduction to the various subcomponents of the justice system: police, courts and corrections. The course will illustrate how these interrelated components result in the administration of justice in a democratic society. Current problems faced by the criminal justice process will be discussed.

CJ 191 Training Seminar (Specific Topic) 1-4 cr.
 Offered: On demand.

This course is for criminal justice elective credit and may be applied toward the criminal justice associate of arts or applied science degree programs. This is a training course specifically designed for the topic at hand. Course may include lectures, discussions and field experiences as the specific topic indicates. This course may be taken more than once under a different topic.

Note: No more than 4 credits of CJ 191 and/or CJ 298 may be applied toward the AS or AAS degree programs. CJ 191 and CJ 298 do not apply toward the bachelor's degree.

CJ 212 The Law Enforcement Function 4 cr.
 Offered: Fall, Winter
 Prerequisites: CJ 110 or instructor's permission.

The role of law enforcement in the criminal justice system and society at large is explored. Emphasis is placed on the history and current practices of policing, the demands and rewards of careers in law enforcement and the dilemma inherent in policing a free society. The course is designed to provide students with realistic expectations about policing, as well as to promote critical thinking about the appropriate role of the police in society.

CJ 213 The Judicial Function 4 cr.
 Offered: Fall, Winter
 Prerequisites: CJ 110 or instructor's permission.

An examination of the criminal court system and criminal process with an analysis of the major judicial decision-makers, i.e., prosecutors, defense attorneys, judges and the courtroom work group. Special attention is given the empowerment of the judiciary, from original through appellate jurisdiction.

CJ 214 The Investigative Process I 4 cr.
 Offered: Fall
 Prerequisites: CJ 110 or instructor's permission.

Theory of investigation, crime scene conduct, collection and preservation of physical evidence; overview of methods used in scientific interpretation of evidence; presentation of evidence to the judicial system.

Note: This course was previously numbered CJ 314 The Investigative Process I.

CJ 220 The Corrections Functions 4 cr.
 Offered: Fall, Winter
 Prerequisites: CJ 110 or instructor's permission, or enrollment in Correctional Officer Certification program.

Introduction to philosophy, theory and practice involved in dealing officially with convicted offenders; appraisal of treatment and post-correctional practices plus functions of probation and parole are analyzed. Problems, trends and issues are identified.

CJ 221 Roles of the Corrections Client 4 cr.
 Offered: Summer
 Prerequisites: CJ 110, CJ 220 or instructor's permission, or enrollment in Correctional Officer Certification program.

Study of offenders in terms of their personal background and definitional dimensions. Attitudes, behavior and criminal careers are examined to help develop realistic perspective on crime and criminals.

CJ 227 Correctional Institutions 4 cr.
 Offered: Summer
 Prerequisites: CJ 110, CJ 220 or instructor's permission, or enrollment in Correctional Officer Certification program.

The development, structure and function of correctional institutions, including jails. Emphasis is placed on the principles and strategies of custody and treatment as they pertain to the confined offender. The propriety and effectiveness of the custody continuum are examined.

CJ 245 Legal Issues in Corrections 4 cr.
 Offered: Fall, Winter, Summer
 Prerequisites: CJ 110, CJ 220, or instructor's permission, or enrollment in correctional officer certification program.

An overview of the major issues, trends and the political and social dimensions of convictions. An analysis of constitutional law, court decisions, current legislation of the federal and state law affecting prisons and the judicial proceedings. Description of Michigan internal review process in institution and field disciplinary matters. Examination of a forum for the legal rights of prisoners and the responsibilities of the legal system and the adjudication of juveniles and the alternatives to incarceration. Examination of the impact of federal court review on state and local corrections systems. Description of recent legal decisions affecting Michigan corrections.

CJ 250 Investigative Interviewing and Interrogation 4 cr.

Offered: Winter

Prerequisite: CJ 110 or instructor's permission.

This course focuses on planning, conducting and analyzing interviews and interrogations as part of an investigation. Fundamental theories will be demonstrated in practical exercises including detecting deception. The class will analyze and discuss key Supreme Court decisions, particularly *Miranda v. Arizona* and the subsequent Fifth and Sixth Amendment cases that guide current practices in public and private investigations. Frequent references are made to current cases or public incidents that relate to material under discussion.

CJ 255 Drugs, Crime and the Justice System 4 cr.

Offered: Every other Summer.

Prerequisites: CJ 110 or instructor's permission.

This course describes and examines the history and current state of the illegal drug problem in the United States from the early 1800s to the present day. This includes the nature of illegal drug use, the drug-crime connection, illegal drug production and trafficking, the structure of illegal drug enterprises, drug user profiles, drug control policy and treatment programs and the drug legalization debate.

CJ 263 Criminology 4 cr.

Offered: Fall, Winter

Prerequisites: SO 101 or SO 113 and CJ 110 or instructor's permission.

Cross listed with SO 263.

This course explores the nature, extent, causes and methods of treatment and prevention of crime and criminality. Emphasis is placed on theories and methods of studying crime and criminal behavior as social phenomena.

CJ 275 Legal Aspects of Retail Security 4 cr.

Offered: Fall, Winter, Summer

Prerequisites: CJ 110 or instructor's permission.

This course examines the legal environment surrounding the private security profession. It is critical to realize that there are major legal restraints upon security officers who help ensure both the protection of the public and their employer. As with public police, in the area of private security there is also a need to strike a balance between the protection of one's business and protecting the individual liberty and civil rights of suspects. As a result, it's extremely important for professional security officers to understand how to avoid incurring civil liability when they take action to protect their business and its customers.

CJ 276 Retail Loss Prevention Management 4 cr.

Offered: Fall, Winter, Summer

Prerequisites: CJ 110 or instructor's permission.

This course focuses on retail loss prevention issues from a supervision and management perspective. It discusses the role of loss prevention within the corporate management structure. It explores classic and contemporary management theory along with basic roles and functions of managers and supervisors. It is designed to assist individuals currently holding or aspiring to management positions in implementing realistic loss prevention strategies in a mass retail environment. The student will be introduced to fundamental principals of management theory with an emphasis in applying them to current-day issues in a retail setting.

Whenever possible, reference will be made to current cases or incidents that relate to material under discussion.

CJ 280 Criminal Law 4 cr.

Offered: Fall, Winter

Prerequisites: CJ 110 or instructor's permission.

Analysis and classification of substantive common law and statutory criminal offenses; defenses and other limitations on criminal capacity.

CJ 290 Methods of Inquiry in Criminal Justice 4 cr.

Offered: Fall, Winter

Prerequisites: CJ 110 or instructor's permission.

This course will expose students to the sources of information available about the field of criminal justice; prepare students to be intelligent consumers of criminal justice research; foster the ability to critically evaluate "facts" and findings relevant to the field; and illustrate the difference between empirical findings and "conventional wisdom." Students will develop skills necessary for academic and professional growth and competency in accessing, analyzing and communicating information about criminal justice issues.

Note: This course was previously numbered CJ 210.

CJ 292 Criminal Justice Leadership Development 2 cr.

Offered: Fall, Winter

Prerequisite: CJ 110 and sophomore standing.

This course introduces students to the concept of leadership and the role that it plays in managing criminal justice organizations. It will also explore opportunities for career development and advancement in our system of justice. Students will first be introduced to the essentials of criminal justice agencies and their management with a special focus on leadership and problem solving. Skills are developed through the hands-on application of different theories of leadership and participation in exercises emphasizing effective agency design, communication, team-building and group dynamics, conflict resolution, motivation, and organizational design. Students also learn how to respond to and benefit from organizational change and conflict. Finally, students will explore the concept and purpose of professional development and advancement strategies for employees within criminal justice agencies.

Note: This course is designed as a mid-point assessment class and must be taken prior to entering any CJ 300-400 level courses. Only students majoring in criminal justice are allowed to enroll in this course.

<p>CJ 295 Special Topics in Criminal Justice 1-4 cr. Offered: On demand. Prerequisite: Instructor's permission. The study of special issues in criminal justice.</p>	<p>CJ 299 Police Academy 12 cr. Offered: Summer Graded S/U Prerequisite: Admission to NMU Regional Police Academy. The Regional Police Academy is a 15 week, 900 hour police training school designed to provide basic law enforcement training to in-service and pre-service recruits. At the successful completion of academy training, a recruit becomes certifiable as a police officer through the Michigan Law Enforcement Officers Training Council. This training is transferable to all states but Hawaii. <i>Note: These credits can only be applied toward the Associate of Applied Science in Law Enforcement degree.</i></p>
<p>CJ 296 Local Jail Corrections Academy 6 cr. Offered: Advanced placement. Graded S/U The Local Jail Corrections Academy consists of 160 hours of classroom instruction involving ethics, stress management, sexual harassment, cultural diversity, prisoner behavior, suicide awareness, correctional law, interpersonal communication, fire safety, report writing, defensive tactics, custody and security, and booking and intake. This Academy is approved through the Michigan Correction Officers Training Council (MCOTC). The Academy is a requirement for employment in the field of corrections and, therefore, students who have already completed the Academy will be given 6 advanced placement credits toward this degree. <i>Note: These credits can only be counted toward the Associate of Applied Science in Corrections.</i></p>	<p>CJ 302 Community Relations and Crime Prevention 4 cr. Offered: Winter Prerequisites: CJ 110, CJ 290, CJ 292 and junior status or instructor's permission. A survey of the field of relationships between policing agencies and the communities they serve. Emphasis is placed on communication and orientation toward common goals, with a focus on the part that crime prevention techniques play in reducing current community problems. <i>Note: May not be taken if the student has previously taken LE 300 Police-Community Relations or LE 400 Crime Prevention.</i></p>
<p>CJ 297 State Corrections Academy 12 cr. Offered: Advanced placement. Graded S/U The State Corrections Academy consists of 640 hours of corrections training, including 320 hours of classroom training and 320 hours of specific, supervised, on-the-job training. This Academy is approved through the Michigan Correction Officers Training Council (MCOTC). The Academy is a requirement for employment in the field of corrections and, therefore, students who have already completed the Academy will be given 12 advanced placement credits toward this degree. <i>Note: These credits can only be counted toward the Associate of Applied Science in Corrections.</i></p>	<p>CJ 303 Victims in Criminal Justice 4 cr. Offered: On demand. Prerequisites: CJ 110, CJ 290, CJ 292 and junior standing or instructor's permission. The role of the victim of crime in the American criminal justice process including the needs, wants, expectations of the victim of crime and how the criminal justice system does or does not address them; survey of the historical development of the place of the victim within the criminal justice process; discussion of victim-oriented programs such as restitution and victim compensation.</p>
<p>CJ 298 Directed Study 1-4 cr. Offered: On demand. Prerequisites: Instructor and department permission. Individual research on an advanced level in the student's field of interest as approved and directed by the major professor. <i>Note: No more than 4 credits of CJ 191 and/or CJ 298 may be applied toward the AS or AAS degree programs. CJ 191 and CJ 298 do not apply toward the bachelor's degree.</i></p>	<p>CJ 315 Criminal Procedure 4 cr. Offered: Fall Prerequisites: CJ 110, CJ 290, CJ 292 and junior standing or instructor's permission. Rules of evidence and legal procedure in important areas such as arrest, force, search and seizure.</p>
	<p>CJ 323 Community-Based Corrections 4 cr. Offered: On demand. Prerequisites: CJ 110, CJ 290, CJ 292, junior standing or instructor's permission. This is a course on non-institutional corrections which focuses on the contemporary means and philosophy of positive intervention in the lives of selected offenders in an effort to facilitate improved social functioning. Specific attention is given to such critical corrections issues as: resource brokering, problem solving, accountability and communication. Methods and techniques of service delivery within the context of probation, parole, diversion, halfway houses and other community settings are stressed.</p>

CJ 412 Crisis Intervention and Stress Analysis 4 cr.

Offered: Every other Winter.

Prerequisites: CJ 110, CJ 290, CJ 292 and junior standing or instructor's permission.

The course will examine the challenges and risks of the various "front line" crisis intervention situations encountered by police and corrections officers. Emphasis is on the dynamics of interpersonal relations and intervention techniques, especially in conflict-oriented situations. Alternatives available to officers, as well as the relative roles of other legal and social agencies, will be discussed. The second half of the course will focus on stress issues relative to police and corrections personnel. Basic concepts in the psychological and physiological effects of stress will be discussed. This information will be applied to specific stressors common to police and corrections officers, administrators and officers' family life.

Note: May not be taken if the student has already taken LE 410 Police Crisis Intervention or LE 415 Police Stress Analysis.

CJ 414 The Investigative Process II 4 cr.

Offered: On demand.

Prerequisites: CJ 110, CJ 214, CJ 290, CJ 292 and junior standing or instructor's permission.

The actual gathering, identifying, preserving and analyzing of evidence. The course prepares students to write investigative reports that can be introduced into a court of law. It stresses the legal importance of all types of evidence and the probability of their acceptance in a court.

CJ 420 Forensic Psychology 4 cr.

Offered: Winter

Prerequisites: CJ 110, CJ 290, CJ 292 and junior standing and instructor's permission.

This course will examine the role of the discipline of psychology in the criminal justice system. Many of the functions performed in law enforcement, adjudication and corrections, rely heavily on psychological principles and research. In this class, students will explore many of the aspects of criminal justice theory and practice which are interdisciplinary in nature and for which a basic understanding of psychological principles is fundamental. This course will be taught as a seminar, with students actively participating in instruction by independently exploring a topic of their choice and sharing their findings with the class.

CJ 426 International Crime and Comparative Criminal Justice Systems 4 cr.

Offered: Fall

Prerequisites: CJ 110, CJ 290, CJ 292 and junior standing or instructor's permission.

This course explores the justice systems of various countries in depth and compares the significant similarities and differences between them and the United States. Both statutory and common law are analyzed, as well as crime rates, prevention, detention and judicial procedures.

CJ 431 Issues in Criminal Justice Administration 4 cr.

Offered: On demand.

Prerequisites: CJ 110, CJ 290, CJ 292 and junior standing or instructor's permission.

This course focuses on new management and administrative requirements of the criminal justice complex in transition. Attention is paid to the development of the understanding of the implementation of processes such as job enrichment, leadership and power, planning for change, motivational and communication theory to the administration and coordination of the criminal justice system and the management of its components.

CJ 435 Domestic and International Terrorism 4 cr.

Offered: On demand.

Prerequisite: CJ 110, CJ 290 and CJ 292, Junior standing or instructor's permission.

This course examines the history and current state of the problem of domestic and international terrorism. This includes the types and nature of terror; profiles of the individuals, organizations and nation states involved in terrorism; their motivations and targets; the attacks against the United States; strategies currently used to control and prevent terrorism; and the prospects for the future.

CJ 440 Discretionary Justice 4 cr.

Offered: Winter

Prerequisites: CJ 110, CJ 290, CJ 292 and junior standing or instructor's permission.

In-depth study of the use of discretion in criminal justice taught in seminar style. Students are required to participate in realistic simulated decision-making situations that reveal subjective and subtle influences on the decision makers. Police, institution classification and parole decision issues are emphasized.

CJ 480 Cybercrime 4 cr.

Offered: Winter

Prerequisites: CJ 110, CJ 214, CJ 290, CJ 292, CIS 110 and junior standing or instructor's permission.

This course examines the history and current state of the problem of domestic and global cybercrime. The situation involves exploring various types of crimes committed with computers, the Internet and electronic devices. Students will learn investigative techniques and legal issues related to the investigation of cybercrimes. Also, forensic issues addressed will include: recognition of leads, tracking cybercriminals as well as the collection and preservation of computer related (digital) evidence.

CJ 490 Professional Development and Assessment 2 cr.

Offered: Fall, Winter

Prerequisites: CJ 110, CJ 290, CJ 292 and senior standing or instructor's permission.

This course is intended to provide students with information and perspectives necessary for a successful career search in criminal justice. Students will be asked to actively engage in various assignments that will heighten their awareness of the importance of communication skills, interviewing skills and overall professional preparation. It will encourage students to explore their values, skills and competencies in order to come to a better understanding of the unique qualities and abilities that each may contribute in their chosen profession. Finally students will assist with the accomplishment of the department's assessment objectives by participating in select activities and discussions.

*Note: This course replaces CJ 489 Theory and Ideology of Criminal Justice.***CJ 491 Internship in Criminal Justice** 4-16 cr.

Offered: Fall, Winter, Summer

Graded S/U

Prerequisites: All 100 and 200 level CJ core courses, junior standing, 2.70 cumulative grade point average and permission of the Criminal Justice Internship Coordinator.

Supervised field experience through university-arranged placements in law enforcement, corrections, loss prevention or other criminal justice agencies.

*Note: May be applied as general elective credit only.***CJ 495 Special Topics in Criminal Justice** 1-4 cr.

Offered: On demand.

Prerequisites: CJ 110, CJ 290, CJ 292 and junior standing or instructor's permission.

The study of special issues in criminal justice at a more advanced level. Sometimes used to accommodate the training of visiting lecturers.

*Note: May be repeated if topic differs for 8 credit hours.***CJ 497 Teaching/Research Apprenticeship** 1-4 cr.

Offered: On demand.

Prerequisites: CJ 110, CJ 290, CJ 292 and junior standing or instructor's permission.

Directed apprentice activities in research or teaching. Students will work under close supervision of their major professor.

*Note: Only 4 credit hours of CJ 497 and/or CJ 498 may be applied toward the major.***CJ 498 Directed Study** 1-4 cr.

Offered: On demand.

Prerequisites: CJ 290, CJ 292 and junior standing or instructor's permission.

Individual research on an advanced level in student's field of interest as approved and directed by major professor.

*Note: Only 4 credit hours of CJ 497 and/or CJ 498 can be applied toward the major.***CLS - CLINICAL LABORATORY SCIENCE****Clinical Laboratory Science Department****CLS 100 Obtaining a Blood Specimen** 1 cr. (2-0-4)

Graded S/U

Offered: Fall, Winter

Meets first four weeks of the semester. A course designed to teach any interested student phlebotomy skills by venipuncture and dermal puncture methods. Lecture topics of infection control, safety, ethics, communication, specimen processing, selection of anti-coagulants, order of draw, prioritizing requests, complications and accidental needlesticks are some of the major areas addressed in this course.

CLS 109 Introduction to Diagnostic Sciences 1 cr.

Offered: Fall, Winter

Prerequisite: High school biology recommended.

The course is designed to introduce students to a variety of diagnostic tests for various aspects of the clinical laboratory. The various tests represent analytes commonly measured because of their diagnostic or screening value for major health conditions in society such as diabetes, heart attacks, anemia and infection. Other areas of consideration will be blood typing and pregnancy testing. Accuracy, safety and quality control will be stressed throughout.

CLS 150 Phlebotomy Practicum 4 cr.

Offered: Fall, Winter

Graded S/U

Prerequisite: CLS 100.

Extensive clinical experience in phlebotomy. The student will log a total of 160 hours at assigned clinical agencies.

CLS 190 Microscopy and Laboratory Techniques 1 cr.

Offered: Fall

The course is designed to develop basic laboratory skills in the use of laboratory tools that are fundamental to science exploration and practice. The student will learn the principles of microscopy, the use and adjustment of microscopes, scope maintenance, slide preparation and definition of terms. Microscopy techniques will be employed using the compound bright-field, phase and dark-field microscopes. Polarized and Fluorescence microscopy will also be discussed. Microscopy techniques will include focusing, ocular lens adjustment, achieving Koehler illumination, troubleshooting problems, use of filters, micrometry etc. Basic generalized laboratory techniques will also be addressed including spectrophotometry and proper pipetting techniques (using a variety of pipettes).

<p>CLS 200 Urine and Body Fluid Analysis 1 cr. (2-0-2) Offered: Winter Prerequisites: High school biology recommended.</p> <p>A study of urine and body fluid examinations. The course will include macroscopic, chemical and microscopic examination of various fluids. Where appropriate, confirmatory and/or supplemental tests will be discussed. Significance, principles, reference ranges, sources of error and data correlation of manual and automated methods will be emphasized in each type of analysis.</p> <p><i>Note: This course meets for the last 6 weeks of the semester.</i></p>	<p>CLS 213 Clinical Immunology and Serology 1 cr. Offered: Winter Prerequisite: One year of high school biology or one semester of college biology, including anatomy and physiology or cell biology; or instructor's permission; chemistry recommended.</p> <p>An introduction to immunology, the immune response and the application of immunological concepts to serological testing in the clinical laboratory.</p>
<p>CLS 201 Clinical Hematology/Coagulation 3 cr. (2-0-3) Offered: Winter Prerequisites: CLS 109, CLS 190, BI 104 or BI 202 or instructor's permission.</p> <p>Study of blood-forming organs, the morphologic, biochemical and functional aspects of the cellular components of blood; the mechanisms of hemostasis. Disorders of the blood are discussed and correlated with the abnormal results found in corresponding lab tests. Manual and automated methods are used in the laboratory with emphasis placed on diagnostic procedures and those used to differentiate normal and abnormal states.</p>	<p>CLS 214 Diagnostic Microbiology 3 cr. (1-1-2.5) Offered: Fall Prerequisites: CLS 204 or concurrent enrollment or instructor's permission.</p> <p>Methods of the isolation and identification of microbial pathogens including clinically significant bacteria, fungi and parasites. Laboratory diagnostic techniques focus on biochemical characterization, serologic testing, rapid identification methods, susceptibility testing and microscopic examination.</p>
<p>CLS 202 Clinical Chemistry 4 cr. (3-0-3) Offered: Fall Prerequisites: One year of high school chemistry and one semester of college chemistry or instructor's permission. CLS 109, CLS 190 recommended.</p> <p>Examination of the methods of analysis and clinical significance of a variety of analytes found in an assortment of body fluids. Correlation of results from different laboratory tests, basic statistics and quality control measures are also explored. Performance of quantitative and qualitative manual and automated clinical chemistry assays typically done in hospital laboratories.</p>	<p>CLS 250 Clinical Practice 1-2 cr. Offered: Fall, Winter Graded S/U Prerequisites: Acceptance for a clinical placement by the Clinical Laboratory Sciences Department.</p> <p>This course is designed for all programs with a clinical practicum that extends into the summer months. This course represents each different discipline identified by the appropriate suffix.</p>
<p>CLS 203 Immunohematology 3 cr. (2-0-3) Offered: Winter Prerequisites: One year of high school biology or one semester of college biology including human anatomy and physiology, or cell biology; CLS 213 or concurrent enrollment or instructor's permission.</p> <p>Fundamentals of blood banking in the ABO, Rh and other blood group systems as applied to recipients and donors of blood; blood component preparation and utilization; transfusion; transfusion complications; quality control and problem-solving; new issues in transfusion medicine. Laboratories include techniques used in immunology/serology; blood grouping; compatibility testing; and antibody identification.</p>	<p>CLS 250A Clinical Practice 2 cr. Offered: Summer</p> <p>Students will practice their clinical assistant skills.</p> <p>CLS 250T Clinical Practice 2 cr. Offered: Summer</p> <p>Students will practice their skills in phlebotomy and serological testing.</p>
<p>CLS 204 Clinical Microbiology 2 cr. Offered: Fall Prerequisites: CLS 109, CLS 190, BI 104 or BI 202 or instructor's permission.</p> <p>Introduction to the medically important bacteria, fungi, viruses and parasites. Infectious diseases are discussed by organ systems including the role of normal flora and clinical information relevant to each. Current practices in the collection and transportation of clinical specimens and infection control issues are emphasized.</p>	<p>CLS 250S Clinical Practice 1 cr. Offered: Summer</p> <p>Students will practice their skills in specimen processing and routine urinalysis.</p> <p>CLS 250C Clinical Practice 2 cr. Offered: Summer</p> <p>Students will practice their skills in routine cytology and histologic techniques.</p> <p>CLS 250G Clinical Practice 2 cr. Offered: Summer</p> <p>Students will become oriented to the cytogenetic or molecular biology laboratory that includes the application of safety policies and learning specialized nomenclature, definitions and some diagnostic genetic techniques. A review of human chromosome and G and Q band patterns are included for cytogenetic students.</p>

<p>CLS 250H Clinical Practice 2 cr. Offered: Summer Students will practice techniques in advanced histology.</p>	<p>CLS 301 Advanced Hematology/Coagulation 3 cr. Offered: Winter Prerequisites: CLS 201 and 251 or instructor's permission. Survey of hematopoiesis, blood cell derivation, iron metabolism, erythropoiesis, physiological classification and laboratory investigation of anemias, leukocyte physiology and function, disorders of phagocytosis, and platelet physiology and function. Key laboratory tests are identified with each area of assessment. Learning activities include computer-assisted instruction, laboratory problems and correlation of clinical data. This course builds upon CLS 201 and the student's clinical experience.</p>
<p>CLS 250M Clinical Practice 1 cr. Offered: Fall, Winter Students will practice techniques in advanced diagnostic microbiology.</p>	<p>CLS 302 Advanced Clinical Chemistry 2 cr. Offered: Fall Prerequisites: CLS 202 and 252. MA 171 recommended. A lecture-laboratory course involving a problem-solving orientation to laboratory practice. Learning activities include a laboratory method comparison, laboratory problems of technical and diagnostic focus, written assignments pertaining to hormones and therapeutic drugs, and computer-assisted instruction.</p>
<p>CLS 251, 252, 253, 254 Sophomore Practicum 14 cr. Graded S/U Prerequisites: A grade of "C-" or better in CLS 200, CLS 201, CLS 202, CLS 203 and CLS 204; a minimum 2.00 grade point average overall, NMU cumulative and in the major, and faculty recommendations. A six-month practicum in an affiliated clinical laboratory under the supervision of clinical laboratory professionals. Includes practical experience in all areas of the clinical laboratory including LIS. Current affiliates are in Upper Michigan, Wisconsin and Minnesota. The practicum is represented by CLS 250T and the following four courses:</p>	<p>CLS 303 Advanced Immunohematology 2 cr. Offered: Winter Prerequisites: CLS 203 and CLS 253; or instructor's permission. Advanced studies in antibody-antigen interaction in relation to blood component therapy. Learning activities include laboratory problems and CAI focusing on complex blood-banking problems; a written assignment for selection of methods for clinical analysis and special techniques in laboratory practice.</p>
<p>CLS 251 Clinical Hematology Practicum 3 cr. Offered: Fall, Winter Includes hematology and coagulation.</p>	<p>CLS 304 Advanced Clinical Microbiology 2 cr. Offered: Fall Prerequisites: CLS 204, CLS 214 and CLS 254 or instructor's permission. A study of selected topics in bacteriology, mycology, parasitology and virology utilizing computer-assisted instruction, written assignments and lab problems. Identification techniques and protocol will be evaluated for both common and infrequently isolated pathogens.</p>
<p>CLS 252 Clinical Chemistry Practicum 4 cr. Offered: Fall, Winter Includes chemistry and routine urinalysis.</p>	<p>CLS 380, 381, 382, 383, 384 Histotechnology Practicum 30 cr. Prerequisites: Completion of the required courses in the Histotechnician or Histotechnologist curriculum and acceptance by a clinical agency with an accredited histology training program. A supervised full-time 6 month to 12 month clinical practicum in an accredited histology program. The practicum prepares students to assist in tissue related procedures to establish and confirm a patient's diagnosis. The preparation and staining of tissue involves a variety of procedures including aspects of enzyme histochemistry, electron microscopy, immunohistochemistry and molecular pathology. The practicum is represented by CLS 250H and the following courses:</p>
<p>CLS 253 Blood Banking Practicum 3 cr. Offered: Fall, Winter Includes blood banking.</p>	<p>CLS 380 Histotechnique I (Processing and Microtomy) 7 cr. Offered: Fall, Winter</p>
<p>CLS 254 Clinical Microbiology Practicum 4 cr. Offered: On demand. Includes bacteriology, mycology and parasitology.</p>	<p>CLS 381 Histotechnique II (Staining, Clinical Correlation, Instrumentation, QC, etc.) 7 cr. Offered: Fall, Winter</p>
<p>CLS 298 Directed Studies in Clinical Laboratory Science 1-4 cr. Offered: On demand. For associate degree programs. May apply to a baccalaureate degree program with the approval of the student's major department. Usually elected only once. Individual directed study in a clinical laboratory science topic. Students study topics through laboratory projects, independent reading and/or a written paper.</p>	

<p>CLS 382 Histotechnique III (Grossing/Embedding, Microscopy) 3 cr. Offered: Fall, Winter</p>	<p>CLS 441 Advanced Clinical Mycology 2 cr. Offered: Fall, Winter</p>
<p>CLS 383 Histochemistry/Pathology (Special stains, Electron Microscopy, DNA) 8 cr. Offered: Fall, Winter</p>	<p>CLS 442 Advanced Clinical Parasitology 2 cr. Offered: Fall, Winter</p>
<p>CLS 384 Advanced Histology (Special projects, Management, Clinical, Legal Procedures) 5 cr. Offered: Fall, Winter</p>	<p>CLS 443 Advanced Clinical Mycobacteriology/Virology 2 cr. Offered: Fall, Winter</p>
<p>CLS 391 Laboratory Experience 1-3 cr. Offered: Fall, Winter, Summer Prerequisites: Appropriate CLS courses (CLS 200, CLS 201, CLS 202, 203, 204, 214) for the designated experience, and permission of supervising faculty and program director.</p> <p>A course subtitle on the student's transcript will describe the content for this course, e.g. CLS 391 Laboratory Experience in Hematology Student Laboratory. The course is designed to offer additional experience in the laboratory which may involve the following activities: perform instrument set-up and shut down, trialing procedures before implementation, laboratory maintenance, implementing quality control procedures, reagent preparation and minor troubleshooting of instruments. Students gain valuable lab experience in a variety of areas beyond the limited exposure in the traditional CLS (non-practicum) classes.</p> <p><i>Note: May be repeated for up to 6 credits if the topic differs.</i></p>	<p>CLS 451, 452, 453, 454 Senior Practicum 14 cr. Prerequisites: a grade of "C-" or better in all CLS courses; a minimum 2.60 GPA overall and NMU cumulative, a minimum 2.00 GPA in the major, CLT certification and recommendations. Junior standing or instructor's permission.</p> <p>An intense, five month practicum in an affiliated clinical laboratory under supervision of clinical laboratory scientists. Includes both practical experience and further acquisition of theoretical principles in all areas of the clinical laboratory with emphasis on special testing, problem-solving and a variety of supervisory functions. Lectures or CAI will be offered regularly. The practicum is represented by CLS 250S and the following four courses:</p>
<p>CLS 420 Clinical Educational Practices 1 cr. Offered: Fall Prerequisites: Junior standing or instructor's permission.</p> <p>Introduction of the laboratory professional to the basic techniques of training students in a clinical setting and presenting laboratory in-services. The principles of learning, the use of goals and objectives and the analysis of a teaching module will be addressed first. Students will be required to teach two laboratory sessions and present one in-service to the Clinical Laboratory Sciences Department.</p>	<p>CLS 451 Advanced Clinical Hematology Practicum 3 cr. Offered: Fall, Winter</p> <p>Includes hematology and coagulation.</p>
<p>CLS 440, 441, 442, 443 Advanced Diagnostic Microbiology Practicum 14 cr. Offered: Fall, Winter Prerequisites: A grade of C- or better in all CLS courses, a minimum of 2.60 grade point average overall and 2.0 GPA in the minor, CLT certification and CLS faculty recommendation. Junior standing or instructor's permission. Students must also enroll in CLS 250M during the summer months.</p> <p>An intense 5 month practicum in an approved clinical laboratory under the supervision of a clinical laboratory scientist or microbiologist. Includes both practical experience with emphasis on proficiency, special or unique procedures, problem solving, method evaluation, setting policy and supervisory functions. The practicum is represented by CLS 250M and the following courses:</p>	<p>CLS 452 Advanced Clinical Chemistry Practicum 3 cr. Offered: Fall, Winter</p> <p>Includes chemistry and special testing.</p>
<p>CLS 440 Advanced Clinical Bacteriology 8 cr. Offered: Fall, Winter</p>	<p>CLS 453 Advanced Clinical Immunohematology Practicum 4 cr. Offered: Fall, Winter</p> <p>Includes blood banking and serology areas.</p>
<p>CLS 460, 461, 462, 463 Cytogenetics Practicum 14 cr. Prerequisites: Students must achieve a 2.60 GPA overall and cumulative and a minimum of 2.80 GPA in the major; students must achieve a grade of "B" or better in BI 111 and BI 206 or BI 312. In addition: cytogenetics track: students must achieve a "B" or better in BI 416 and BI 313 and a grade of "C" or better in all other major courses. Completion of the required courses in the diagnostic genetics curriculum and acceptance by an affiliated clinical agency. Junior standing or instructor's permission.</p> <p>An intense 6-month practicum in an affiliated full service laboratory under supervision of appropriately credentialed cytogenetics professionals. Includes both practical experience and theoretical principles in areas of bone marrow, peripheral and other specialized techniques and projects will be addressed. The practicum is represented by CLS 250G and the following courses:</p>	<p>CLS 454 Advanced Clinical Microbiology Practicum 4 cr. Offered: Fall, Winter</p> <p>Includes bacteriology, mycology, parasitology and virology.</p>
<p>CLS 460 Specimen Processing and Culture 4 cr. Offered: Fall, Winter</p>	<p>CLS 460 Specimen Processing and Culture 4 cr. Offered: Fall, Winter</p>

CLS 461 Microscopic Analysis Offered: Fall, Winter	4 cr.	CLS 483 Tissue Cytology III Offered: Winter	8 cr.
CLS 462 Fish Technology Offered: Fall, Winter	3 cr.	Includes all other tissues.	
CLS 463 Specialized Tech/Projects Offered: Fall, Winter	3 cr.	CLS 484 Applied Clinical Practicum Offered: Winter	5 cr.
CLS 470, 471, 472, 473 Molecular Biology Technology Practicum Prerequisites: Students must achieve a "B" or better in BI 418 and CH 454 and a grade of "C" or better in all other major courses. Completion of the pre-clinical courses in the diagnostics genetics curriculum and acceptance by an affiliated clinical agency. Junior standing or instructor's permission. An intense 6-month practicum in an affiliated full service laboratory under supervision of appropriately credentialed molecular biology technology professionals. Includes both practical experience and theoretical principles in areas of DNA purification, Southern Blot Analysis and Polymerase Chain Reaction (PCR) Analysis. Specialized techniques and projects will also be incorporated. The practicum is represented by CLS 250G and the following courses:	14 cr.	CLS 485 Advanced Cytology Techniques Offered: Winter	2 cr.
CLS 470 DNA Purification Offered: Fall, Winter	2 cr.	CLS 498 Directed Studies in Clinical Laboratory Science Offered: On demand. Prerequisites: Junior standing or instructor's permission. Individual directed study in a clinically related topic. Students study topics through research projects, independent reading and/or a written paper. <i>Note: May apply only to a baccalaureate degree program with the approval of the student's major department. Usually elected only once.</i>	1-4 cr.
CLS 471 Southern Blot Analysis Offered: Fall, Winter	5 cr.	<h2 style="text-align: center;">CN - CONSTRUCTION</h2> <h3 style="text-align: center;">Technology and Occupational Sciences Department</h3>	
CLS 472 PCR Analysis Offered: Fall, Winter	5 cr.		
CLS 473 MB Specialized Tech/Projects Offered: Fall, Winter	2 cr.		
CLS 480, 481, 482, 483, 484, 485, Cytotechnology Practicum Prerequisites: Completion of required courses in the cytotechnology curriculum and acceptance by a clinical agency with an accredited cytotechnology program. Junior standing or instructor's permission. A supervised full-time 12 month clinical practicum in an accredited cytotechnology program. It includes tissue preparation and staining techniques; microscopic study of cellular alterations indicative of cancer, pre-cancerous conditions, bacterial, viral and parasitic infections and hormonal abnormalities. The practicum is represented by CLS 250C and the following seven courses:	32 cr.		
CLS 480 Cytology Orientation Offered: Fall	1 cr.	CN 107 Construction Documents Offered: Fall	3 cr. (2-0-2)
CLS 481 Tissue Cytology I Offered: Fall Includes female genital tract.	8 cr.	Survey of the content, preparation, application and interpretation of various construction contract documents. The interrelationship of the documents is also discussed. The three major parts of construction documents are plans, specifications and the construction manual. Sample sets of documents are interpreted and developed using computer applications with word processing.	
CLS 482 Tissue Cytology II Offered: Fall Includes respiratory and G.I. tract.	8 cr.	CN 151 Introduction to Construction Offered: Fall	3 cr.
		This course is designed to introduce the basic fundamentals of construction and provide an overview of the industry and the relationships that exist among the various stages of construction.	
		CN 154 Construction Survey and Layout Offered: Fall	3 cr. (2-0-2)
		An introductory course covering theory, principles and techniques of construction surveying.	
		CN 156 Construction Systems and Methods Offered: Winter Prerequisites: CN 107 and WT 161 or instructor's permission.	3 cr. (2-0-3)
		Basic systems and methods of constructing structures.	
		CN 158 Concrete Offered: Winter	3 cr. (2-0-3)
		Study and illustration of basic principles of masonry, concrete and concrete forming and procedures.	

CN 191 Carpentry Internship 8 cr. (0-0-40)

Offered: Contact department for information.

Graded S/U

Prerequisites: DD 100, CN 107, CN 151, CN 154, CN 156, CN 158, WT 161.

This course places students in an actual construction situation on a live job site. Students receive hands-on experience in all phases of carpentry construction.

CN 251 Construction Field Operations 2 cr.

Offered: Fall

Prerequisites: CN 107 and WT 161 or instructor's permission.

An introductory course to acquaint students with the requirements necessary to direct the field operations of a construction project.

CN 252 Codes and Inspection 3 cr.

Offered: Winter

Prerequisites: CN 107 or instructor's permission.

Introduction to basic inspections that comply with local building codes and ordinances.

CN 253 Construction Estimating 3 cr.

Offered: Winter

Prerequisites: CN 151, CN 251 and CN 278 or instructor's permission.

Introduction to estimating, using means and national reporting systems as a guide. Students are provided with theory, principles and techniques to arrive at a total construction cost for a building project.

CN 278 Mechanical Systems 3 cr.

Offered: Fall

Prerequisites: CN 107 or instructor's permission.

A course organized to provide basic understanding of design procedures of mechanical systems, flexibilities in each system, space required and at what point the job will be done.

CN 298 Directed Study and Research 1-4 cr.

Prerequisites: Department permission.

Selection of problem in area of emphasis, specialized instruction and experiences to reinforce technical skill and knowledge. Written reports of work are required.

CN 353 Soils and Foundations 3 cr. (2-0-2)

Offered: Winter

Prerequisites: CN 154, CN 158, MA 104 or instructor's permission.

Study of basic theory and application detailed in ASTM (American Society of Testing Materials) procedures, developing a knowledge of fundamental principles and good judgment in foundation design supported by experience and scientific data.

CN 357 Legal Aspects of Construction 3 cr.

Offered: Fall

Prerequisites: CN 253 or instructor's permission.

Introduction to legal implications in the building industry.

CN 450 Project Control 3 cr.

Offered: Fall

Prerequisites: CN 357 and CN 458 or instructor's permission.

Development of a mechanism for cost estimating and its relationship to other project control functions of scheduling, budgeting and cost control.

CN 458 Bidding Strategies 3 cr.

Offered: Winter

Prerequisites: CN 357 or instructor's permission.

An advanced course involving student contribution on bidding strategies and a professional approach to analyzing this competitive information.

CN 459 Construction Management 3 cr.

Offered: Winter

Prerequisites: CN 450 or instructor's permission.

In-depth orientation to construction management methods, major engineering and construction management techniques and practices relating to the organization of a company.

CN 498 Directed Study and Research 1-4 cr.

Prerequisites: Junior standing and department permission.

Selection of problem in area of emphasis, specialized instruction and experiences to reinforce technical skill and knowledge. Written reports of work are required.

COS - COSMETOLOGY

Technology and Occupational Sciences Department

COS 111 Fundamentals of Cosmetology 4 cr.

Co-requisites: COS 112 and COS 113.

Textbook study covering 60 theory hours on the subjects of hair shaping, hair color, hair growth, hair and scalp health, facial procedures, manipulation and skin as prescribed by the Michigan State Board of Cosmetology and listed in the *Cosmetology Laws and Rules Book*.

COS 112 Fundamentals of Cosmetology II 4 cr.

Co-requisites: COS 111 and COS 113.

Textbook study covering 60 theory house on the subjects of chemical texturizing, hair designing, bacteriology, decontamination, infection control, water/hot oil manicures and pedicures as prescribed by the Michigan State Board of Cosmetology and listed in the *Cosmetology Laws and Rules Book*.

COS 113 Fundamental Application of Physical Services 8 cr. (0-0-18)

Co-requisites: COS 111 and COS 112.

The practical study of services through 270 hours of practice on mannequins and classmates. Services studied in this course will prepare students to legally work on the general public as part of their continuing education.

COS 121 Intermediate Cosmetology I 4 cr.
 Co-requisites: COS 122 and COS 123.
 Prerequisites: COS 111, COS 112 and COS 113.

Intermediate level study covering 60 theory hours on the subjects of hair shaping, hair coloring, chemical texturizing and artificial nail application procedures as prescribed by the Michigan State Board of Cosmetology and listed in the *Cosmetology Laws and Rules Book*.

COS 122 Intermediate Cosmetology II 4 cr.
 Co-requisites: COS 121 and COS 123.
 Prerequisites: COS 111, COS 112 and COS 113.

Intermediate level study covering 60 theory hours on the subjects of hair design, appointment scheduling, client/receptionist protocol, payment records, cash control, retail sales, inventory control, esthetics of skin, and the braiding and styling of long hair as prescribed by the Michigan State Board of Cosmetology and listed in the *Cosmetology Laws and Rules Book*.

COS 123 Intermediate Application of Physical Services 8 cr. (0-0-18)
 Co-requisites: COS 121 and COS 122.
 Prerequisites: COS 111, COS 112 and COS 113.

Intermediate level practice through 270 hours of practical work involving the public patron clinic. Students are assigned a work service station and serve patrons on the supervision of an instructor.

COS 131 Advanced Cosmetology I 4 cr.
 Co-requisites: COS 132 and COS 133.
 Prerequisites: COS 121, COS 122 and COS 123.

Advanced level study covering 60 theory hours on the subjects of hair shaping, hair coloring, chemical texturizing, gels and fiberglass nails as prescribed by the Michigan State Board of Cosmetology and listed in the *Cosmetology Laws and Rules Book*.

COS 132 Advanced Cosmetology II 4 cr.
 Co-requisites: COS 131 and COS 133.
 Prerequisites: COS 121, COS 122 and COS 123.

Advanced level study covering 60 theory hours on the subjects of hair design, customer relations, machine facials, makeup application, wiggery and hair extensions as prescribed by the Michigan State Board of Cosmetology and listed in the *Cosmetology Laws and Rules Book*.

COS 133 Advanced Applications of Physical Services 8 cr. (0-0-18)
 Co-requisites: COS 131 and COS 132.
 Prerequisites: COS 121, COS 122 and COS 123.

Advanced level cosmetology practice through 270 hours of practical work involving the public patron clinic. Students are assigned a work service station and serve patrons on the supervision of an instructor.

COS 141 Master Level of Cosmetology I 4 cr.
 Co-requisites: COS 142 and COS 143.
 Prerequisites: COS 131, COS 132 and COS 133.

Master level study covering 60 theory hours on the subjects of salon management, financial and legal liabilities and Michigan State Laws and Rules regulating the cosmetology profession as prescribed by the Michigan State Board of Cosmetology and listed in the *Cosmetology Laws and Rules Book*.

COS 142 Master Level of Cosmetology II 4 cr.
 Co-requisites: COS 141 and COS 143
 Prerequisites: COS 131, COS 132 and COS 133

Master level study covering 60 theory hours on the subjects of the State Board Exam, anatomy of the neck, face and head, chemicals and their effects on the client and professional stylist as prescribed by the Michigan State Board of Cosmetology and listed in the *Cosmetology Laws and Rules Book*.

COS 143 Master Level Application of Physical Services 8 cr. (0-0-18)
 Co-requisites: COS 141 and COS 142.
 Prerequisites: COS 131, COS 132 and COS 133.

Master level cosmetology practice through 270 hours of practical work involving the public patron clinic. Students are assigned a work service station and serve patrons on the supervision of an instructor.

CRT-COLLISION REPAIR TECHNOLOGY

Technology and Occupational Sciences Department

CRT 011 Fundamentals of Collision Repair 4 cr. (1-0-9)
 Co-requisite: CRT 012

A comprehensive introduction to auto body repair techniques, tools and materials. Lecture and laboratory topics covered include the repairing of dented and rusted body components, metal working, grinding, sanding, filling and priming. This hands-on course is designed to lay the groundwork for intermediate and advanced auto body repair operations.

CRT 012 Component Analysis and Replacement 4 cr. (1-0-9)
 Co-requisite: CRT 011

A comprehensive introduction to auto body component review and replacement techniques. Lecture and laboratory topics covered include analysis of components for verification of the need for replacement and replacement techniques for all common types of automobile components (e.g., body panels and glass).

CRT 021 Intermediate Collision Repair 4 cr. (1-0-9)
 Co-requisite: CRT 022
 Prerequisites: CRT 011 and CRT 012

Continued development of expertise in body repair, frame alignment and component replacement. Stressing a practical approach, students apply previously acquired knowledge and are instructed in additional special techniques used in the repair of more severely damaged vehicles.

CRT 022 Automotive Paint Preparation and Application 4 cr. (1-0-9)
 Co-requisite: CRT 021
 Prerequisites: CRT 011 and CRT 012.

A comprehensive survey of paint and solvent types, brand name products as well as various application tools, techniques and complete painting processes. Extensive laboratory experience in paint-prep, mixing, application, curing, finishing and clean up will be gained by students in this course.

CRT 031 Advanced Collision Repair 4 cr. (1-0-9)

Co-requisite: CRT 032
Prerequisites: CRT 021 and CRT 022

This course provides students with an opportunity to further refine their expertise in various auto body repair techniques by applying them to difficult auto damage and problem paint situations.

CRT 032 Advanced Refinishing 4 cr. (1-0-9)

Co-requisite: CRT 031
Prerequisites: CRT 021 and CRT 022

Instruction in methods of estimating the cost of labor, parts and materials. Students learn to visually inspect and systematically list all items included in a complete and cost effective cost estimate.

CS-COMPUTER SCIENCE

Mathematics and Computer Science Department

CS 101 Web Site Construction 4 cr.

Offered: On demand.

This class covers all facets of Web site construction, from the creation of a Web site's content to technical definitions such as 'hit' and 'page view'. Audio, video and 3D graphic formats will be explored. Legal issues will be covered. This class is designed for students of all majors.

CS 120 Computer Science I 4 cr.

Offered: Fall, Winter, Summer
Prerequisites: MA 100 or equivalent or instructor's permission.

- Satisfies the formal communication studies requirement.

An introductory course in computer science. This is a first course in computer programming. Topics include methods and parameters, conditionals, loops, arrays, graphical user interfaces and object-oriented program design.

Note: Students with some programming experience are encouraged to take CS 120A.

CS 120A Accelerated Computer Science I 4 cr.

Offered: Fall
Prerequisites: MA 100 and one high school computer class or equivalent or instructor's permission.

- Satisfies the formal communication studies requirement.

This course covers the same range of topics as CS 120, but carries some topics further, adding additional topics as appropriate.

CS 122 Computer Science II 4 cr.

Offered: Fall, Winter
Prerequisites: CS 120 or equivalent, or instructor's permission.

A continuation of CS120. This course provides an opportunity to further develop fundamental programming skills. Topics include introductions to string handling, algorithm analysis, recursion, linked lists, interfaces, inheritance and fundamental data structures.

CS 201 Programming in C++ 3 cr.

Offered: Fall, Winter
Prerequisites: CS 122. Students with some programming experience, especially in C, may take CS 201 concurrently with CS 122.

CS 201 teaches how to program in C++. Topics include pointers, memory management, data structures, object-oriented design and file processing.

CS 222 Data Structures 4 cr.

Offered: Fall, Winter
Prerequisites: CS 122, CS 201 and either MA 240 or MA 340.

This course covers data structures and algorithms in depth. Topics covered include basic data structures (e.g., arrays, stacks, queues, linked lists, trees and graphs), an introduction to basic problem solving strategies and complexity analysis, sorting and searching algorithms, hashing techniques and some advanced tree structures (e.g., AVL trees, B and B+ trees, splay trees and so on).

CS 228 Network Programming 3 cr.

Offered: Fall, Winter
Prerequisites: CS 122 and CS 201.

This course covers creating network-based applications as well as the basic theory of networking. Topics include programming Internet applications, client-server programming and Internet protocols. Applications created have included mail clients, Web servers and Internet-based games.

CS 255 Computing for the Elementary School Teacher 4 cr.

Offered: Fall, Winter
Prerequisites: MA 150 with a "C" or better or instructor's permission.

- Satisfies the formal communication studies requirement.

The course serves as an introduction to technology in education. The primary focus will be the use of computers and the Internet in education. The course projects concentrate on applications relevant to the school curricula.

CS 295 Special Topics in Computer Science 1-4 cr.

Offered: On demand.

Designed for freshmen and sophomores. Topics reflecting the special interests of students and staff.

Note: May be repeated if topic differs with instructor's permission.

CS 297 Directed Studies in Computer Science 1-4 cr.

Offered: On demand.
Graded S/U
Prerequisite: Department head permission.

Individual investigations of a special topic in computer science.

CS 298 Directed Studies in Computer Science 1-4 cr.

Offered: On demand.
Same as CS 297 except that letter grades are given.

- CS 302 Unix System Administration** 4 cr.
Offered: Winter
Prerequisites: Six credit hours in CS or CIS numbered 120 or above, system administration experience, or consent of instructor.
This is a hands-on course in Unix system administration. The topics will cover installing an operating system, user account management including the sharing of account information over a network, printer management including networked printing, disk management, including quotas, network connectivity, sharing files over a network, installing various servers including a Web server, electronic mail management, security in a networked environment and performance tuning. In addition, students will learn the substantial troubleshooting skills. Aspects of security will be discussed pertaining to the detection and correction of various attacks against a computer or network.
- CS 322 Principles of Programming Languages** 4 cr.
Offered: Winter
Prerequisites: MA 240, CS 222 and CS 330 (concurrent enrollment in CS 330 permitted) or instructor's permission.
This course will survey the concepts and characteristics that are currently employed in modern programming languages. These include the assignment effects, procedure activation, scope, rules, type systems for conventional imperative programming languages, and data encapsulation and inheritance in the object-oriented paradigm. This course will also cover concurrent and non-imperative languages (i.e., functional and logic). The implementation of high-level languages will be examined, including the major components of modern compilers (e.g., lexical analyzers, parsers and machine code generation), compiler theory (e.g., push-down automata and formal grammars) and translator-based language design issues (e.g., compilers versus interpreters, single-pass versus multi-pass compilers).
- CS 326 Object-Oriented Design** 3 cr.
Offered: Fall
Prerequisites: CS 222 or consent of instructor.
The aim of this course is to develop a thorough understanding of software engineering principles that support the development of large projects. Object-oriented design patterns will be emphasized in the course.
- CS 330 Microcomputer Architecture** 4 cr.
Offered: Fall, Winter
Prerequisite: An introductory laboratory course in a natural science or a computer programming course or instructor's permission.
Study of how computer hardware responds to stored instructions. Construction projects with logic circuits lead to the development of interfacing connections and the conceptual designs of microprocessors. Assembly language programming of the microprocessor functions is introduced in the context of the logic circuitry being controlled. Programming projects emphasize the software needed in common interfacing tasks.
- CS 370 Intelligent Mobile Robots** 4 cr.
Offered: On demand.
Prerequisites: CS 201 or CS 330, or equivalent software or hardware experience.
This course teaches how to design, build and program autonomous robots. Topics include robot architecture (e.g., sensors, effectors, processors and platforms), as well as adaptive behavior (e.g., navigation, machine learning and evolutionary robotics). A significant portion of the course incorporates hands-on experience with real robots as well as simulators. The second half of the course will involve team-based projects and a final demonstration.
- CS 422 Algorithms Design and Analysis** 3 cr.
Offered: Fall
Prerequisite: CS 222 and MA 161 or MA 271.
This course covers advanced algorithms and data structures, formal analysis of algorithm complexity and the theory of computation. Topics can include algorithms design technique (e.g., divide-and-conquer, dynamic programming), upper bounds and lower bounds, graph algorithms, geometric algorithms, symbolic and numeric algorithms, string matching, NP-completeness, complexity classes, computability and undecidability and parallel and distributed algorithms. Students finishing this course will learn the basic skills of designing and analyzing sequential and parallel algorithms.
- CS 424 Compilers: Theory and Practice** 4 cr.
Offered: On demand.
Prerequisites: CS 222 and either CS 322 or CS 330 and junior standing or instructor's permission.
A compiler is a program that translates one computer language to another. In this course, students will learn how compilers work, what makes some languages easier to compile than others and different approaches to compiler design. Over the course of the semester, students will build their own compilers.
- CS 426 Operating Systems** 3 cr.
Offered: Winter
Prerequisite: CS 228 and CS 330, junior standing or instructor's permission.
This course explores the underlying concepts of modern operating systems. Topics include memory management, processor scheduling, security management and file system design. Design concepts such as the microkernel architecture and object-oriented operating systems are covered. Examples are drawn from a wide variety of operating systems, including Windows NT and Linux. Students will be expected to perform hands-on experiments with operating system behavior and make minor modifications to existing operating systems. Students without CS 330 may enter with consent of instructor.
- CS 442 Advanced Networking** 3 cr.
Offered: Every other Fall.
Prerequisites: CS 228, junior standing or instructor's permission.
The course teaches several higher-level computer networking concepts, such as distributed objects and high-level communication protocols. Network programming skills will be developed. Students will write and test networked programs using a variety of paradigms. Current topics of industry interest such as CORBA and DCOM will be covered.

CS 444 Parallel and Distributed Processing 4 cr.

Offered: Winter

Prerequisites: CS 228 or instructor's permission.

This course introduces the students to the basics of parallel and distributed computing. Topics include parallel hardware architecture, multi-processor architecture, process communications, data sharing, threads, deadlock avoidance, distributed algorithms, remote method invocation, client/server applications and transactions. Students will write programs demonstrating their understanding of these topics.

CS 446 Computer Graphics 4 cr.

Offered: On demand.

Prerequisites: CS 322 and MA 211 or instructor's permission.

An introduction to the concepts and techniques of computer graphics. Topics include geometric transformations, viewing, object hierarchy, input and interaction, curves and surfaces, illumination and shading. In this course students will design graphics applications.

CS 460 Advanced Web Programming 3 cr.

Offered: Every other Fall.

Prerequisites: Six credit hours of computer science courses at the 200 level or above.

This course teaches students how to program client/server applications for the Web focusing on database integration. Topics cover scripting languages such as Perl, PHP or other current alternatives and using them to read input from Web forms and produce Web output. SQL will be used to interface with databases as the backend technology.

CS 470 Artificial Intelligence 4 cr.

Offered: On demand.

Prerequisites: CS 222, junior standing or instructor's permission.

This course takes students beyond the traditional algorithms of computer science. Students learn techniques for making computers behave more intelligently and adaptively than typical programs. The course includes a survey of the broad and dynamic field of computer intelligence, from the established techniques for automated reasoning, knowledge representation and machine learning, to the newer areas of stochastic, adaptive systems, such as neural networks, genetic algorithms or intelligent agents. A few specific methodologies will be explored in depth, through implementation and application to real world problems. The class will cover the topics listed above, recent advances in artificial intelligence and any necessary background materials.

CS 480 Senior Project in Computer Science 3 cr.

Offered: Fall, Winter

Prerequisites: CS 222, CS 228, junior standing and permission of adviser.

This course involves a significant software (and possibly hardware) development and implementation project under the supervision of a CS faculty member. Students will be expected to create significant new computer applications (e.g., writing over a 1000 lines of new code, building integrated hardware and software systems or making diverse technologies work together in novel ways). Students will use algorithms and expertise developed from material in earlier courses. They are expected to begin the project prior to registering for CS 480 by finding and working with a project adviser (CS faculty). Enrollment in CS480 allows students to wrap up the project, including testing, documenting and giving a demonstration and presentation to an evaluation committee of CS faculty for feedback and grading.

CS 490 Special Projects in Computer Science 1-4 cr.

Offered: On demand.

Prerequisites: Prior arrangement with instructor and junior standing.

Development of projects of an extensive nature, working in small groups and in consultation with the instructor. The project would draw heavily upon, and substantially reinforce and extend, the student's previous work in computer science and possibly related areas as well. Included would be the delineation of a major computer-related problem, followed by the design and implementation of a maintainable solution.

Note: May be repeated if project differs.

CS 491 Internship in Computer Science 1-8 cr.

Offered: On demand.

Graded S/U

Prerequisites: Junior standing, minimum grade point average of 3.00 and departmental approval.

The course provides on-the-job experience in the application of computer science principles. Internship positions are coordinated with the Job Search Office and the Math and Computer Science Department.

Note: May be repeated for credit, not to exceed eight credits total. Only four credits may be applied to a computer science minor.

CS 495 Special Topics in Computer Science 1-4 cr.

Offered: On demand.

Prerequisites: For upper division students and majors and minors.

Topics reflecting special interest of students and staff.

Note: May be repeated if topic differs with instructor's permission.

CS 496 Special Topics in Computer Science 1-4 cr.

Offered: On demand.

Graded S/U

Prerequisites: For upper division students and majors and minors.

Topics reflecting special interest of students and staff.

Note: May be repeated if topic differs with instructor's permission.

CS 497 Directed Studies in Computer Science 1-4 cr.
 Offered: On demand.
 Graded S/U
 Prerequisites: Available only with consent of department head.
 Individual investigations of a special topic in computer science.

CS 498 Directed Studies in Computer Science 1-4 cr.
 Offered: On demand.
 Prerequisites: Available only with consent of department head.
 Individual investigations of a special topic in computer science.

DD - DRAWING AND DESIGN

Engineering Technology Department

DD 100 Technical Drafting with Introduction to CAD 4 cr. (2-1-2)
 Offered: Fall, Winter

Introductory drafting and computer-aided design including sketching, lettering, instrument usage, orthographic projection, sectional views, auxiliary views, dimensioning, tolerancing, threads, fasteners, pictorial drawings and computer graphic applications. This course is designed for students with little or no previous mechanical drafting or CAD experience.

DD 102 Engineering Graphics 3 cr.
 Offered: Winter
 Prerequisites: DD 100 or instructor's permission.

Graphic problem solving with advanced orthographic projections techniques, including fundamentals of spatial relationships, auxiliary views, revolutions, intersections, developments and vector analysis.

DD 103 Geometric Dimensioning and Tolerancing 2 cr. (1-0-2)
 Offered: Fall
 Prerequisites: DD 100 or instructor's permission.

Principles and practices of using geometric dimensioning and tolerancing (GDT) as found in contemporary industry. Interpretation, understanding and implementation of the concept in design, drawing and making of mechanical parts for production.

DD 105 Schematic/Diagram Drafting 2 cr. (1-0-2)
 Offered: Fall

Students will learn to produce electrical/electronic, hydraulic/pneumatic, heating, ventilation and air conditioning (HVAC) and piping drawings in accordance with contemporary industrial standards. Previous drafting experience is not required. Topics included are block diagrams, electronic schematics, wiring diagrams, hydraulic and pneumatics circuits, central air conditioning and related piping. Drawings will be computer generated (CAD) using symbols libraries.

DD 110 CAD Productivity and Customization 2 cr. (1-0-2)
 Offered: On demand.
 Prerequisite: DD 100

An introductory level course designed to acquaint the CAD student with drafting efficiency. Program customization will be explored to enhance the productivity of the individual and the office environment. Topics include editing techniques, menu creation, LISP routines and proper drawing planning.

DD 202 Product Development and Design 4 cr. (2-1-2)
 Offered: Fall
 Prerequisites: DD 100 or instructor's permission.

Graphic fundamentals, problem solving concepts and the design process are applied toward the development and design of products. The course includes techniques in graphic presentation, computer aided design and technical illustration.

DD 203 Industrial Drawing and Design 4 cr. (2-1-2)
 Offered: Winter
 Prerequisite: DD 100 or instructor's permission.

Special areas of industrial drawing are taught. Precision dimensioning-tolerancing, machine drawings, electrical-electronic schematics, pneumatics-hydraulics, tooling, computer assisted graphics, use of handbooks and catalogs and special drafting.

DD 205 Architectural Presentation Techniques 2 cr. (1-0-2)
 Offered: Fall

Fundamentals of architectural presentation drawings including two-point perspective, elevation rendering, plan presentation drawing, basic shade and shadow techniques and entourage.

DD 206 Architectural and Industrial Prototypes 2 cr. (1-0-2)
 Offered: Fall

An introductory-level course designed to acquaint students with methods and techniques of preparing industrial form and prototypes. Miniature scale mock-ups are developed and presented to illustrate the design technique.

DD 207 Architectural Design 4 cr. (2-1-2)
 Offered: Winter

Beginning course in architectural design fundamentals. Student develops basic skills and techniques required for the architectural profession. A study of concepts and procedures essential to architectural design including site analysis, programming, schematics and design development. The student solves a practical design problem and prepares a complete graphic solution.

DD 208 Architectural Detailing 4 cr. (2-1-2)

Offered: Winter

Introduction to small commercial and industrial building construction techniques, materials and methods. Included are foundation, wall and roof construction requirements for various building structures, along with comparison of structural materials and methods and suitable application to various structures. The investigation of building uses and functions and consideration of equipment, services and accessory facilities are integral to this course.

DD 214 Structural Design 3 cr.

Offered: On demand.

Prerequisite: ET 211

Basic approach to the design of structural members in building of usual types of construction, spans and story heights where many of the more sophisticated refinements permitted by modern codes are not warranted. Included are the principles of structural mechanics, design of steel and wood beams and columns, structural connections and reinforced concrete systems.

DD 295 Special Topics in Computer Aided Design 1-4 cr.

Offered: On demand.

Prerequisite: Adviser permission.

Specialized work not covered by other courses.

DD 298 Directed Study and Research 1-4 cr.

Offered: On demand.

Prerequisite: Department permission.

Selection of problem in area of emphasis, specialized instruction and experiences to reinforce technical skill and knowledge. Written reports of work are required.

DD 302 Architectural Drawing-Residential 4 cr. (2-1-2)

Offered: Fall

Prerequisites: DD 100 or instructor's permission.

Conventions and practices used in modern home building, planning, general knowledge related to consumer housing and graphic presentation of working drawings and specifications. Emphasis upon vacation-recreational housing and complete exhibits for residential housing.

DD 303 Architectural Drawing-Commercial 4 cr. (2-1-2)

Offered: Winter

Prerequisites: DD 100 or instructor's permission.

Architectural drawing emphasizing conventions and practices used in commercial architecture. Presentation drawings, perspective layout and planning, rendering, commercial prints and structural detailing are stressed.

DD 310 Three Dimensional Computer Modeling/Presentation 2 cr. (1-0-2)

Offered: On demand.

Prerequisites: DD 110 and DD 102 or DD 207 or instructor's permission.

This course explores the use of three-dimensional design in both the engineering and architectural disciplines. Through the uses of solids modeling and parametric design, engineered parts are created and analyzed. Architectural prototypes are created, displayed and analyzed through surface modeling.

DD 402 Senior Design Project 4 cr. (1-0-6)

Offered: On demand.

Prerequisites: IT 380, senior standing or instructor's permission and completion of all other minor requirements.

This course will provide the graduating senior in a computer aided drafting minor experience in design of an appropriate project in his or her area of specialization. The course calls upon the student to use all of his or her previous design and drafting experience to create a solution to a problem(s).

DD 495 Special Topics in Computer Aided Design 1-4 cr.

Offered: On demand.

Prerequisite: Adviser permission and junior standing.

Specialized work not covered by other courses.

DD 498 Directed Study and Research 1-4 cr.

Offered: On demand.

Prerequisite: Department permission and junior standing.

Selection of problem in area of emphasis, specialized instruction and experiences to reinforce technical skill and knowledge. Written reports of work are required.

EC - ECONOMICS

Economics Department

EC 101 The American Economy 4 cr.

Offered: Fall, Winter, Summer

- Satisfies the foundations of social sciences requirement.

Introduction to the structure, processes and problems of the American economic system. The historical development of the market economy is emphasized with discussion of the major economic institutions, such as corporations, cooperatives, market competition and the banking system. Some introduction to the functioning of supply and demand in price determination is included.

Note: Not open to students who have credit in, or are currently enrolled in, another economics course. May be counted toward a major or minor in economics.

EC 201 Microeconomic Principles 4 cr.

Offered: Fall, Winter, Summer

Prerequisite: Sophomore standing or EC 101 or instructor's permission.

Analysis of price determination and resource allocation in a market economy. Particular attention is paid to individual consumer and producer choice under a variety of market structures.

<p>EC 202 Macroeconomic Principles 4 cr. Offered: Fall, Winter, Summer Prerequisites: Sophomore standing and EC 201 or instructor's permission.</p> <p>Continuation of Economics 201. Introduction to theories of national income, money, public finance and international transactions.</p>	<p>EC 401 Intermediate Microeconomics 4 cr. Offered: Fall Prerequisites: EC 201 and EC 202, junior standing or instructor's permission.</p> <p>Theoretical analysis of the behavior of the consumer, the firm and other economic units and of the determination of product and factor prices under various market structures. Application of theory to contemporary economic problems.</p>
<p>EC 320 Money, Banking and Monetary Theory 4 cr. Offered: Fall Prerequisites: EC 201 and EC 202 or instructor's permission.</p> <p>Institutional description of money, commercial banking, central banking, deposit intermediaries, government finance and foreign exchange. Theoretical analysis of the effect of monetary institutions on economic behavior and applications of monetary theory to problems in macroeconomics.</p>	<p>EC 402 Intermediate Macroeconomics 4 cr. Offered: Winter Prerequisites: EC 201 and EC 202, junior standing or instructor's permission. EC 320 recommended.</p> <p>Analysis of savings, consumption, investment and other aggregates in the national economy as related to determination of national income, employment and prices. This is a course in macrostatics.</p>
<p>EC 337 American Economic History 4 cr. Offered: Winter Prerequisites: Completion of the foundations of communication requirement and sophomore standing. Cross listed as HS 337.</p> <ul style="list-style-type: none"> • Satisfies the foundations of social sciences requirement. • Satisfies the upper division liberal studies requirement. <p>Transformation of the American economy, with particular emphasis on the modern period of industrialization. The focus is resource allocation within the major theme of economic growth. Special attention is devoted to the role of the corporation, ethics, advertising, environment, labor, public policy decisions, critics and defenders of the economic order.</p>	<p>EC 405 Public Finance 4 cr. Offered: Every other Fall. Prerequisites: EC 201 junior standing or instructor's permission.</p> <p>Introduction to the theory of the public economy with emphasis upon the effects of government activity on allocation of scarce resources. Study of theories and practices related to government spending, taxing, borrowing and management of the public debt.</p>
<p>EC 345 Environmental and Natural Resource Economics 4 cr. Offered: Every other Winter. Prerequisites: EC 101 or EC 201, or instructor's permission.</p> <p>The subjects of this course include air and water pollution, climate change, acid rain, depletion of biodiversity and other environmental, natural resource and land-use problems. This course allows students to apply tools of economic analysis to the study of current environmental and natural resource issues. Property rights, social welfare maximization and cost-benefit analysis are some of the key concepts used during the course.</p>	<p>EC 410 Managerial Economics 4 cr. Offered: Every other Winter. Prerequisites: EC 201, MA 171, junior standing or instructor's permission.</p> <p>The application of economic analysis to business problems. Economic techniques and principles used in formulating business policies are considered: forecasting, estimation and analysis of demand functions; estimation of production functions and cost functions; forms of competition, pricing techniques and profits; application of linear programming and game theory.</p>
<p>EC 350 Methods and Materials in Teaching Social Studies Education 4 cr. Offered: Fall, Winter Prerequisite: Admission to methods phase of teacher education. Co-requisite: Concurrent enrollment in ED 349.</p> <p>Survey of the concepts, materials and strategies used in economics at the secondary level. The course includes practice in the construction of units, identification of objectives, selection of materials and development of activities and procedures. Some discussion of evaluation and classroom management is included.</p> <p><i>Note: Does not count toward the non-teaching economics major or minor. Can count toward the secondary education economics minor if required.</i></p>	<p>EC 415 Labor Economics 4 cr. Offered: Every other Fall. Prerequisites: EC 201 junior standing or instructor's permission.</p> <p>Analysis and description of the U.S. labor force and labor markets. Wage determination for the firm, industry and economy is examined. The impact of unions, licensing and other institutional forces on wages and employment is evaluated.</p>
	<p>EC 420 Capitalism, Socialism and Democracy 4 cr. Offered: Every other Winter. Prerequisites: Completion of the foundations of communication requirement, junior standing or instructor's permission. One course in economics recommended.</p> <ul style="list-style-type: none"> • Satisfies the foundations of social sciences requirement. • Satisfies the upper division liberal studies requirement. <p>Broad view of economic systems, integrating aspects of political and social institutions with traditional and alternative economic theories and institutions. Topics include worker self-management, class struggles, revolution, redistribution of income and wealth, anarchism, socialism and government control.</p>

EC 425 International Economics 4 cr.
 Offered: Every other Winter.
 Prerequisites: EC 201 and EC 202, junior standing or instructor's permission.

Introduction to the theory of international trade and finance with emphasis on the study of the gains from international specialization and exchange, the mechanisms of intercountry economic relations, the balance of payments, the correction of imbalances in international trade flows, and the effects and purposes of restrictions on trade. Attention is given to major contemporary international trade problems.

EC 435 Law and Economics 4 cr.
 Offered: Every other Fall.
 Prerequisites: Junior or senior standing or instructor's permission. One course in economics (EC 101 or 201) recommended.

An exploration of the interface between the two disciplines of law and economics with emphasis on the economic analysis of law. Rather than focusing solely on what the law is, this course explores why the law is as it is. Major topics include property, contract, torts, product liability, common law and crime.

EC 444 Health Care Economics 4 cr.
 Offered: Every other Winter.
 Prerequisites: EC 101 or EC 201 and junior standing or instructor's permission.

An application of basic microeconomic principles to the ever growing health care sector. Topics include, but are not limited to, health care production, the demand for health care and the effects of third-party payers, the supply of health insurance, managed care systems (HMO's, PPO's, etc.), government insurance programs, physicians' behavior, hospital structure and organization, medical malpractice, government intervention in the U.S. health care market and international health care systems.

EC 460 Economic Development 4 cr.
 Offered: Every other Fall.
 Prerequisites: EC 201 and EC 202, junior standing or instructor's permission.

The meaning and characteristics of underdevelopment; survey of theories of growth and development; the problem of "disguised" unemployment, factor proportions and optimal techniques of production; the role of capital accumulation and foreign trade in industrialization; planning techniques for economic development.

EC 490 Seminar in Economics 1-4 cr.
 Offered: On demand.
 Prerequisites: EC 201 and EC 202, junior standing and instructor's permission.

Topic determined by the specialties of the instructor.

EC 495 Special Topics in Economics 1-4 cr.
 Offered: On demand.
 Prerequisites: instructor's permission and junior standing.

Variable content, depending upon the specialization of the instructor and special needs of the student.

Note: May be repeated if topic differs.

EC 498 Directed Studies in Economics 1-4 cr.
 Offered: On demand.
 Prerequisites: EC 201 and EC 202, junior standing and instructor's permission.

Readings and research under faculty supervision. Designed for advanced economics majors.

ED-TEACHER EDUCATION

School of Education

See the "School of Education" section of this bulletin for minimum grade point average requirements.

ED 201 Introduction to Education 2 cr.
 Offered: Fall, Winter, Summer
 Prerequisite: Admission to teacher education.

An opportunity for students to explore a career in education. In addition to providing background information on the organization, control, supervision, financing and professional aspects of American schooling, the course provides a foundation for content presented in other education courses. A central focus of the course is the relationship of school, the workplace and citizenship in American society. Basic skills and traits necessary for success in the teaching profession are assessed in a number of ways in the course.

ED 222 Classroom Management 1 cr.
 Offered: Fall, Winter

A study through a variety of techniques of methods to manage behavior in the classroom. Field experience may be involved.

ED 223 Multicultural Education 1 cr.
 Offered: Fall, Winter

A study of how multicultural and global perspectives can be reflected in curricular design and planning; instructional design, practice and evaluation; and teachers' and students' knowledge, attitudes and behavior. Field experience may be involved.

ED 230 Teaching and Learning in the Elementary Classroom 4 cr.
 Offered: Fall, Winter
 Prerequisite: Admission to teacher education.

This course is an introduction to contemporary theories of teaching and learning for elementary education students. The course will focus on the connections of these theories to classroom practice as they relate to children of varying abilities from birth to early adolescence. Teacher-student relationships are observed and discussed. This course includes field experience.

- ED 231 Teaching and Learning in the Secondary Classroom** 4 cr.
Offered: Fall, Winter
Prerequisite: Admission to teacher education.
- This course is an introduction to contemporary theories of teaching and learning for secondary education students. The course will focus on the connections of these theories to classroom practice as they relate to children of varying abilities at early to late adolescence. Teacher-student relationships are observed and discussed. This course includes field experience.
- ED 295 Special Topics in Education** 1-4 cr.
Offered: On demand.
- An opportunity for freshmen and sophomores to study problems in education that are not part of the regular offerings.
- ED 301 Dimensions of American Education** 2 cr.
Offered: Fall, Winter, Summer
Prerequisites: Admission to teacher education and ED 201.
- Exploration of historical, philosophical, political, economic, social and legal dimensions of American education in order to gain insight into the nature, purposes and results of public and private schooling. Consideration is also given to significant current issues such as equality of opportunity, multicultural education and the quest for educational excellence.
- ED 306 Children's Literature** 3 cr.
Offered: Fall, Winter
Prerequisites: Admission to the methods phase of teacher education.
- Introduction to the literature available for children, the development of criteria for evaluating books and a study of the literature program in the elementary schools.
- ED 307 Integrating the Arts into the Elementary Curriculum** 2 cr.
Offered: Fall, Winter
Prerequisites: Admission to the methods phase of teacher education. Satisfactory completion of MU 149A and AD 310.
- A capstone course for pre-professional elementary education teachers focusing on: 1) utilizing creative dramatics and theatre as the medium for integrating the visual and performing arts in K-8 subjects such as science, history, language arts, mathematics and geography; 2) demonstrating creative teaching and learning strategies from music, art, dance and theatre to motivate students and to enhance their study of school subjects; 3) developing lesson plans and their effective application for integrating the arts in field settings. This course includes a field assignment.
- ED 310 Social Studies Methods and Materials for Elementary Teachers** 3 cr.
Offered: Fall, Winter
Prerequisite: Admission to the methods phase of teacher education.
- Survey of social studies curricula: their content, aims and objectives in the elementary school (K-8). Includes the use of materials and unit method planning emphasizing basic generalizations and concepts. Basic principles of economics and the roles of economic institutions and business in American society are included. The application of good basic skills and attitudes to careers and the world of work in general are addressed.
- ED 311 Language Arts Methods and Materials for Elementary Teachers** 3 cr.
Offered: Fall, Winter
Prerequisite: Admission to the methods phase of teacher education.
- Survey of theories, research, strategies and activities for incorporating the language arts throughout the elementary school curriculum. A predetermined number of practicum hours in the elementary school are required.
- ED 312 Science Methods and Materials for Elementary Teachers** 3 cr.
Offered: Fall, Winter
Prerequisites: Admission to the methods phase of teacher education and 12 credits of science.
- A survey of science curricula and instructional methodology for the teaching of biological, earth and physical sciences and technology in K-8 classrooms. Basic concepts of environmental education and teaching children the interdisciplinary nature of the sciences are stressed. Field experience is required.
- ED 316 Elementary Reading Instruction I** 3 cr.
Offered: Fall, Winter
Prerequisite: Admission to the methods phase of teacher education.
- Study of the reading process and introduction to various techniques, with a number of observations of reading instruction in elementary classrooms.
- ED 318 Elementary Reading Instruction II** 3 cr.
Offered: Fall, Winter
Prerequisites: Admission to the methods phase of teacher education and ED 311 and ED 316.
- An in-depth consideration and extension of the content provided in Reading Instruction I: examination of diagnostic techniques, introduction of reading subject matter materials and a practicum experience.
- ED 319 The Teaching of Reading for Secondary Teachers** 3 cr.
Offered: Fall, Winter
Prerequisite: Admission to the methods phase of teacher education.
- Methods the content area teacher can use to help students comprehend course materials more effectively, to determine reading needs of students and to adapt instruction to their needs. Field experience is required.
- ED 349 Teaching for Diversity, Equity and Social Justice in the Secondary School Community** 2 cr.
Offered: Fall, Winter
Prerequisites: Completion of ED 201, ED 301, ED 231 and admission to the methods phase of teacher education.
Co-requisite: Concurrent enrollment required in ED 319.
- This course, which is combined with ED 319 and situated in a school setting, is a study of ethical principles and teaching methods common to all secondary school certification areas. In particular, the course addresses issues of diversity, equity and social justice within four major areas of knowledge: (1) teaching strategies; (2) authentic performance assessment; (3) classroom management; and (4) uses of technology for a variety of curricula at the secondary level.

<p>ED 360 Orientation to Special Education 4 cr. Offered: Fall Prerequisites: ED 230, ED 231 and PY 100.</p> <p>Study of children with exceptionalities: etiology and characteristics of these individuals and the educational provisions that exist for their care, treatment, training, education and habitation. Students are assigned to a 20 hour pre-teaching experience.</p>	<p>ED 404 Assistive Technology for Students with Disabilities 2 cr. Offered: Fall Prerequisites: ED 360, junior standing or instructor's permission.</p> <p>Development of ability to design, order and acquire modern technology and equipment for a variety of handicapping conditions. Emphases are on assisting independent living and enhancing communication and use of assisting technology for teachers.</p>
<p>ED 361 Special Education and the General Classroom Teacher 2 cr. Offered: Fall, Winter, Summer Prerequisite: Admission to the methods phase of teacher education.</p> <p>An introductory course covering the range of handicapping conditions, designed for the elementary or secondary teacher or paraprofessional who seeks to develop an awareness of the emotional, educational and social implications of handicaps and to formulate some practical applications of this knowledge when working with students with exceptionalities in the general classroom.</p>	<p>ED 405 Diagnosis and Assessment in Special Education 4 cr. Offered: Winter Prerequisites: ED 360 and ED 400, or ED 407, junior standing or instructor's permission.</p> <p>Study of diagnostic process in the assessment of intellectual capacity, educability, behavioral and emotional characteristics, and academic achievement. Students are required to administer, score and interpret selected instruments and to compile a diagnostic write-up.</p>
<p>ED 400 Introduction to Cognitive Impairment 4 cr. Offered: Fall Prerequisites: ED 360, junior standing or instructor's permission.</p> <p>Study of cognitive impairment, its historical background and etiology, characteristics of students with cognitive impairments and assistance in habilitation.</p>	<p>ED 406 Supervised Apprenticeship in Teaching Students with Cognitive Impairment in K-12 Settings 2 cr. Offered: Summer Graded S/U Prerequisites: Completion of all required course work in the cognitive impairment preparatory sequence, junior standing or instructor's permission.</p> <p>A four week full-day career related supervised experience. Students are assigned in school based programs for students with mild or moderate cognitive impairment. Provides an opportunity to refine goals and polish skills; to translate abstract classroom theory to life application.</p>
<p>ED 401 Curriculum and Methods for Teaching Students with Cognitive Impairment 4 cr. Offered: Winter Prerequisites: ED 318, ED 400, junior standing or instructor's permission.</p> <p>Lesson construction and methodology for teaching students with moderate and mild cognitive impairment; includes the use of commercially and teacher-made materials. The teacher's multiple professional roles are stressed.</p>	<p>ED 407 Introduction to Emotional Impairment 4 cr. Offered: Fall Prerequisites: ED 360, PY 211, PY 203, junior standing or instructor's permission.</p> <p>Students will study the evolution of the field, investigate the biophysical, psychodynamic, behavioral and ecological models of influence and develop a knowledge of both internalizing and externalizing disorders. Teacher roles will be explored as well as systems that impact in both negative and positive ways.</p>
<p>ED 402 Teaching Life Skills to Students with Disabilities 2 cr. Offered: Fall Prerequisites: ED 360, junior standing or instructor's permission.</p> <p>Survey of national, state and community resources in independent living, recreation and socialization opportunities for students with disabilities. In addition, students examine materials and curriculum for educating students with disabilities in social skills, free time activities and human sexuality.</p>	<p>ED 408 Curriculum and Methods for Teaching Students with Emotional Impairment 4 cr. Offered: Winter Prerequisites: ED 407, junior standing or instructor's permission.</p> <p>Instruction and education structuring for teaching students with emotional/behavior disorders. Students will obtain knowledge of teaching strategies, service units and educational assessment unique to the needs of this population. Various roles and strategies used by teachers will be studied as well as prescriptive parent planning.</p>
<p>ED 403 Transition for Students with Disabilities 2 cr. Offered: Winter Prerequisites: ED 360, ED 400, or ED 407, junior standing or instructor's permission.</p> <p>Study of pre-vocational curricula within the special education classroom including the development of transition objectives, vocational assessment and potential vocational options following completion of pre-vocational training. Emphasis is placed on practical applications and programs as well as theoretical concepts.</p>	

- ED 409 Supervised Apprenticeship in Teaching Students with Emotional Impairment in K-12 Settings** 2 cr.
Offered: Summer
Graded S/U
Prerequisites: Completion of all required course work in the preparatory sequence for the emotionally behaviorally impaired program, junior standing or instructor's permission.
A four week full-day career related supervised experience. Students are assigned to facilities for students with emotional/behavioral impairment. These may be school-based programs or treatment facilities with an educational service. This is an opportunity to refine goals and translate abstract theory to life application.
- ED 410 Legal Rights and Services** 2 cr.
Offered: Winter
Prerequisites: ED 360 and ED 400 or ED 407, junior standing or instructor's permission.
This course is designed to introduce students to the legal system, terms and definitions, and the major impact of Section 504 and its interrelatedness with IDEA. It discusses eligibility, assessment and due process. Abuse, negligence, discipline and confidentiality as well as excursion and disclosure are studied. Federal and State of Michigan mandates which apply to special education are examined as they impact early childhood and transition programs as well as the school years.
- ED 411 Violence in Schools: Identification, Prevention and Intervention Strategies** 4 cr.
Offered: Contact department for information.
Prerequisites: ED 360 and PY 203.
A foundation for understanding the possible causes of aggression in schools and ways to intervene. The impact of the media, community and family upon violence will be investigated. A review of behavioral techniques and intervention strategies that remediate disruptive behavior, reduce power struggles and increase classroom control will be studied.
- ED 420 Teaching in the Elementary School** 11 cr.
Offered: Fall, Winter
Graded S/U/P
Prerequisites: See Eligibility for Student Teaching Placement in the "School of Education" section of this bulletin.
The opportunity for a gradual, guided introduction of students in the elementary education curriculum into assuming responsibility for teaching, together with related activities, while they learn to translate theory into practice.
- ED 421 Teaching in Elementary/Secondary Schools Communication Disorders** 11 cr.
Offered: Fall, Winter
Graded S/U/P
Prerequisites: See Eligibility for Student Teaching Placement in the "School of Education" section of this bulletin.
The opportunity for a gradual, guided introduction of students in the communication disorders curriculum into assuming responsibility for teaching while they learn to translate theory into practice.
- ED 423A Teaching in the Elementary School** 5 cr.
Offered: Fall, Winter
Graded S/U/P
Prerequisites: See Eligibility for Student Teaching Placement in the "School of Education" section of this bulletin.
The opportunity for a gradual, guided introduction of students in the cognitive or emotional impairment education curriculum into assuming responsibility for teaching in a general classroom while they learn to translate theory into practice.
- ED 423B Teaching Students with Cognitive Impairment in K-12 Schools** 6 cr.
Offered: Fall, Winter
Graded S/U/P
Prerequisites: Satisfactory completion of ED 423A. See Eligibility for Student Teaching Placement in the "School of Education" section of this bulletin.
The opportunity for a gradual, guided introduction of students in the cognitive impairment education curriculum into assuming responsibility for teaching the educable and/or students with cognitive impairment while they learn to translate theory into practice.
- ED 423C Teaching Students with Emotional Impairment in K-12 Schools** 6 cr.
Offered: Fall, Winter
Graded S/U/P
Prerequisites: Satisfactory completion of ED 423A. See Eligibility for Student Teaching Placement in the "School of Education" section of this bulletin.
The opportunity for a gradual, guided introduction of students in the emotional impairment education program into assuming responsibility for teaching students with emotional impairment while they learn to translate theory into practice.
- ED 423D Teaching in the Secondary School** 5 cr.
Graded S/U/P
Prerequisites: See Eligibility for Student Teaching Placement and Teacher Selection and Retention Standards under the "School of Education" section of this bulletin.
The opportunity for a gradual, guided introduction of students in the secondary education curriculum into assuming responsibility for teaching, together with related activities, while they learn to translate theory into practice.
- ED 424A Teaching Students with Cognitive Impairment in K-12 Schools** 11 cr.
Offered: Fall, Winter
Graded S/U/P
Prerequisites: Satisfactory completion of ED 423A. See Eligibility for Student Teaching Placement in the "School of Education" section of this bulletin.
The opportunity for a gradual, guided introduction of students in the educable and/or trainable cognitive impairment education program into assuming responsibility for teaching the educable and/or trainable with cognitive impairment while they learn to translate theory into practice.

<p>ED 424B Teaching Students with Emotional Impairment in K-12 Schools 11 cr. Offered: Fall, Winter Graded S/U/P Prerequisites: Satisfactory completion of ED 423A. See Eligibility for Student Teaching Placement in the "School of Education" section of this bulletin.</p> <p>The opportunity for a gradual, guided introduction of students in the emotionally impaired education program into assuming responsibility for teaching the emotionally impaired while they learn to translate theory into practice.</p>	<p>ED 450 Seminar in Teaching 1 cr. Offered: Fall, Winter Co-requisite: Concurrent enrollment in student teaching.</p> <p>This course is designed to help the student teacher better understand and apply education principles and theories in full-time classroom teaching experience. It focuses on the roles, responsibilities, issues and concerns of student teachers such as classroom management, instruction, assessment, multicultural education, human relations, employment, policy and practices.</p>
<p>ED 425 Teaching Students with Emotional Impairment and/or Cognitive Impairment in K-12 Schools 11 cr. Offered: Fall, Winter Graded S/U/P Prerequisites: ED 406 and 409. See Eligibility for Student Teaching Placement in the "School of Education" section of this bulletin.</p> <p>The opportunity for a gradual, guided introduction of students in the emotional impairment and the educable and/or trainable cognitive impairment education program into assuming responsibility for teaching students with emotional impairment and students with educable and/or trainable cognitive impairment while they learn to translate theory into practice.</p>	<p>ED 460 The Middle School 3 cr. Offered: On demand. Prerequisites: Junior standing or instructor's permission.</p> <p>Analysis of the philosophy, structure, curriculum, needs of students and strategies of teaching of the middle school.</p>
<p>ED 430 Teaching in the Secondary School 11 cr. Offered: Fall, Winter Graded S/U/P Prerequisites: See Eligibility for Student Teaching Placement in the "School of Education" section of this bulletin.</p> <p>The opportunity for a gradual, guided introduction of students in the secondary education curriculum into assuming responsibility for teaching, together with related activities, while they learn to translate theory into practice.</p>	<p>ED 462 Literature for Young Adults 3 cr. Offered: Every other Fall. Prerequisites: Junior standing or instructor's permission. Cross listed as EN 462.</p> <p>A comprehensive study of books for young adults, designed for secondary school teachers. Needs and interests of adolescents are studied in conjunction with the application of selection principles to fiction and nonfiction of all types. Emphasis is placed on developmental reading for the accelerated, the average and the reluctant student.</p>
<p>ED 440 Student Teaching (Elementary Education, Cognitive Impairment, Speech Correction, Secondary Education) 3-6 cr. Offered: Fall, Winter Graded S/U/P Prerequisites: Department head permission. See Eligibility for Student Teaching Placement in the "School of Education" section of this bulletin.</p> <p>The opportunity for a gradual, guided introduction of students in the secondary education curriculum into assuming responsibility for teaching, together with related activities, while they learn to translate theory into practice.</p>	<p>ED 483 Educational Media and Technology 2 cr. Offered: Fall, Winter, Summer. Prerequisites: Admission to the methods phase of teacher education.</p> <p>Focuses upon the education/instructional uses of audiovisual media including computers and related technologies. Emphasis will be upon each type of hardware and software and its use as well as the subject matter areas that most easily integrate the technology.</p>
<p>ED 445 Practicum in the Middle School 2 cr. Offered: On demand. Prerequisites: Student teaching experience.</p> <p>A 60 clock-hour experience in assisting, observing, directed teaching and tutoring in skill development laboratories and participating in team planning sessions in a middle school setting.</p>	<p>ED 491 Workshops and Seminars in Education 1 cr. Offered: On demand. Prerequisites: Junior standing or instructor's permission.</p> <p>Opportunities for the concentrated study of selected professional educational problems.</p>
	<p>ED 495 Special Topics in Education 1-4 cr. Offered: On demand. Prerequisite: Junior standing and instructor's permission.</p> <p>An opportunity for a group of upper division students to study problems in education that are not part of the regular offering.</p>
	<p>ED 498 Directed Study in Education 2 cr. Offered: On demand. Prerequisites: Junior standing, adviser and instructor's permission.</p> <p>An opportunity for students to do independent study.</p>

EL-ELECTRICAL LINE

Technology and Occupational Sciences Department

EL 010 Line Electrician Field Practicum I 6 cr. (0-0-18)

Prerequisite: Admission to the program.

This course provides introductory elevated outdoor work site field experiences related to electrical power transmission. Climbing, guying and bucket truck operation will be stressed.

EL 011 Fundamentals of Electricity 2 cr. (1-0-2)

Co-requisite: Concurrent enrollment in EL 013

An orientation to the principles of electricity, definition of terms and the fundamentals of current flow in series, parallel and compound circuits.

EL 012 Introduction to Line Electrician Safety 2 cr. (1-0-2)

This course introduces students to the general safety rules used in the electrical power distribution industry. Applications of safety polices, personal responsibility, accident reporting procedures and the safe use of various tools will be covered.

EL 013 Electrical Formulas 4 cr. (4-0-0)

Co-requisite: Concurrent enrollment in EL 011

A thorough coverage of the formulas and current/voltage relationships used in the electrical power transmission field.

EL 014 Computer Skills for Electrical Trades 2 cr. (2-0-0)

Computer familiarization and the application of computers in the power transmission field.

EL 020 Line Electrician Field Practicum II 6 cr. (0-0-18)

Prerequisite: EL 010

The course provides advanced elevated outdoor work site field experiences related to electrical power transmission. Complex wiring operations will be completed on various elevated work sites including poles and towers.

EL 021 Applied Electricity for Linepersons 3 cr. (2-0-2)

Prerequisite: EL 011 and EL 013.

This course builds on the students understanding of basic electrical principles and electrical formulas. Topics covered include single and three-phase power and complex circuits.

EL 022 Advanced Line Electrician Safety 2 cr. (1-0-2)

Prerequisite: EL 012

This course covers electrical right-of-way maintenance, generating stations, overhead lines, protective equipment, underground lines and substations. First aid and response procedures are covered.

EL 023 Line Electrician Career Seminar 2 cr. (2-0-0)

Prerequisite: EL 014

This course prepares the student for entry into the electrical power distribution career field along with covering customer relations, telephone usage, and interpersonal communications.

EL 024 Construction Standards for Line Electricians 2 cr. (1-0-2)

Construction standards, components and methods used in electrical power distribution will be covered in detail.

EN-ENGLISH

English Department

All courses marked with V (variable credit) are available for an additional research credit; students must be registered for the three-credit course before signing up for the additional credit. This additional credit must be added separately.

EN 080 Reading and Writing 4 cr.

Offered: Contact department for information.

Remedial or developmental course. Does not meet requirements for associate or bachelor's degrees but may meet requirements for vocational diplomas and certificates. Course is not calculated in the NMU grade point average and is not counted as earned credit hours toward an associate or bachelor's degree.

An intensive, integrated review of reading and writing skills, study strategies and vocabulary development. Designed to prepare students for EN 090, it differs from that course in providing more individualized instruction of various types.

EN 090 Basic Composition 4 cr.

Offered: Fall, Winter

Remedial or developmental course. Does not meet requirements for associate or bachelor's degrees, but may meet requirements for vocational diplomas and certificates. Course is not calculated in the NMU GPA and is not counted as earned credit hours toward an associate or bachelor's degree. A grade of "C-" or better in EN 090 is required to enroll in EN 111.

A review of English grammar, punctuation and spelling. Through individualized study and frequent practice, students learn to write Standard English sentences and to improve writing fluency. Mastery of these skills is required for enrollment in EN 111 and for success in other college courses.

EN 091 Review of Writing Skills 2 cr.

Offered: Winter

Remedial or developmental course.

Prerequisites: EN 211 and demonstrated need (such as repeated attempts to pass the university's Writing Proficiency Examination).

A review of principles of effective writing that provides extensive practice, with special emphasis on those aspects of writing which each student finds most troublesome.

Note: Does not meet requirements for associate or bachelor's degrees.

Course is not calculated in the NMU grade point average and is not counted as earned credit hours toward an associate or bachelor's degree.

<p>EN 101 Learning Skills Development 2 cr. Offered: Fall, Winter</p> <p>An emphasis on basic learning skills, especially reading, study techniques, note-taking and writing. Students are helped to develop perceptions, attitudes and self-concepts that lead to academic success.</p> <p><i>Note: Does not count toward an English major or minor.</i></p>	<p>EN 205 Introduction to Professional Writing 1 cr. Offered: Fall, Winter Prerequisite: EN 211</p> <p>An orientation to areas of study in the field and to employment possibilities; includes discussions of technical and professional writing, journalism, radio and TV writing, public relations and advertising, drama, poetry, fiction, and nonfiction. Students will also receive a thorough grounding in word processing.</p>
<p>EN 102 Personal Reading Improvement 2 cr. Offered: Fall, Winter</p> <p>A course to improve reading rate and comprehension, vocabulary and critical reading skills.</p> <p><i>Note: Does not count toward an English major or minor.</i></p>	<p>EN 206 Survey of Journalism 4 cr. Offered: Fall, Winter</p> <p>Theory and history of print journalism. Introduction to the fundamentals of news writing, reporting and editing.</p>
<p>EN 110 Good Books 4 cr. Offered: Fall, Winter, Summer</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. <p>An exploration of a variety of books from the past and present for the general reader. Emphasized are reading and discussing ideas from books with insights into human experiences.</p>	<p>EN 207 Journalism: News and Reporting 4 cr. Offered: Fall Prerequisite: EN 206 or equivalent.</p> <p>The mechanics of straight news reporting and writing. Frequent exercises and critiques.</p>
<p>EN 111 College Composition I 4 cr. Offered: Fall, Winter, Summer</p> <ul style="list-style-type: none"> • Satisfies the foundations of communication requirement. <p>Development of students' abilities to read and discuss and to write paragraphs and short essays about significant subjects. During the semester, each student writes a minimum of 5,000 words.</p> <p><i>Note: Does not count toward an English major or minor.</i></p>	<p>EN 211 College Composition II 4 cr. Offered: Fall, Winter, Summer Prerequisite: EN 111 with a grade of "C- "or better, or equivalent.</p> <ul style="list-style-type: none"> • Satisfies the foundations of communication requirement. <p><i>Note: Education students must have a "C" or better in EN 111. Does not count toward the English major or minor.</i></p> <p>Continued development of students' abilities to read closely, to discuss critically and to write carefully. Writers expand their stylistic range, awareness of form and ability to deal with complex issues; further, they concentrate on developing a comfortable facility with at least one mode of writing. Longer papers are written with at least one paper using information from other sources. Five thousand words are spread over at least six or seven graded assignments. Sections are offered with the following subtitles:</p>
<p>EN 112 Mythology 4 cr. Offered: Fall, Winter, Summer</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. <p>Study of cultural myths, emphasizing Western (Greek, Roman, Norse) but including others such as Eastern (Chinese, Indian) and American Indian mythologies.</p>	<p>EN 211A Writing and Literature 4 cr. Offered: Fall, Winter, Summer</p> <ul style="list-style-type: none"> • Satisfies the foundations of communication requirement. <p>Readings and writing assignments using literature as a source and stimulus for composition. Expository and narrative writing are emphasized.</p>
<p>EN 125 Introduction to Film 4 cr. Offered: Fall, Summer</p> <ul style="list-style-type: none"> • Satisfies the foundations of visual and performing arts requirement. <p>Provides a broad introduction to the study of film. Offers close analysis of selected films in relation to their cultural contexts. Consideration will be given to ways of writing about film.</p>	<p>EN 211B Narrative and Descriptive Writing 4 cr. Offered: Fall, Winter, Summer</p> <ul style="list-style-type: none"> • Satisfies the foundations of communication requirement. <p>Readings and writing assignments investigating perception, the ordering of experiences and insights and methods of expression. Descriptive and narrative writing are emphasized.</p>
<p>EN 200 Basic English Grammar and Usage for Teachers 2 cr. Offered: Fall, Winter, Summer</p> <p>A course to familiarize students with the fundamentals of English grammar. The course is designed to prepare future English and language arts education students to teach these concepts, to prepare students with insufficient knowledge of basic traditional grammar for advanced English language study or to improve or refresh any student's knowledge of basic English grammar.</p>	<p>EN 211D Technical and Report Writing 4 cr. Offered: Fall, Winter, Summer</p> <ul style="list-style-type: none"> • Satisfies the foundations of communication requirement. <p>Readings and writing assignments treating subjects appropriate for students in scientific, technical or business fields. Formal expository writing and the preparation of reports are emphasized.</p>

<p>EN 211E Critical Thinking and Writing 4 cr. Offered: Fall, Winter</p> <ul style="list-style-type: none"> • Satisfies the foundations of communication requirement. <p>Reading and writing assignments focus on critical thinking, articulation of ideas, analysis of audience and writing an effective argument using library resources to document ideas. Argumentative and critical techniques are emphasized.</p>	<p>EN 280 Patterns and Continuity of the Literary Past I 1 cr. Offered: Fall, Winter</p> <p>Part one of a series of multimedia presentations followed by small group discussions of examples to present an overview of the historical contexts of literature. Examples and discussion will note both the advantages and the difficulties of determining the historical context of literature and the continuing influences of earlier traditions on current literature.</p>
<p>EN 215 Introduction to Creative Writing 4 cr. Offered: Fall, Winter, Summer Prerequisite: EN 211 or instructor's permission.</p> <p>An introduction to the craft of writing poetry, fiction and drama/script writing, emphasizing the analysis of models and class discussion of student work.</p>	<p>EN 281 Patterns and Continuity of the Literary Past II 1 cr. Offered: Fall, Winter</p> <p>Part two of a series of multimedia presentations followed by small group discussions of examples to present an overview of the historical contexts of literature. Examples and discussion will note both the advantages and the difficulties of determining the historical context of literature and the continuing influences of earlier traditions on current literature.</p>
<p>EN 220 Introduction to Shakespeare 4 cr. Offered: Fall Prerequisite: EN 111</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. <p>Introduction to the comedies, tragedies, romances and sonnets of Shakespeare.</p>	<p>EN 282 Introduction to Literature 4 cr. Offered: Fall, Winter Prerequisite: EN 111</p> <p>The practice of analysis and interpretation of literature. This first course for English majors introduces students to important terms and concepts relevant to literary study and improves students' abilities to read and interpret works of fiction, poetry and drama.</p>
<p>EN 225 History of World Cinema 4 cr. Offered: Every other Fall.</p> <p>A survey of the development of an international film language from its origins. Begins with emphasis on classical Hollywood cinema and European art cinema and moves to a wide geographical, political and aesthetic spectrum.</p>	<p>EN 283 Survey of British Literature I 4 cr. Offered: Fall Prerequisite: EN 111</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. <p>British literature from before the Middle Ages to the eighteenth century, concentrating on major figures and works and on the development of modern issues in literature.</p>
<p>EN 250 Images of Women 4 cr. Offered: On demand. Prerequisite: EN 111</p> <p>Examination of literatures of different periods and cultures to identify female images, archetypes and stereotypes; emphasis is on their connections to contemporary popular culture.</p>	<p>EN 284 Survey of British Literature II 4 cr. Offered: Winter Prerequisite: EN 111</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement.
<p>EN 260 Popular Culture 4 cr. Offered: On demand. Prerequisite: EN 111</p> <p>The arts and artifacts of popular culture from generic and thematic perspectives, emphasizing the spoken and written word, films, radio and television; the application of critical methods to these arts.</p>	<p>A survey of British literature from the Romantic period to the mid-twentieth century, concentrating on major figures and works and on the development of modern issues in literature.</p>
<p>EN 265 Introduction to Folklore 4 cr. Offered: On demand. Prerequisite: EN 111</p> <p>The genres and themes of American folklore, including folk speech, proverbs, legends, poetry and ballads. Includes samples of folk narrative dealing with customs, traditions and work experience.</p>	<p>EN 295 Special Topics 1-4 cr. Offered: On demand. Prerequisite: EN 111</p> <p>Investigation of a significant topic, theme or group of works. Content varies.</p> <p><i>Note: May be repeated if topic varies.</i></p>

<p>EN 298 College Composition Directed Study 1-2 cr. Offered: On demand. Prerequisites: Enrollment limited to transfer students; less than six transfer credits earned toward the liberal studies program foundations of communication requirement; permission of the director of foundations of communication. Offered every semester; may not be taken more than once.</p> <ul style="list-style-type: none"> • Satisfies the foundations of communication requirement. <p>Independent undergraduate writing, planned by the student in consultation with the instructor, to complete credit for either EN 111 or EN 211.</p>	<p>EN 307 Journalism Practicum 2 cr. Offered: Fall, Winter Prerequisites: EN 211 and EN 207.</p> <p>Closely supervised service as a reporter or editor for the student newspaper or other local medium.</p> <p><i>Note: May be repeated twice.</i></p>
<p>EN 300 Creative Writing: Fiction 4 cr. Offered: Fall, Winter Prerequisite: EN 111, EN 215 or instructor's permission.</p> <p>The art of writing fiction, emphasizing class discussion of student work.</p>	<p>EN 309 The Teaching of Writing 4 cr. Offered: Summer Prerequisite: EN 211</p> <p>Study of the principles of teaching writing appropriate for teachers in all grade levels and subject areas. Emphasis on the process and product of writing and effective strategies for teaching it, achieved through varied and frequent writing assignments.</p>
<p>EN 301 Creative Writing: Poetry 4 cr. Offered: Fall Prerequisite: EN 111, EN 215 or instructor's permission.</p> <p>The art of writing poetry, emphasizing individual conferences and class discussion of student work.</p>	<p>EN 310 Literature and the Bible 4 cr. Offered: Every other Winter. Prerequisites: EN 211 and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. • Satisfies the upper division liberal studies requirement. <p>Ancient and modern literature inspired and influenced by the Bible; the Bible is studied in literature and as literature.</p>
<p>EN 302 Nonfiction Writing 4 cr. Offered: Winter Prerequisite: EN 211</p> <p>The craft of writing nonfiction, emphasizing the analysis of models and class discussion of student work.</p>	<p>EN 311 World Literature in English 4 cr. Offered: Fall, Winter, Summer Prerequisites: EN 211 and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. • Satisfies the upper division liberal studies requirement. • Satisfies the world cultures requirement when offered as EN 311Z. <p>A survey of translated works of literature from one country, stressing historical development and comparative analysis.</p> <p><i>Note: May be repeated if topic differs.</i></p>
<p>EN 303 Technical and Professional Writing 4 cr. Offered: Every other Fall. Prerequisites: EN 211 and junior standing.</p> <p>Study and practice in the principles of writing for organizations in business, government and industry. Emphasizes the need for audience analysis, careful document design and appropriate style in correspondence, proposals, reports and manuals.</p>	<p>EN 312 Medieval British Literature 3-4 cr. Offered: Contact department for information. Prerequisite: EN 211</p> <p>The study of the literature of England from the beginnings to about 1485.</p>
<p>EN 305 Tutoring Writing 2 cr. Offered: Fall Prerequisite: Instructor's permission.</p> <p>A presentation of theoretical knowledge and practical experience to enable Writing Center tutors to help other students with composition. The process of writing and methods of conferencing about writing are studied.</p>	<p>EN 313 Introduction to Linguistic Theory 4 cr. Offered: Every other Fall. Prerequisites: EN 211, junior standing or instructor's permission. Cross listed with PY 313.</p> <p>An introduction to modern (Chomskyan) linguistics as the foundation of empirical psycholinguistics. This course emphasizes morphological, syntactic and semantic analyses of language and language behavior.</p>
<p>EN 306 Journalism Editing and Design 4 cr. Offered: Every other Winter. Prerequisites: EN 211 and EN 207.</p> <p>Theory and practice of copy and photo editing, headline writing, layout and design.</p>	

EN 314 Traditional Oral Literatures: Selected Native American Cultures

4 cr.

Offered: Fall, Winter

Prerequisites: Completion of the foundations of communication requirement and sophomore standing.

- Satisfies the foundations of humanities requirement.
- Satisfies the upper division liberal studies requirement.
- Satisfies the world cultures requirement.

Provides a discussion of Native American traditional teaching stories from several cultures, with additional emphasis on the traditions of the Eastern Woodlands and Great Lakes Anishinabe people, and offers useful background for studies in modern literature written by Native Americans. The course presents poetry, stories and songs that have been transcribed and/or translated from oral tradition, as well as guest teachings by elders and spiritual leaders of the Great Lakes Ojibwa communities and by elders of other Native cultures when feasible.

EN 316 Native American Novels and Poetry

4 cr.

Offered: Fall

Prerequisites: Completion of the foundations of communication requirement and sophomore standing.

- Satisfies the foundations of humanities requirement.
- Satisfies the upper division liberal studies requirement.
- Satisfies the world cultures requirement.

A survey of novels and poetry in English by indigenous writers of North America. The primary focus of the course will be on modern and contemporary novels and poems by Canadian and U.S. authors with occasional works by earlier writers and/or a few traditional stories and songs translated into English. The course stresses analysis of how the writers' indigenous heritage informs the form and content of the works and how such literature has developed.

Note: A student who has taken either EN 315 or EN 311Z Native Canadian Literature may take either EN 316 or EN 317 but not both. A student who has taken both EN 315 and EN 311Z Native Canadian Literature is not eligible for either.

EN 317 Native American Drama, Non-fiction and Short Stories

4 cr.

Offered: Winter, Summer

Prerequisites: Completion of the foundations of communication requirement and sophomore standing.

- Satisfies the foundations of humanities requirement.
- Satisfies the upper division liberal studies requirement.
- Satisfies the world cultures requirement.

A survey of drama, non-fiction and short stories in English written by indigenous peoples of North America. The primary focus of the course will be on modern and contemporary works by Canadian and U.S. authors with an occasional work by an earlier writer and/or a few traditional works translated into English. The course stresses analysis of how the writers' indigenous heritage informs the form and content of the works and how such writings have developed. A student who has taken either EN 315 or EN 311Z Native Canadian Literature may take EN 316 or EN 317 but not both. A student who has taken both EN 315 and EN 311Z Native Canadian Literature is not eligible for either.

√EN 320 Renaissance British Literature

3-4 cr.

Offered: Contact department for information.

Prerequisite: EN 211

Several representative authors, trends or genres prominent between 1495 and 1660, exclusive of Shakespeare or Milton.

√EN 322 Restoration Eighteenth Century British Literature

3-4 cr.

Offered: Contact department for information.

Prerequisite: EN 211

The rise and development of neo-classical literature between 1660 and 1785 and the beginnings of romanticism.

EN 325 Authorship in the Cinema

4 cr.

Offered: Every other Winter.

Prerequisites: EN 125, or EN 225, or instructor's permission.

Deals with issues of personal and collaborative creativity in film through the study of the style, themes and development of one or more film directors.

Note: May be repeated for credit if topic varies.

EN 326 National Cinema

4 cr.

Offered: Every other Winter.

Prerequisites: EN 125, or EN 225, or instructor's permission.

Study of selected national cinemas (or a selected topic in national cinema) with emphasis on their relationship to national cultural traditions.

Note: May be repeated for credits if topic varies.

√EN 330 British Romantic Literature

3-4 cr.

Offered: Contact department for information.

Prerequisite: EN 211

The important romantic writers in England from 1798 to 1832, including Wordsworth, Coleridge, Byron, Shelley and Keats.

√EN 340 Victorian Literature

3-4 cr.

Offered: Contact department for information.

Prerequisite: EN 211

The important Victorian writers between 1820 and 1900, including Tennyson, Browning, Dickens and Arnold.

EN 350 Methods and Materials in Teaching English Education

4 cr.

Offered: Fall, Winter

Prerequisite: Admission to the methods phase of teacher education and instructor's permission; should be taken the semester prior to student teaching.

Introduction to recent methods and materials to motivate secondary students. Presents phases of language, literature and composition in a classroom situation. Text readings are balanced with professional research tailored to individual interests.

Note: May not be applied toward a non-teaching major or any minor in English. Can be applied to the secondary education English minor if required.

<p>√EN 360 Modern British Literature 3-4 cr. Offered: Contact department for information. Prerequisite: EN 211</p> <p>British fiction and poetry after 1900, with emphasis on major figures such as Conrad, Joyce, Lawrence, Yeats and Auden.</p>	<p>EN 370 American Literature I: Columbus to the American Revolution (1492-1800) 4 cr. Offered: Contact department for information. Prerequisites: Completion of the foundations of communication requirement and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. • Satisfies the upper division liberal studies requirement. <p>Considers issues of colonialism (travel literature and the literature of conquest) and the conflicts between indigenous populations and the European ideas that influenced the literatures of colonial life. The survey ends with a consideration of the movement from colony to nation.</p>
<p>√EN 361 Studies in Genre, Poetry 3-4 cr. Offered: Every other Fall. Prerequisite: EN 282</p> <p>A study of poetry meant to acquaint students with the broad variety of verbal activities in the genre. The course will include an examination of lyric, dramatic and narrative forms. Lyric poems may include hymns, meditations, songs, elegies, odes and sonnets, as well as contemporary forms of the lyric. Dramatic forms may include monologues, plays, soliloquies and dialogues. Narrative forms may include epic, romance, ballad and satire, as well as contemporary narrative forms. Didactic poetry may fall under either narrative or lyric.</p>	<p>EN 371 American Literature II: Emergent National Voices (1800-1865) 4 cr. Offered: Contact department for information. Prerequisites: Completion of the foundations of communication requirement and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. • Satisfies the upper division liberal studies requirement. <p>Considers the movement toward inventing a "National Voice." The course will discuss the innovations of the American Literary Renaissance and transcendentalism, the development of slave narratives, the rise of the sentimental novel and the literature of the Civil War period.</p>
<p>√EN 362 Studies in Genre, Narrative 3-4 cr. Offered: Every other Fall. Prerequisite: EN 282</p> <p>The course in narrative studies the characteristics that define this varied genre in history. The class provides students with a complex historical knowledge of narrative from the epic to the novel with emphasis on the novel, the short story and theories of narrative, but with some consideration of narrative forms from the epic to the romance.</p>	<p>EN 372 American Literature III: Realism, Naturalism, to WWI (1865-1930) 4 cr. Offered: Contact department for information. Prerequisites: Completion of the foundations of communication requirement and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. • Satisfies the upper division liberal studies requirement. <p>Considers the literature that took shape in the wake of the Civil War up through World War I. The course will focus on literary movements at the turn of the century such as regionalism, realism and naturalism, as well as the impact of World War I upon American writing and the creative output of the Harlem Renaissance.</p>
<p>√EN 363 Studies in Genre, Drama 3-4 cr. Offered: Every other Winter. Prerequisite: EN 282</p> <p>A study of drama as genre from Greek tragedy to modern drama. The course may be organized according to a history of drama, types of drama or major themes.</p>	<p>EN 373 American Literature IV: Contemporary Vistas (1930-Present) 4 cr. Offered: Contact department for information. Prerequisites: Completion of the foundations of communication requirement and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. • Satisfies the upper division liberal studies requirement. <p>The final segment of the American survey will begin with the literature of modernism and World War II and conclude with a consideration of American postmodernism. The course will cover definitive movements such as imagism, the Beats, literature of the 1960's and Vietnam, new journalism, minimalism and literature integral to the women's movement.</p>
<p>√EN 364 Studies in Genre, Film 3-4 cr. Offered: Every other Winter. Prerequisite: EN 282</p> <p>An examination of the ways in which film communicates story and experience, emphasizing structure, narrative techniques and other elements of the cinematic art.</p>	
<p>EN 366 Applied Literary Theory 4 cr. Offered: Winter Prerequisite: EN 211</p> <p>Examination of contemporary literary theories, emphasizing their ways of redefining literature and the study of literature. It also explores the application of theory to literary texts.</p>	

<p>EN 375 Diverse Traditions in American Literature 4 cr. Offered: Contact department for information. Prerequisites: Completion of the foundations of communication requirement and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. • Satisfies the upper division liberal studies requirement. • Satisfies the world cultures requirement when offered as EN 375Z. <p>This is a variable content survey course that deals with the writings of minority populations in the U.S. The class will detail the specific historical context of each group and examine their distinct literary contributions. Possible offerings: African American, Asian American, Arab American, Latino American, Jewish American, etc.</p> <p><i>Note: May be repeated if topic differs.</i></p>	<p>EN 402 Nonfiction Writing Seminar 4 cr. Offered: Fall Prerequisites: EN 302 or equivalent, junior standing or instructor's permission.</p> <p>The study of nonfiction theory, conventions and forms, and the further pursuit of excellence in writing nonfiction.</p>
<p>√EN 380 Contemporary Literature 3-4 cr. Offered: Contact department for information. Prerequisite: EN 211</p> <p>Selected British and American literature after 1945, including figures such as Updike, Roth, Lowell and Fowles.</p>	<p>EN 403 Drama and Script Writing Seminar 4 cr. Offered: Every other Winter. Prerequisites: EN 211, EN 300 or EN 301, junior standing or instructor's permission.</p> <p>The study of drama and script theory, conventions and forms, and the pursuit of excellence in writing these forms.</p>
<p>√EN 381 Contemporary Dramatic Literature 3-4 cr. Offered: Contact department for information. Prerequisite: EN 211</p> <p>An examination of drama as literature, concentrating on major developments in Europe and America after 1945 and on works by authors such as Albee, Beckett, Pinter, Lonesco and Shepherd.</p>	<p>EN 404 The English Language 4 cr. Offered: Fall, Winter, Summer Prerequisites: EN 211, junior standing or instructor's permission.</p> <p>An overview of the history and present structure of the English language, with emphasis on traditional grammar and other modern theories of linguistic analysis; the definition and status of language; the sounds, inflections and syntax of modern English; the historical development of grammatical signals; usage, dialect geography; and the position of English among world languages.</p>
<p>EN 385 Theatre in Perspective: The Stratford Festival Stage 3 cr. Offered: Summer Prerequisites: Completion of the foundations of communication requirement or instructor's permission. Cross listed with TH 385.</p> <ul style="list-style-type: none"> • Satisfies the foundations of visual and performing arts requirement. • Satisfies the upper division liberal studies requirement. <p>This summer session course offers an interdisciplinary approach to four or five plays that will be performed at the Stratford Theatre Festival in Stratford, Ontario. Students who register for EN 385/TH 385 will be encouraged to register at the same time for TH 493, Field Studies, so that they will also be able to view these same plays in performance in Stratford.</p>	<p>EN 405 Technical Writing Seminar 4 cr. Offered: Every other Winter. Prerequisites: EN 211, EN 303, junior standing or instructor's permission.</p> <p>The study of technical communication theory, conventions and forms, and the further pursuit of excellence in writing technical documents.</p>
<p>EN 400 Narrative Writing Seminar 4 cr. Offered: Fall and every other Winter. Prerequisites: EN 211, EN 300, junior standing or instructor's permission.</p> <p>The study of narrative theory, conventions and forms, and the further pursuit of excellence in writing narratives.</p>	<p>EN 406 Public Affairs Reporting 4 cr. Offered: Contact department for information. Prerequisites: EN 211, EN 207, junior standing or instructor's permission.</p> <p>An advanced course in researching and reporting the news, emphasizing access to information and coverage of public meetings.</p>
<p>EN 401 Poetry Writing Seminar 4 cr. Offered: Winter Prerequisites: EN 211, EN 301, junior standing or instructor's permission.</p> <p>The study of poetic theory, conventions and forms, and the pursuit of excellence in writing poetry.</p>	<p>EN 407 Feature and Magazine Writing 4 cr. Offered: Every other Winter. Prerequisites: EN 211, EN 207, junior standing or instructor's permission.</p> <p>An advanced course in journalistic feature writing for both newspapers and magazines. Students will write several types of short feature articles, come up with story ideas, research topics and interview sources and, as a final project, produce a full-length, well-researched magazine article.</p>

<p>√EN 411 Topics in World Literature 3-4 cr. Offered: Contact department for information. Prerequisites: Completion of the foundations of communication requirement, junior standing or instructor's permission.</p> <ul style="list-style-type: none"> • Satisfies the world cultures requirement when offered as EN 411Z. • Does not satisfy the upper division liberal studies requirement. <p>A variable-format course with a general focus on critical reading and comparative analysis that can include team teaching, guest units and interdisciplinary approaches to inter-textual study on a global level. Special topics will introduce single national or transnational groupings of texts, organized around such principles as genre, theme, canonicity, identity, theory and intellectual movements.</p> <p><i>Note: May be repeated if topic differs.</i></p>	<p>√EN 462 Literature for Young Adults 3-4 cr. Offered: Every other Fall. Prerequisites: Junior standing or instructor's permission. Cross listed as ED 462.</p> <p>A comprehensive study of books for young adults, designed for secondary school teachers. Needs and interests of adolescents are studied in conjunction with the application of selection principles to fiction and nonfiction of all types. Emphasis is placed on developmental reading for the accelerated, the average and the reluctant student.</p>
<p>√EN 412 Chaucer 3-4 cr. Offered: Contact department for information. Prerequisites: EN 211, junior standing or instructor's permission.</p> <p>Critical reading, in relation to medieval literary and social background, of <i>Canterbury Tales</i> and other works in the original language.</p>	<p>√EN 490 Seminar 3-4 cr. Offered: Contact department for information. Prerequisites: EN 211, junior standing and instructor's permission. Limited to 20 students. A strong background in literature is recommended.</p> <p>The subject, an analysis of a literary genre or a study of literary criticism, is announced in advance.</p> <p><i>Note: May be repeated if topic differs.</i></p>
<p>√EN 420 Shakespeare 3-4 cr. Offered: Fall, Winter, Summer Prerequisites: EN 211, junior standing or instructor's permission. Intended for English majors and minors.</p> <p>The poetry and plays.</p>	<p>EN 491 Internship 2-6 cr. Offered: On demand. Prerequisites: Junior standing or instructor's permission. Screening by department committee.</p> <p>Supervised practical work for selected students in newspaper, public relations or other field.</p> <p><i>Note: May be taken more than once for up to six credits.</i></p>
<p>√EN 422 Milton 3-4 cr. Offered: Contact department for information. Prerequisites: EN 211, junior standing or instructor's permission.</p> <p>The poetry and several of the major prose works.</p>	<p>EN 493 Seminar: Issues in Literature 4 cr. Offered: Winter Prerequisites: EN 282 plus at least 20 additional hours toward the major, junior standing or instructor's permission.</p> <p>Designed as a capstone course to allow students to draw together their experiences with literature and set them in context. Each section will have a particular focus selected by the instructor, but will also include consideration of current issues in literary studies such as debates over the selection of works to be studied in literature courses; multiculturalism and the interactions of literature and culture; specific sub-issues like pornography, censorship and the political correctness; and the future of literary forms including film, hypermedia, virtual reality and the interactive novel. The course will include a review of each student's writing portfolio.</p>
<p>EN 425 Topics in Film Theory 4 cr. Offered: Contact department for information. Prerequisites: EN 125 or EN 225, or instructor's permission.</p> <p>Introduction to various theoretical and critical discourses that have attempted to explain the cinema. Application of the theories to selected films of the same period.</p>	<p>EN 495 Special Topics 1-4 cr. Offered: On demand. Prerequisites: EN 211, junior standing and instructor's permission.</p> <p>Authors' works or genres not otherwise emphasized in undergraduate courses.</p> <p><i>Note: May be repeated if topic differs.</i></p>
<p>√EN 430 Major Authors 3-4 cr. Offered: On demand. Prerequisites: EN 211, junior standing or instructor's permission.</p> <p>One author or a limited number of British and American authors. Author(s) to be announced in advance.</p> <p><i>Note: May be repeated if topic differs.</i></p>	<p>EN 495W Special Topics Writing 1-4 cr. Offered: On demand. Prerequisites: EN 211, junior standing and instructor's permission.</p> <p>Special writing subjects and methods not otherwise emphasized in undergraduate courses.</p> <p><i>Note: May be repeated if topic differs.</i></p>
<p>√EN 440 Topics in Gender in Literature 3-4 cr. Offered: Contact department for information. Prerequisites: EN 211, plus two upper division courses in literature, junior standing or instructor's permission.</p> <p>A study of the role and significance of gender in literature, concentrating on a particular genre and/or period. Generally, the emphasis will be on women writers and/or the portrayal of gender.</p>	

EN 496 Special Topics 1-4 cr.
Offered: On demand.
Graded S/U
Prerequisites: EN 211, junior standing and instructor's permission.

Authors' works or genres not otherwise emphasized in undergraduate courses.

Note: May be repeated if topic differs.

EN 498 Directed Study 1-4 cr.
Offered: On demand.
Prerequisites: EN 211, junior standing and department head permission; maximum of four credits.

Independent study by qualified undergraduates in an area defined by the student and the instructor.

ENV-ENVIRONMENTAL SCIENCE

Environmental Science

ENV 101 Introduction to Environmental Science 4 cr.
Offered: Fall, Winter, Summer

- Satisfies the foundations of natural sciences/mathematics requirement.
- Does not meet the laboratory course graduation requirement.

Introduction to the basic scientific principles and concepts surrounding Environmental Science. Major components of the natural environment including climate, soils, geologic and hydrologic processes are described. Important ecological concepts concerning aquatic and terrestrial systems are discussed in relation to air, water and soil resources. Human influences to these natural systems and processes are evaluated in terms of energy and natural resources management, major pollution issues, research and assessment techniques and environmental sustainability.

ESPR-ENTERTAINMENT AND SPORTS PROMOTION

Communication and Performance Studies Department

ESPR 160 Introduction to Entertainment and Sports Promotion 4 cr.
Offered: Fall

An introduction to the work of the communication practitioner in the entertainment and sports industry. Course topics include the public relations process as it exists in entertainment and sports; the role of entertainment and sports in American society as it is created by the communication practitioner; career options in entertainment and sports and the four models of public relations as found in entertainment and sports. Students will begin work on their professional portfolios by researching the career area of their choice, determining what expectations prospective employers have and planning their academic work. Emphasis is on developing professional and ethical standards and understanding the role of the communication practitioner in entertainment and sports publicity and promotional activities.

ESPR 260 Fundamentals of Entertainment and Sports Promotion 4 cr.
Offered: Winter
Prerequisites: Completion of ESPR 160 and EN 111 with a grade of "C" or higher.

Instruction in the basic principles of research necessary to doing publicity and promotion. Emphasis is placed on learning about data bases relevant to communication practices in entertainment and sports. Students are taught the systematic preparation of background information and materials to facilitate conceptual thinking and creative problem solving. The use of primary and secondary research techniques in discovering necessary information about the five publics (the participant, the spectator, the corporate sponsor, the volunteer and the affinity consumer) critical to communication practice are covered.

ESPR 295 Special Topics in Entertainment and Sports Promotion 2-4 cr.

Offered: On demand.
Prerequisites: ESPR 160 or instructor's permission.

Study of a particular topic area or problem in entertainment and sports promotion that expands on a topic from ESPR 160 or ESPR 260.

Note: May be repeated for credit if topic varies.

ESPR 298 Directed Study in Entertainment and Sports Promotion 1-4 cr.

Offered: On demand.
Prerequisites: ESPR 160 and instructor and department head permission. The student must be a major or minor in the ESPR curriculum.

Independent study in an area of Entertainment and Sports Promotion defined by student and instructor.

Note: May be repeated for up to eight credits.

ESPR 360 Publicity Techniques for Entertainment and Sports Promotion 4 cr.

Offered: Fall
Prerequisites: Completion of ESPR 260 and EN 211E (or another EN 211 plus SP 200 Argumentation) with a grade of "C" or better and successful completion of the NMU writing exam. Students must be of sophomore standing or higher.

A focus on the basic techniques of publicity and the design of messages used in promoting entertainment and sports activities and events. This course emphasizes writing and planning skills. Basic concepts and fundamental elements from ESPR 160 and ESPR 260 are utilized as communication practice in this course. Students need to have completed the writing component of the liberal studies to succeed in this course.

ESPR 431 Campaigns 4 cr.

Offered: Winter

Prerequisites: PR 430 or ESPR 360 with a minimum grade of "C" and a speech theory course (SP 300, SP 310 or SP 401), junior standing or instructor's permission.

Cross listed as PR 431.

Focus on the technical and theoretical aspects of creating communication campaigns. Students are expected to develop a campaign and present it to a "client." Students will be assigned "clients" at the beginning of the semester and develop a five-phase campaign assignment including research designs, budgets, campaign concepts, post-campaign evaluation and an oral presentation.

ESPR 463 Field Studies in Entertainment and Sports Promotion 1-2 cr.

Offered: On demand..

Prerequisites: Must be a major or minor in entertainment and sports promotion and junior standing or higher.

A site study of an entertainment or sports event that will include travel to the venue and related lecture-discussion of the activity.

ESPR 491 Practicum in Entertainment and Sports Promotion 1-8 cr.

Offered: On demand..

Graded S/U

Prerequisites: ESPR 360 and instructor and department head permission.

The student must be a major or minor in the ESPR curriculum.

Projects in entertainment and sports under the supervision of a faculty member and a designated site supervisor.

ESPR 492 Internship in Entertainment and Sports Promotion 1-8 cr.

Offered: On demand..

Graded S/U

Prerequisites: ESPR 360, instructor and department head permission and a minimum grade point average of 2.75. The student must be a major or minor in the ESPR curriculum.

Practical, applied experience involving placement in a job situation.

ESPR 495 Special Topics in Entertainment and Sports Promotion 2-4 cr.

Offered: On demand..

Prerequisites: ESPR 260 or instructor's permission.

Study of a particular topic area or problem in entertainment and sports promotion that expands on a topic from the ESPR Curriculum.

Note: May be repeated if topic varies.

ESPR 498 Directed Studies in Entertainment and Sports Promotion 1-4 cr.

Offered: On demand..

Prerequisites: ESPR 260 and instructor and department head permission.

The student must be a major or minor in the ESPR curriculum.

Independent study in an area of entertainment and sports promotion defined by student and instructor.

Note: May be repeated for up to 8 credits.

ET-ELECTRONIC TECHNOLOGY

Engineering Technology Department

ET 100 Fundamentals of Electricity 2 cr. (1-0-2)

Offered: Winter

Prerequisites: MA 090 or higher mathematics course.

The fundamentals of DC, series circuits, parallel circuits, compound circuits and magnetism are explored. Other topics include Ohm's Law, the Power Formula and Kirchoff's Laws. Emphasis is placed on using standard methods of circuit analysis and basic electrical measuring equipment.

Note: This course is taught during the first seven weeks of the semester.

ET 101 Principles of Electrical Wiring 2 cr. (1-0-2)

Offered: Winter

Prerequisites: ET 100 or instructor's permission.

A study of basic wiring practices and techniques as they apply to residential dwellings and commercial buildings. Emphasis will be placed on wiring practices, the essentials of electrical code requirements, electrical principles of automotive systems and the principles of electric motors.

Note: This course is taught during the second seven weeks of the semester.

ET 110 Introduction to Electricity 4 cr. (3-0-2)

Offered: Fall

Prerequisites: MA 100 or higher mathematics course.

The fundamentals of DC, AC, series circuits, parallel circuits, compound circuits, inductance, capacitance and magnetism are explored. Emphasis is placed on using standard methods of circuit analysis and basic test equipment.

ET 112 DC Circuit Analysis 4 cr. (3-0-2)

Offered: Fall

Prerequisites: MA 100 or math placement equivalency.

An introduction to electricity and electronics through applied DC circuit theory. Course content will include topics on Ohms Law, Kirchoff's Law and Power Laws as well as discrete electronic components and schematic diagrams. Theory to be reinforced by practical laboratory experimentation emphasizing the use of the volt-ohmmeter (VOM) and the digital multimeter (DMM).

ET 113 AC Circuit Analysis 4 cr. (3-0-2)

Offered: Winter

Prerequisites: MA 104, ET 112

An introduction to AC electricity and electronics through applied circuit theory. Course content will include topics on basic AC circuit components, circuit analysis, transformers, pulse and frequency response and polyphase circuits. Theory to be reinforced by practical laboratory experimentation emphasizing the use of the volt-ohmmeter (VOM) and the digital multimeter (DMM) and the oscilloscope.

<p>ET 201 Visual Programming for Technicians 4 cr. Offered: Winter Prerequisite: ET 113</p> <p>The course introduces the development of industrial and technical software applications with Rapid Application Development (RAD) tools currently used in industry. Students will learn graphical user interface (GUI) concepts, program flow control and problem solving skills.</p>	<p>ET 282 Computer Software Systems 3 cr. (2-0-2) Offered: Fall, Winter</p> <p>Coverage of personal computer operating systems and their maintenance. Specific topics include disk partitioning, operating system installation and configuration, maintenance techniques and utilities. The course content is based on enabling the student to pass the A+ operating systems exam.</p>
<p>ET 210 Discrete Semiconductors 4 cr. (3-0-2) Offered: Fall Prerequisite: ET 113</p> <p>Analysis of basic discrete semiconductor devices. Course work and laboratory activities are based on the study of semiconductor diodes, zener diodes, regulators, bipolar transistors, JFET transistors and the application of these devices in power supplies and amplifiers.</p>	<p>ET 283 A+ Computer Technician Certification Review 2 cr. Offered: Fall, Winter Prerequisites: ET 281 and ET 282.</p> <p>A review of the principals and procedures of computer maintenance with the focus on readying the student for the A+ Computer Certification Examination.</p>
<p>ET 211 Digital Electronics 4 cr. (3-0-2) Offered: Fall Prerequisite: ET 210</p> <p>Comprehensive coverage of digital integrated circuits including the TTL and CMOS families. Topics include logic gates, decoders, drivers, counters, multiplexers and RAM memories.</p>	<p>ET 295 Special Topics in Electronics 1-4 cr. Offered: On demand. Prerequisite: Adviser permission.</p> <p>Specialized work not covered in other courses.</p>
<p>ET 212 Advanced Linear Circuits 3 cr. (2-0-2) Offered: Winter Prerequisite: ET 210</p> <p>The fundamentals of active linear monolithic circuits are explored. Emphasis is placed on operational amplifiers and their application as comparators, active filters and amplifiers. Additional topics include feedback circuits, on/off controls, mathematical operations and instrumentation devices.</p>	<p>ET 298 Directed Study and Research 1-4 cr. Offered: On demand. Prerequisite: Department permission.</p> <p>Selection of problem in area of emphasis, specialized instruction and experiences to reinforce technical skill and knowledge. Written reports of work are required.</p>
<p>ET 250 Industrial Electrical Machinery 4 cr. (2-0-4) Offered: Fall Prerequisites: ET 110 or ET 112.</p> <p>A study of the principles of operation, applications and selection of motors, generators and transformers used in industry today.</p>	<p>ET 311 Applied Programmable Controllers 2 cr. (1-0-2) Offered: Fall Prerequisite: ET 252.</p> <p>Practical applications of programmable controllers in motor control and industrial automation situations. Emphasis is placed on applying a commercial grade programmable controller involving I/O applications as well as the use of programming instructions. Applications include A/D, timers and events counters.</p>
<p>ET 252 Industrial Motor Controls 4 cr. (2-0-4) Offered: Winter Prerequisites: ET 110 or ET 112.</p> <p>Industrial power devices and associated control circuits, including starters, contactors, limit switches and various types of electric motors. Emphasis is placed on motor control line diagrams as well as wiring diagrams including line voltage control.</p>	<p>ET 320 Advanced Digital Electronics 3 cr. Offered: Winter Prerequisite: ET 211.</p> <p>This course is a continuation of ET 211 Digital Electronics. This new course covers memory, programmable logic, hardware implementation of arithmetic algorithms, simulation of digital systems and computer architecture.</p>
<p>ET 281 Computer Systems Servicing 3 cr. (2-0-2) Offered: Fall, Winter, Summer</p> <p>Procedures and techniques used to service personal computer systems. Topics covered include troubleshooting techniques, power supplies, option cards, keyboards, disk drives, monitors and printers. Course content is based on enabling the student to pass the A+ core hardware exam.</p>	<p>ET 360 Process Control Systems 3 cr. (2-0-2) Offered: Winter Prerequisite: ET 212</p> <p>An introduction to Process Control focusing on industrial instrumentation and processes. Course content will include basic process control theory, signal conditioning, sensor and control loop characteristics. Theory to be reinforced by lab work using actual industrial instrumentation and sensors.</p>

ET 410 Interfacing and Data Acquisition Techniques 3 cr. (2-0-2)

Offered: Winter

Prerequisites: ET 211, ET 201, junior standing or instructor's permission.

A hardware-software oriented course involving use of the microcomputer as an I/O and data gathering device using a "high level language" for the purpose of process and machine control. Emphasis is placed on various digital sensors and the use of A/D and D/A converters and real-time clocks as integral parts of the control system.

ET 420 Microcontroller Applications 3 cr. (2-0-2)

Offered: Fall

Prerequisites: ET 201, ET 320, junior standing or instructor's permission.

Analysis of the PIC16CXX families of microcontroller products along with the application of 8 bit processors in typical industrial applications involving process control. Emphasis is also placed on a wide range of development tools available for these microcontroller devices.

ET 430 Senior Project 2 cr.

Offered: Fall, Winter

Prerequisites: ET 410, ET 420, junior standing or instructor's permission.

A problem solving and applications course that focuses on the use of electronic systems including microcontrollers, personal computers, PLC's or other electronic systems to control or otherwise interface between mechanisms and circuitry. The courses will culminate in an oral senior project demonstration with supporting written documentation.

ET 483 Studies in Business and Industry 4 cr.

Offered: On demand.

Prerequisites: Junior standing or instructor's permission.

Cooperative work experience to provide up-to-date technical skills in the area of specialization; includes work experience with business and industrial operations, services and materials, processes and techniques.

ET 495 Special Topics in Electronics 1-4 cr.

Offered: On demand.

Prerequisites: Junior standing or instructor's permission.

Specialized work not covered in other courses.

ET 498 Directed Study and Research 1-4 cr.

Offered: On demand.

Prerequisites: Junior standing or instructor's permission.

Selection of problem in area of emphasis; specialized instruction and experiences to reinforce technical skill and knowledge. Written reports of work are required.

FIN-FINANCE

College of Business

FIN 224 Personal Financial Management 4 cr.

Offered: Contact department for information.

Development of practical solutions for routine problems faced in personal financial affairs. Major topics to be discussed are tax return preparation, tax planning, insurance, property, consumer credit, financial institutions, investing and other current topics.

Note: This course is not intended for finance majors.

FIN 351 Management of Financial Resources 3 cr.

Offered: Fall, Winter, Summer

Prerequisites: ACT 240 or approval of instructor and junior standing.

Financial management of corporations. Management of capital sources of short and intermediate funds; factors determining the capital structure; sources of long-term capital; the securities market; and financing growth and development. Emphasis on the analysis and interpretation of financial accounting measurements.

FIN 352 Financial Management 4 cr.

Offered: Winter

Prerequisite: FIN 351 and junior standing.

Study of financial management theories and their applications to complex corporate financial problems. By means of case studies, special emphasis is given to analysis and decision making about all major problems in financial management.

FIN 354 Money and Capital Markets 4 cr.

Offered: Fall

Prerequisite: Junior standing.

Analysis of money market instruments in conjunction with monetary policy influences. The markets and their role in channeling liquid and investment funds to the private and public sectors. The roles of major financial institutions (pension funds, insurance companies, banks) as both suppliers and users of market capital.

FIN 355 Insurance Planning 3 cr.

Offered: Fall

Prerequisite: Junior standing.

An introduction to the principles of insurance planning including the identification of risk exposures, property and liability analysis, life insurance policy analysis, health insurance policy analysis, social insurance, employee insurance benefits, insurance regulation and taxation. Discussion and analysis will include evaluation techniques and insurance planning concepts from contract selection to cost benefit analysis.

<p>FIN 413 New Venture Finance: Capital Formation and Legal Issues 3 cr.</p> <p>Offered: Every other Winter. Prerequisites: ACT 325, junior standing or instructor's permission.</p> <p>Summarizes and ties together the materials presented in the entrepreneurship core of classes. Extends the student's knowledge in this area through the incorporation of cases based on creating and managing new business ventures; this includes various methods of raising capital for new and growing ventures and a thorough examination of the legal issues involved in such an undertaking.</p>	<p>FIN 461 Management of Financial Institutions 3 cr.</p> <p>Offered: Contact department for information. Prerequisites: FIN 351 and junior standing or instructor's permission. The prerequisites may be waived for students whose work experience or background enables them to understand the basic objectives and operation of the monetary system.</p> <p>Analysis of the major policy areas of financial institutions including commercial banks, thrifts, insurance companies and pension funds. Liquidity business and credit, asset and liability management and capital structure are discussed in relation to profit objectives and the regulatory and monetary policy environment. Holding companies, financial institution competition and current issues are discussed.</p>
<p>FIN 420 Financial Statement Analysis 3 cr.</p> <p>Offered: Winter Prerequisites: ACT 240, junior standing or instructor's permission.</p> <p>An intensive study of the interpretation and analysis of a financial statement. Emphasis is placed on analyzing financial data for investment, credit and managerial decisions.</p>	<p>FIN 462 Investment Analysis 4 cr.</p> <p>Offered: Fall Prerequisites: FIN 351, junior standing or instructor's permission.</p> <p>Types of investment securities; bonds, stock, valuation of common stocks, valuation and grading of bonds and preferred stocks; risks associated with each form of investment. Policies in construction and management of investment portfolio. Current trends and timing of investments.</p>
<p>FIN 424 Personal Financial Planning 3 cr.</p> <p>Offered: Winter Prerequisites: ACT 240, ACT 321, FIN 462, FIN 355, FIN 450, FIN 460, and junior standing or instructor's permission.</p> <p>Intensive study of personal financial affairs and planning. The planning process is emphasized while developing an in-depth understanding of tax planning, retirement planning, consumer credit and sources of financing, risk and insurance planning, and investment analysis and instruments.</p>	<p>FIN 463 Portfolio Management 3 cr.</p> <p>Offered: Contact department for information. Prerequisites: FIN 462, junior standing or instructor's permission.</p> <p>A theoretical and empirical discussion of the effect of information and investor preference on investment decisions.</p>
<p>FIN 450 Estate Planning 3 cr.</p> <p>Offered: Winter Prerequisites: Junior standing or instructor's permission.</p> <p>A study of various estate planning principles and techniques as they relate to the financial planning process. Included in this course is the study of methods of property transfer, estate planning documentation, principles of estate, gift and trust taxation, features and classification of trusts, the use of life insurance in the estate planning process and the tools and techniques for general estate planning.</p>	<p>FIN 491 Internship in Finance 1-4 cr.</p> <p>Offered: Fall, Winter, Summer Graded S/U Prerequisites: Junior standing or instructor's permission.</p> <p>Professional experience for qualified accounting and finance students. Working relationships will be established with accounting firms and other business organizations. Students are required to write a paper and will be evaluated by their faculty supervisor in consultation with the employer. Credit hours are over and above any existing catalog requirements for the finance degree.</p>
<p>FIN 458 International Financial Management 3 cr.</p> <p>Offered: Contact department for information. Prerequisites: FIN 351 and junior standing or instructor's permission.</p> <p>Financial management of multinational firms. Management of international sources of funds; dealing with international exchange; international expansion and investment.</p>	<p>FIN 495 Variable Topics in Finance 1-4 cr.</p> <p>Offered: Contact department for information.</p> <p>May be taken more than once for credit. Prerequisites: Junior standing or instructor's permission.</p> <p>Variable topics of current interest.</p>
<p>FIN 460 Employee Benefits and Retirement Planning 3 cr.</p> <p>Offered: Fall Prerequisites: Junior standing or instructor's permission.</p> <p>A working knowledge of employee benefits and retirement planning tools. Topics covered include: qualified plan characteristics, deferred saving plans, plan distributions and options, group insurance benefits and retirement needs analysis. The financial planning process is emphasized along with cases, discussions and lectures.</p>	<p>FIN 498 Directed Study in Finance 1-4 cr.</p> <p>Offered: Contact department for information. Prerequisites: Junior standing or instructor's permission.</p> <p>Independent study of some special problem in accounting or finance under the guidance of a faculty member. This study is limited to students with superior grade point averages.</p>

FR - FRENCH

Modern Languages and Literatures Department

FR 101 Elementary French I 4 cr.
Offered: Fall

- Satisfies the formal communication studies requirement.

FR 101 is an introduction to the French language and cultures of the people who speak it. Students learn rudimentary "survival" skills such as social pleasantries, shopping, exchanging money, eating in restaurants, talking about family, school and weather.

FR 102 Elementary French II 4 cr.
Offered: Winter

Prerequisites: FR 101 or one year of high school French.

- Satisfies the formal communication studies requirement.

FR 102 is a continuation of FR 101. Students add to their proficiency in matters such as those related to health, free time, employment, travel and talking about the past.

FR 201 Intermediate French I 4 cr.
Offered: Fall

Prerequisites: FR 102 or two years of high school French.

- Satisfies the formal communication studies requirement.

FR 201 reviews all grammar and major topics from FR 101 and FR 102. This course incorporates more reading, writing and conversation than in first-year courses and explores more matters dealing with French cultures. Students expand their proficiency into areas such as expressing opinions and persuading.

FR 202 Intermediate French II 4 cr.
Offered: Winter

Prerequisites: FR 201 or three years of high school French.

- Satisfies the formal communication studies requirement.

FR 202 is a continuation of FR 201. Students do considerably more reading and writing than in prior courses. The course expands their cultural and linguistic proficiency.

FR 299 Apprenticeship 1-2 cr.
Offered: Fall, Winter

Graded S/U

Prerequisites: Written department approval.

Directed apprentice work and activities that would require students to use their knowledge of French and develop their competencies in the language. This would include such things as oral expression, appreciation of grammatical structure, proofreading and editing skills, research skills in French, and skills in teaching French to others.

Note: May be taken for a maximum of 2 credits.

FR 300 Reading and Writing 4 cr.

Offered: Fall

Prerequisites: FR 202 or instructor's permission.

This course teaches essential reading and writing skills in French (mastery of form, content, style and purpose of genre writing, use of dictionary, root analysis, decoding, comparison of sentence structure, identification of meaning through analysis, use of contextual cues). Materials will consist of French newspapers, magazines, short stories and will prepare students for subsequent upper level courses.

FR 305 Conversational French and Phonetics 4 cr.

Offered: Winter

Prerequisites: FR 202 or instructor's permission.

- Satisfies the formal communication studies requirement.
- Satisfies the upper division liberal studies requirement.

Students improve their conversational abilities through emphasis on natural forms of speech and by learning how to use language in social encounters. Students learn to communicate and respond to problems as well as discuss major social issues. A variety of contexts are used to create authentic situations.

FR 310 Introduction to French Civilization and Culture 4 cr.

Offered: Every other Winter.

Prerequisites: Completion of the foundations of communication requirement and sophomore standing.

- Satisfies the foundations of humanities requirement.
- Satisfies the upper division liberal studies requirement.

An overview of early European history; a comprehensive view of France's geography and 2,000 years of social customs and how they are reflected in the arts, music, architecture and literature. The course includes aspects of the interaction between France and the U.S.

Note: FR 310 is taught in English.

FR 315 Medieval Culture and Literature of France 4 cr.

Offered: Contact department for information.

Prerequisites: Sophomore standing and completion of EN 211. For those taking this course for a major or minor in French, FR 202 is a prerequisite.

This course is an introduction to Medieval life in France. The period covered is from the fifth to the 15th century. It covers three major aspects: historical background, everyday life and literature.

Note: FR 315 is taught in English.

FR 361 Survey of French Literature from the Medieval Period to the 17th Century 4 cr.

Offered: Every other Fall.

Prerequisites: FR 300 or instructor's permission.

Students examine some of the masterpieces of French literature from the medieval period through the 17th century. The texts studied serve as springboards to consideration of art, culture, language, history and humanity.

FR 362 Survey of French Literature of the 18th and 19th Centuries 4 cr.

Offered: Every other Fall.

Prerequisites: FR 300 or instructor's permission.

An examination of some of the masterpieces of French's 18th- and 19th-century literature. The texts studied serve as springboards to consideration of art, culture, language, history and humanity.

FR 363 Survey of French Literature of the 20th Century 4 cr.

Offered: Every other Fall.

Prerequisites: FR 300 or instructor's permission.

A study of some of the masterpieces of France's 20th-century literature. The texts studied serve as springboards to consideration of art, culture, language, history and humanity.

FR 400 Advanced French Composition and Grammar 4 cr.

Offered: Winter

Prerequisites: FR 300 or instructor's permission.

A review of all major points of the French grammar system, with an especially intense focus on the rich verb system and common problems native English speakers have in French. In an interrelated way, it also provides the opportunity for students to refine their writing skills through composition of essays, letters and resumes.

FR 426 Eighteenth Century French Literature 4 cr.

Offered: Every other Fall.

Prerequisites: FR 300 or instructor's permission.

Students examine some of the masterpieces of France's 18th-century literature. The texts studied serve as springboards to consideration of art, culture, language, history and humanity.

FR 428 Twentieth Century French Novel 4 cr.

Offered: Every other Fall.

Prerequisites: FR 300 or instructor's permission.

Students examine some of the masterpieces of France's 20th-century literature. The texts studied serve as springboards to consideration of art, culture, language, history and humanity.

FR 495 Special Topics in French 1-4 cr.

Offered: Every other Fall.

Prerequisites: instructor's permission and junior standing.

This is an experimental course based on topics of authors, genres or literature periods not covered in other regularly approved French courses.

Note: May be repeated for credit if topic varies.

FR 498 Directed Study in French 1-4 cr.

Offered: On demand.

Prerequisites: Instructor and department head permission, junior standing.

Independent study by qualified students. A directed study course is designed to meet a specific academic requirement of the student who is unable to earn the credit during regularly scheduled course offerings. The student and professor agree to the specific topic and requirements needed to earn the credit.

GC - GEOGRAPHY

Geography Department

GC 001 Geographic Information Science Certified 0 cr.

Offered: Contact department for information.

Graded S/U

Indicates that the student has successfully completed all of the core and elective classes in the GIS minor with a minimum grade point average of 3.00. Student registers in this course during the semester in which they complete the requirements for the minor.

GC 100 Physical Geography 4 cr.

Offered: Fall, Winter, Summer

- Satisfies the foundations of natural sciences/mathematics requirement.

Examination of the earth's physical phenomena to develop a knowledge and appreciation of the relationships between human activities and environmental processes.

Note: Does not meet the laboratory course graduation requirement.

GC 164 Human Geography 4 cr.

Offered: Fall, Winter, Summer

- Satisfies the foundations of social sciences requirement.
- Satisfies the world cultures requirement.

Examination of the culturally induced differences in the world pattern of population growth, resource utilization, language, religion, agriculture, industry, political systems and environmental impact.

GC 200 North America 4 cr.

Offered: On demand.

Analysis of the physical and cultural geography of Canada and the United States.

GC 202 Soils 4 cr. (3-0-2)

Offered: Fall, Summer

Prerequisites: GC 100 or instructor's permission.

Study of soil classification, soil survey applications, laboratory and field procedures, and soil management.

GC 205 Introduction to Geographic Research 4 cr.

Offered: Fall, Winter

Prerequisites: AIS 101, completion of the foundations of communication requirement and sophomore standing.

An introduction to geographic thought and geographic research methods. Included are a survey of the history and philosophy of changes in the discipline of geography and an introduction to the writings of historical and contemporary geographers. Research includes an examination of professional journals, book reviews, proposal development and literature searches.

<p>GC 220 Economic Geography 4 cr. Offered: Fall</p> <p>Analysis of the spatial characteristics of the economic environment and the economic principles related to resource use in the private and public sectors.</p>	<p>GC 305 Regional Studies 4 cr. Offered: Contact department for information. Prerequisites: Completion of the foundations of communication requirement and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of social sciences requirement. • Satisfies the upper division liberal studies requirement. <p>Regional focus is determined by demand and faculty availability. <i>Note: May be repeated if topic differs.</i></p>
<p>GC 225 Introduction to Maps 2 cr. (1-0-2) Offered: Fall, Winter, Summer Prerequisite: MA 100 or instructor's permission.</p> <p>Maps are important tools for understanding geographic patterns. This course introduces students to major concepts and applications in the reading, use and interpretation of maps. It is designed to provide a foundation in maps as well as to prepare students for upper level courses in spatial sciences.</p>	<p>GC 310 Urban Geography 4 cr. Offered: Winter Prerequisites: GC 220 and GC 205, or successful completion of the writing proficiency exam, or instructor's permission.</p> <p>Study of the development, form and function of urban places and the interactions of humans, cities and regions.</p>
<p>GC 235 Quantitative Methods 4 cr. Offered: Fall, Winter, Summer Prerequisites: CIS 110 and MA 103.</p> <p>Presentation and interpretation of data, descriptive statistics and measures of spatial patterns, introduction to statistical inference and measures of association, with particular reference to geographic examples.</p>	<p>GC 316 Geography of Tourism 4 cr. Offered: Winter Prerequisites: GC 164 and GC 205 or instructor's permission.</p> <p>Understand the historical development of tourism, its importance to local and national economies and the impact that tourists have upon the environment, economy and local cultures.</p>
<p>GC 246 Earth Science 4 cr. (3-0-2) Offered: Prerequisite: Sophomore standing.</p> <p>Analysis of essential observations and concepts in meteorology, astronomy, oceanography and geology and their significance in understanding humankind's relation to the environment. Does not count toward a major or minor in geography or earth science.</p>	<p>GC 317 Geography of Food Systems 4 cr. Offered: Prerequisites: GC 205 or EN 211 or instructor's permission.</p> <p>This course examines the different forces acting upon commodity flows from producer to consumer. Particular attention is given to the following topics: the transition from agriculture to food manufacturing, globalization and food production and the environmental impact of food manufacturing.</p>
<p>GC 255 Physical Geology 4 cr. (3-0-2) Offered: Fall, Winter, Summer</p> <ul style="list-style-type: none"> • Satisfies the foundations of natural sciences/mathematics requirement. <p>The structures of the earth, minerals, rocks and the development of landforms.</p>	<p>GC 320 Environmental Policy and Regulation 4 cr. Offered: Winter Prerequisites: Eight hours of GC credit, including ENV 101 and junior standing.</p> <p>Examination of the history and status of land use and environmental laws in the U.S. at the national, regional and state levels. Included is an introduction to the policy-making process in the U.S. as related to the area of environmental policy. The paradox of that policy in terms of short vs. long-term solutions will be investigated.</p>
<p>GC 260 Minerals and Rocks 4 cr. (3-0-2) Offered: Fall Prerequisite: GC 255.</p> <p>The study of common rocks and minerals. Special attention is given to Michigan rocks and minerals, their occurrence, formation and economic importance. Field trips are required and are commonly taken in the laboratory period.</p> <p><i>Note: This course meets over the first half of the semester.</i></p>	<p>GC 330 Planning Theory and Practice 2 cr. Offered: Fall Prerequisite: GC 205</p> <p>Study of land use planning from its beginnings through contemporary comprehensive and policy plans. The focus is on planning as a technical, political and economic process.</p>
<p>GC 300 Regional Studies: World Cultures 4 cr. Offered: Fall, Winter, Summer Prerequisites: EN 111, EN 211 and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of social sciences requirement. • Satisfies the upper division liberal studies requirement. • Satisfies the world cultures requirement. <p>Regional focus determined by demand and faculty availability. <i>Note: May be repeated if topic differs.</i></p>	

- GC 335 Geographic Information Systems** 4 cr.
Offered: Fall, Winter, Summer
Prerequisites: GC 225 and GC 235 or instructor's permission.
The study of computer-based manipulation of geographic data. Introduction to geographic information systems and sciences including geographic data modeling, hardware, software, GIS data integration, visualization, cartographic modeling, basic and advanced GIS analysis methods, organizational issues, GIS project development and emerging geographic information science issues.
- GC 337 Computer Cartography** 4 cr. (3-0-2)
Offered: Every other Fall.
Prerequisites: GC 335 or instructor's permission.
The study of computer-based visualization of geographic data. Introduction to computer cartography including thematic mapping, cartographic projections for map designers, base map compilation, cartographic symbols, statistics for cartography, mapping in GIS environment, data classification, legend design, mapping point, line, aerial and volume phenomena, cartogram, color mapping, map composition technique, interactive mapping and mapping on the World Wide Web.
- GC 340 Land Use Controls** 2 cr.
Offered: Winter
Prerequisites: GC 205, GC 330 and junior standing.
Study of land-use controls and the relationship of these controls to planning theory and practice.
- GC 350 Methods and Materials in Teaching Social Studies Education** 4 cr.
Offered: Fall, Winter
Prerequisite: Admission to the methods phase of teacher education.
Co-requisite: Concurrent enrollment in ED 349.
Strategies, methods, materials and media that can be used to improve the teaching-learning process of geography in grades seven through 12.
Note: May not be applied toward a non-teaching major or any minor in geography. Can be applied to the secondary education geography minor if required.
- GC 360 Population Geography** 4 cr.
Offered: Fall, Winter
Prerequisite: Completion of the foundations of communication requirement and sophomore standing; GC 164 and/or GC 220 recommended.
• Satisfies the foundations of social sciences requirement.
• Satisfies the upper division liberal studies requirement.
Examination of demographic processes and how these vary from one society to another. Considers, in depth, data sources, population geography literature and techniques used in analyzing population characteristics and distributions.
- GC 365 Historical Geology** 4 cr. (3-0-2)
Offered: Every other Winter.
Prerequisite: GC 255
Examination of the techniques used by geologists in interpreting earth history. Particular attention is given to the physiographic provinces of the United States with particular attention to the Canadian Shield and interior plains and plateaus.
- GC 370 Geomorphology** 4 cr. (3-0-2)
Offered: Every other Fall.
Prerequisite: GC 100 or GC 255 or instructor's permission.
The study of earth surface processes and landforms. Surface features created by streams, glaciers, shorelines, groundwater and wind will be studied. Topographic maps, aerial photographs, the Atlas of Landforms and satellite imagery will be used in labs. Field trips are part of the course.
- GC 385 Weather and Climate** 4 cr. (3-0-2)
Offered: Winter
Prerequisite: GC 100 or instructor's permission.
Introduction to climatology, including principal processes of the global climatic systems and their variation over space and time. Topics include introduction to the atmosphere and global atmospheric circulation, including tropical, mid latitude and polar subsystems; radiation/heat exchanges, the hydrologic cycle, global climate patterns, climate change, measurement and data sources and urban climatic systems and interactions.
- GC 390 Oceanography** 2 cr.
Offered: Contact department for information.
Examination of historical, chemical and physical, aspects of the world's oceans and seas. The course also deals with the interaction of water bodies with the atmosphere, solar energy and gravity.
- GC 401 Biogeography** 4 cr. (3-0-2)
Offered: Fall
Prerequisites: GC 100, BI 111, junior standing or instructor's permission.
Examination of the spatial distribution of life forms on a global scale from ecological and historical perspectives. Topics include diversity, extinction and dispersal of species.
- GC 425 Remote Sensing** 4 cr. (3-0-2)
Offered: Winter
Prerequisites: GC 225 and a course in statistics (GC 235 or equivalent), junior standing or instructor's permission.
The study of remotely sensed imagery and datasets for spatial analysis. Introduction to aerial photographic interpretation techniques and computer digital image processing of satellite and other spatial datasets, including preprocessing techniques, enhancements, classification and GIS modeling.
- GC 428 Spatial Analysis** 4 cr.
Offered: Winter
Prerequisites: GC 335 or GC 425 or instructor's permission.
Examines the collection and management of spatial data. The application of appropriate quantitative, GIS and remote sensing techniques for the analysis of geographic problems is emphasized.

<p>GC 435 Geography of Michigan 4 cr. Offered: On demand. Prerequisites: Junior standing or instructor's permission. Study of the physical, historical and cultural geography of Michigan.</p>	<p>GC 485 Planning Practicum 4 cr. Offered: Winter Prerequisites: GC 205, GC 330, GC 335, GC 340 and senior standing or instructor's permission. Development of planning skills by working through planning problems in a real world context.</p>
<p>GC 445 Advanced Aerial Photograph Interpretation and Photogrammetry 2 cr. (1-0-2) Offered: Every other Winter. Prerequisites: GC 100, GC 225, GC 425 and junior standing or instructor's permission. An advanced examination of the principles of aerial photograph interpretation and photogrammetric methods. Applications in several disciplines including geography, soils, forestry and ecological studies, geology and geomorphology, engineering, urban and industrial studies, and archaeology and cultural resource management are examined. Comprehension of natural and cultural processes that have produced landscape features and geographic patterns visible on aerial photographs are stressed. Personal student interests are encouraged through completion of an individual air photo interpretation and mapping project.</p>	<p>GC 489 Human Impact Upon the Environment 4 cr. Offered: Fall, Winter Prerequisites: GC 205, GC 235 and 24 GC credit hours, junior standing or instructor's permission. Examination of historical and contemporary roles of humans as a major agent of environmental change on Earth. Emphasis will be placed on anthropogenic changes to plant and animal communities; water, air and soil resources; and the potential for human induced global climate change.</p>
<p>GC 455 Digital Image Processing 2 cr. (1-0-2) Offered: Every other Winter. Prerequisites: GC 225, GC 425 and junior standing or instructor's permission. Digital image processing of satellite and aircraft derived remotely sensed data for earth resource management applications.</p>	<p>GC 490 Seminar 2-4 cr. Offered: On demand. Prerequisites: Departmental major and junior standing or instructor's permission. The opportunity to apply skills and concepts developed within departmental programs.</p>
<p>GC 465 Hydrology 4 cr. (3-0-2) Offered: Every other fall. Prerequisites: GC 235 or MA 171, junior standing or instructor's permission. Study of the hydrologic cycle. Precipitation, runoff, interception and groundwater processes are addressed. Measurement techniques and analytical methods are also presented. Informed decision-making with regard to the water cycle is stressed. Some field work required.</p>	<p>GC 491 Internship 2-6 cr. Offered: Fall, Winter Graded S/U Prerequisites: Overall grade point average of 2.75 and 88 credits hours or instructor's permission. A practical experience with a private, municipal, county, state and/or federal agency.</p>
<p>GC 470 Environmental Ethics 4 cr. Offered: Fall Prerequisites: Twelve hours of GC credit, including ENV 101, GC 205 and senior standing or instructor's permission. Various perspectives and philosophies concerning the natural environment and resource utilization are explored in order to give students a basis on which to develop an ethical perspective. An in-depth survey of both historical and contemporary viewpoints will be conducted. The human factor in addressing natural resource issues is emphasized.</p>	<p>GC 492 Research in Water Science 2 cr. (0-0-6) Offered: Prerequisites: Water science major and junior standing or instructor's permission. Introduction to environmentally related research. Projects are pursued in cooperation with a faculty research adviser. The research adviser and research problem must be selected a semester prior to registration. Students must submit a written and oral final report.</p>
<p>GC 475 Environmental Impact Assessment 4 cr. Offered: Fall Prerequisites: GC 205, GC 320 and senior standing or instructor's permission. A field course in which students develop and organize an environmental impact assessment for a local project. Involves the laws governing environmental decision and the laws governing the content of environmental impact statements (as mandated by NEPA).</p>	<p>GC 495 Special Topics in Geography 2-4 cr. Offered: On demand. Prerequisites: Junior standing or instructor's permission. Special study of problems and/or regions which are not part of the regular offerings.</p>
	<p>GC 498 Directed Studies in Geography 1-4 cr. Offered: On demand. Prerequisite: Major or minor in geography, earth science, conservation or planning, junior standing or instructor's permission. An opportunity for the student to work on a specific topic.</p>

GR - GERMAN

Modern Languages and Literatures Department

GR 101 Elementary German I

4 cr.

Offered: Fall

- Satisfies the formal communication studies requirement.

GR 101 is an introduction to the German language and cultures of the people who speak it. Students learn rudimentary "survival" skills such as social pleasantries, shopping, exchanging money, eating in restaurants, talking about family, school and weather.

GR 102 Elementary German II

4 cr.

Offered: Winter

Prerequisites: GR 101 or one year of high school German.

- Satisfies the formal communication studies requirement.

GR 102 is a continuation of GR 101. Students add to their proficiency in matters such as those related to health, free time, employment, travel and talking about the past.

GR 201 Intermediate German I

4 cr.

Offered: Fall

Prerequisites: GR 102 or two years of high school German.

- Satisfies the formal communication studies requirement.

GR 201 is a continuation of GR 201. Students do considerably more reading and writing than in prior courses. The course expands their cultural proficiency.

GR 202 Intermediate German II

4 cr.

Offered: Winter

Prerequisites: GR 201 or three years of high school German.

- Satisfies the formal communication studies requirement.

GR 202 is a continuation of GR 201. Students do considerably more reading and writing than in prior courses. The course expands their cultural and linguistic proficiency.

GR 299 Apprenticeship

1-2 cr.

Offered: Fall, Winter

Graded S/U

Prerequisites: Written department approval.

Directed apprentice work and activities that require students to use their knowledge of German and develop their competencies in the language. This includes such things as oral expression, appreciation of grammatical structure, proofreading and editing skills, research skills in German and skills in teaching German to others.

Note: May be taken for a maximum of 2 credit hours.

GR 300 German Reading and Writing

4 cr.

Offered: Every other Winter.

Prerequisites: GR 202 or instructor's permission.

This course teaches essential reading and writing skills in German (use of dictionary, comparison of sentence structure, identification of meaning through analysis, use of contextual cues). Readings will include literary works in three genres. Student writings and revisions will serve as the basis for developing grammatical and stylistic skills.

GR 305 Conversational German

4 cr.

Offered: Every other Winter.

Prerequisites: Completion of the foundations of communication requirement, GR 202 or instructor's permission.

- Satisfies the formal communication studies requirement.
- Satisfies the upper division liberal studies requirement.

GR 305 focuses on improving the conversational abilities of students through reinforcement of three basic language functions: description, narration and opinion. Students learn how to communicate and respond to problems and discuss major social issues.

GR 310 Introduction to German Civilization and Culture

3 cr.

Offered: Fall

Prerequisites: Completion of the foundations of communication requirement and sophomore standing.

- Satisfies the foundations of humanities requirement.
- Satisfies the upper division liberal studies requirement.

This course is a multidisciplinary introduction to the culture and civilization of Germany. It offers a comprehensive view of the historical, geographical, political and economic factors which have helped shape today's German society.

Note: This course counts toward the German minor only upon completion of GR 410. GR 310 is taught in English.

GR 400 Advanced German Composition and Grammar

4 cr.

Offered: On demand.

Prerequisites: GR 300 or instructor's permission.

A review of all major points of the German grammar system, with an especially intense focus on the rich verb system and common problems native English speakers have in German. In an interrelated way, it also provides the opportunity for students to refine their writing skills through composition of essays, letters and resumes.

GR 410 Advanced German Civilization and Culture

1 cr.

Offered: Fall

Prerequisites: Completion of GR 202 or equivalent proficiency and completion of GR 310 or concurrent enrollment in GR 310.

This course explores in additional depth and in German the topics and perspectives explored in GR 310.

Note: GR 410 is taught in German.

GR 495 Special Topics in German 1-4 cr.
 Offered: On demand.
 Prerequisites: Junior standing, instructor and department head permission.
 This is an experimental course based on topics of authors, genres or literature periods not covered in other regularly approved German courses.
Note: May be repeated for credit if topic varies.

GR 498 Directed Study in German 1-4 cr.
 Offered: On demand.
 Prerequisites: Junior standing, instructor and department head permission.
 Independent study by qualified students. A directed study course is designed to meet a specific academic requirement of the student who is unable to earn the credit during regularly scheduled course offerings. The student and professor agree to the specific topic and requirements needed to earn the credit.

GRN - GERONTOLOGY
Sociology and Social Work Department

GRN 001 Internship Completion 0 cr.
 Offered: On demand.
 Graded S/U
 Prerequisites: Completion of 4 credits of GRN 490 or GRN 490 plus additional field placement credits to equal 4 credits.
 Indicates that the student has completed the internship requirement for the gerontology minor.

GRN 101 Introduction to Gerontology 4 cr.
 Offered: Winter
 This course is designed to provide an overview of the physical, psychological and social aspects of aging. It examines the aging process as experienced by the individual and how aging impacts the entire society. Theories related to aging are studied and students gain exposure to the use of the scientific method to investigate biological, psychological and social aspects of aging. Some of the topics covered in the course include the distinction between normal and abnormal aging and the impact class, race, ethnicity and gender exert on the life course. Societal attitudes and beliefs about growing old will be explored and how these social constructs influence the development of policies designed to assist this population.

GRN 490 Gerontology Field Placement 1 - 4 cr.
 Offered: On demand.
 Prerequisites: Gerontology minor, completion of gerontology minor core.
 Students who are required to take a field placement for their major would have to enroll for at least one GRN 490 credit and make the additional three credit hours up with an approved gerontology minor course substitution.
 Provides students in the gerontology minor with the opportunity to interface with older adults in a social or health care setting. It provides a learning experience for students, in cooperation with the professional community serving older adults. It provides hands-on experience designed to benefit students as they move toward their own career objectives.

HL - HEALTH

Health, Physical Education and Recreation Department

HL 101 Medical Terminology for Health Educators 1 cr.
 Offered: Fall, Winter

This self directed course challenges students in the health professions to learn and apply common medical terms and abbreviations.

HL 110 Introduction to Health and Fitness Education 2 cr.
 Offered: Fall

An introduction to the logic of health promotion and health education, which includes discussions concerning historical context, professional organizations, behavior change models, professional ethics, programming models, career, internship and graduate school opportunities. Identifies outcomes associated with majors.

HL 111 Personal Wellness 4 cr.
 Offered: Fall, Winter

Study of the intellectual, emotional, social, physical, occupational, environmental and spiritual components of wellness with a view to addressing developmental tasks related to decisions concerning self-direction and self-management. Addresses health literacy.

HL 150 Health Education for the Elementary School Teacher 2 cr.
 Offered: Fall, Winter
 Prerequisite: Admission to teacher education.

A course designed to acquaint prospective elementary teachers with a framework for comprehensive school health education. Emphasis on background information and strategies for teaching health promoting and disease preventing behaviors. Including an understanding of the physical, social, emotional and intellectual factors which influence health issues and health behaviors.

HL 211 Health Aspects of Aging 3 cr.
 Offered: Fall

An exploration of preventive health behaviors impacting normal aging and common age related disease processes. Theoretical issues in promoting the health of older adults are introduced and applied.

HL 212 Suicide Education 2 cr.
 Offered: Every other Fall.

Introduction to child, adolescent and adult suicides, the suicide personality, basic intervention techniques and the professional's personal values and attitudes toward suicide.

HL 213 Death Education 2 cr.
 Offered: Every other Fall.

This is an interdisciplinary study of death, dying and bereavement in which cultural and individual values and beliefs are explored.

<p>HL 215 Cardiovascular Risk Factor Education 1 cr. Offered: Winter and on demand.</p> <p>Exploration of factors that contribute to the development of diseases of the vascular system, including heart disease.</p>	<p>HL 315 Consumer Health and Quackery 3 cr. Offered: Fall</p> <p>Introduction to the health care delivery system in the United States and the use of that system by the consumer. Special emphasis on questionable health practices, health practitioners and health products.</p>
<p>HL 240 Community Health 2 cr. Offered: Fall</p> <p>This course provides an introduction to the health of populations through a study of community health and public health organization and practice in the United States.</p>	<p>HL 322 International Health Issues 4 cr. Offered: Winter Prerequisites: Completion of the foundations of communication requirement and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of social sciences requirement. • Satisfies the upper division liberal studies requirement. • Satisfies the world cultures requirement.
<p>HL 242 Emergency Health Care 2 cr. (1-0-2) Offered: Fall, Winter</p> <p>Study of basic concepts and techniques for administering Emergency First Aid and Cardio-Pulmonary Resuscitation to those who are sick or injured. Satisfactory completion of the course entitles the student to the American Red Cross certificate for "Responding to Emergencies."</p>	<p>A survey of the cultural, economic, environmental, historical and political concepts associated with the delivery of health care to various world populations. Major determinants of health status in several regions of the world are studied in concert with patterns of intervention at the local, community, national and international levels.</p>
<p>HL 245 Basic Emergency Medical Technician Training I 4 cr. (2-0-4) Offered: Fall Prerequisites: HL 101 and BI 104 or instructor's permission.</p> <p>Instruction in pre-hospital emergency medical care of the sick and injured; beginning from the time of the initial call for help through the transfer of care to the receiving medical facility, including scene management, patient packaging and care during transport. Successful completion of both HL 245 and HL 246 is required before the student may apply to take the National Registry Basic EMT licensing exam for the State of Michigan.</p> <p><i>Note: May not be applied toward the secondary education major or secondary education minor in health education.</i></p>	<p>HL 340 School Health Program 3 cr. Offered: Winter</p> <p>Survey of school health programs in middle and high schools including health instruction, school health services and the school health environment.</p>
<p>HL 246 Basic Emergency Medical Technician Training II 4 cr. (2-0-4) Offered: Winter Prerequisite: HL 245.</p> <p>A continuation of HL 245.</p> <p><i>Note: May not be applied toward any major or minor in health education other than the minor in Emergency Medical Services.</i></p>	<p>HL 350 Methods and Materials in Teaching Health Education 3 cr. Offered: Fall Prerequisites: Admission to the methods phase of teacher education and HL 340. Co-requisite: Concurrent enrollment in ED 349.</p> <p>Study of methods and scientific materials that support health instruction programs in the secondary schools and their measurement and evaluation.</p> <p><i>Note: May not be applied toward a non-teaching major or minor in health education. May be applied to the secondary education health education minor if required.</i></p>
<p>HL 295 Special Topics in Health Education 1-4 cr. Offered: Fall, Winter</p> <p>Detailed study of one or more special problems in health education.</p>	<p>HL 367 Planning and Evaluation in Health and Fitness 4 cr. Offered: Fall, Winter</p> <p>Focus on planning safe, relevant and effective health programs. Links to CHES and ACSM outcomes.</p>
<p>HL 296 Special Topics in Health Education 1-4 cr. Offered: Fall, Winter Graded S/U</p> <p>Detailed study of one or more special problems in health education.</p>	<p>HL 368 Programming in Health and Fitness 2 cr. Offered: Winter Prerequisite: HL 367 or instructor's permission.</p> <p>Explores how health promotion experts use planning and evaluation concepts/models to determine the effectiveness of their programs. Focus is on corporate/worksites health programs.</p>
<p>HL 311 Health Communication 2 cr. Offered: Fall Prerequisite: HL 111 and HL 240.</p> <p>The course provides theoretical and practical communication techniques required for health educators.</p>	

HL 440 Critical Issues in Health Education 3 cr.
Offered: Winter
Prerequisites: HL 111, junior standing or instructor's permission.

A multidisciplinary approach to the study of health related issues within our changing society using critical thinking and scientific thinking methodologies. Focuses on health literacy competencies.

HL 450 Human Sexuality: Educational Issues 3 cr.
Offered: Fall
Prerequisites: Junior standing or instructor's permission.

Study of materials relevant to sex education programs found in public school systems, as well as materials related to human sexuality.

HL 460 Human Disease Education 4 cr.
Offered: Winter
Prerequisites: HL 101, HL 111 and a course in human anatomy and physiology, junior standing or instructor's permission.

Introduction to the rudiments of disease processes and basic components of diseases commonly found in our society.

HL 470 Electrocardiography 1 cr.
Offered: Winter
Prerequisites: Junior standing or instructor's permission.

The course provides a study of the electrophysiological basis of the ECG. The development of a conceptual understanding of cardiac anatomy, events and metabolism underlying various ECG responses will be stressed.

HL 485 Drug Use and Abuse 3 cr.
Offered: Fall, Winter
Prerequisites: Junior standing or instructor's permission.

Survey of the psychosocial, medical and legal aspects of drug use as it exists in our country. Emphasis is placed on the non-medical use of drugs as well as upon the self-destructive use of drugs leading to chemical dependencies.

HL 490 Seminar in Health Education 1-4 cr.
Offered: On demand.
Prerequisites: Junior standing or instructor's permission.
Detailed exploration of special topics and faculty research.

HL 491 Internship in Management of Health and Fitness 2-8 cr.
Offered: Fall, Winter
Graded S/U
Prerequisites: PE 471 and PE 472 and junior standing or instructor's permission.

Supervised experience enabling the student to apply theoretical knowledge in a practical situation.

Note: Up to 4 credit hours may be earned for on-campus internship, up to 8 credit hours may be earned through an off-campus internship. If off-campus internship is chosen, approval of internship site and supervisor is required. (See off-site internship packet.)

HL 492 Field Experience in Community Health 2-4 cr. (Arr.)
Offered: Fall, Winter

Prerequisites: Prior approval of Coordinator for Health Education, junior standing or instructor's permission. Approval of fieldwork site and supervisor required.

Application of Certified Health Education Specialist (CHES) and health literacy competencies in a community health setting.

HL 495 Special Topics in Health Education 1-4 cr.
Offered: Fall, Winter
Prerequisites: Junior standing or instructor's permission.

Detailed study of one or more special topics in health education.

HL 496 Special Topics in Health Education 1-4 cr.
Offered: Fall, Winter
Graded S/U
Prerequisites: Junior standing or instructor's permission.

Detailed study of one or more special topics in health education.

HL 497 Directed Studies in Health Education 1-4 cr.
Offered: Fall, Winter
Graded S/U
Prerequisites: Junior standing or instructor's permission.

Independent study or research in health education.

HL 498 Directed Studies in Health Education 1-4 cr.
Offered: Fall, Winter
Prerequisites: Junior standing or instructor's permission.

Independent study or research in health education.

HM - HOSPITALITY MANAGEMENT

Technology and Occupational Sciences Department

HM 100 Food Selection and Preparation 4 cr. (3-0-2)
Offered: When scheduling permits.

The student will be introduced to the principles of food selection, composition and preparation. This includes purchasing guides and nutritional principles. The lab portion will serve to reinforce the lecture sessions.

HM 111 Food Service Sanitation 2 cr.
Offered: Fall, Winter

A study of all aspects of food service sanitation and safety, emerging pathogens, proper personal hygiene and sanitation procedures as well as the role management must play in the instruction of employees in proper sanitation methods relative to the new Federal and Michigan Food Codes. Successful completion of an examination from the Educational Foundation will result in a nationally recognized certificate from the National Restaurant Association.

HM 112 Introduction to the Hospitality Industry 4 cr.
Offered: Fall
Prerequisite or co-requisite: HM 111.

This course provides a basic understanding of the hospitality industry and its various segments as they relate to organizational dynamics and career paths.

HM 115 Professional Cooking I 4 cr. (1-0-9)
Offered: Fall
Prerequisite or co-requisite: HM 111.

Students gain practical experience in quantity production by operating the Jacobetti Center Culinary Cafe, rotating through front and back of the house stations, learning to cook and serve quantity foods for public consumption. Emphasis is placed on eye appeal, texture and palatability of quantity cooking and the proper techniques of preparing, cooking, holding and serving.

HM 116 Baking I 4 cr. (1-0-6)
Offered: Contact department for information.
Prerequisite or co-requisite: HM 111.

Topics covered include ingredients and their purpose, mixing methods, the basic steps to baking and general procedures in the production of cookies, muffins, biscuits, breads, rolls and specialty items. Students gain practical experience by preparing baked goods for the Jacobetti Center Culinary Cafe operation and special function orders.

HM 120 Professional Cooking II 4 cr. (1-0-9)
Offered: Winter
Prerequisites: HM 111 and HM 115.

Experience in restaurant food production by participating in the operation of the Jacobetti Center Chez Nous restaurant and Culinary Cafe.

HM 125 Professional Baking II 4 cr. (1-0-6)
Offered: Contact department for information.
Prerequisites: HM 111 and HM 116.

Students further their knowledge of baking in learning the techniques and the preparation of cakes, pies, pastries, tortes, puff pastry and specialty items. Preparing baked goods and desserts for the Jacobetti Center Chez Nous restaurant operation, Culinary Cafe and special functions provides practical experience.

HM 210 Supervision in the Hospitality Industry 4 cr. (1-0-9)
Offered: Fall
Prerequisites: HM 111 and HM 120.

A study of the supervisory skills necessary to manage a staff of hospitality employees. Students get hands-on supervisory experience in the Jacobetti Center Culinary Café and production areas and in using a computerized point-of-sale system.

HM 214 Cost Control for the Hospitality Industry 4 cr.
Offered: Fall
Prerequisites: MA 100 or department permission.

This course presents practical techniques for protecting profits in the hospitality industry by building a sound foundation of management cost and quality control procedures throughout the hospitality operation.

HM 221 Hospitality Services Management 4 cr. (1-0-6)
Offered: Winter
Prerequisite: HM 210

This course provides students with knowledge and experience in the hospitality industry while operating the Jacobetti Center Chez Nous restaurant. The student will be exposed to the development of production packets, the proper styles of service, the manager's role in the dining room and the restaurant's computerized point-of-sale system.

HM 225 Banquets and Catering 4 cr. (1-0-6)
Offered: Winter
Prerequisites: HM 210 or instructor's permission.

Hotel banquet operations and catering organization procedures including setup, layout, pricing, costing, on- and off- premise events, bar and wine service will be discussed in depth.

HM 226 Purchasing for the Hospitality Industry 2 cr.
Offered: Winter

This course examines selection and procurement of both food and non-food items from a management viewpoint. Topics include receiving, storage, issuing, accounting and security issues.

HM 240 Hotel and Lodging Operations 3 cr.
Offered: Every other Fall.

Covers the organizational structure within which a hotel operates. This course examines the economic and financial aspects of lodging operations. Basic information about departmental development, pre-opening, marketing and operations will be provided. Students will examine trends in new areas of hotel development.

HM 298 Special Topics in Hospitality 1-4 cr.
Offered: When scheduling permits.

Various topics of current interest to the student. Topics will require departmental approval and will pertain to the food service and hospitality industry.

HM 310 Menu Analysis and Design 4 cr.
Offered: Fall
Prerequisite: HM 221

A study of the essential elements necessary for developing a successful food service menu. Aspects of design, sales mix, marketing and menu analysis will be discussed. Exercises will result in students designing a food service menu.

HM 315 Multi-Cultural Foods 4 cr. (3-0-2)

Offered: When scheduling permits.

Prerequisite: HM 221 or instructor's permission.

A study of the national and regional cooking styles found around the world. This course will expose students to the culinary practices of various cultures through a lecture format and then provide practical experience as students prepare and taste the foods of selected cultures in a laboratory situation at the Jacobetti Center kitchen.

HM 318 Resort Development 4 cr.

Offered: When scheduling permits.

Prerequisites: Junior standing or department approval.

This course is a study of the world of resorts and resort management. The resort industry will be examined from a managerial point of view, with emphasis on project planning, marketing, promotion and recreational activities.

HM 330 Beverage and Bar Management 4 cr.

Offered: Fall

Prerequisites: HM 214 or instructor's permission.

This course provides a study of the purchase, receipt, storage, control and retail sales of both alcohol and non-alcohol beverages. A thorough overview of wines, beers and spirits is provided.

HM 401 Internship 1-4 cr.

Offered: On demand.

Prerequisites: Junior standing or instructor's permission.

Practical, applied experience involving placement in a job situation.

HM 450 Hospitality Operations Plan and Design 4 cr.

Offered: Winter

Prerequisite: HM 221, junior standing or instructor's permission.

This course will teach students about planning and design techniques used in the construction of a hospitality facility from the initial concept to the opening of the facility for business.

HM 480 Current Issues in the Hospitality Industry 4 cr.

Offered: Winter

Prerequisites: Senior status or instructor's permission.

This course will look at contemporary issues in the field of hospitality management and address their implications for the hospitality professional.

HM 495 Special Topics in Hospitality 1-4 cr.

Offered: When scheduling permits.

Prerequisites: Departmental approval, junior standing.

Various topics of current interest to the student. Topics will require departmental approval and will pertain to the hospitality industry.

HM 498 Directed Study in Hospitality Management 1-4 cr.

Offered: On demand.

Prerequisites: Junior standing and instructor's permission.

Individual study of a significant topic or problem in the practice of hospitality management.

HN - HUMAN NUTRITION

Health, Physical Education and Recreation Department

HN 210 Nutrition for Humans 4 cr.

Offered: Fall, Winter, Summer

Survey of dietary requirements and processes, sources of the various nutrients, the relationships of food to health, the role of diet in prevention of diseases, and methods of improving eating habits at different age levels and in different cultures. The course assumes and expands on some high school science background.

HN 297 Directed Studies in Nutrition 1-4 cr.

Offered: On demand.

Graded S/U

Prerequisites: Instructor and department head permission. For freshmen or sophomore students only.

Individual study.

HN 298 Directed Studies in Nutrition 1-4 cr.

Offered: On demand.

Prerequisites: Instructor and department head permission. For freshmen or sophomore students only.

Individual study.

HN 301 Nutrition for Health Professions 4 cr.

Offered: Fall, Winter

Principles of normal and therapeutic nutrition as they relate to the treatment of various physical and mental disorders and to various medications.

HN 362 Cultural Food Patterns 4 cr.

Offered: Winter

Prerequisites: Junior standing or instructor's permission.

Consideration of economic, environmental, historical and psychological aspects of food habits; influence of national and international dietary patterns on nutrition of individuals.

HN 415 Obesity and Weight Management 4 cr.

Offered: Fall

Prerequisites: HN 210, BI 202 junior standing or instructor's permission.

Study of current theories surrounding the causes of and control of obesity. Students will apply their understanding of the fundamentals of human nutrition and exercise to construct programs containing sound principles of weight management and total fitness.

HN 451 Advanced Nutrition 4 cr.

Offered: On demand.

Prerequisites: Students are encouraged to select a total of eight credits from the following: CH 107, CH 108, BI 104, BI 202, HN 210. Junior standing or instructor's permission.

Study of human nutrition based on fundamental knowledge of biochemistry and physiology. Lectures and reports of current research.

<p>HN 495 Special Topics in Nutrition Offered: On demand. Prerequisites: Junior standing or instructor's permission. Basic course in area of study.</p>	1-4 cr.	<p>HON 102 Origins of Western Values-Medieval to Modern 4 cr. Offered: Winter Prerequisites: Course enrollment is restricted to students admitted to the honors program and who have successfully completed HON 101. The course will be of the same format as HON 101, except that the writing component will include a major paper. Readings, almost entirely from primary sources, will be drawn from major writers and thinkers of the medieval, renaissance, reformation, enlightenment and romantic periods.</p>
<p>HN 496 Special Topics in Nutrition Offered: On demand. Graded S/U Prerequisites: Junior standing or instructor's permission. Basic course in area of study.</p>	1-4 cr.	<p>HON 111 Modern Art-European Sources 4 cr. Offered: Fall Prerequisites: Course enrollment is restricted to students admitted to the honors program. This course will investigate the primarily European aesthetic theories and art forms that influenced contemporary music, performance and the visual arts.</p>
<p>HN 497 Directed Studies in Nutrition Offered: On demand. Graded S/U Prerequisites: Junior standing and instructor and department head permission. Individual study.</p>	1-4 cr.	<p>HON 112 Modern Art-American Sources 4 cr. Offered: Winter Prerequisites: Course enrollment is restricted to students admitted to the Honors Program who have successfully passed HON 111. This course is a continuation of HON 111 which then explores the aesthetic concepts that were refined and others that were developed in American music, performance and the visual arts.</p>
<p>HN 498 Directed Studies in Nutrition Offered: On demand. Prerequisites: Junior standing and instructor and department head permission. Individual study.</p>	1-4 cr.	

HON - HONORS

Honors Program

<p>HON 001 Honors Program Completion Offered: Fall Graded S/U Prerequisites: Enrollment in the honors program, senior status, completion of core and cognate honors courses. Indicates that the student has successfully completed all of the requirements of the honors program, including the honors thesis or equivalent. Student registers in this course during the semester in which they complete the honors program requirements.</p>	0 cr.	<p>HON 211: The Social Sciences 4 cr. Offered: Winter Prerequisites: Sophomore status and enrollment in the honors program. The course introduces students to some of the major ideas and developments in the social sciences. The goal of the course is to explore the development of the social science method as well as some of the major intellectual ideas and scientific discoveries in the social sciences. The course also explores the impact of science and scientific thought on society and shows how the social sciences have been a powerful force in shaping the modern world.</p>
<p>HON 101 Origins of Western Values-Antiquity 4 cr. Offered: Winter Prerequisites: Course enrollment is restricted to students admitted to the honors program. The course will investigate the origins in the worlds of the Hebrews, Greeks and Romans of ideas and values central to western culture. Readings will be drawn from primary sources in the Jewish and Christian scriptures and from the writings of Greek and Roman philosophers, poets and playwrights. The course will have a significant writing component, including written responses to and reflections on the readings.</p>	4 cr.	<p>HON 212: The Natural Sciences 4 cr. Offered: Fall Prerequisites: Sophomore status and enrollment in the honors program. This is an honors interdisciplinary course based on topical issues of current interest in areas such as biology, chemistry, physics, psychology or earth sciences and related topics. The goal of the course is to understand the natural science method as well as some of the major ideas and scientific discoveries in the natural sciences. This course also explores the interconnection of science and scientific thought and shows how the natural sciences have been a powerful force in shaping contemporary life.</p>

HP-HEALTH PROMOTION

Health, Physical Education and Recreation Department

<p>HP 090 Geriatric Swimming 1 cr. Offered: Fall, Winter, Summer</p> <p>Swimming exercise for senior citizens.</p>	<p>HP 212 Flat Water Canoeing 1 cr. Offered: Fall</p> <p>Emphasis is on tandem flat water canoeing, although solo paddling is also introduced. Students learn equipment handling on land and water; terminology; hull control; power; turning and bracing strokes; maneuvers for going ahead, abeam, and astern; rescue of self and others; wind paddling; and day tripping. A swimming test must be passed at the first course session to continue in the course.</p>
<p>HP 091 Geriatric Exercise 1 cr. Offered: Fall, Winter, Summer</p> <p>Conditioning exercise for senior citizens.</p>	<p>HP 212S Solo Flat Water Canoeing 1 cr. Offered: On demand.</p> <p>Students learn equipment handling on land and water; terminology; hull control; power; turning and bracing strokes; maneuvers for going ahead and abeam; rescue of self and others; wind paddling; day tripping. Prior canoeing experience not needed. ACA certification is offered. A swimming test must be passed at the first course session to continue in the course. Course usually meets on two weekends.</p>
<p>HP 200 Physical Well Being 1 cr. Offered: Fall, Winter, Summer</p> <p>A lecture class on the foundations and principles of physical fitness and health. Students learn to recognize the hazards of being unfit and inactive, determine individual levels of physical fitness, and acquire the knowledge and skills to achieve and maintain a personal satisfaction level of physical fitness.</p>	<p>HP 212F Freestyle Canoeing 1 cr. Offered: On demand. Prerequisite: HP 212 or HP 212S.</p> <p>Students learn equipment handling; rescue of self and others; new strokes and review; on-side and off-side maneuvers for going ahead, astern and abeam. Students may emphasize solo or tandem freestyle. ACA certification may be offered. A swimming test must be passed at the first course session to continue in the course. Course usually meets on two weekends.</p>
<p>HP 205 Archery 1 cr. Offered: On demand.</p> <p>Students learn skills and techniques of archery.</p>	<p>HP 213 Sea Kayaking 1 cr. Offered: On demand.</p> <p>Students learn sea (coastal) kayaking equipment handling; strokes, maneuvers and other techniques; rescue of self and others; trip planning and navigation; weather and environmental hazards and safety. ACA or BCUC certification may be offered. Students provide their own equipment or may rent through the instructor. A swimming test must be passed at the first course session to continue in the course. Course meets on weekends.</p>
<p>HP 206 Backpacking 1 cr. Offered: Fall</p> <p>Students learn about backpacking and planning a trip. A weekend trip off-campus is required.</p>	<p>HP 216 Skating-Beginning 1 cr. Offered: Fall, Winter</p> <p>Students learn basic skills and techniques of skating.</p>
<p>HP 207 Badminton-Beginning 1 cr. Offered: Winter</p> <p>Students learn basic skills and techniques of badminton.</p>	<p>HP 216A Skating-Figure 1 cr. Offered: On demand.</p> <p>Students learn basic skills and techniques of figure skating.</p>
<p>HP 208 Basketball 1 cr. Offered: Fall</p> <p>Students learn skills and techniques of basketball.</p>	<p>HP 216B Skating-Intermediate Figure 1 cr. Offered: On demand.</p> <p>Designed for the figure skater who already has basic skills.</p>
<p>HP 209 Bicycling-Mountain 1 cr. Offered: Fall</p> <p>Students learn skills and techniques of off-road bicycling.</p>	<p>HP 217 Fly and Bait Casting 1 cr. Offered: Summer</p> <p>Students learn skills and techniques of fly and bait casting.</p>
<p>HP 211 Bowling-Beginning 1 cr. Offered: Fall, Winter</p> <p>Students learn skills and techniques of bowling. Lab fee required.</p>	

<p>HP 218 Folk Dance 1 cr. Offered: Fall Students learn skills and techniques of folk dance.</p>	<p>HP 230A Rock Climbing-Intermediate 1 cr. Offered: Winter Designed for the climber who already has basic skills.</p>
<p>HP 219 Golf-Beginning 1 cr. Offered: Summer Students learn skills and techniques of golf.</p>	<p>HP 231 Skiing-Beginning 1 cr. Offered: Winter Students learn skills and techniques of downhill skiing. Lab fee required. Students may rent equipment if needed.</p>
<p>HP 222 Hiking 1 cr. Offered: Fall, Winter, Summer Students learn about hiking in the wilderness and planning hiking trips.</p>	<p>HP 231A Skiing-Intermediate 1 cr. Offered: Winter Designed for the skier who already has basic skills. Lab fee required. Students may rent equipment if needed.</p>
<p>HP 223 Individually Prescribed Program 1 cr. Offered: On demand. Individually designed activity for someone who is physically unable to participate in any other HP activity.</p>	<p>HP 231B Skiing-Cross Country 1 cr. Offered: Winter Students learn skills and techniques of cross country skiing. Lab fee required. Students may rent equipment if needed.</p>
<p>HP 224 Jogging 1 cr. Offered: Fall, Winter Students learn skills and techniques of jogging.</p>	<p>HP 232 Snowboarding-Beginning 1 cr. Offered: Winter Students learn skills and techniques of snowboarding.</p>
<p>HP 226 Modern Dance-Beginning 1 cr. Offered: Fall Students learn skills and techniques of modern dance.</p>	<p>HP 233 Snowshoeing 1 cr. Offered: Winter Students learn skills and techniques of snowshoeing.</p>
<p>HP 226A Modern Dance-Intermediate 1 cr. Offered: Winter Designed for the student who already has basic modern dance skills.</p>	<p>HP 234 Soccer 1 cr. Offered: Fall, Winter Students learn skills and techniques of soccer.</p>
<p>HP 226C Aerobics 1 cr. Offered: Fall, Winter Students learn and participate in various forms of aerobic exercise, including step aerobics.</p>	<p>HP 235A Country and Square Dancing 1 cr. Offered: Winter Students learn skills and techniques of traditional western-style American dancing. The emphasis will be on square, contra and set dances. Country line and old fashioned partner dancing will also be taught.</p>
<p>HP 227 Orienteering 1 cr. Offered: On demand. Students learn skills and techniques of running in wooded terrain utilizing maps and compasses.</p>	<p>HP 235B Ballroom and Latin Dancing 1 cr. Offered: Fall Students learn skills and techniques of American ballroom dancing. Waltz, Tango, Fox Trot, Rumba, Cha Cha and Mambo will be emphasized. Polkas, party dances and mixers will also be taught.</p>
<p>HP 228 Power Skating and Hockey 1 cr. Offered: Winter Students learn skills and techniques of power skating and hockey.</p>	<p>HP 235C Swing and Salsa Dancing 1 cr. Offered: Winter Students learn skills and techniques of swing dancing. Emphasis will be on East Coast Swing (or Jitterbug), Salsa, Merengue and Samba. West Coast Swing will also be taught.</p>
<p>HP 229 Racquetball 1 cr. Offered: Fall, Winter Students learn skills and techniques of racquetball.</p>	<p>HP 236 Softball 1 cr. Offered: On demand. Students learn skills and techniques of softball.</p>
<p>HP 230 Rock Climbing 1 cr. Offered: Fall, Winter, Summer Students learn skills and techniques of rock climbing.</p>	

<p>HP 238 Winter Camping 1 cr. Offered: Winter</p> <p>An introduction to winter camping. Major topics include: clothing, equipment, food and outdoor cooking, trip planning, shelters, health and safety, basic principles of outdoor living and winter travel techniques. Two weekend trips are required.</p>	<p>HP 245A Weight Training and Conditioning-Intermediate 1 cr. Offered: Winter</p> <p>Designed for the student who already has basic weight-training skills.</p>
<p>HP 239 Swimming-Beginning 1 cr. Offered: Fall</p> <p>Students learn skills and techniques of swimming.</p>	<p>HP 246 Karate 1 cr. Offered: Fall, Winter</p> <p>Students learn skills and techniques of karate.</p>
<p>HP 239A Swimming-Intermediate 1 cr. Offered: Fall, Winter</p> <p>Designed for the swimmer who already has basic skills.</p>	<p>HP 247 Yoga-Beginning 1 cr. Offered: Fall, Winter</p> <p>Students learn skills and techniques of yoga.</p>
<p>HP 239B Swimming-Lifeguard Training 1 cr. Offered: Winter</p> <p>American Red Cross training for lifeguard certification.</p>	<p>HP 249 Hunter Safety Education 1 cr. Offered: Fall</p> <p>Students learn basics of hunting safety and receive a Michigan Hunter Safety certificate.</p>
<p>HP 239C Swimming-WSI 1 cr. Offered: On demand.</p> <p>American Red Cross training for certification as a swimming instructor.</p>	<p>HP 253 Adventure Based Learning 1 cr. Offered: Fall, Winter</p> <p>Involves active participation and experiential learning in a variety of adventure-based activities (games, initiatives, climbing wall, ropes course) with an emphasis on the development, application and transfer of individual and group skills.</p>
<p>HP 239D Swimming-SCUBA 1 cr. Offered: Fall, Winter</p> <p>Students learn skills and techniques of SCUBA.</p>	<p>HP 259 Tai-Chi-Beginning 1 cr. Offered: Fall, Winter</p> <p>Students will learn the techniques of Tai Chi Chuan, a soft style Chinese martial art that involves low impact exercises.</p>
<p>HP 239E Swimming-Advanced SCUBA 2 cr. Offered: Fall</p> <p>Prerequisite: HP 239D or instructor's permission.</p> <p>Designed for the diver who already has basic skills.</p>	<p>HP 259A Tai Chi-Intermediate 1 cr. Offered: On demand.</p> <p>This form of Tai Chi is different from other forms in that it consists of more dramatic turns, kicks and jumps. It is more appropriate for those who have some experience with Tai Chi practice.</p>
<p>HP 241 Tennis-Beginning 1 cr. Offered: Fall, Summer.</p> <p>Students learn skills and techniques of tennis.</p>	<p>HP 260 Rape Aggression Defense Systems 1 cr. Offered: Fall, Winter</p> <p>The Rape Aggression Defense approach to personal safety education embodies a practical blend of threat avoidance strategies and real-world assault resistance tactics for women.</p>
<p>HP 241A Tennis-Intermediate 1 cr. Offered: On demand.</p> <p>Designed for the tennis player who already has basic skills.</p>	<p>HP 295 Special Topics in Health Promotion 1 cr. Offered: On demand.</p> <p>Students learn skills and techniques of new activities.</p> <p><i>Note: May be repeated if topic differs.</i></p>
<p>HP 244 Volleyball-Beginning 1 cr. Offered: Fall, Winter</p> <p>Students learn skills and techniques of volleyball.</p>	
<p>HP 244A Volleyball-Intermediate 1 cr. Offered: Fall, Winter</p> <p>Designed for the volleyball player who already has basic skills.</p>	
<p>HP 245 Weight Training and Conditioning 1 cr. Offered: Fall, Winter</p> <p>Students learn skills and techniques of weight training and conditioning.</p>	

HR - COSMETOLOGY

Technology and Occupational Sciences Department

HR 060 Theory of Cosmetology Fundamentals 4 cr.

An orientation and review of all cosmetology curricula. The curriculum discussed is set by the State of Michigan. The related knowledge is necessary for successful completion of the state test for licensure.

HR 061 Theory of Cosmetology Supervision 4 cr.

Applications and awareness are discussed regarding the monitoring of students practicing cosmetology application on the general public and mannequins. In addition, strategies for presenting practical and theoretically related to the practice of cosmetology are also discussed. The procedures presented meet State of Michigan standards for licensure.

HR 062 Theory of Cosmetology Administration 2 cr.

An awareness of the laws and rules required by the State of Michigan for cosmetology school administration and record keeping are discussed.

HR 063 Practice of Cosmetology Fundamentals 4 cr.

Assisting students in developing competencies in all practical and theory related areas set by the State of Michigan curriculum.

HR 064 Practice of Cosmetology Supervision 4 cr.

Monitoring student activities in all classroom and lab situations for the safe and sanitary practice of cosmetology activities. In addition, attention to compliance with State law is observed.

HS - HISTORY

History Department

HS 101 History of Western Civilization to 1600 4 cr.

Offered: Fall, Winter

- Satisfies the foundations of humanities requirement.

Development of culture from the earliest times to 1600. Emphasis is distributed equally among the Ancient, Medieval and Renaissance worlds.

HS 102 History of Western Civilization Since 1600 4 cr.

Offered: Fall, Winter

- Satisfies the foundations of humanities requirement.

Development of culture from 1600 to the present day. Cultural, social, economic and political ideas and institutions are traced as background to the understanding of contemporary problems.

HS 104 The Third World in Historical Perspective 4 cr.

Offered: Fall, Winter

- Satisfies the foundations of social sciences requirement.
- Satisfies the world cultures requirement.

Survey of Asia, Africa and Latin America in the nineteenth and twentieth centuries, including the colonial pattern, the anti-colonial movements for national independence, the reassessment of tradition, the strategies for development, the understanding of human rights.

HS 126 The United States to 1865 4 cr.

Offered: Fall, Winter

- Satisfies the foundations of social sciences requirement.

Survey of early American history from the colonial period through the Civil War. Emphasis on political developments within a broad economic, social and cultural context.

HS 127 The United States Since 1865 4 cr.

Offered: Fall, Winter

- Satisfies the foundations of social sciences requirement.

Survey of recent American history from reconstruction to the present. Political, economic, social, cultural, educational and diplomatic facets of the American experience are emphasized.

HS 200 Historical Thinking and Writing 4 cr.

Offered: Fall, Winter

Prerequisites: EN 111 with grade of "C" or better.

The study of the past as a way of thinking and writing about evidence, interpretation and explanation. Explores difficulties inherent in examining the human past and asks basic questions about historical study as both a social science and an art.

Note: History majors should take this course prior to their senior year or with instructor's permission.

HS 233 Native American History 4 cr.

Offered: Winter

- Satisfies the foundations of social sciences requirement.
- Satisfies the world cultures requirement.

Study from origins to the present. Central theme is the persistence of Native American ethnic identity in the face of white conquest and efforts at elimination or assimilation.

HS 234 Indigenous People of Latin America 4 cr.

Offered: Summer, even years.

- Satisfies the foundations of humanities requirement.
- Satisfies the world cultures requirement.

A study of the Indians of Latin America which traces their general development from the pre-Columbian era to the contemporary period. The national Indian policies of the 19th and 20th centuries will be stressed.

<p>HS 244 The American Labor Movement 2 cr. Offered: Contact department for information.</p> <p>This course provides a historical perspective on the history of the American worker's response to the Industrial Revolution, the origins and development of the union movement and an analysis of the current problems facing the American worker and the union movement today.</p>	<p>HS 258 The Emergence of Modern Japan 4 cr. Offered: Fall</p> <p>The main emphasis is on a study of the changes in Japanese ideas and institutions since the country was forced open by the West in 1853 to the present day. In order to set the stage there is a brief overview of ancient and medieval Japan, with somewhat more attention given to the Tokugawa Period (1603-1868).</p>
<p>HS 245 The American West 4 cr. Offered: Contact department for information.</p> <p>Development and settlement of the trans-Mississippi west from the mid-nineteenth century to the present. Myths and realities are contrasted in order to understand and appreciate the role of the West in the past and present and its influence on the American character.</p>	<p>HS 273 Gay and Lesbian History 4 cr. Offered: Contact department for information.</p> <p>An introduction to the historical development of gay and lesbian social, cultural and political identities and movements. Investigation of the development of discussions and discourses relevant to "homosexuality" and "homosexuals", primarily in 19th- and 20th-century North America.</p>
<p>HS 251 Latin American Civilization 4 cr. Offered: Fall</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. • Satisfies the world cultures requirement. <p>Introduction to the development of culture, society and values through a study of pertinent topics from the colonial origins to the present.</p>	<p>HS 283 The American Woman 4 cr. Offered: Winter</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. <p>The story of American women. Emphasis on the accomplishments and contributions of women in history, on understanding the historical relationship between women and men and on the individual perception associated with these relationships.</p>
<p>HS 252 Arab-Islamic History 4 cr. Offered: Winter</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. • Satisfies the world cultures requirement. <p>Introduction to the political, social, economic, intellectual and artistic history of the Arabic-speaking peoples from the seventh century to the present. The religious history of Islam and the Islamic way of life is intrinsic to the whole course.</p>	<p>HS 293 Minorities in American History 4 cr. Offered: Fall</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. <p>Examination of the origin, development and significance of selected minority groups. Emphasis on women, African Americans, Chicanos, Japanese and Native Americans as well as on such problems as cultural identity, racism and sexism.</p>
<p>HS 254 Introduction to the History of Africa 4 cr. Offered: Fall</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. • Satisfies the world cultures requirement. <p>Survey of the history of the continent south of the Sahara Desert. Consideration of pre-colonial African peoples, cultures and ecology. Emphasis on 19th-century imperial rivalries, the rise of nationalism and the creation of present day independent states.</p>	<p>HS 295 Special Topics in History 1-4 cr. Offered: Fall, Winter</p> <p>Investigation of a significant topic or problem in history. Content varies depending upon the intention of the instructor and the needs of the student.</p> <p><i>Note: May be repeated for credit if topic differs.</i></p>
<p>HS 256 Approaching China 4 cr. Offered: Winter</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. • Satisfies the world cultures requirement. <p>Historical introduction to the distinctive cultural integration of pre-revolutionary China, approached comparatively as an original style of thinking, feeling and organizing life.</p>	<p>HS 300 Ancient Egypt 4 cr. Offered: Contact department for information.</p> <p>Survey of culture in the Age of the Pharaohs (3100 B.C. to 300 B.C.) and into the Ptolemaic, Roman and Christian eras, with an epilogue on Muslim Egypt from the conquest to the present.</p>
	<p>HS 302 Ancient Rome 4 cr. Offered: Contact department for information.</p> <p>Rome from the earliest times, the republic, the conquest of the Mediterranean world, the Roman revolution, Caesar and Augustus, the Pax Romana and the later empire. Cultural, political and social institutions are reviewed.</p>

<p>HS 304 The Middle Ages 4 cr. Offered: Contact department for information.</p> <p>Europe from the fall of the Roman Empire (300 A.D.) to the beginning of modern civilization with the Renaissance (1400 A.D.). Topics include the barbarian invasions, Carolingian times, feudalism, the growth of the Catholic Church, the Crusades, philosophy and the arts.</p>	<p>HS 315 Imperialism 4 cr. Offered: Winter Prerequisite: Completion of the foundations of communication requirement and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. • Satisfies the upper division liberal studies requirement. <p>The course investigates the development of modern Imperialism from the eighteenth century to the present, from the rise of European economic interests in Asia and Africa to the process of decolonization in the twentieth century. It examines the responses of both colonizers and colonized to the forces of imperialism, with emphasis placed upon primary readings in history, politics and literature.</p>
<p>HS 305 Renaissance-Reformation 4 cr. Offered: Contact department for information.</p> <p>Europe from 1300 to 1600: the transition from the medieval to the modern world. The development of the modern state, society and economy; the age of humanism, Renaissance art, exploration and science; the Protestant, Catholic and counter reformations.</p>	<p>HS 316 The Holocaust 4 cr. Offered: Contact department for information.</p> <p>The course concerns the mass murder of approximately six million Jews by the Nazi regime and its allies from 1939-1945. Students will investigate the way in which the German government attempted to impose "the final solution," as well as its causes and consequences with reference both to its victims and perpetrators. The course employs literature and psychology as well as historical works in its discussion of the "Shoah."</p>
<p>HS 307 Early Modern Europe, 1600-1815: A Thematic Approach 4 cr. Offered: Contact department for information.</p> <p>The course provides in-depth study both in terms of content and historiography of some of the main themes of early modern European history. Topics include overseas expansion; reform of religion; the royal state; the intellectual revolution; society and economy in the pre-industrial age; and the French Revolution. The number of topics and the approach will vary according to the instructor.</p> <p><i>Note: Cannot be repeated except for failing grade.</i></p>	<p>HS 325 Colonial American History 4 cr. Offered: Contact department for information.</p> <p>This course looks at such topics as European expansion and colonization in the New World and the social, political and economic foundations of American society.</p>
<p>HS 308 Modern Europe, 1815-Present: A Thematic Approach 4 cr. Offered: Contact department for information.</p> <p>The course provides in-depth study both in terms of content and historiography of some of the main themes of modern European history, 1815 to the present. Topics may include industrialization and its consequences, the creation of the modern nation state, the new imperialism, the road to war, the age of total war, and post-war world and epilogue. The number of topics and the approach will vary according to the instructor.</p> <p><i>Note: Cannot be repeated except for failing grade.</i></p>	<p>HS 326 The American Revolution and the Constitution 4 cr. Offered: Contact department for information.</p> <p>Begins with the origins of the War of Independence, traces the war and its leaders, and then follows the nation through the Confederation. The development and implementation of the Constitution of 1787 and the Bill of Rights is then discussed.</p>
<p>HS 312 Revolutionary Russia 4 cr. Offered: Contact department for information.</p> <p>Study of autocracy, nationality and orthodoxy in imperial Russia and the reformist movements culminating in the Revolutions of 1917; the theory and practice of communism from 1917 to the present.</p>	<p>HS 327 Civil War and Reconstruction 4 cr. Offered: Contact department for information.</p> <p>A study of the social, political, economic and military developments starting with the causes and the background of the Civil War, carrying on through the war itself and the reconstruction after the war. The impact of the Civil War on the development of major issues in United States history since the war, such as racism, constitutionalism and economics will also be considered.</p>
<p>HS 314 Modern Britain, 1485-Present 4 cr. Offered: Contact department for information.</p> <p>A survey of the history of Great Britain and Ireland from the accession of the Tudor dynasty in 1485 to present times. Attention is given to political development and reform, economic life, empire, foreign relations and changes in society and culture.</p>	<p>HS 328 Turbulent Decades, 1930-1950 4 cr. Offered: Contact department for information.</p> <p>This course will focus on two major events that changed American life: The Depression and World War II. Emphasis will be on economics, political and social developments.</p>

<p>HS 335 Michigan History 4 cr. Offered: Winter</p> <p>Survey of state developments from the coming of the European to the present. Emphasis on its regional and national context.</p>	<p>HS 353 The Finnish Immigrant in America 4 cr. Offered: Contact department for information.</p> <p>Focus on the inner meaning of immigration for Finnish Americans and on the institutional pattern they created in the new environment of America, particularly the Upper Peninsula. Written project consisting of a social history of a Finnish-American family spanning three generations is required.</p>
<p>HS 336 History of the Upper Peninsula 4 cr. Offered: Contact department for information.</p> <p>Survey of Michigan's Upper Peninsula from its Indian origins to the present.</p>	<p>HS 360 Chinese Revolution, 1800-Present 4 cr. Offered: Contact department for information.</p> <p>The transformation of life patterns in China induced by the collision between China and the West. Emphasizes the causes and implications of this collision for China and ourselves.</p>
<p>HS 337 American Economic History 4 cr. Offered: Winter</p> <p>Prerequisites: Completion of the foundations of communication requirement and sophomore standing. Cross listed with EC 337.</p> <ul style="list-style-type: none"> • Satisfies the foundations of social sciences requirement. • Satisfies the upper division liberal studies requirement. <p>Transformation of the American economy with particular emphasis on the modern period of industrialization. Special attention will be devoted to the role of the corporation, ethics, advertising, environment, labor, public-policy decisions, critics and defenders of the economic order.</p>	<p>HS 361 History of the Americas 4 cr. Offered: Fall</p> <p>Prerequisite: Completion of the foundations of communication requirement and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. • Satisfies the upper division liberal studies requirement. <p>A comparative and thematic history of the people and history of the Western Hemisphere. The topical approach will concentrate on the comparison and contrast of concepts and ideas throughout the hemisphere from the prehistoric Native American cultures to the contemporary scene.</p>
<p>HS 340 American Foreign Policy to 1900 4 cr. Offered: Contact department for information.</p> <p>Key episodes of American diplomacy from 1776 to 1900. Both policy formulation and implementation are emphasized via critical analysis.</p>	<p>HS 362 History of Mexico 4 cr. Offered: Winter</p> <p>Prerequisite: Completion of the foundations of communication requirement and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. • Satisfies the upper division liberal studies requirement. • Satisfies the world cultures requirement. <p>A history of the Mexican people from their prehistoric origins, through the colonial development, independence, the rise of national Mexico and the era of Diaz. Special attention will be paid to the Mexican Revolution (1910) and the development of modern Mexico.</p>
<p>HS 341 American Foreign Policy Since 1900 4 cr. Offered: Contact department for information.</p> <p>Examination of the salient aspects of American diplomacy in the twentieth century and America's role in the world as it becomes a world power.</p>	<p>HS 363 Canadian History and Culture 4 cr. Offered: Contact department for information.</p> <p>Survey of geography, history and culture from the arrival of the white man to the present, with considerable emphasis on contemporary Canada.</p>
<p>HS 350 Methods and Materials in Teaching Social Studies Education 4 cr. Offered: Fall, Winter</p> <p>Prerequisite: Admission to the methods phase of teacher education. Co-requisite: Concurrent enrollment in ED 349.</p> <p>Teaching of the social studies at the secondary level. The objectives, the organization of subject matter, the evaluation and use of materials and the development of classroom procedures and techniques.</p> <p><i>Note: May not be applied toward a non-teaching major or minor in history.</i></p>	<p>HS 372 American Urban History 4 cr. Offered: Contact department for information.</p> <p>Survey of the history of the American city. Topics include the development of cities, immigration and migration to cities, the relationship of urban and rural areas, and the reasons for the growth and/or decay of cities.</p>
<p>HS 352 African American History 4 cr. Offered: Winter</p> <p>Prerequisite: Completion of the foundations of communication requirement and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. • Satisfies the upper division liberal studies requirement. <p>An overview of African American history in the United States with particular emphasis on such topics as the slave experience, the civil rights movement and significant contributions to the nation's history.</p>	<p>HS 380 Public History 4 cr. Offered: Contact department for information.</p> <p>This course provides a background in public history which deals with historical administration, grantship and fund raising, editing, preservation, management, and use of historical resources in historical societies, museums, galleries, governmental agencies and private consulting firms.</p>

HS 382 Historical Role Playing 2 cr.

Offered: Winter
Prerequisites: HS 126 and HS 127 highly recommended.

Required for Michigan Bureau of History living history role players.

Study of role playing in America with special concentration on a specific site such as Fort Wilkins State Park, Fayette State Park or other parks. Students study the philosophy of role playing, the role of park interpretation and the social history of the period.

Note: May be repeated for credit if the site differs.

HS 410 Seminar in Approaches to History 4 cr.

Offered: Fall, Winter
Prerequisites: Junior standing and completion of at least 12 credit hours of history, or post-baccalaureate standing or instructor's permission.

This course offers an examination of various approaches to history and how those approaches shape the way historians ask historical questions, conduct historical research and formulate historical arguments. The course examines the dominant approaches to history, including intellectual history, social history, cultural history, political history and economic history. The course also examines the major theoretical issues that pertain to all approaches to history, notably: the nature of history as intellectual inquiry, the posing of historical questions and the evaluation of historical evidence.

HS 444 Research in Labor History 2 cr.

Offered: Contact department for information.
Prerequisites: Junior standing or instructor's permission.

An examination of case studies in American Labor History to ascertain the dimensions of the human struggle in achieving organizational goals concerning working conditions, compensation and the labor market.

HS 481 Oral History 1 cr.

Offered: Winter
Prerequisites: Junior standing or instructor's permission.

Study of the history, techniques and application of interviewing individuals for historical purposes.

Note: May be taken only once.

HS 490 Junior/Senior Seminar in History 4 cr.

Offered: Fall, Winter
Prerequisites: HS 200 and 12 additional credits in history. Junior standing or instructor's permission.

Seminar dealing with an important historical problem or with important historians or texts as determined by the instructor. Major work will consist of researching and writing an article-length, student-critiqued historical essay.

Note: May be repeated if topic differs.

HS 491 Internship in History 1-6 cr.

Offered: On demand.
Prerequisites: HS 200, 2.5 grade point average, junior standing and departmental permission.

Professional internship experience, such as in a museum, historical society or archives, or in historical preservation advocacy.

Note: May be taken more than once for up to 6 credits with a maximum of 3 counting for the minor.

HS 495 Special Topics in History 1-4 cr.

Offered: Fall, Winter
Prerequisites: Junior standing or instructor's permission.

Investigation of a significant topic or problem in history. Content varies depending upon the intentions of the instructor and the needs of the students.

Note: May be repeated if topic differs.

HS 498 Directed Study in History 1-4 cr.

Offered: On demand.
Prerequisites: Junior standing and department permission.

Individual investigation of a significant topic or problem in the study, teaching or writing of history.

HV-HEATING AND VENTILATION

Technology and Occupational Sciences Department

HV 170 Applied Electricity for Trades 4 cr. (2-0-4)

Offered: Fall, Winter

Basic concepts of electricity as applied to heating, ventilation, air conditioning, refrigeration, construction, industrial maintenance and related trade areas. Introduction to electrical circuit fundamentals, electrical safety, meters, basic circuit components and symbols, single and three phase power supply systems, wiring installation, circuit protection, motors, capacitors, relays and wiring diagrams.

HV 171 Basic Heating 4 cr. (2-0-4)

Offered: Fall
Prerequisites: HV 170 or concurrent enrollment.

An introduction to the principles and components used in heating systems. Pipe and tube fitting, theory of heat flow, sources of energy, combustion, electrical controllers, humidification, air filtering, venting and code requirements.

HV 172 Basic Refrigeration 4 cr. (2-0-4)

Offered: Fall
Prerequisites: HV 170 or concurrent enrollment.

Introduction to the components necessary for mechanical refrigeration. Students become familiar with the functions, operations and relationship of the components. Emphasis is placed on designs, operations and variations of component parts and control systems.

HV 173 Heating Systems I 4 cr. (2-0-4)

Offered: Winter
Prerequisites: HV 170 and HV 171 or instructor's permission.

Gas heating systems, gas piping design and installation, mid-and high-efficiency gas heating equipment, basic and advanced gas heating controls, integrated microprocessor controls, venting, installation, troubleshooting, service and code requirements.

HV 174 ACR Systems I 4 cr. (2-0-4)

Offered: Winter
Prerequisites: HV 172 or instructor's permission.

This course is a continuation of the study of mechanical air conditioning systems. It will include sequence of operation, electrical systems, psychometrics and specialized tools and techniques used to service these types of equipment. Specific emphasis will be on principles of operation and applications of heat pumps and ventilation equipment including residential and commercial equipment.

HV 175 Air Delivery Systems 4 cr. (2-0-4)

Offered: Winter
Study of psychrometrics (the properties of air), air flow principles and duct system configurations and fabrication. Emphasis will be placed on testing (measuring), adjusting and balancing air delivery systems.

HV 270 Heating Systems II 4 cr. (2-0-4)

Offered: Fall
Prerequisites: HV 170 and HV 171 or instructor's permission.

Oil heating systems, hydronic (hot water) controls and circuits, hydronic heating system components and design, zoned systems, system control strategies, installation, troubleshooting, service and code requirement.

HV 271 ACR Systems II 4 cr. (2-0-4)

Offered: Fall
Prerequisites: HV 172 or instructor's permission.

This is an advanced mechanical refrigeration course that includes the study and application of total system operation with specific emphasis on: accessories, defrost systems, pressure controls, pressure regulating devices, multiple systems, commercial pipe sizing, motor starters and controllers.

HV 273 Comfort Systems Design 4 cr.

Offered: Winter
Prerequisites: HV 171 and HV 172 or concurrent enrollment in HV 172 and HV 173.

This course is designed to teach the basic principles and techniques needed to accurately calculate heating/cooling loads and size duct for a residential building. Standard industry methods used are based on Air Conditioning Contractors of America (ACCA) manuals "J" and "D". The student is introduced to computer programs used for residential system design.

HV 275 HVACR Technical Problems 4 cr. (2-0-4)

Offered: Fall
Prerequisites: HV 173 and HV 174; HV 270 and HV 271 or concurrent enrollment.

Advanced laboratory experience in installation and service of air conditioning and refrigeration systems. Emphasis is placed on completion of specialized laboratory projects involving application, installation and service of equipment.

HV 291 HVACR Internship 1-4 cr.

Offered: Fall, Winter
Prerequisite: Instructor's permission.

Internship work as an HVACR Technician under the supervision of a professional HVACR Technician.

HV 298 Directed Study and Research 1-4 cr.

Prerequisite: Department permission.

Selection of problem in area of emphasis, specialized instruction and experiences to reinforce technical skill and knowledge. Written reports of work are required.

IM - INDUSTRIAL MAINTENANCE

Technology and Occupational Sciences Department

IM 110 Industrial Measurement and Fabrication 2 cr. (1-0-2)

Offered: Fall
This is a practical course to serve as a guide for the proper use and care of industrial maintenance tools. This will include pullers, bearing heaters, oxyacetylene torches, taps, dies, portable and stationary drill presses, metal brakes, punches, shears, cutoff saws, grinders, hydraulic presses, band saws, measuring tools, levels and power hand tools.

IM 214 Alignment, Power Transmission and Conveyors 4 cr. (2-0-4)

Offered: Fall
Prerequisites: IM 110 and IT 215, or instructor's approval.

Principles of operation and applications of industrial conveyors, power transmission equipment and alignment. Component examples are couplings, sheaves, bushings, bearings, housings, belts, chains, sprockets, seals, variable speed drives and gear reducers. Includes installation and maintenance.

IM 220 Pumps, Piping and Valves 4 cr. (2-0-4)

Offered: Winter
Prerequisites: IM 110 and IT 215 or instructor's approval.

Principles of design, operation and maintenance of pumps, industrial valves and piping systems used to move liquids and materials in industry.

IM 298 Directed Study and Research 1-4 cr.

Offered:

Prerequisite: Department permission.

Selection of problem in area of emphasis, specialized instruction and experiences to reinforce technical skill and knowledge. Written reports of work are required.

IP - INTERNATIONAL STUDIES**Modern Languages and Literatures Department****IP 285 Study Abroad: Special Topics** 1-12 cr.

Offered: Contact department for information.

Courses taken abroad in the student's area of study. NMU credits determined by applicable departments.

IP 286 Study Abroad: Special Topics 1-12 cr.

Offered: Contact department for information.

Graded S/U

Courses taken abroad in the student's area of study. NMU credits determined by applicable departments.

IP 485 Study Abroad: Special Topics 1-12 cr.

Offered: Contact department for information.

Prerequisites: Junior standing or instructor's permission.

Courses taken abroad in the student's area of study. NMU credits determined by applicable departments.

IP 486 Study Abroad: Special Topics 1-12 cr.

Offered: Contact department for information.

Graded S/U

Prerequisites: Junior standing or instructor's permission.

Courses taken abroad in the student's area of study. NMU credits determined by applicable departments.

IP 490 International Studies Seminar 4 cr.

Offered: Contact department for information.

Prerequisites: Completion of study abroad experience and 75 credit hours, junior standing or instructor's permission.

The objective of the course is to discuss and analyze the various experiences of traveling, studying and living in a foreign culture. Discussion focuses on the various stages of "culture-shock" and the adaptation process that a person experiences while abroad.

IP 498 Directed Study in International Studies 1-4 cr.

Offered: Contact department for information.

Prerequisites: Junior standing and permission of advising department.

Individual research in international studies. Final report must be filed with the instructor.

IS - INFORMATION SYSTEMS**College of Business**

CIS majors or minors must earn a minimum grade of C- in each CIS/IS course applying to their CIS major/minor.

CIS 110 is the equivalent of IS 100, IS 101, IS 102 and IS 104.

IS 100 Introduction to Windows, E-mail and the Internet 1 cr.

Offered: Fall, Winter

- Satisfies 1 credit hour of the formal communication studies requirement.

This course will introduce students to the use of Microsoft Windows operating system, e-mail and the Internet. Students must successfully complete this course or pass the waiver exam to enroll in any of the other IS software application courses.

Note: If CIS 110 has been completed, this course may not be taken for credit.

IS 101 Beginning Word Processing 1 cr.

Offered: Fall, Winter

Prerequisite: IS 100

- Satisfies 1 credit hour of the formal communication studies requirement.

Students will develop basic skills in the operation of word processing software. Emphasis is on creating, formatting and revising documents and tables, merging documents and working with graphics.

Note: If CIS 110 has been completed, this course may not be taken for credit.

IS 102 Beginning Spreadsheets 1 cr.

Offered: Fall, Winter

Prerequisite: IS 100

- Satisfies 1 credit hour of the formal communication studies requirement.

Students will develop basic skills in the operation of spreadsheet software. Emphasis is on the principles of spreadsheet design and creating and formatting basic spreadsheets and charts.

Note: If CIS 110 has been completed, this course may not be taken for credit.

IS 104 Beginning Database 1 cr.

Offered: Fall, Winter

Prerequisite: IS 100

- Satisfies 1 credit hour of the formal communication studies requirement.

Students will develop basic skills in the use of database software. Emphasis is on database terminology, manipulating database files and creating queries.

Note: If CIS 110 has been completed, this course may not be taken for credit.

IS 105 Presentation/Multimedia Software 1 cr.

Offered: Fall, Winter

Prerequisite: IS 100

- Satisfies 1 credit hour of the formal communication studies requirement.

Students will develop proficiency in the use of presentation and multimedia software. Emphasis is on the principles of presentation design and development of multimedia presentations. In addition, students will learn how to use projection devices for audience viewing.

<p>IS 107 Beginning Desktop Publishing 1 cr. Offered: Fall, Winter Prerequisite: IS 100</p> <ul style="list-style-type: none"> • Satisfies 1 credit hour of the formal communication studies requirement. <p>This course will introduce students to desktop publishing, including the principles of page layout and design. The emphasis will be on the elements of design through hands-on applications.</p>	<p>IS 203 Advanced Spreadsheets 1 cr. Offered: Periodically Prerequisites: IS 100, IS 102 and IS 202.</p> <p>Students will develop advanced skills in applying spreadsheet software tools to work-related problems. Emphasis is on working with macros, custom charts, data tables and pivot tables.</p>
<p>IS 111 Computerized Personal Accounting 1 cr. Offered: Contact department for information. Prerequisite: IS 100</p> <p>This course will provide students with an ability to use a computerized software program to manage their personal finances.</p>	<p>IS 204 Advanced Database 1 cr. Offered: Winter Prerequisites: IS 100 and IS 104.</p> <ul style="list-style-type: none"> • Satisfies 1 credit hour of the formal communication studies requirement. <p>Students will expand their skills in the use of database software. Emphasis is on creating databases and creating and modifying reports.</p>
<p>IS 112 Computerized Small Business Accounting 1 cr. Offered: Winter Prerequisite: IS 100</p> <ul style="list-style-type: none"> • Satisfies 1 credit hour of the formal communication studies requirement. <p>This course will provide students with basic "business literacy" by having them operate a business using a popular small business accounting software program. Students develop confidence in recording business transactions using an up-to-date commercial software program designed for small to mid-size businesses.</p>	<p>IS 206 Software Integration 1 cr. Offered: Every other Winter, even years. Prerequisites: IS 100, IS 101, IS 102, IS 104 and IS 105.</p> <ul style="list-style-type: none"> • Satisfies 1 credit hour of the formal communication studies requirement. <p>Students will develop skills in integrating word processing, spreadsheet, database and presentation graphics documents. Emphasis will be on merging word processing and database files, linking and embedding work sheets and charts in word processing documents, and integrating word processing, spreadsheet and database documents with presentation graphics documents.</p>
<p>IS 120 Computer Concepts 2 cr. Offered: Fall, Winter Prerequisite: IS 100</p> <ul style="list-style-type: none"> • Satisfies 2 credit hours of the formal communication studies requirement. <p>Students will develop an understanding of basic computer concepts. Computer technology, hardware and software, security and technology in organizations will be covered. No hands-on computer applications are included.</p>	<p>IS 207 Intermediate Desktop Publishing 1 cr. Offered: Fall, Winter Prerequisites: IS 100 and IS 107.</p> <ul style="list-style-type: none"> • Satisfies 1 credit hour of the formal communication studies requirement. <p>This course will provide students with more advanced application in desktop publishing, including design concepts, working with multiple pages and advanced graphics. The emphasis will be on the elements of design through hands-on applications.</p>
<p>IS 201 Advanced Word Processing 1 cr. Offered: Periodically Prerequisites: IS 100 and IS 101.</p> <p>Students will develop advanced skills in the operation of word processing software. Emphasis is on working with large documents, arranging text and text objects, and creating and modifying charts and forms.</p>	<p>IS 208 Web Page Development 1 cr. Offered: Winter Prerequisite: IS 100</p> <ul style="list-style-type: none"> • Satisfies 1 credit hour of the formal communication studies requirement. <p>This course focuses on Web design concepts and building Web pages with an editing tool.</p>
<p>IS 202 Intermediate Spreadsheets 1 cr. Offered: Every other Fall, even years. Prerequisites: IS 100 and IS 102.</p> <ul style="list-style-type: none"> • Satisfies 1 credit hour of the formal communication studies requirement. <p>Students will expand their skills in the operation of spreadsheet software. Emphasis is on manipulating large spreadsheets, applying advanced formulas and functions to solve problems, and sorting and querying lists of data.</p>	<p>IS 295 Special Topics in Information Systems 1 cr. Offered: Contact department for information. Prerequisite: IS 100</p> <ul style="list-style-type: none"> • Satisfies 1 credit hour of the formal communication studies requirement. <p>A detailed study of one or more special topics in information systems. <i>Note: If topic differs, may be repeated for credit with instructor's permission.</i></p>

IT-INDUSTRIAL TECHNOLOGY

Engineering Technology Department

<p>IT 145 Power Transmission Methods 2 cr. Offered: On demand.</p> <p>A study of principles, concepts and applications of various mechanisms encountered in industrial applications of engineering technology. Such mechanisms include belt drives, chain drives, linkages, actuators, valves, fans and blowers.</p>	<p>IT 260 Fluid Power Controls 2 cr. (1-0-2) Offered: On demand. Prerequisites: IT 180 and ET 252.</p> <p>Introduction of electronically controlled fluid power systems, including a study of proportional control components, service valves, circuits, closed loop and open loop systems.</p>
<p>IT 150 Industrial Practices I 2 cr. Offered: Fall</p> <p>This seminar-oriented course addresses topics including employee orientation, organizational structure and other topics appropriate for manufacturing employees.</p>	<p>IT 261 Robotics/Automation Systems 4 cr. (2-1-2) Offered: Winter Prerequisites: IT 180, ET 110, or ET 100 and ET 101.</p> <p>This course uses the principles of control systems and how they are applied to achieve automation. The interfacing of controllers, sensors and actuators will be accomplished using a computer integrated manufacturing cell and industrial robots.</p>
<p>IT 151 Industrial Practices II 2 cr. Offered: Winter Prerequisite: IT 150</p> <p>This seminar-oriented course addresses topics including orientation, organizational structure, corporate culture, industrial safety issues and other topics appropriate for a manufacturing employee.</p>	<p>IT 265 Total Productive Maintenance 1 cr. Offered: Fall Prerequisite: Sophomore standing.</p> <p>A study of the concept and principles that underlie industrial maintenance and the partnership that exists between maintenance and production personnel. The goal of this course is to improve equipment maintenance. An exposure to the types of condition monitoring equipment and software used to determine equipment reliability are included in this course.</p>
<p>IT 180 Introduction to Fluid Power 3 cr. (2-0-2) Offered: Fall, Winter Prerequisites: MA 104 or above.</p> <p>An overview of fluid power technology and a working introduction to each of the components used in fluid power circuits. Hydraulic and pneumatic fundamentals of fluid dynamics, conventional fluid circuits and fluid power components.</p>	<p>IT 295 Special Topics in Industry and Technology 1-4 cr. Offered: On demand. Prerequisite: Adviser permission.</p> <p>Specialized work not covered by other courses.</p>
<p>IT 210 Non-Destructive Testing 3 cr. (2-0-2) Offered: On demand.</p> <p>Review of conventional non-destructive testing and evaluation of materials. The aim is to detect and characterize flaws and microstructural changes in materials using laboratory equipment and reporting the findings.</p>	<p>IT 298 Directed Study and Research 1-4 cr. Offered: On demand. Prerequisite: Department permission.</p> <p>Selection of problem in area of emphasis, specialized instruction and experiences to reinforce technical skill and knowledge. Written reports of work are required.</p>
<p>IT 214 Industrial Observation 1 cr. Offered: Fall, Winter</p> <p>An introduction to the methods and equipment used in manufacturing. The main focus of this course is to take field trips to a variety of manufacturing and fabrication plants to observe and study their processes.</p>	<p>IT 300 Industrial Supervision 3 cr. Offered: Fall Prerequisites: EN 111 and upper division standing.</p> <p>Designed to provide the potential first-line supervisor with the knowledge and skills necessary to function effectively in the role of directing and facilitating the work of subordinates.</p>
<p>IT 215 General Industrial Safety 2 cr. Offered: Winter</p> <p>The application of the Occupational Safety and Health Administration regulations to industrial and manufacturing work places and effects on the individual and collective work force.</p>	<p>IT 340 Enterprise Resource Planning 3 cr. Offered: Winter Prerequisite: IT 300</p> <p>The concepts and techniques utilized by manufacturing practitioners to accomplish manufacturing control functions. These functions include forecasting, production planning, production scheduling, production control, inventory management, inventory control and manufacturing cost estimating.</p>
<p>IT 220 Statistical Process Control 1 cr. Offered: On demand.</p> <p>The introduction of a set of procedures using statistical techniques for the control of a manufacturing process.</p>	

IT 380 Facility Planning 3 cr. (2-0-2)

Offered: Fall

Prerequisites: DD 100 or instructor's permission.

Planning of facilities, including office, work and service areas. Planning for materials handling equipment and preparing plant layout sketches and drawings. Detailing of conveyor component installation along with mechanical support systems.

IT 400 Industrial Safety and Ergonomics 2 cr.

Offered: Winter

Prerequisites: Junior standing or instructor's permission.

The technology and management of industrial occupational activities with specific reference to the causes, investigation, analysis and prevention of accidents. The dynamics of an ever changing work place and the effects on the human and his/her place in the work environment will be integrated into the discussion of laws and legislation effecting safety.

IT 420 Quality Control 3 cr.

Offered: Fall

Prerequisites: MA 171, junior standing or instructor's permission.

The application of product and process improvement techniques, including statistical process control methods to accomplish total quality control.

IT 483 Studies in Business and Industry 4 cr.

Offered: On demand.

Prerequisite: Junior standing and instructor's permission.

Cross listed as TE 483.

Cooperative work experience to provide up-to-date technical skills in the area of specialization; includes work experience with business and industrial operations, services and materials, processes and techniques.

IT 495 Special Topics in Industry and Technology 1-4 cr.

Offered: On demand.

Prerequisites: Junior standing and adviser permission.

Specialized work not covered by other courses.

IT 498 Directed Study and Research 1-4 cr.

Offered: On demand.

Prerequisites: Junior standing and department permission.

Selection of problem in area of emphasis, specialized instruction and experiences to reinforce technical skill and knowledge. Written reports of work are required.

JP - JAPANESE

Modern Languages and Literatures Department

JP 101 Elementary Japanese I 4 cr.

An introduction to the Japanese language and culture.

JP 102 Elementary Japanese II 4 cr.

Prerequisite: JP 101 or equivalent.

A continuation of Japanese language and culture.

LB - LIBERAL STUDIES PROGRAM

Liberal Studies Program

LB 121 Origins of Western Values: Greeks and the Bible 4 cr.

Offered: Fall

- Satisfies the foundations of humanities requirement.

Study of some of the significant intellectual, spiritual and cultural roots of Western values as they originated and developed among the Greeks and the Biblical peoples.

LB 295A Special Topics in Liberal Studies: Visual and Performing Arts 2-4 cr.

Offered: On demand.

- Satisfies the foundations of visual and performing arts requirement (minimum 3 credit hours needed to satisfy this requirement).

Study of a particular topic in the visual and performing arts. The exact title will be indicated in the *Schedule of Classes* booklet.

Note: May be repeated for credit if topic varies.

LB 295F Special Topics in Liberal Studies: Formal Communication Studies 2-4 cr.

Offered: On demand.

- Satisfies the formal communication studies requirement (minimum 3 credit hours needed to satisfy this requirement).

Study of a particular topic in Formal Studies. The exact title will be indicated in the *Schedule of Classes* booklet.

Note: May be repeated for credit if topic varies.

LB 295H Special Topics in Liberal Studies: Humanities 4 cr.

Offered: On demand.

- Satisfies the foundations of humanities requirement.

Study of a particular topic in the area of the humanities. The exact title will be indicated in the *Schedule of Classes* booklet.

Note: May be repeated for credit if topic varies.

LB 295N Special Topics in Liberal Studies: Natural Sciences 4 cr.

Offered: On demand.

- Satisfies the foundations of natural sciences/mathematics requirement.

Study of a particular topic in the area of natural science. The exact title will be indicated in the *Schedule of Classes* booklet. If a laboratory is included, it may be used to meet the laboratory requirement.

Note: May be repeated for credit if topic varies.

LB 295S Special Topics in Liberal Studies: Social Sciences 4 cr.

Offered: On demand.

- Satisfies the foundations of social sciences requirement.

Study of a particular topic in the area of the Social Sciences. The exact title will be indicated in the *Schedule of Classes* booklet.

Note: May be repeated for credit if topic varies.

LG - LANGUAGES

Modern Languages and Literatures Department

LG 295 Special Topics in Languages 1-4 cr.
Offered: On demand.
Prerequisite: Instructor's permission.

Study of languages not regularly offered or of special topics in a particular language.

LG 317 World Studies through Literature in Translation 4 cr.
Offered: Winter, Summer
Prerequisites: Completion of the foundations of communication requirement and sophomore standing.

- Satisfies the foundations of humanities requirement.
- Satisfies the upper division liberal studies requirement.
- Satisfies the world cultures requirement when offered as LG 311Z.

An examination of the art, culture, language, history and humanity of different areas of the world through their literature. At least two-thirds of the texts are translations into English of works originally written in other languages. Students may take this course more than once as the content varies.

Note: May be repeated if topic differs.

LG 350 Methods and Materials in Teaching Language Education 4 cr.
Offered: Fall
Prerequisites: Admission to methods phase of teacher education.

This course introduces students to the theory and practice of teaching languages in public schools.

Note: May not be applied toward a non-teaching major or minor in modern languages. May be applied to a secondary education minor in French, German or Spanish if required.

LG 399 Graduation Assessment for Language Minors 0 cr.
Offered: Fall, Winter
Graded S/U
Prerequisite: Concurrent application for graduation.

Graduating students meet with faculty in November (for fall graduates) or March (for winter or summer graduates) to show their skills in the language of their minor. This will include reading, writing, conversation and culture-related skills. An "S" grade will be granted for participating in the assessment. This is required to graduate with a minor in a language.

LG 495 Special Topics in Languages 1-4 cr.
Offered: On demand.
Prerequisites: Junior standing and instructor's permission.

Study of languages not regularly offered or of special topics in a particular language.

LG 499 Graduation Assessment for Language Majors 0 cr.
Offered: Fall, Winter
Graded S/U
Prerequisite: Concurrent application for graduation.

Graduating students meet with faculty in November (for fall graduates) or March (for winter or summer graduates) to show their skills in the language of their major. This will include reading, writing, conversation and culture-related skills. An "S" grade will be granted for participating in the assessment. This is required to graduate with a major in a language.

LSP-LABOR STUDIES PROGRAM

Advised by the History Department

LSP 101 Introduction to Labor Studies 4 cr.

This course provides an overview of topics including the origin and development of contemporary labor organizations; social inequality, labor and employment law; the structure and function of unions, collective bargaining, contract administration, grievance procedures, and arbitration; and leadership development, the future of work in American society and the global economy.

LSP 101A Introduction to Labor Studies 2 cr.

The first half of LSP 101. Topics include the origins and development of unions, labor law, social inequality, the structure and function of unions and leadership development.

LSP 101B Introduction to Labor Studies 2 cr.

The second half of LSP 101. Topics include collective bargaining, contract administration, the arbitration process, the impact of labor organizations on the economy and society, the future of work in American society and the global economy.

LSP 295 Special Topics in Labor Studies 1-4 cr.

Investigation of a significant topic or problem in the field of labor studies. Content varies depending upon the intentions of the instructor and the needs of the students.

LSP 490 Seminar in Labor Leadership 4 cr.
Prerequisites: Junior standing or instructor's permission.

This course provides labor leaders, aspiring leaders or persons who wish to understand leadership in unions a solid understanding of organizations and how they function, how labor unions are similar to but different from other types of organizations. The course explores the various roles that leaders are required to fulfill in labor organizations if these organizations are to be effective in representing their membership and successful in the competitive political and economic environment of American society.

LSP 495 Special Topics in Labor Studies 1-4 cr. (Arr.)

Prerequisites: Junior standing or instructor's permission.

Investigation of a significant topic or problem in the field of labor studies. Content varies depending upon the intentions of the instructor and the needs of the students.

MA - MATHEMATICS

Mathematics and Computer Science Department

All students must pass prerequisite courses with a grade of "C-" or higher unless otherwise indicated. Education students must pass required courses with a grade of "C" or higher.

MA 090 Beginning Algebra 4 cr.

Offered: Fall, Winter

Prerequisites: OC 080 (B- or better) or satisfactory score on the math placement exam.

Remedial or developmental course. Does not meet requirements for associate or bachelor's degrees, but may meet requirements for vocational diplomas and certificates. Course is not calculated in the NMU grade point average and is not counted as earned credit hours toward an associate or bachelor's degree.

The course is designed for students who did not have a year of high school algebra or for those who did poorly in high school algebra. The fundamental operations of algebra are covered with a problem solving emphasis. The course includes graphing, linear equations, exponents and introductory probability and statistics.

MA 100 Intermediate Algebra 4 cr.

Offered: Fall, Winter, Summer

Prerequisites: MA 090 or satisfactory score on math placement exam. A graphing calculator or equivalent computer software is required.

The study of polynomials, graphing, algebraic fractions, radicals, lines and linear equations and inequalities, quadratic and exponential equations and systems of equations. Applications are emphasized.

MA 103 Finite Mathematics 4 cr.

Offered: Fall, Winter, Summer

Prerequisites: MA 100 or satisfactory score on math placement exam. A graphing calculator or equivalent computer software is required.

- Satisfies the foundations of natural sciences/mathematics requirement.

Linear equations, systems of linear equations, inequalities, linear programming, functions, the mathematics of finance, matrices, permutations, combinations and probability.

MA 104 College Algebra with Applications in the Sciences and Technologies 4 cr.

Offered: Fall, Winter

Prerequisites: MA 100 or satisfactory score on the math placement exam. A graphing calculator or equivalent computer software is required.

- Satisfies the foundations of natural sciences/mathematics requirement.

Continued development of students' abilities to manipulate algebraic statements and solve problems. A study of functions, graphing, equation solving techniques, exponents and logarithms, and systems of equations. Emphasis is on the application of algebra to the applied sciences.

MA 105 College Algebra for Calculus Preparation 4 cr.

Offered: Fall, Winter

Prerequisites: MA 100 (B- or better) or satisfactory score on math placement exam. A graphing calculator or equivalent computer software is required.

- Satisfies the foundations of natural sciences/mathematics requirement.

Continued development of students' abilities to manipulate algebraic statements and solve problems. A study of functions, graphing, equation solving techniques, exponents and logarithms, and systems of equations. Topics, applications and pace are tailored for those students intending to take calculus.

MA 106 Trigonometry 3 cr.

Offered: Fall, Winter

Prerequisites: MA 103, or MA 104, or MA 105 or satisfactory score on math placement exam. Credit cannot be earned for both MA 106 and MA 115, except by written permission from the department. Students planning to take MA 161 should enroll in MA 115 instead of this course. A graphing calculator or equivalent computer software is used in this course.

- Satisfies the foundations of natural sciences/mathematics requirement.

Right triangle trigonometry, laws of sines and cosines, circular functions, graphs of trigonometric functions, trigonometric identities and equations, inverse trigonometric functions, selected topics. The emphasis will be on applications in the applied sciences.

MA 115 Precalculus 4 cr.

Offered: Fall, Winter

Prerequisites: MA 104 (B- or better), or MA 105, or satisfactory score on the math placement exam. A graphing calculator or equivalent computer software is used in this course.

- Satisfies the foundations of natural sciences/mathematics requirement.

This course is intended for students who plan to study calculus. Topics include trigonometry (right triangle trigonometry, laws of sines and cosines, circular functions, graphs of trig functions, inverse trig functions, trigonometric identities and equations, polar coordinates, complex numbers); analytic geometry (algebraic and transcendental functions and their graphs, the conics and their equations, the analysis of graphs, vectors, parametric equations, three-dimensional analytic geometry); and topics in algebra (sequences, series, limits, permutations and combinations, mathematical induction).

Note: Credit cannot be earned for both MA 106 and MA 115, except by written permission from the department.

<p>MA 150 Mathematics for the Elementary School Teacher I 4 cr. Offered: Fall, Winter Prerequisites: MA 100 or equivalent.</p> <p>Elements of set theory, numeration, analysis of whole numbers, integers, rational numbers and real numbers.</p>	<p>MA 250 Algebraic Structures for the Elementary School Teacher 4 cr. Offered: Fall Prerequisite: MA 151</p> <p>Logic, relations, operations and algebraic structures and their role in elementary school mathematics.</p>
<p>MA 151 Mathematics for the Elementary School Teacher II 4 cr. Offered: Fall, Winter Prerequisite: MA 150</p> <p>Probability and statistics, informal geometry and measurement.</p>	<p>MA 251 Probability and Statistics for the Elementary School Teacher 4 cr. Offered: Winter Prerequisite: MA 151</p> <p>The concept of function, probability and statistical reasoning and their roles in elementary school mathematics.</p>
<p>MA 161 Calculus I 5 cr. Offered: Fall, Winter Prerequisites: MA 115 or satisfactory score on math placement exam. A graphing calculator or equivalent computer software is used in this course.</p> <ul style="list-style-type: none"> • Satisfies the foundations of natural sciences/mathematics requirement. <p>Meaning and use of the derivative; differentiation formulas, including transcendental functions; applications of the derivative; Fundamental Theorem of Calculus; meaning and use of the definite integral.</p>	<p>MA 265 Calculus III 3 cr. Offered: Fall, Winter Prerequisite: MA 163 and MA 211.</p> <p>Limits, continuity of a function of several real variables, partial differentiation, multiple integrals, vector analysis.</p>
<p>MA 163 Calculus II 4 cr. Offered: Fall, Winter Prerequisites: MA 161. A graphing calculator or equivalent computer software is used in this course.</p> <p>Methods of integration; numerical integration; improper integrals; applications of integration; sequences and series; Taylor polynomials.</p>	<p>MA 271 Calculus with Applications 4 cr. Offered: Winter Prerequisite: MA 103 or MA 104 or MA 105 or instructor's permission. A laptop computer is required.</p> <p>Designed for students of electronics, industrial technologies, biology, psychology, social sciences and business. Real numbers, functions, limits, differentiation, integration and partial derivatives. Emphasis is placed on applications of derivatives and integration.</p>
<p>MA 171 Introduction to Probability and Statistics 4 cr. Offered: Fall, Winter, Summer. Prerequisites: MA 103, or MA 104, or MA 105 or equivalent. A laptop computer is required.</p> <ul style="list-style-type: none"> • Satisfies the formal communication studies requirement. <p>Descriptive statistics; discrete and continuous probability distributions; Central Limit Theorem; hypothesis testing; confidence intervals; regression and correlation; ANOVA; categorical data.</p>	<p>MA 275 Sample Survey Methods 4 cr. Offered: On demand. Prerequisite: MA 171 or instructor's permission.</p> <p>A study of the most efficient sampling procedures for various situations and the associated problems of estimation, costs and sample size. Emphasis is placed on application, with time spent on construction of questionnaires, gathering data through interviews and mailings and coding for input into the computer. The computer packages SPSS and SAS are introduced and used to summarize and analyze data gathered by the class.</p>
<p>MA 211 Introduction to Matrix Theory and Linear Algebra 3 cr. Offered: Fall, Winter Prerequisites: MA 161 or instructor's permission.</p> <p>Matrices, matrix operations, systems of linear equations, determinants, vector spaces, linear transformations and characteristic roots and vectors.</p>	<p>MA 295 Special Topics in Mathematics 1-4 cr. Offered: On demand. Prerequisites: Designed for freshmen and sophomores.</p> <p>Study of topics reflecting the special interests of students and staff. <i>Note: May be repeated, with instructor's permission, if topic differs.</i></p>
<p>MA 240 Discrete Mathematics 3 cr. Offered: Fall, Winter Prerequisites: CS 120 and MA 103 or equivalent.</p> <p>This course covers the mathematical foundations of computer science. The goal is to make students comfortable with formal systems, data structures, abstract models and analysis of problems and algorithms, so that they can apply these intellectual tools in later CS courses. Topics covered can include propositional and predicate logic, sets, binary numbers, proof techniques, graph theory, permutations, combinations, models of computation, automata theory, regular expressions and the use of logic for circuit design.</p>	<p>MA 297 Directed Studies in Mathematics 1-4 cr. Offered: On demand. Graded S/U Prerequisite: Department head permission.</p> <p>Individual investigations of a special topic.</p>

<p>MA 298 Directed Studies in Mathematics 1-4 cr. Offered: On demand. Same as MA 297 except that letter grades are given.</p>	<p>MA 353 Methods and Materials in Teaching Elementary School Mathematics Education 3 cr. Offered: Fall, Winter Prerequisites: Admission to the methods phase of teacher education, MA 150 and MA 151. A course designed to acquaint prospective elementary teachers with contemporary methods and materials employed in the teaching of mathematics in the elementary school. Field experiences are required. <i>Note: May not be applied toward a non-teaching major or minor in mathematics.</i></p>
<p>MA 310 Mathematical Models and Problem Solving 4 cr. Offered: Fall Prerequisites: MA 211 and CS 120. Exploration of the application of mathematics in the physical and social sciences with an emphasis on problem solving.</p>	<p>MA 354 Methods and Materials in Teaching Junior High School Mathematics Education 2 cr. Offered: Winter Prerequisites: Admission to the methods phase of teacher education, junior standing and either MA 151 or ED 349 (may be taken concurrently). Examination of the current middle school curriculum and proposed curriculum revisions as well as effective methodology for this level. Field experiences are required. <i>Note: May not be applied toward a non-teaching major or minor in mathematics.</i></p>
<p>MA 312 Abstract Algebra with Applications 3 cr. Offered: Fall Prerequisites: MA 211 and MA 163 or instructor's permission. Topics chosen from the following: universal algebraic notions, graphs, trees, lattices, Boolean algebras, groups, rings, fields, and applications.</p>	<p>MA 361 Differential Equations 3 cr. Offered: Winter Prerequisite: MA 265 First-order equations, theory of second-order linear equations, higher-order linear equations and systems, series solutions, Laplace transform and applications and stability.</p>
<p>MA 331 Geometry I 3 cr. Offered: Winter Prerequisites: MA 211 or instructor's permission. Geometry from a modern axiomatic viewpoint. The orientation of this course is to prepare students to teach high school geometry.</p>	<p>MA 363 Advanced Calculus I 3 cr. Offered: On demand. Prerequisites: MA 211 and MA 265. Sets and functions, topological ideas, sequences. Continuity and uniform continuity. Properties of continuous functions and mean value theorems. Integration theory in one and two variables. Evaluation of double and improper integrals.</p>
<p>MA 340 Combinatorics 4 cr. Offered: Fall Prerequisites: CS 120 and MA 211. Combinatorics and applied abstract algebra, including enumeration, counting, sorting, searching and graph algorithms.</p>	<p>MA 366 General Topology 3 cr. Offered: On demand. Prerequisites: MA 211 and MA 265. Introduction to concepts such as topological space, connectedness, compactness and homeomorphism.</p>
<p>MA 350 Methods and Materials in Teaching Senior High School Mathematics Education 3 cr. Offered: Fall Prerequisites: Admission to the methods phase of teacher education, MA312 and MA331. ED349 should be taken concurrently or have been completed already. A course designed to acquaint prospective secondary teachers with contemporary methods and materials employed in the teaching of mathematics in the secondary school. Field experiences are required. <i>Note: May not be applied toward a non-teaching major or minor in mathematics. May be applied to the secondary education mathematics minor if required.</i></p>	<p>MA 371 Applied Probability and Statistics 3 cr. Offered: Every other Winter. Prerequisites: MA 211 and MA 265. A general introduction to the basics of statistics, introduction to discrete and continuous probability distributions and generating functions, and derivation of distributions of functions of random variables. Finally, sampling distributions and limit theorems.</p>
<p>MA 351 Models and Problem Solving for the Elementary School Teacher 4 cr. Offered: Winter Prerequisite: MA 250 or instructor's permission. An emphasis on problem solving from the following areas: historical mathematics, number theory, geometry, trigonometry and recreational mathematics. <i>Note: May not be applied toward a non-teaching major or minor in mathematics.</i></p>	

<p>MA 380 Linear Programming 3 cr. Offered: Every other Winter. Prerequisite: MA 211</p> <p>Introduction to the fundamental principles and techniques of linear programming with strong emphasis on mathematical modeling, analysis and application to non-trivial problems arising in various areas of the physical, social and decision sciences.</p>	<p>MA 465 Complex Variables 3 cr. Offered: On demand. Prerequisites: MA 211, MA 265, junior standing or instructor's permission.</p> <p>Complex numbers, analytic functions, conformal mapping, residues and poles, analytic continuation and Riemann surfaces.</p>
<p>MA 381 Integer Programming and Network Flows 3 cr. Offered: On demand. Prerequisite: MA 380</p> <p>Introduction to the basic concepts, algorithms and methodology of network and integer programming with strong emphasis on mathematical modeling, analysis and application to non-trivial problems arising in various areas of the physical, social and decision sciences, and applied mathematics.</p>	<p>MA 472 Advanced Applied Statistics 3 cr. Offered: On demand. Prerequisites: MA 371, junior standing or instructor's permission.</p> <p>Multivariate normal and other multivariate distributions are introduced. The theory of estimation and hypothesis testing is discussed in detail. The theory of regression, correlation and other linear models are briefly touched upon.</p>
<p>MA 410 Mathematical Modeling 3 cr. Offered: On demand. Prerequisites: MA 312, MA 361, MA 371, MA 380, junior standing or instructor's permission.</p> <p>The focus of this course is the application of a wide variety of mathematical tools and techniques to construct and analyze several substantial classes of discrete, continuous, deterministic and stochastic models arising in many areas of science, engineering, operations research and other disciplines outside of mathematics. The nature of the complex linkages between formulation and solution of real-world problems as well as the major issues pertaining to the implementation phase of the modeling process will be discussed.</p>	<p>MA 473 Numerical Analysis 4 cr. Offered: Every other Fall. Prerequisites: MA 211 and either MA 265 or MA 361, junior standing or instructor's permission.</p> <p>Notions and definitions of numerical analysis and study of numerical methods applied to systems of linear algebraic equations, non-linear equations, polynomial equations, integration, ordinary and partial differential equations and integral equations.</p>
<p>MA 412 Abstract Algebra II 3 cr. Offered: On demand. Prerequisite: MA 312, junior standing or instructor's permission.</p> <p>Topics selected from the following: groups, subgroups, homomorphisms, the isomorphism theorems. Sylow theorems, rings, ideals, quotient rings, Euclidean rings, integral domains, factorization of ring elements, extension fields, splitting fields and Galois theory.</p>	<p>MA 475 Intermediate Statistics 4 cr. Offered: On demand. Prerequisites: MA 171, junior standing or instructor's permission.</p> <p>Application of statistics in research using the SPSS and SAS computer packages. Topics include multiple and curvilinear regression analysis, analysis of variance, discriminant analysis and factor analysis, and time series.</p>
<p>MA 462 Higher Mathematics for the Sciences 3 cr. Offered: On demand. Prerequisites: MA 211, MA 265, junior standing or instructor's permission.</p> <p>The difference calculus and differential equations, least squares, vector analysis, theorems of Green, Gauss and Stokes. Fourier series, partial differential equations, the method of separation of variables and applications and calculus of variations.</p>	<p>MA 478 Probability 3 cr. Offered: On demand. Prerequisites: MA 211, MA 265, junior standing or instructor's permission.</p> <p>Theory of probability, probability distributions, combinatorial analysis, generating functions and stochastic processes.</p>
<p>MA 464 Advanced Calculus II 3 cr. Offered: On demand. Prerequisites: MA 363, junior standing or instructor's permission.</p> <p>Infinite series and uniform convergence, power series, transformations, inverse function and implicit function theorems and calculus of several variables.</p>	<p>MA 481 Mathematical Logic 3 cr. Offered: Every third Winter. Prerequisites: Junior standing and instructor's permission.</p> <p>The propositional and predicate calculi, syntax and semantics, consistency and completeness and undecidability. Included are Goedel's theorems, recursive function theory, model theory and applications.</p>
	<p>MA 482 Foundations of Mathematics 3 cr. Offered: On demand. Prerequisites: Junior standing and instructor's permission.</p> <p>Informal axiomatic set theory, cardinal and ordinal arithmetic, transfinite induction and issues in the philosophy of mathematics.</p>

MA 483 Introduction to Number Theory 3 cr.
 Offered: On demand.
 Prerequisites: MA 312, junior standing or instructor's permission.
 Peano's axioms, Euclidean algorithm, congruence, quadratic reciprocity law, Gaussian integers, continued fractions, Diophantine equations and theory of equations.

MA 484 History of Mathematical Thought 3 cr.
 Offered: Fall
 Prerequisites: MA 312 or MA 331, junior standing or instructor's permission.
 An historical view of mathematics. Studies in discovery, rigorization and generalization through abstraction.

MA 485 Stochastic Models in Operations Research 3 cr.
 Offered: On demand.
 Prerequisites: MA 371, MA 381, junior standing or instructor's permission.
 Survey of stochastic models in operations research with emphasis on dynamic programming, Markovian decision processes, queuing, inventory control, production planning and simulation models.

MA 490 Senior Seminar 1 cr.
 Offered: On demand.
 Prerequisites: Senior standing or instructor's permission.
 A series of presentations by students, both research talks about individual and group projects and expository talks about contemporary issues in applied mathematics and about interesting papers selected from undergraduate mathematics journals.

MA 491 Internship in Applied Mathematics 3-6 cr.
 Offered: On demand.
 Graded S/U
 Prerequisites: Junior status in good standing with an overall grade point average of 2.75, a GPA in the major of 3.00 and departmental approval.
 Supervised practical experience in some area of applied mathematics in an industrial, business or governmental setting. Students are required to document their work experience and write a report which will be evaluated by their faculty supervisor in consultation with the employer.

MA 495 Special Topics in Mathematics 1-4 cr.
 Offered: On demand.
 Prerequisites: For upper division students and majors and minors or instructor's permission.
 Topics of special interest to students and staff.
Note: May be repeated, with instructor's permission, if topic differs.

MA 496 Special Topics in Mathematics 1-4 cr.
 Offered: On demand.
 Graded S/U
 Same as MA 495.

MA 497 Directed Studies in Mathematics 1-4 cr.
 Offered: On demand.
 Graded S/U
 Prerequisites: Junior standing. Available only with department head permission.
 Individual investigations of a special topic in mathematics.

MA 498 Directed Studies in Mathematics 1-4 cr.
 Offered: On demand.
 Same as MA 497 except that letter grades are given.

MET-MECHANICAL ENGINEERING TECHNOLOGY

Engineering Technology Department

MET 211 Mechanics-Statics 4 cr.
 Offered: Fall, Winter
 Prerequisites: MA 104 or MA 105.
 Introduction to mechanics—the study of forces that act upon rigid bodies—and to statics, which deals with the distribution and effects of forces on rigid bodies at rest.

MET 213 Materials Science I 3 cr. (2-0-2)
 Offered: Fall, Winter
 Prerequisite: EN 211D

An introduction to the nature, processing, application and testing of materials used in industry today. Students will perform laboratory tests on plastics, wood, concrete, steel and other metals in order to gain an understanding of the behavior and characteristics of materials under specific conditions. Students will also become acquainted with the elements of correct procedures in technical report writing and the use of reference materials.

MET 216 Material Science II 3 cr. (2-0-2)
 Offered: Fall
 Prerequisite: MA 104

Processes and equipment in metallurgy; comparison of the physical properties and structures of metals.

MET 310 Mechanics-Dynamics 3 cr.
 Offered: Fall
 Prerequisites: MA 104 or MA 105, MA 271 and MET 211.

An introductory study of linear and angular displacement, velocity and acceleration; absolute and relative motion; mechanisms, planar motion, work, energy, power and momentum.

MET 311 Strength of Materials 4 cr.
 Offered: Winter
 Prerequisite: MET 211

Analysis of the relationship between externally applied forces and internal reactions in materials of the loaded bodies.

MET 320 Mechanical Design 4 cr. (2-2-1)

Offered: Winter
Prerequisites: DD 202, MET 213, MET 310 and MET 311.

Applying engineering concepts to components such as gears, shafts, fasteners and structural members. In addition to theoretical analysis, this course incorporates solid modeling and finite element analysis software to model strain and motion behavior of complex systems.

MET 410 Applied Thermodynamics 4 cr.

Prerequisites: MA 271, CH 105, IT 310, junior standing or instructor's permission.

The study of energy, heat, work, the properties of the media employed and the processes involved as applied to solving problems in engineering.

MET 430 Senior Project 2 cr.

Prerequisites: Senior standing or instructor's permission.

A problem solving and applications course that focuses on the use of electronic systems including micro controllers, personal computers, PLC's or other electronic systems to control or otherwise interface between mechanisms and circuitry. The course will culminate in an oral senior project demonstration along with supporting written documentation.

MF - MANUFACTURING TECHNOLOGY

Engineering Technology Department

MF 133 Machinery Handbook 2 cr.

Offered: Winter

This course introduces students to the technical content found in the Machinery Handbook. Students will understand the organization of the handbook and gain experience in using this reference volume to solve typical machine shop problems.

MF 134 Manufacturing Process 4 cr. (2-0-4)

Offered: Fall

An introduction to the processes and materials of manufacturing with emphasis on the metal removal technology.

MF 233 Numerical Control 4 cr. (2-1-2)

Offered: On demand.

Numerical control and automation fundamentals; testing of materials and suitability of fabrication.

MF 235 Computer Numerical Control 3 cr.

Offered: Winter

Prerequisite: Instructor's permission.

An advanced computer numerical control class utilizing a Tsugami 5 axis turning center with live tooling.

MF 295 Special Topics in Manufacturing 1-4 cr.

Offered: On demand.
Prerequisite: Adviser permission.

Specialized work not covered by other courses.

MF 298 Directed Study and Research 1-4 cr.

Offered: On demand.
Prerequisite: Department permission.

Independent research of a special technical topic. Written reports of work are required.

MF 383 Computer-Aided Manufacturing 4 cr. (2-1-2)

Offered: Fall
Prerequisite: MF 233

The integration of numerical control (CNC) and computer graphics for increasing productivity.

MF 384 Flexible Manufacturing Cells 4 cr. (2-1-2)

Offered: On demand.
Prerequisites: MF 383 and IT 340 or instructor's permission.

The integration of computers, industrial robots, numerical control machines and material handling devices to create a manufacturing cell capable of independent production of a product.

MF 495 Special Topics in Manufacturing 1-4 cr.

Offered: On demand.
Prerequisites: Junior standing and adviser permission.

Specialized work not covered by other courses.

MF 498 Directed Study and Research 1-4 cr.

Offered: On demand.
Prerequisite: Junior standing and department permission.

Selection of problem in area of emphasis, specialized instruction and experiences to reinforce technical skill and knowledge. Written reports of work are required.

MGT - MANAGEMENT

College of Business

MGT 210 Time Management 1 cr.

Offered: Winter

The primary objective of this course is to provide a practical approach to the misuse of managerial time and to design a mechanism to improve management effectiveness.

MGT 215 Entrepreneurship 3 cr.

Offered: Winter

A study of people who create new businesses in the face of risk and uncertainty for the purposes of achieving profit and growth potential. This includes a study of identifying opportunities and the assembling of necessary resources to capitalize on these opportunities.

<p>MGT 221 Business Law I: Legal Environment of Business 3 cr. Offered: Fall, Winter</p> <p>Overview of the areas of law affecting business operations. Students are introduced to basic legal rights and social forces affecting business.</p>	<p>MGT 322 Business Law II 3 cr. Offered: Contact department for information. Prerequisite: MGT 221, junior standing.</p> <p>A continuation of MGT 221 with emphasis on topics of interest to management and marketing majors and to students preparing for the CPA examination. Topics include: commercial paper, creditors' rights, partnerships and corporations, agency and employment and estates.</p>
<p>MGT 225 Operations Management 3 cr. Offered: Fall, Winter Prerequisites: MA 103, MA 171 and CIS 110 or equivalent IS courses.</p> <p>Survey of problems that production-operations managers face and the quantitative tools that are helpful in solving these problems.</p>	<p>MGT 326 Deterministic Models in Business 3 cr. Offered: Winter Prerequisite: MGT 225, junior standing.</p> <p>Develops selective quantitative tools useful in operations management and managerial decision making. The focus of the course is deterministic quantitative analysis of business systems. The course covers both development and application of selected MS/OR tools such as linear programming, network analysis and dynamic programming.</p>
<p>MGT 228 Customer Service 2 cr. Offered: Fall</p> <p>This course will provide a clear, usable process for developing the kinds of skills, attitudes and thinking patterns necessary to deliver excellent customer service. Individual success is contingent on how effectively fundamental customer service skills are mastered and carried out. This course will emphasize self-assessment and mastery of those skills and abilities that are so important, but are often ignored or taken for granted.</p>	<p>MGT 327 Random Models in Business 3 cr. Offered: Fall Prerequisite: MGT 225, junior standing.</p> <p>Develops selected quantitative tools useful in operations management and managerial decision making. The focus of the course is probabilistic quantitative analysis of business systems. The course covers both development and application of selected MS/OR tools such as the decision theory, Markov chains, stochastic inventory problems, simulation, queuing theory, etc.</p>
<p>MGT 240 Organizational Behavior and Management 3 cr. Offered: Fall, Winter, Summer</p> <p>The study of managerial processes with emphasis upon human behavior in organizations. Concepts from the psychological, sociological, organizational and other relevant literature will be applied to decision making and its ethical implications in the international context of organizations.</p>	<p>MGT 343 Human Resource Management 3 cr. Offered: Fall, Winter Prerequisite: MGT 240, junior standing.</p> <p>Introduction to research and principles pertinent to the development of human resources through the use of case studies and resource persons in relevant management situations.</p>
<p>MGT 240R Organizational Behavior and Management-Recitation 1 cr. Offered: Fall, Winter</p> <p>Provides students the opportunity to further develop management-related knowledge and skills through a series of integrated assignments and additional topics in management. This course is designed to complement MGT 240. MGT 240R is not required for business majors; it is intended for those non-business majors who need/require a four credit course in introductory management.</p>	<p>MGT 344 Managerial Communication 3 cr. Offered: Fall, Winter Prerequisite: Junior standing.</p> <p>Principles of effective written and oral communication. Communication theory as related to business letters, reports and oral presentations. Emphasis on psychology underlying these means of communication.</p>
<p>MGT 285 International Business Seminar 3-4 cr. Offered: Contact department for information.</p> <p>This seminar is designed to enrich the students' understanding of factors which influence business activity within world markets. It combines a set of classroom/seminar sessions with an international trip, focused on studying domestic and international firms as they compete abroad. While the geographic focus of the trip will vary from year to year, a common set of theoretical constructs will serve to guide learning in this seminar. The end goal will be to allow students to better understand the development of business strategy in the global marketplace and the key role information technology plays in the development and implementation of strategy.</p>	<p>MGT 355 Methods of Training 4 cr. Offered: Winter Prerequisite: Junior standing.</p> <p>This course provides an application of theories of learning and instructional development to the education and training of employees in office systems. Emphasis is on instructional design and the implementation, evaluation and management of training in a organizational environment.</p>
<p>MGT 295 Special Topics in Management 1-4 cr. Offered: Contact department for information.</p> <p>Topic dependent on individual instructor and student needs.</p> <p><i>Note: May be repeated if topic differs.</i></p>	

<p>MGT 360 Controversial Issues in Marketing and Management 3 cr. Offered: Periodically Prerequisites: MKT 230, MGT 240, minimum of junior standing or instructor's permission. Cross listed with MKT 360.</p> <p>Businesses and non-profit organizations are confronted with a contemporary variety of controversial issues, which make both strategic and day-to-day decision-making difficult for managers. The course will examine some of the most contemporary critical issues facing businesses and non-profit organizations today (e.g., environmental issues, use of child and forced labor in foreign countries, data ownership and privacy issues, etc.) focusing on recent developments and a review of some of the "best practices" by organizations who have taken a leadership role.</p>	<p>MGT 421 Labor Law 3 cr. Offered: Contact department for information. Prerequisites: MGT 240, junior standing or instructor's permission.</p> <p>Study of the major pieces of legislation relating to labor and to labor-management relations. Intensive case study.</p>
<p>MGT 412 Compensation Administration 3 cr. Offered: Periodically Prerequisites: MGT 343, junior standing or instructor's permission.</p> <p>Study of the administration of the wage and salary function of an organization, including the determinants of wages, job evaluation, compensation plans, employee evaluation and the administration of fringe benefits.</p>	<p>MGT 422 Business and Government Policy 3 cr. Offered: Fall Prerequisites: Junior standing or instructor's permission.</p> <p>Examination of the policy relationships between government and business in the United States. Operationally the course considers the influence of government policies on the firm and the consumer.</p>
<p>MGT 414 Small Enterprise Management 3 cr. Offered: Fall Prerequisites: MGT 240, junior standing or instructor's permission.</p> <p>Survey of information and assistance helpful in the initiation, operation and growth of a small business enterprise. Each student develops a complete prospectus for starting and operating a small business.</p>	<p>MGT 423 Seminar in Organizational Theory 3 cr. Offered: Periodically Prerequisites: MGT 240, junior standing or instructor's permission.</p> <p>A course in which students examine areas of organizational theory and behavior of particular interest to them and share their discoveries and insights. Emphasis is placed upon critical study of selected theoretical views and their practical implications for decision makers in organizations.</p>
<p>MGT 415 Small Business Consulting 3 cr. Offered: Winter Prerequisites: Completion of business core, junior standing or instructor's permission; minimum overall GPA of 2.70 or GPA of 3.00 for previous semester (at least 12 credits).</p> <p>Application of students' skills, developed in their academic programs, to real problems faced by independent businesses in this area. Teams are formed to provide a blend of academic disciplines and to be responsive to the situation and problems of the client.</p>	<p>MGT 424 Collective Bargaining 3 cr. Offered: Periodically Prerequisites: MGT 240, junior standing or instructor's permission.</p> <p>Review of major legislation and judicial decisions affecting labor.</p>
<p>MGT 417 Organizational Theory 3 cr. Offered: Winter Prerequisites: MGT 240, junior standing or instructor's permission.</p> <p>An integrated view of the theories relevant to organizations and human behavior in organizations. The active role of managers adapting organizations to environments is studied utilizing knowledge of such areas as perception, motivation, leadership, conflict resolution, interpersonal and group dynamics and organizational design.</p>	<p>MGT 425 Business Research 3 cr. Offered: Fall, Winter Prerequisites: 4 credit hours in IS courses, MA 171, junior standing or instructor's permission.</p> <p>Development of an appreciation for the role of research in problem solving and decision making. Topics covered include science and the scientific method, techniques of defining problems, the role of objectives and hypotheses in research, research design, measurement, data collection (secondary and primary), surveys, interviews, observation, simulation, types of sampling, sample size, hypothesis testing, and the role of statistics in research.</p>
<p>MGT 419 Seminar in Human Resource Management 3 cr. Offered: Periodically Prerequisites: MGT 343, junior standing or instructor's permission.</p> <p>Discussion of industrial and manpower management and research in advanced problems. Individual research by students.</p>	<p>MGT 426 Advanced Business Research 3 cr. Offered: Contact department for information. Prerequisites: MGT 425, junior standing or instructor's permission.</p> <p>Further refinement of an understanding of business research. A business presents a general area of concern from which the student defines an actual management problem, develops objectives and hypotheses, specifies a research design, performs the analysis and writes up the final research report.</p>

<p>MGT 436 Strategic Management 3 cr. Offered: Fall, Winter Prerequisites: MKT 230, MGT 240, FIN 351, junior standing or instructor's permission.</p> <p>Integrated analysis of a cross-section of decision-making situations faced by top managers. Realistic cases and decision-making simulation games assist students in moving from academic theory to specific applications of management strategy.</p>	<p>MKT 230R Introduction to Marketing-Recitation 1 cr. Offered: Fall, Winter</p> <p>Introduction to Marketing/Recitation section will provide the student with opportunities to further develop marketing-related knowledge and skills through a series of integrated assignments and exposure to additional topics in Marketing. The course is designed to complement MKT 230 Introduction to Marketing and will therefore cover a wide-variety of marketing-related topics with specific emphasis on the strategic implications of marketing decision-making. MKT 230R is not required for business majors and is intended for those non-business majors who need/require a four credit introductory marketing course.</p>
<p>MGT 475 International Business 3 cr. Offered: Periodically Prerequisites: Admission to the College of Business, junior standing or instructor's permission.</p> <p>Introduction to the difficulties and opportunities inherent in international business. This course does not provide a step-by-step procedural guide to conducting business overseas, but rather focuses on students acquiring an awareness and appreciation of the cultural variables that abound in the global arena. Special emphasis is placed on the administrative and marketing concepts unique to foreign trade.</p>	<p>MKT 310 Marketing for Entrepreneurship 3 cr. Offered: Every other Fall. Prerequisite: Junior standing.</p> <p>Marketing for Entrepreneurship is a course which applies the basic tools of marketing to entrepreneurial settings. The focus of this course includes the principles and applications of marketing plans and strategies for entrepreneurs, the generation and evaluation of product/market concepts, and the development, testing and commercialization of new products and businesses.</p>
<p>MGT 491 Internship in Management 1-4 cr. Offered: Fall, Winter, Summer Graded S/U Prerequisites: Junior standing and College of Business permission.</p> <p>Professional experience for qualified management students. Working relationships will be established with organizations. Students are required to write a paper and will be evaluated by their faculty supervisor in consultation with the employer. Will count as an elective in the management or marketing program. Repeatable up to a total of four credits.</p>	<p>MKT 331 Retail Administration 3 cr. Offered: Fall Prerequisite: MKT 230, junior standing.</p> <p>Study of retailing and its role in the distribution of goods and services from the total systems approach. Emphasis on overall planning, control and coordination of retail institutions.</p>
<p>MGT 495 Special Topics in Management 1-4 cr. Offered: Contact department for information. Prerequisites: Junior standing or instructor's permission.</p> <p>Variable topics of current interest. <i>Note: May be repeated if topic differs.</i></p>	<p>MKT 335 Consumer Behavior Analysis 3 cr. Offered: Fall Prerequisite: MKT 230, junior standing.</p> <p>Study of important psychological, sociological and cultural determinants of buying. Students are expected to make applications of concepts, theories and principles to specific marketing problems.</p>
<p>MGT 498 Directed Study in Management 1-4 cr. Offered: Contact department for information. Prerequisites: Limited to students with a superior grade point average, junior standing and College of Business permission.</p> <p>Individual research in management. Work is supervised through conferences with an adviser. A written final report must be filed with the college.</p>	<p>MKT 337 Marketing Channels 3 cr. Offered: Contact department for information. Prerequisite: MKT 230, junior standing.</p> <p>Survey of channels of distribution as a functional part of the marketing system. Emphasis is placed on the economic and social relationships that determine channel efficiency.</p>

MKT - MARKETING

College of Business

<p>MKT 230 Introduction to Marketing 3 cr. Offered: Fall, Winter, Summer</p> <p>Study of the basic marketing functions from a managerial aspect. Emphasis is placed on the development of a marketing mix to enhance the operational performance of all organizations which undertake marketing activities.</p>
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MKT 360 Controversial Issues in Marketing and Management 3 cr.

Offered: Periodically

Prerequisites: MKT 230, MGT 240, minimum of junior standing or instructor's permission.

Cross listed with MGT 360.

Businesses and non-profit organizations are confronted with a contemporary variety of controversial issues, which make both strategic and day-to-day decision-making difficult for managers. The course will examine some of the most contemporary critical issues facing businesses and non-profit organizations today (e.g., environmental issues, use of child and forced labor in foreign countries, data ownership and privacy issues, etc.) focusing on recent developments and a review of some of the "best practices" by organizations who have taken a leadership role.

MKT 410 Sales Management 3 cr.

Offered: Fall

Prerequisites: MKT 230, junior standing or instructor's permission.

Examination of management of a sales force and the role and character of creative personal selling. The course emphasizes actual selling conditions including role playing and analysis of case settings.

MKT 411 Personal Selling 3 cr.

Offered: Winter

Prerequisites: MKT 230, junior standing or instructor's permission.

Review of the role of a sales representative and the value of that role to customers as well as employers. The selling process is explored in an in-depth analysis, and students learn specific selling techniques.

MKT 430 Services Marketing 3 cr.

Offered: Winter

Prerequisites: Junior standing or instructor's permission.

The overall approach or theme to Services Marketing is that service organizations (i.e. banks, hotels, hospitals, transportation companies, professional service providers, etc..) require a distinctive approach to developing marketing strategy and delivering service products. This course is especially designed for those students who may be interested in working in service industries (both domestically as well as internationally) and also in industries where services are becoming an important component of a firm's product (and marketing) mix. Through this course, students will develop theoretical, conceptual, research and practical skills which can be used in a wide variety of careers.

MKT 432 Advertising and Sales Promotion 3 cr.

Offered: Winter

Prerequisites: MKT 230, junior standing or instructor's permission.

Survey of non-personal efforts by firms to stimulate demand. A survey of advertising and sales promotion. Real cases are analyzed to understand major tasks and decisions involved in promoting products.

MKT 435 Marketing Strategy 3 cr.

Offered: Fall

Prerequisites: MKT 230, plus two other marketing courses and junior standing or instructor's permission. Marketing majors only.

Improvement of students' ability to define marketing problems and develop decisions for their solutions. Realistic cases cover the conceptual areas of marketing including demand, advertising, personal selling, physical distribution, channels, product policy, pricing, marketing research and integrated marketing programs.

MKT 438 Marketing Management 3 cr.

Offered: Winter

Prerequisites: MKT 230, plus two other marketing courses and junior standing or instructor's permission. Marketing majors only.

Study of the following marketing management tools and their application in marketing decisions: experience curves; profit impact of market strategy (PIMS); strategic marketing windows; perceptual mapping and product positioning; growth share models; product portfolios analysis.

MKT 466 International Marketing 3 cr.

Offered: Fall

Prerequisites: MKT 230, junior standing or instructor's permission.

Focuses on global marketing management concepts and decisions. The following concepts are developed: framework for a conceptual understanding of global marketing; the global environment, targeting global markets; formulating global marketing strategy; the global marketing mix.

MKT 470 E-Commerce and Marketing 3 cr.

Offered: Periodically

Prerequisites: MKT 230, minimum of junior standing or instructor's permission.

This course is designed to explore a range of strategic issues influencing firms who are engaged in e-commerce. As the e-commerce business model continues to grow and evolve, marketers find themselves faced with a wide range of key strategic and tactical issues. Given the powerful influence that the World Wide Web and Internet have had on marketing, it is critical for firms to understand the interrelationships between their core offering, customers and existing and new competitors.

MKT 491 Internship in Marketing 1-4 cr.

Offered: Fall, Winter, Summer

Graded S/U

Prerequisites: College of Business permission, junior standing or instructor's permission.

Professional experience for qualified marketing students. Working relationships will be established with organizations. Students are required to write a paper and will be evaluated by their faculty supervisor in consultation with the employer.

Note: May be repeated for up to four credits total.

Counts as an elective in the marketing program.

MKT 495 Special Topics in Marketing 1-4 cr.

Offered: Contact department for information.

Prerequisites: Junior standing or instructor's permission.

Variable topics of current interest.

Note: May be repeated if topic differs.

MKT 498 Directed Study in Marketing 1-4 cr.

Offered: Contact department for information.

Prerequisites: College of Business permission, junior standing or instructor's permission.

Limited to students with a superior GPA. Individual research in marketing. Work is supervised through conferences with an adviser. A written final report must be filed with the department.

MS 259 Troop Leader Training 1 cr. (2-0-1)

Offered: Winter, Summer

Co-requisite: Contracted cadets must participate in Leadership Laboratory.

Advanced individual tactical training centered around leadership and tactical orders. Ethics, professionalism, communication and advanced land navigation are also covered. Leadership labs supplement the instruction by allowing students to assume junior leadership roles.

MS 269 Army Physical Fitness Training 1 cr. (0-0-3)

Offered: Fall, Winter, Summer

Development of skills and physical fitness by participation in and conducting exercises. Emphasis is placed on aerobic exercises. Physical fitness testing and team sports supplement the program. May be used as an HP activity credit.

MS 279 Army History Research 1 cr.

Offered: Fall, Winter, Summer

Prerequisite: Department permission.

The systematic preparation of an analytical research paper on an Army history subject.

MS 295 Special Topics in Military Science 1-4 cr.

Offered: On demand.

Prerequisite: Department permission.

Study of a significant topic in military science. The requirements of this course may be met through seminars, lectures, participation in outdoor activities or readings.

MS 339 Advanced Leadership Training 4 cr. (3-0-2)

Offered: Fall

Prerequisite: Completion of the Basic Course of Instruction or the equivalent and/or department permission.

Co-requisite: Contracted cadets must participate in Leadership Laboratory.

Study of the techniques of junior officer leadership. Examines leadership skills such as counseling, coordination, communication and delegation of authority. The science of command and control through personal leadership is practiced. Military skills are taught in preparation for Advanced Camp.

MS 359 Applied Leadership Training 4 cr. (3-0-2)

Offered: Winter

Prerequisite: MS 339 and/or department permission.

Co-requisite: Contracted cadets must participate in Leadership Laboratory.

Duties and responsibilities of a junior officer, with emphasis on the leader's role in planning, directing, coordinating individual and team training, and in motivating subordinates through human relations and counseling skills. Covers the principles of command, control and leadership techniques. Military skills are taught in preparation for Advanced Camp.

MS - MILITARY SCIENCE

Military Science Department

MS 139 Leadership and Confidence Building 1 cr. (0-0-2)

Offered: Fall

Introduction to military leadership techniques and confidence building currently taught by the U.S. Army. Students are also introduced to ethics instruction and the role of the U.S. Army. Leadership and confidence building are taught through the application of learned skills during hands-on training, including marksmanship, rappelling, orienteering and first aid. Student involvement in planning and performance increases poise, confidence and self-sufficiency.

MS 159 Leadership, Confidence Building and Winter Training 1 cr. (0-0-2)

Offered: Winter

Introduction to military leadership techniques and confidence building with a concentration on outdoor winter training. Students are also introduced to communication, ethics instruction and the role of the U.S. Army. Leadership and confidence building are taught through the application of learned skills during hands-on training, including cross-country skiing, snowshoeing, winter orienteering and first aid. Student involvement in planning and performance increases poise, confidence, leadership and self-sufficiency.

MS 239 Leadership at the Unit Level 1 cr. (2-0-1)

Offered: Fall

Co-requisite: Contracted cadets must participate in Leadership Laboratory.

Study of tactics, command and planning procedures for the Army's basic combat unit, the infantry rifle squad. Land navigation, communication, ethics, professionalism and the role of the Army are also covered. Self-confidence building exercises are implemented. Leadership labs supplement the instruction by allowing students to assume junior leadership roles.

MS 439 Leadership 4 cr. (3-0-2)

Offered: Fall

Prerequisites: MS 339 and MS 359, junior standing and/or department permission.

Co-requisite: Contracted cadets must participate in Leadership Laboratory.

Development of an appreciation for command and staff organization and functions. Stresses processes for arriving at sound and timely decisions and the translation of decisions into plans and orders. Develops skills in long-range planning, coordination of diverse groups and activities, written communication and briefing techniques.

MS 459 Team Development 4 cr. (3-0-2)

Offered: Winter

Prerequisite: MS 439, junior standing and/or department permission.

Co-requisite: Contracted cadets must participate in Leadership Laboratory.

Students prepare for and participate in a seminar which focuses on the role of the Army officer in areas such as military law, professional ethics and the obligations and responsibilities of the commissioned officer and organizational leader.

MS 495 Special Topics in Military Science 3 cr.

Offered: On demand.

Prerequisite: Junior standing and department permission.

Study of a significant topic in military science. The requirements of this course may be met through seminars, lectures, participation in outdoor activities or readings.

MS 498 Directed Study in Military Science 1-3 cr.

Offered: On demand.

Prerequisite: Junior standing and department permission.

Individual directed study on a selected military science topic.

MSED - MATHEMATICS / SCIENCE EDUCATION

School of Education

Note: MSED 250, MSED 251 and MSED 252 are all required for elementary education majors beginning in 2001.

MSED 250 Physical Science for Educators 4 cr.

Offered: Fall, Winter and occasionally Summer

Prerequisites: Admission to elementary education or special education program.

Basic concepts and principles of physics and chemistry that are important for elementary school teachers to understand. Discussions and hands-on laboratory experiences emphasize the use of higher-level thinking skills without the prerequisite of advanced mathematics.

MSED 251 Life Science for Educators 4 cr.

Offered: Fall, Winter and occasionally Summer

Prerequisites: Admission to elementary education or special education program.

Life science course for the pre-service elementary teacher. This inquiry-based laboratory course, framed around state and national science education standards, is designed to give the future teacher a strong conceptual understanding of the life science content he/she will be expected to teach as well as learning experiences from a variety of teaching and assessment strategies. Topics include basic structure and function of plant and animal cells, organization of living things, basic understanding of heredity, concepts of adaptation and evolution.

MSED 252 Earth Science for Educators 4 cr.

Offered: Fall, Winter and occasionally Summer

Prerequisites: Admission to elementary education or special education program.

Earth science course for the pre-service elementary teacher. This inquiry-based laboratory course, framed around state and national science education standards, is designed to give the future teacher a strong conceptual understanding of the earth science content he/she will be expected to teach as well as learning experiences from a variety of teaching and assessment strategies. Focus on the perspective of earth-systems education and interactions between the different topics, including major concepts from the areas of geology, hydrology, meteorology and astronomy.

MSED 340 Fundamental Concepts in Science 4 cr.

Offered: Winter

Prerequisites: This course is a professional education requirement for all secondary science education majors. Students should be admitted to the pre-methods phase of the educational program.

This laboratory-based course provides deeper investigations into fundamental, unifying concepts in science through inquiry methods employing an integrated approach. Concepts studied include energy, form and function, homeostasis and equilibrium, change and evolution. Historical vignettes are introduced as a way to increase understanding and minimize misconceptions. An independent research project is required.

MSED 350 Methods and Materials in Teaching Science Education 4 cr.

Offered: Winter

Prerequisites: Admission to the methods phase of teacher education.

Co-requisite: Concurrent enrollment in ED 349.

Preparation to teach science in middle and high schools. State and national trends and initiatives in science education provide a foundation on which students build a philosophy and structure for teaching science. Instructional strategies are examined, and students participate in practicum experiences with middle or high school students.

MU - Music

Music Department

<p>MU 101 Theory I 2 cr. Offered: Fall</p> <p>Introduction to basic musical skills and fundamentals of theory through the study of structural elements in music. This course is required of all music majors and minors.</p>	<p>MU 111 University Choir 0.5 cr. Offered: Fall, Winter</p> <p>Open to all university students.</p> <p>Required of vocal music students; emphasis on familiarizing students with a broad choral repertoire; performs a public concert at least once each semester.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 102 Sight Singing and Ear Training I 2 cr. Offered: Fall</p> <p>A course in basic singing at sight of melodic material from all periods; ear training including rhythmic, melodic and contrapuntal material. This course is required of all music majors.</p>	<p>MU 112 Choral Society 0.5 cr. Offered: Fall, Winter</p> <p>Prerequisite: Director permission.</p> <p>A group of community singers and the largest of the choral organizations. Repertoire includes major choral masterworks and two major concerts are performed each year.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 103 Piano I 2 cr. Offered: Fall</p> <p>A course designed to gain elementary keyboard facility and skill in sight reading with pieces up to grade two. The electronic piano lab is used in both individual and group playing.</p>	<p>MU 113 Symphonic Band 0.5 cr. Offered: Winter</p> <p>Prerequisite: Audition; required of all music majors whose performance area is wind/percussion.</p> <p>A band that performs traditional and contemporary band repertoire as well as transcriptions from symphonic literature. Performs only during the winter semester.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 104 Theory II 2 cr. Offered: Fall, Winter</p> <p>Prerequisite: MU 101</p> <p>Continuation of the development begun in MU 101, with emphasis on seventh chords, modulation, secondary dominants, four-part chorale writing and analysis of small forms.</p>	<p>MU 114 Marching Band 0.5 cr. Offered: Fall</p> <p>Open to all university students.</p> <p>The marching band performs only during the fall semester; performances include football games and the December commencement ceremony.</p> <p><i>Note: May be repeated for credit. Required for all wind/percussion BME majors for one semester.</i></p>
<p>MU 105 Sight Singing and Ear Training II 2 cr. Offered: Winter</p> <p>Prerequisite: MU 102</p> <p>Continued development of the skills pursued in MU 102. Emphasis is placed upon four-part exercises, simple and compound meters and triadic harmony.</p>	<p>MU 116 University Orchestra 0.5 cr. Offered: Fall, Winter</p> <p>Open to all university string players.</p> <p>Required of string music majors. A group that performs major compositions for small orchestra.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 106 Piano II 2 cr. Offered: Winter</p> <p>Prerequisite: MU 103 or the equivalent of performance.</p> <p>Continuation of MU 103; designed for students with an elementary background in piano. Development of keyboard facility, sight-reading techniques and transposition.</p>	<p>MU 117 Jazz Band 0.5 cr. Offered: Fall, Winter</p> <p>Prerequisite: Open to qualified players with instructor's permission.</p> <p>A band that performs many concerts throughout the school year and is the featured ensemble at the NMU Jazz Festival.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 108 Madrigal Choir 0.5 cr. Offered: Fall, Winter</p> <p>Open to all students through audition.</p> <p>A select choral ensemble that performs chamber repertoire largely from the early Renaissance period. The ensemble meets two times per week.</p> <p><i>Note: May be repeated for credit.</i></p>	

<p>MU 118 Chamber Ensemble 0.5 cr. Offered: Fall, Winter Prerequisite: Open to other students by audition. New students must audition during the first week of classes.</p> <p>Duos, trios, quartets and quintets are formed depending on available players. Ensembles must rehearse a minimum of two times per week and are coached by a faculty member. Number of performances is established by the faculty member when the group is formed.</p> <p><i>Note: May be repeated for credit. Required of BME instrumental majors for two semesters.</i></p>	<p>MU 141 Performance I-Keyboard 1 cr. Offered: Fall, Winter Prerequisite: Audition</p> <p>One individual half-hour lesson per week with emphasis on development of repertoire, technical dexterity and musicianship.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 119 Musical/Opera Workshop Ensemble 0.5 cr. Offered: Winter Prerequisite: Audition.</p> <p>A small instrumental ensemble, usually conducted, which meets one or two times per week before production schedule.</p> <p><i>Note: May be repeated for credit. May be elective credit for music major.</i></p>	<p>MU 142 Piano IV 2 cr. Offered: Contact department for information.</p> <p>Further development of facility, score reading, harmonization, transposition and sight-reading.</p>
<p>MU 122 Jazz Improvisation 2 cr. Offered: Contact department for information. Prerequisite: Audition or instructor's permission.</p> <p>Explores jazz harmony and improvisational techniques in common practice in the jazz tradition. Styles include blues, swing, bebop, fusion and contemporary pop. Skills will be applied in a performance situation.</p> <p><i>Note: May be repeated up to four semesters as elective credit.</i></p>	<p>MU 146 Classroom Instruments 1 cr. Offered: Fall</p> <p>Open to all university students.</p> <p>A course designed for prospective teachers for the elementary grades K-6, introducing the use of appropriate instruments. A functional approach develops skills in playing the recorder, autoharp, Orff instruments, small percussion instruments and guitar.</p>
<p>MU 125 Music in Society 4 cr. Offered: Fall, Winter</p> <ul style="list-style-type: none"> • Satisfies the foundations of visual and performing arts requirement. <p>A study of a wide variety of music, including Western European art music, contemporary American music (for example, Afro-American music, the blues, jazz, rock 'n' roll, experimental art music) and non-Western music. An approach to investigation and the accumulation of objective listening skills will be used to develop the understanding that music, like any art form, is a cultural expression of the society that produced it.</p>	<p>MU 148 Elementary Guitar 1 cr. Offered: Fall, Winter</p> <p>A functional approach developing basic skills in playing the guitar.</p>
<p>MU 131 Performance I-Brass 1 cr. Offered: Fall, Winter Prerequisite: Audition</p> <p>Trumpet, horn, trombone, baritone, tuba. One individual half-hour lesson per week with emphasis on proper embouchure development, breath control, styles of articulation, major and minor scales and solo literature compatible with the student's level of proficiency.</p> <p><i>Note: May be repeated for credit.</i></p>	<p>MU 149A Music in the Elementary School I 2 cr. Offered: Fall, Winter</p> <p>Not open to music majors.</p> <p>An introductory course for students in elementary or special education. The course covers musical concepts, skills (performing, analyzing, creating), and the appreciation needed for teaching music in the elementary classroom. Students will become familiar with music of various eras, styles and cultures.</p>
<p>MU 140 Piano III 2 cr. Offered: Fall</p> <p>A course for the intermediate piano student including development of keyboard facility, sight-reading, harmonization and transposition. Pieces up to grade three are studied. The electronic piano lab is used in both individual and group instruction.</p>	<p>MU 149B Music in the Elementary School II 2 cr. Offered: Winter Prerequisite: MU 149A.</p> <p>Not open to music majors.</p> <p>A continuation of MU 149A. Includes more advanced work in rhythm and pitch (minor keys, harmony and polyphony), concepts of timbre and dynamics and musical performance emphasizing skills in accompanying.</p>
	<p>MU 150 Percussion Class 2 cr. Offered: Contact department for information.</p> <p>A course of study for prospective instrumental teachers. Percussion instruments are taught through class instruction; knowledge of all percussion instruments is stressed.</p>

<p>MU 151 Performance I-Percussion 1 cr. Offered: Fall, Winter Prerequisite: Audition</p> <p>One individual half-hour lesson per week with emphasis on the fundamental performance concepts and techniques of percussion instruments. Snare drum and keyboard instruments are stressed for this level of study.</p> <p><i>Note: May be repeated for credit.</i></p>	<p>MU 181 Performance I-Woodwind 1 cr. Offered: Fall, Winter Prerequisite: Audition</p> <p>Flute, oboe, clarinet, bassoon, saxophone. One individual half-hour lesson per week with concentration on tone production, embouchure formation, breath control and articulation. Representative solos and technical exercises are used. Students who play clarinet must accept the soprano B-flat for their study. Similarly, any student who plays a secondary saxophone (tenor, baritone) may take no more than one semester before switching to the E-flat alto saxophone.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 161 Performance I-Strings 1 cr. Offered: Fall, Winter Prerequisite: Audition</p> <p>Violin, viola, violoncello, string bass. One individual half-hour lesson per week with emphasis on the development of independence of the left hand, scales and shifting in seven positions.</p> <p><i>Note: May be repeated for credit.</i></p>	<p>MU 201 Theory III 2 cr. Offered: Fall Prerequisite: MU 104</p> <p>Study, analysis and composition of counterpoint, chromatic harmony and larger forms with historical applications to Renaissance, Baroque and Classical periods.</p>
<p>MU 170 Class Voice 1 cr. Offered: Fall, Winter</p> <p>Classroom instruction in vocal technique for those students with little or no previous instruction.</p>	<p>MU 202 Sight Singing and Ear Training III 2 cr. Offered: Fall Prerequisite: MU 105</p> <p>Continuation of development begun in MU 105; emphasis on transient modulations and altered chords.</p>
<p>MU 171 Performance I-Vocal 1 cr. Offered: Fall, Winter Prerequisite: Audition</p> <p>One individual half-hour lesson per week with emphasis on understanding the technical aspects of singing: good posture and breathing, diction, and resonance. Repertoire will be at the discretion of the instructor but should include Italian and English literature.</p> <p><i>Note: May be repeated for credit.</i></p>	<p>MU 203 Music History and Literature I: Ancient Music to 1750 3 cr. Offered: Contact department for information. Prerequisites: MU 125 and MU 201 or instructor's permission.</p> <p>Chronological study of music literature and its development in Western civilization from ancient music through the Baroque period.</p>
<p>MU 172 Musical Diction in Singing I 2 cr. Offered: Contact department for information.</p> <p>Usage of the International Phonetic Alphabet for clear expressive English diction for singing and Italian pronunciation.</p>	<p>MU 204 Theory IV 2 cr. Offered: Winter Prerequisite: MU 201</p> <p>Continuation of the study of chromatic materials begun in MU 201 with additional study of extended harmony. Nineteenth and twentieth-centuries are explored through analysis, study and composition.</p>
<p>MU 173 Musical Diction in Singing II 2 cr. Offered: Contact department for information. Prerequisite: MU 172</p> <p>Continuation of material from MU 171 with additional study of German and French diction for singing.</p>	<p>MU 205 Form and Analysis 2 cr. Offered: On demand. Prerequisite: MU 201</p> <p>Examination of the components of musical structural design. Basic elements of homophonic and contrapuntal forms are studied through scores and recordings. Emphasis is placed on the study of forms of the Middle Ages through the 20th century.</p>
<p>MU 174 Opera Theatre Workshop 1 cr. Offered: Contact department for information.</p> <p>The course offers practical experience in the performance of operatic scenes or whole operas. Techniques of operatic acting; analysis of roles; musical pantomime; exercises in visualization and concentration.</p> <p><i>Note: May be repeated for credit.</i></p>	<p>MU 206 Music History and Literature II: 1750 to the Present 3 cr. Offered: Every other Winter. Prerequisites: MU 201 and MU 203 or instructor's permission.</p> <p>A continuation of MU 203. A chronological study of music literature and its development in Western civilization from the classic period through the 20th century.</p>

<p>MU 208 Conducting I 2 cr. Offered: On demand. Prerequisites: MU 104 and MU 105.</p> <p>A course designed to develop comprehension of the musical score and the acquisition of a baton technique that exemplifies this understanding.</p>	<p>MU 241 Performance II-Keyboard 1 cr. Offered: Fall, Winter Prerequisite: Passing 200 level proficiency exam.</p> <p>One individual half-hour lesson and one class per week. A continuation of MU 141 with advanced levels of repertoire. Students perform in a student recital at least once a semester. Satisfactory completion of this level and promotion to the next are required before students can qualify for a senior recital.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 209 Conducting II 2 cr. Offered: Contact department for information. Prerequisite: MU 208</p> <p>Continuation of MU 208 with emphasis on rehearsal technique, score comprehension and expressive conducting.</p>	<p>MU 251 Performance II-Percussion 1 cr. Offered: Fall, Winter Prerequisite: Passing 200 level proficiency exam.</p> <p>One individual half-hour lesson and one class per week. A continuation of MU 151 with inclusion of timpani, drum set and more advanced levels of proficiency in keyboard and accessory percussion instruments. Students perform on a student recital at least once a semester. Satisfactory completion of this level and promotion to the next are required before student can qualify for a senior recital.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 210 Sight Singing and Ear Training IV 2 cr. Offered: Winter Prerequisite: MU 202</p> <p>Further development of the skills involving more complex modulations, changing meters and 20th-century melodic and harmonic idioms.</p>	<p>MU 260U Upper Strings Class 1 cr. Offered: On demand.</p> <p>A course devoted to teaching the basic skills of violin and viola to prospective teachers. Principles of bow control and elementary left-hand techniques are studied.</p> <p><i>Note: May be repeated once for credit.</i></p>
<p>MU 212 Choral Methods 2 cr. Offered: Contact department for information. Prerequisite: MU 208 or instructor's permission.</p> <p>A course including vocal fundamentals in rehearsals; rehearsal techniques; literature; scheduling, curriculum, promotional activities, organizing the singers; style and traditions; performances.</p>	<p>MU 260L Lower Strings Class 1 cr. Offered: On demand.</p> <p>A course devoted to teaching the basic skills of cello and bass to prospective teachers. Principles of bow control and elementary left-hand techniques are studied.</p> <p><i>Note: May be repeated once for credit.</i></p>
<p>MU 230H High Brass Class 1 cr. Offered: On demand.</p> <p>A course designed for prospective instrumental teachers. Fundamentals of all brass instruments are studied with emphasis upon teaching procedures. Students concentrate sufficiently on one instrument (cornet or horn).</p> <p><i>Note: May be repeated once for credit.</i></p>	<p>MU 261 Performance II-Strings 1 cr. Offered: Fall, Winter Prerequisite: Passing 200 level proficiency exam.</p> <p>Violin, viola, violoncello, string bass. One individual half-hour lesson and one class per week. Continuation of MU 161 with emphasis upon vibrato and development of detached and legato bowings. Satisfactory completion of this level and promotion to the next is required before a student can qualify for a senior recital and graduation. Students perform on a student recital at least once during the year.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 230L Low Brass Class 1 cr. Offered: On demand.</p> <p>A course designed for prospective instrumental teachers. Fundamentals of all brass instruments are studied with emphasis upon teaching procedures. Students concentrate sufficiently on one instrument (trombone or tuba).</p> <p><i>Note: May be repeated once for credit.</i></p>	<p>MU 265 Piano Pedagogy 2 cr. Offered: On demand.</p> <p>Specialized training in materials and techniques for piano teachers. The course includes a survey of current methods, observation of individual and group lessons, preparation of mini-lessons and discussion of business procedures for establishing a piano studio.</p>
<p>MU 231 Performance II-Brass 1 cr. Offered: Fall, Winter Prerequisite: Passing 200 level proficiency exam.</p> <p>One individual half-hour lesson and one class per week. A continuation of MU 131 with advanced levels of études and solo literature studied. Students perform on a student recital at least once a semester. Satisfactory completion of this level and promotion to the next are required before students can qualify for a senior recital.</p> <p><i>Note: May be repeated for credit.</i></p>	

<p>MU 271 Performance II-Vocal 1 cr. Offered: Fall, Winter Prerequisite: Passing 200 level proficiency exam.</p> <p>One individual half-hour lesson and one class per week. Continuation of MU 171 with more work on technique and further development of a concept of singing, agility and range. Repertoire should include German Lieder with continued study of Italian and English songs. Students perform on a student recital at least once during the year.</p> <p><i>Note: May be repeated for credit.</i></p>	<p>MU 325 World Music 4 cr. Offered: Fall, Winter Prerequisite: Completion of the foundations of communication requirement and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of visual and performing arts requirement. • Satisfies the upper division liberal studies requirement. • Satisfies the world cultures requirement. <p>A survey of non-Western music from a representative music culture (or cultures) emphasizing music's place in a culture, its historical development, and analysis and interpretation of forms of aesthetic expression.</p>
<p>MU 280D Double Reeds Class 1 cr. Offered: On demand.</p> <p>A class demonstrating the characteristics unique to the oboe, bassoon and English horn. Students are exempt from studying their major instrument.</p> <p><i>Note: May be repeated once for credit.</i></p>	<p>MU 331 Performance III-Brass 1 cr. Offered: Fall, Winter Prerequisite: Passing 300 level proficiency exam.</p> <p>One individual half-hour lesson and one class per week. Continuation of MU 231 with advanced levels of études and solo literature studied. Students perform on a student recital each semester.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 280F Flute Class 1 cr. Offered: On demand.</p> <p>Teaching procedures demonstrating the characteristics unique to the flute. Flute majors are exempt from this course.</p>	<p>MU 341 Performance III-Keyboard 1 cr. Offered: Fall, Winter Prerequisite: Passing 300 level proficiency exam.</p> <p>One individual half-hour lesson and one class per week. Continuation of MU 241 with advanced levels of literature. Students perform on a student recital each semester.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 280S Single Reeds Class 1 cr. Offered: On demand.</p> <p>Teaching procedures demonstrating the characteristics unique to the clarinet and saxophone. Students are exempt from the study of their major instrument.</p> <p><i>Note: May be repeated once for credit.</i></p>	<p>MU 345A Marching Band Practicum 1 cr. Offered: On demand. Prerequisite: MU 114.</p> <p>Study of marching band procedures, such as drill writing, marching styles, uniforms, instrument care, music selection, auxiliary percussion and flags. Students serve as assistant drill instructors with marching band.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 281 Performance II-Woodwind 1 cr. Offered: Fall, Winter Prerequisite: Passing 200 level proficiency exam.</p> <p>One individual half-hour lesson and one class per week. Continuation of MU 181 with advanced études and solo literature. Students perform a recital at least once a semester. Satisfactory completion of this level and promotion to the next is required before the student can qualify for a senior recital.</p> <p><i>Note: May be repeated for credit.</i></p>	<p>MU 345B Symphonic Band Practicum 1 cr. Offered: On demand.</p> <p>Study of literature, methods of instruction and procedures for symphonic bands.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 295 Special Topics in Music 1-4 cr. Offered: On demand.</p> <p>Topics dependent on students' needs and interests.</p>	<p>MU 349 Methods and Materials in Teaching Music Education I 2 cr. Offered: Every other Fall; Every other Winter. Prerequisites: MU 201 and MU 202 or instructor's permission.</p> <p>An in-depth study of contemporary music education in grades K-6. The course includes a study of performance objectives, philosophical and musical concepts, instructional methods and materials, and various innovative approaches used in the general music class. Each student observes and participates in general music classes in area schools on a limited basis.</p> <p><i>Note: May not be applied toward a non-teaching major or any minor in music.</i></p>
<p>MU 320 Survey of Jazz, from its Origins to the Present 4 cr. Offered: Winter Prerequisite: Completion of the foundations of communication requirement and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of visual and performing arts requirement. • Satisfies the upper division liberal studies requirement. <p>This course explores jazz from its origins at the turn of the century to its present forms. Emphasis will be on the music itself, with some consideration of the socio-cultural situations which act as catalysts to the music's various stylistic features.</p>	

<p>MU 350 Methods and Materials in Teaching Music Education II 2 cr. Offered: Every other Fall; Every other Winter. Prerequisites: Admission to the methods phase of teacher education. All core courses MU 101- MU 210; and instructor's permission.</p> <p>A study of contemporary music education in today's secondary schools (grades 7-12). The course includes a study of teaching and administrative procedures. Students are exposed to various philosophies of vocal and instrumental music education. Technical problems such as the changing voice and general music classes are discussed.</p> <p><i>Note: May not be applied toward a non-teaching major or any minor in music.</i></p>	<p>MU 431 Performance IV-Brass 1 cr. Offered: Fall, Winter Prerequisites: Passing 400 level proficiency exam.</p> <p>One individual half-hour lesson and one class per week. Continuation of MU 331 representing the highest level of undergraduate achievement. More challenging works are studied. Students are expected to perform on a student recital each semester.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 351 Performance III-Percussion 1 cr. Offered: Fall, Winter Prerequisite: Passing 300 level proficiency exam.</p> <p>One individual half-hour lesson and one class per week. Continuation of MU 251 with emphasis upon mallet keyboard and multiple percussion. Care and maintenance of percussion are applied. Composition and improvisation are encouraged. Students are expected to perform on a student recital each semester.</p> <p><i>Note: May be repeated for credit.</i></p>	<p>MU 441 Performance IV-Keyboard 1 cr. Offered: Fall, Winter Prerequisite: Passing 400 level proficiency exam.</p> <p>One individual half-hour lesson and one class per week. Continuation of MU 341 representing the highest level of undergraduate achievement. More challenging works are studied. Students are expected to perform on a student recital each semester.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 361 Performance III-Strings 1 cr. Offered: Fall, Winter Prerequisite: Passing 300 level proficiency exam.</p> <p>Violin, viola, violo, cello, string bass. One individual half-hour lesson and one class per week. Continuation of MU 261 with stress on bowing strokes (sautille and flying staccato) and pacing the bowing for phrasing. Students perform on a student recital each semester.</p> <p><i>Note: May be repeated for credit.</i></p>	<p>MU 451 Performance IV-Percussion 1 cr. Offered: Fall, Winter Prerequisite: Passing 400 level proficiency exam.</p> <p>One individual half-hour lesson and one class per week. Continuation of MU 351 with study of all percussion instruments. Students are expected to perform on a student recital each semester.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 371 Performance III-Vocal 1 cr. Offered: Fall, Winter Prerequisite: Passing 300 level proficiency exam.</p> <p>One individual half-hour lesson and one class per week. Continuation of MU 271 with more work on technique. Repertoire should expand into the French literature with some simple oratorio and/or operatic arias. Students perform on a student recital each semester.</p> <p><i>Note: May be repeated for credit.</i></p>	<p>MU 461 Performance IV-Strings 1 cr. Offered: Fall, Winter Prerequisite: Passing 400 level proficiency exam.</p> <p>One individual half-hour lesson and one class per week. Continuation of MU 361 with further development of technique, tone and repertoire. Students are expected to perform on a student recital each semester.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 381 Performance III-Woodwind 1 cr. Offered: Fall, Winter Prerequisite: Passing 300 level proficiency exam.</p> <p>One individual half-hour lesson and one class per week. Continuation of MU 281 with continued emphasis on repertoire. Students perform on a student recital each semester.</p> <p><i>Note: May be repeated for credit.</i></p>	<p>MU 471 Performance IV-Vocal 1 cr. Offered: Fall, Winter Prerequisite: Passing 400 level proficiency exam.</p> <p>One individual half-hour lesson and one class per week. Continuation of MU 371 with work on technique and repertoire of all areas of vocal literature. Students are expected to perform on a student recital each semester.</p> <p><i>Note: May be repeated for credit.</i></p>
<p>MU 478 Advanced Seminar in Music Theory 1-2 cr. Offered: Contact department for information. Prerequisites: MU 204 and instructor's permission.</p> <p>Topics may vary (advanced theory, counterpoint, etc.).</p> <p><i>Note: May be repeated if topic differs.</i></p>	

MU 480 Advanced Topics in Music History 1-2 cr.

Offered: Contact department for information.
Prerequisites: MU 203, MU 204, MU 205, MU 206 and instructor's permission.

Topics vary (period, genre, composer or select group of compositions) and are announced when the course is offered.

Note: May be repeated if topic differs.

MU 481 Performance IV-Woodwind 1 cr.

Offered: Fall, Winter
Prerequisite: Passing 400 level proficiency exam.

One individual half-hour lesson and one class per week. Continuation of MU 381 representing the highest level of undergraduate achievement. Advanced repertoire and stylistic interpretation is emphasized. Students are expected to perform a recital each semester.

Note: May be repeated for credit.

MU 490 Senior Recital 1 cr.

Offered: Fall, Winter
Prerequisite: Promotion to the 300 level, junior standing or instructor's permission.

A required public recital (full or partial) or its equivalent prepared with the approval and assistance of a faculty member. Works programmed must meet the standard of the department (Performance Level III) and be performed with satisfactory style and skill.

MU 491 Senior Project 1 cr.

Offered: Fall, Winter
Prerequisites: MU 203, MU 204, MU 206 and MU 210. Junior standing or instructor's permission. Promotion to 300 level required for those seeking a performance project.

Senior Project may be a composition, paper or performance. A project proposal must be approved by the supervising teacher and department head. A pre-presentation review must be approved by area faculty two weeks before final presentation.

MU 495 Special Topics in Music 1-4 cr.

Offered: Contact department for information.
Prerequisites: Junior standing or instructor's permission.

Topics dependent on student needs and interests.

MU 498 Directed Studies in Music 1-4 cr.

Offered: Contact department for information.
Prerequisites: Junior standing and instructor and department head permission. Independent study of a topic determined by the student and instructor.

NAS-NATIVE AMERICAN STUDIES

Center for Native American Studies

NAS 101 Anishinaabe Language, Culture and Community I 4 cr.

Offered: Fall

- Satisfies the formal communication studies requirement.

An introduction to Anishinaabemowin language, including grammar, vocabulary, idioms and syllabics, (a phonetic writing system for Anishinaabemowin and related languages). This course will teach students to read, write and speak basic Anishinaabemowin and will promote the preservation and enhanced appreciation for the Anishinaabe culture. This course offers a close look at and discussion of various facets of Anishinaabe life including the role of gathering wild rice and other native foods, tool making, arts and crafts, as well as each item's social implications and use in everyday life.

NAS 102 Anishinaabe Language, Culture and Community II 4 cr.

Offered: Winter

Prerequisite: NAS 101 or equivalent.

- Satisfies the formal communication studies requirement.

An in-depth study of Anishinaabemowin language. This course is a continuation of materials introduced in NAS 101. Students will focus on higher-level use of the language and will apply it in situations related to contemporary Anishinaabe cultural issues and community structures.

NAS 204 Native American Experience 4 cr.

Offered: Fall, Winter, Summer

- Satisfies the foundations of humanities requirement.
- Satisfies the world cultures requirement.

A study of the development of Native American history, culture, attitudes and issues from the prehistoric era to the contemporary scene. One of the main focuses will be on native culture in the Great Lakes region. However, shared native world view, contact experience and native peoples' contributions to world culture are an important part of the course.

NAS 280 Storytelling by Native American Women 4 cr.

Offered: Winter, Summer

This course examines traditional customs and cultures, political activism, healing, family, art work, education, urbanism, reservation life, fiction, poetry, grandmothers, mothers, daughters, relationships to Mother Earth, spiritualism and links to the present, past and future through the eyes of Native American women.

NAS 287 The Legal and Political History of Michigan Indian Education 2 cr.
Offered: Winter

This course provides an overview of the legal and political history of Indian education within the State of Michigan. It is designed for individuals who have a career interest in Indian education programs. The course covers pre-colonial considerations, early colonial policy, treaty educational provisions, the boarding school era, Indian urbanization and current self-determination/self-education efforts.

NAS 288 The Politics of Indian Gaming 4 cr.
Offered: Winter, Summer

This course provides a general overview of contemporary issues surrounding the laws and politics of Indian gaming. It is designed to introduce researchers to the complexity of inter/intra-governmental relationships that bring tribal groups and other external government systems into contact i.e., local, state, federal and international levels.

NAS 295 Special Topics 1-4 cr.
Offered: Contact department for information.

Investigation of significant topic, theme or group of works. Content varies.

NAS 298 Directed Study in Native American Studies 1-4 cr.
Offered: On demand.

Students are able pursue further study in an interest area under the direction of the director of the Center for Native American Studies or a Native American Studies faculty member. Prior to taking this course, students must have completed NAS 204. All directed studies must be pre-approved.

NAS 310 Tribal Law and Government 4 cr.
Offered: Fall

Course content includes a focus on the relationships between American Indian tribes, the federal government and states. Particular emphasis is placed on examining the current status of tribal governments and tribal citizens within the State of Michigan. Includes a study of the U.S. Constitution, treaties and tribal, federal and state laws and court cases.

NAS 484 Native American Inclusion in the Classroom 2cr.
Offered: Winter

This course will challenge student preconceptions of what Native American inclusion means and provide them with methods and materials that will help them meet state standards while effectively including Native American cultural concepts across the curriculum. There is a strong emphasis on State of Michigan standards and Anishinaabe language and cultural concepts.

NAS 485 American Indian Education 3 cr.
Offered: Summer

This course provides an overview of significant policy changes in American Indian education from pre-colonial times to present day, with a special focus on current American Indian educational leadership issues. Students will review materials relevant to different historical eras and engage in on-line discussions/chat-rooms with American Indian education leadership about various topics relevant to course goals including the history of American Indian education; aboriginal and treaty rights to education; current U.S. federal Indian education law; contemporary American Indian education leadership; teaching about Native American languages and cultures; standards based reform and Native American inclusion; and American Indian education and students with disabilities. This course is also unique in that it provides individuals from different parts of the world an opportunity to consider alternative perspectives on indigenous education issues.

NAS 488 Native American Service Learning Project 1-4 cr.
Offered: On demand.

This is a capstone course for the Native American Studies minor. Students will complete an approved service learning project in Native American Studies under the guidance of the Director of the Center for Native American Studies upon completion of all other requirements for the minor.

NE - NURSING

School of Nursing

NE 200 Basic Health Assessment, Interviewing and Communication (Theory) 2 cr.

Offered: Fall, Winter
Prerequisite: Admission to the nursing major or instructor's permission.
Taken concurrently with NE 200L, NE 201, NE 202 and NE 222.

The focus of this course is basic assessment skills. Assessments of mental status, psycho-social status, functional patterns and physical status will be taught with a systems approach. Skills in interviewing, communication, history taking and physical assessment will be attained.

NE 200L Basic Health Assessment, Interviewing and Communication (Lab) 1 cr. (0-0-2)

Offered: Fall, Winter
Graded S/U
Prerequisite: Admission to the nursing major or instructor's permission.
Taken concurrently with NE 200, NE 201, NE 202 and NE 222.

The focus of this course is the application of theory taken in NE 200. Students will practice organization, analysis and communication of data using a basic diagnostic reasoning process. The development of these skills will take place in a laboratory setting.

<p>NE 201 Introduction to Nursing Concepts (Theory) 4 cr. Offered: Fall, Winter Prerequisite: Admission to the nursing major. Taken concurrently with NE 200, NE 200L, NE 202 and NE 222.</p> <p>Students will be introduced to major concepts in the nursing model, laying a foundation for the major. The client as an individual is viewed as a total system. Focus is on health promotion and maintenance with adaptive mechanisms identified.</p>	<p>NE 301 Psychiatric/Mental Health Nursing (Theory) 3 cr. Offered: Fall, Winter Prerequisites: NE 200, NE 200L, NE 201 and NE 202. Taken concurrently with NE 204.</p> <p>Using stress-adaptation, developmental and psychological models, the course further develops nursing assessment and intervention while exploring patient rights/legal issues for individuals and groups of mental health clients. A major focus is on the development and implementation of nursing care which promotes mental health for a variety of clients in various health care settings.</p>
<p>NE 202 Introduction to Nursing Skills I (Lab) 1 cr. (0-0-2) Offered: Fall, Winter Graded S/U Prerequisite: Admission to the nursing major or instructor's permission. Taken concurrently with NE 200, NE 200L, NE 201 and NE 222.</p> <p>This course focuses on skills required to care for adult clients using demonstration and simulated practice.</p>	<p>NE 302 Psychiatric/Mental Health Nursing (Clinic) 3 cr. (0-0-6) Offered: Fall, Winter Graded S/U Prerequisites: NE 200, NE 200L, NE 201 and NE 202. Taken concurrently with NE 301.</p> <p>Students will develop and implement therapeutic modalities that promote and/or maintain mental health with mentally ill clients. Opportunities are provided to integrate learning into practice in clinical settings that include in and out-patient mental health programs.</p>
<p>NE 204 Introduction to Nursing Skills II (Clinical) 2 cr. (0-0-4) Offered: Fall, Winter Graded S/U Prerequisites: NE 200, NE 200L, NE 201 and NE 202. Taken concurrently with NE 301, NE 302 and NE 212.</p> <p>Students will use the skills taught in NE 202 in a structured, non-emergent environment.</p>	<p>NE 311 Adult Health Nursing (Theory) 4 cr. Offered: Fall, Winter Prerequisites: NE 222, NE 212, NE 301, NE 302, BI 203 and HN 210/HN 301. Taken concurrently with NE 312.</p> <p>This course provides the theoretical foundation necessary to make critical decisions in planning and implementing therapeutic nursing interventions in caring for the adult experiencing acute complex health needs in a structured hospital or home environment.</p>
<p>NE 212 Pharmacology and Therapeutics 2 cr. Offered: Fall, Winter Prerequisites: BI 104 or BI 201 and BI 202. Usually taken concurrently with NE 301, NE 302 or PN 116, PN 117 and PN 118.</p> <p>This course focuses on the fundamentals of drug actions, the application of specific drugs in treatment of disease, normal and abnormal responses to drug therapy and appropriate nursing actions to achieve desired outcomes of drug therapy.</p> <p><i>Note: May be taken by non-nursing majors.</i></p>	<p>NE 312 Adult Health Nursing (Clinical) 6 cr. (0-0-12) Offered: Fall, Winter Graded S/U Prerequisites: NE 222, NE 212, NE 301, NE 302, BI 203 and HN 210 or HN 301. Taken concurrently with NE 311.</p> <p>This clinic provides an opportunity to implement the theoretical foundation of NE 311. The primary focus of the course is the utilization of the nursing process in the care of adult clients experiencing complex health needs in a structured environment either in the hospital or home. Students will continue to develop critical thinking abilities, effective communication skills and therapeutic nursing intervention skills.</p>
<p>NE 222 Concepts of Altered Health States 3 cr. Offered: Fall, Winter Prerequisites: BI 104 or BI 201 and BI 202.</p> <p>May be taken by non-nursing majors.</p> <p>This course focuses on the study of how normal physiological processes are altered by disease. Theories relating to pathogenesis, etiology and clinical manifestations are used to study common diseases. Concepts from anatomy and physiology courses provide the foundation for exploring altered physiologic function and are basic to nursing practice.</p>	<p>NE 322 Introduction to Nursing Research 2 cr. Offered: Fall, Winter Prerequisites: NE 200, NE 200L, NE 201, NE 202, NE 204 and NE 301/302. Usually taken concurrently with NE 311 and NE 312.</p> <p>This course is intended to provide an introduction to the research process in nursing, an appreciation of the development and use of the scientific method in the discipline of nursing, and its application to human responses and health behavior across the life span.</p>
<p>NE 295 Special Topics in Nursing 1-4 cr. Offered: Winter Prerequisite: Instructor's permission.</p> <p>Study of a particular topic reflecting special interests of students and instructor. Intended for freshmen and sophomores.</p> <p><i>Note: May be repeated if topic differs.</i></p>	

<p>NE 336 Nursing in a Multi-Cultural Society 2 cr.</p> <p>Offered: Winter</p> <p>Prerequisites: NE 301 and NE 302 or instructor's permission.</p> <p>Study of cultural practices and patterns relative to health and illness among special populations. Emphasis is on identification of ways in which nursing assessments and interventions may be modified to accommodate racial and cultural differences of clients and their families within the American culture.</p>	<p>NE 381 Child and Family Nursing (Theory) 4 cr.</p> <p>Offered: Fall, Winter</p> <p>Prerequisites: NE 311 and NE 312.</p> <p>Taken concurrently with NE 371, NE 372 and NE 382.</p> <p>This course focuses on the nursing care of children from infancy through adolescence and their family units. Growth and development, health promotion, family theories, disease prevention and care of the child with simple and complex health needs are examined.</p>
<p>NE 352 Advanced Concepts in Family Nursing 4 cr.</p> <p>Offered: Winter</p> <p>Prerequisites: NE 311 and NE 312 or concurrent enrollment, or instructor's permission.</p> <p>An exploration of family nursing in which the family unit is the focus of care. Family assessment models provide the framework for planning nursing care for families in a variety of health care settings.</p>	<p>NE 382 Child and Family Nursing (Clinic) 3 cr. (0-0-6)</p> <p>Offered: Fall, Winter</p> <p>Graded S/U</p> <p>Prerequisites: NE 311 and NE 312.</p> <p>Taken concurrently with NE 381, NE 371 and NE 372.</p> <p>This course provides an opportunity for students to practice nursing skills and apply nursing theory with children and their families in community and in-patient settings. This course is taught in a seven week block.</p>
<p>NE 370 Cardiac Arrhythmias and Nursing Care 2 cr.</p> <p>Offered: Winter</p> <p>Prerequisites: BI 104 or BI 201, BI 202, NE 200, NE 200L, NE 201, NE 202, NE 212 and NE 222.</p> <p>This course covers the fundamentals of single lead basic cardiac rhythm and arrhythmia interpretation and current treatments. Upon completion, the student will be able to recognize common cardiac rhythms and arrhythmias and describe appropriate nursing care.</p>	<p>NE 391 Transitions in Professional Nursing: Theory 2 cr.</p> <p>Offered: Winter</p> <p>Prerequisite: Must be a registered or graduate nurse.</p> <p>The focus is to present an overview and synthesis of professional concepts basic to the development of professional nurses. The course explores historical influences, philosophical perspectives, factors that influence socialization into the profession and the development of professional self-concept.</p>
<p>NE 371 Maternal-Infant Nursing (Theory) 2 cr.</p> <p>Offered: Fall, Winter</p> <p>Prerequisite: NE 311 and NE 312.</p> <p>Taken concurrently with NE 372, NE 381 and NE 382.</p> <p>Emphasis is on the primary family unit during the expanding years. Physiological adaptation of the female during pregnancy, the fetus and mother during labor and delivery and the dyad during the postpartum period are examined within the context of the nursing process. Psychosocial adaptation of family members, health promotion and normal as well as complex pregnancy and newborn care are addressed.</p>	<p>NE 392 Transitions in Professional Nursing: Clinic 1 cr.</p> <p>Offered: Winter</p> <p>Graded S/U</p> <p>Prerequisites: NE 391 or concurrent enrollment. Must be a registered or graduate nurse.</p> <p>Demonstration and practice of selected nursing and physical assessment skills in a laboratory setting. Provides opportunity to implement the theoretical foundations of NE 391.</p>
<p>NE 372 Maternal-Infant Nursing (Clinical) 2 cr. (0-0-4)</p> <p>Offered: Fall, Winter</p> <p>Graded S/U</p> <p>Prerequisite: NE 311 and NE 312.</p> <p>Taken concurrently with NE 371, NE 381 and NE 382.</p> <p>The emphasis of the clinic is the practice of nursing skills, planning and implementing of nursing care plans, and critical judgments/thinking in an acute care maternal/child setting. Assigned 1:1 intrapartum care is presented by students as a case study. Antepartum care in the community and post-partum follow-up in the community are also assigned. This course is taught in a seven week block.</p>	<p>NE 399 Advanced Nursing Apprenticeship 1-2 cr.</p> <p>Offered: Winter</p> <p>Prerequisites: Registered nurse graduate accepted into nursing major.</p> <p>Application of clinical knowledge to a variety of settings. Directed apprentice activities in laboratory sections of undergraduate courses, specifically in the Nursing Technology Center. The RN to BSN student would work under the direction and supervision of the clinical instructor.</p> <p><i>Note: May be repeated in different settings. Not to exceed 4 credits total.</i></p>
	<p>NE 404 Human Sexuality for Health Care Providers 4 cr.</p> <p>Offered: Fall, Winter</p> <p>Prerequisites: NE 301 concurrently, junior standing or instructor's permission.</p> <p>Uses a developmental view of human sexuality to apply health teaching to a variety of sexual problems. This course is designed to meet the needs of those students who will provide sexual health care to clients in various settings.</p>

<p>NE 420 Community Health Nursing and Continuity of Care (Theory) 4 cr.</p> <p>Offered: Fall, Winter</p> <p>Prerequisites: NE 371 and NE 372, NE 381 and NE 382.</p> <p>Taken concurrently with NE 421, NE 422.</p> <p>The focus is the synthesis of nursing science and practice concepts for the promotion and preservation of the health aggregates (e.g. sub-populations, vulnerable populations, communities) as well as on issues related to providing effective seamless care to individuals, families and aggregates within the context of community resources and limitations. Content includes application of public health nursing principles, epidemiological investigation, knowledge of rural environments, health care economic influences, care management, as well as supervision and leadership in promoting desired health evaluation, outcomes in community and home environments.</p>	<p>NE 432 Management Concepts in Nursing (Clinic) 4 cr. (0-0-8)</p> <p>Offered: Fall, Winter</p> <p>Graded S/U</p> <p>Prerequisites: NE 420, NE 421 and NE 422.</p> <p>Taken concurrently with NE 431 and NE 435.</p> <p>The primary focus of the course is to provide the student with opportunities to apply the knowledge and skills for the development of leader/manager role. This involves the leader/manager skills necessary as provider/case manager of clients with complex health problems. The clinical experience is also intended to give the student opportunities to develop communication and collaboration skills which are necessary to function in both a structured and community environment.</p>
<p>NE 421 Community Health Nursing and Continuity of Care (Clinic) 4 cr. (0-0-8)</p> <p>Offered: Fall, Winter</p> <p>Graded S/U</p> <p>Prerequisites: NE 371, NE 372, NE 381 and NE 382.</p> <p>Taken concurrently with NE 420 and NE 422.</p> <p>Clinical experience in community health and community based nursing and in provision of community based care to individuals, families and aggregates in selected structured/unstructured environments. The focus is on application of NE 420 concepts to the provision of nursing care within the various role dimensions of community and home care nursing.</p>	<p>NE 435 Senior Nursing Seminar (Theory) 2 cr.</p> <p>Offered: Fall, Winter</p> <p>Prerequisites: NE 420, NE 421 and NE 422.</p> <p>Taken concurrently with NE 431 and NE 432.</p> <p>This course is designed to serve as a capstone experience wherein students synthesize theoretical and research-based knowledge from the physical and behavioral sciences, humanities, and nursing for the purpose of making critical judgments and creating holistic plans of care that demonstrate proficiency in meeting the B.S.N. program's terminal objectives and accreditation outcome criteria.</p>
<p>NE 422 Nursing Issues Seminar 2 cr.</p> <p>Offered: Fall, Winter</p> <p>Prerequisites: NE 371, NE 372, NE 381 and NE 382.</p> <p>Taken concurrently with NE 420 and NE 421.</p> <p>This course is designed to provide a forum to examine, analyze and develop positions on issues influencing current nursing practice. A variety of teaching/learning strategies will be utilized to explore topics pertinent to today's professional nurse.</p>	<p>NE 491 Nursing Practicum/Internship 1-4 cr.</p> <p>Offered: On demand.</p> <p>Prerequisites: Junior or senior nursing status, RN's accepted into the nursing major.</p> <p>Supervised clinical experience through university-arranged placements which would include in-patient, out-patient and/or community-focused agencies. The student would work under the direction and supervision of the clinical instructor and identified preceptors at the specified agencies.</p>
<p>NE 431 Management Concepts in Nursing (Theory) 2 cr.</p> <p>Offered: Fall, Winter</p> <p>Prerequisites: NE 420, NE 421 and NE 422.</p> <p>Taken concurrently with NE 432 and NE 435.</p> <p>The primary focus of this course is to provide the student with the requisite knowledge and skills for development of the leader/manager role. This involves leader/manager skills necessary as provider/case manager of clients with complex multidimensional health problems and communication and collaboration skills when functioning in the coordinator of health care role. As such the course focuses on the competencies needed in the delivery of health care services and those necessary to function within the organizational structure of various clinical and community settings.</p>	<p>NE 495 Special Topics in Nursing 1-4 cr.</p> <p>Offered: Winter</p> <p>Prerequisite: Junior standing and instructor's permission.</p> <p>Study of a particular topic reflecting special interest of students and instructor.</p> <p><i>Note: May be repeated for credit if topic varies.</i></p>
	<p>NE 498 Directed Study in Nursing 1-4 cr.</p> <p>Offered: On demand.</p> <p>Prerequisites: Junior standing and instructor and department head permission.</p> <p>Independent study by qualified undergraduates in an area to be defined by the student and instructor.</p>

OC-OCCUPATIONAL STUDIES

Technology and Occupational Sciences Department

OC 080V General Mathematics 4 cr.
Offered: On demand.

Remedial or developmental course. Does not meet requirements for associate or bachelor's degrees, but may meet requirements for vocational diplomas and certificates. Course is not calculated in the NMU grade point average and is not counted as earned credit hours toward an associate or bachelor's degree.

A review of whole numbers, decimals, fractions, ratio and proportion, and percent with emphasis placed on the application of these skills in technical, business and consumer environments. This course is primarily intended for students in vocational diploma-level programs whose secondary schooling did not include a background in mathematics sufficient to succeed in MA 090 Elementary Algebra, and for non-traditional students who find that their mathematical skills have diminished from lack of use in daily life.

OC 080 General Mathematics 4 cr.
Offered: On demand.

Remedial or developmental course. Does not meet requirements for associate or bachelor's degrees, but may meet requirements for vocational diplomas and certificates. Course is not calculated in the NMU grade point average and is not counted as earned credit hours toward an associate or bachelor's degree.

A review of whole numbers, decimals, fractions, ratio and proportion, and percent. Stress is placed on learning the basic concepts of algebra, use of formulas, the metric system, powers and roots of numbers and calculator use. Includes an introduction to geometry. This course is intended to serve students in certificate and degree programs that do not possess the skills necessary to succeed in MA 090, Elementary Algebra.

OIS-OFFICE INFORMATION SYSTEMS

College of Business

OIS 101 Keyboarding for Information Processing 1 cr.
Offered: Fall, Winter

Development of basic touch keyboarding skills for persons who will be using a computer for processing information. Course meets seven weeks.

OIS 103 Beginning Formatting 1 cr.
Offered: Fall, Winter
Prerequisite: OIS 101 or equivalent.

Development of keyboarding skills using the computer with major emphasis on formatting basic business letters, tables and reports. Course meets eight weeks.

OIS 121 Introduction to Business 4 cr.
Offered: Fall, Winter

Introduction to the principles, organizational structure and functions of the business system. Study of business careers, influence of business in the American culture, informed citizenship, human factors and the decision making process of business in a free enterprise system.

OIS 161 Word Processing I 4 cr.
Offered: Fall, Winter
Prerequisite: OIS 103 or equivalent.

This course introduces common business documents and basic word processing techniques. The student will have hands-on practice formatting and editing a variety of business documents such as correspondence, tables and reports. Keyboarding speed and accuracy skills will also be developed. In addition, effective use of the Microsoft Windows operating system, e-mail and the Internet will also be covered.

OIS 171 Medical Terminology 4 cr.
Offered: Fall, Winter

The terminology for each major body system is presented. Emphasis is placed on correct identification and spelling of the body systems and the commonly used disease and treatment terms for each system.

OIS 172 Diagnostic and Therapeutic Terminology 4 cr.
Offered: Winter
Prerequisite: Grade of "C-" or better in OIS 171.

Diagnostic and Therapeutic Terminology will enable the student to correctly identify and spell commonly used diagnostic, laboratory and medical procedure terminology. Emphasis will be on specialty areas such as radiology, pharmacology, nuclear medicine and pathology.

OIS 183 Business Administrative Procedures 4 cr.
Offered: Fall

Course deals with administrative and general business procedures for the office. Content includes efficient procedures for managing appointments, handling mail, telephone, office supplies and equipment, records processing, reprographics and customer service.

OIS 185 Introductory Software Applications 4 cr.
Offered: Fall, Winter

Students will develop basic skills in the operation of spreadsheet and database software. Spreadsheet competencies will include the principles of spreadsheet design, creating and formatting basic spreadsheets and charts, creating basic and advanced formulas and functions, and manipulating large spreadsheets. Database competencies will include database terminology, creating and manipulating files, creating queries, and creating and modifying forms and reports.

<p>OIS 190 Professional Development 3 cr. Offered: Fall, Winter</p> <p>This course is designed to help students take control of their lives by developing an awareness of their emotional, intellectual and physical potential. Through a process of self-development, students will discover their values, increase their commitment to professional goals and balance their technical skills with human relations competencies.</p>	<p>OIS 271 Medical Office Procedures 3 cr. Offered: Winter Prerequisites: Grade of "C-" or better in OIS 171, OIS 172, OIS 270 and OIS 183.</p> <p>A lecture/application course which emphasizes processing health information in ambulatory care setting, including but not limited to physicians' offices, outpatient surgery and medical clinics. Students will use office management skills as they apply to the health care industry.</p>
<p>OIS 244 Applied Office Communication 3 cr. Offered: Fall, Winter</p> <p>Development of skills in production of business messages for office personnel. Application of oral and written communication for office support personnel is emphasized. Not open to students who have completed MGT 344. It is recommended that students enroll in this course after the completion of EN 111 College Composition.</p>	<p>OIS 273 Medical Coding 3 cr. Offered: Winter Prerequisites: Grade C- or better in OIS 171, OIS 172, OIS 270, OIS 271, IS 270 and IS 271 or instructor's permission.</p> <p>A lecture/application course in which students develop entry-level medical diagnostic and procedural coding skills using current protocol like the International Classification of Diseases, Clinical Modification (ICD-CM) and Current Procedural Terminology (CPT). Emphasis is placed on accurate and ethical coding practices as they effect reimbursement for health care services.</p>
<p>OIS 261 Word Processing II 3 cr. Offered: Winter Prerequisite: Grade of "C-" or better in OIS 161.</p> <p>This course enables students to further develop production skill in the use of word processing software programs. Students will develop proficiency in advanced word processing techniques.</p>	<p>OIS 280 Introduction to Law, Legal Assistant 4 cr. Offered: Contact department for information.</p> <p>Introduction to the American legal system with an emphasis on the Michigan court system. Emphasis is on the role of the legal secretary in the law office.</p>
<p>OIS 263 Business Document Editing 4 cr. Offered: Fall, Winter Prerequisites: OIS 161</p> <p>This course is intended for students who are preparing to become experienced professionals in their chosen field of work or for anyone who writes, edits or prepares materials for distribution or publication. Emphasis is on grammar usage and the chief elements of style—punctuation, number expression, capitalization, word choices, abbreviations and plurals and possessives. Students will develop skill in processing text from oral to printed form by transcribing on the computer from recorded media or through the use of voice recognition software.</p>	<p>OIS 281 Legal Office Procedures 4 cr. Offered: Contact department for information. Prerequisites: OIS 261, OIS 262 and OIS 280.</p> <p>A course dealing with office duties of special interest to the legal secretary. Proper client relationships and legal ethics are emphasized. Practical experience is provided in the preparation of various legal documents.</p>
<p>OIS 266 Medical Transcription 3 cr. Offered: Fall Prerequisites: Grade of "C-" or better in OIS 161, OIS 162, OIS 171 and OIS 172.</p> <p>A course in which the student transcribes a variety of common medical reports covering a wide range of medical specialties from prepared tapes. It requires approximately 60 hours of machine transcription practice on materials such as the American Medical Records Association study tapes and other supplemental materials.</p>	<p>OIS 285 Advanced Software Applications and Integration 3 cr. Offered: Fall, Winter Prerequisites: OIS 185, OIS 261 and IS 105.</p> <p>Students will further develop their skills in using spreadsheet and database software programs. In addition, students will develop skills in integrating word processing, spreadsheet, database and presentation graphics documents. Emphasis will be on merging word processing and database files; linking and embedding worksheets and charts in word processing documents and presentation documents; analyzing database information in a spreadsheet program; and linking and embedding database information in a word processing or presentation document.</p>
<p>OIS 270 Health Information Processing 4 cr. Offered: Fall Prerequisites: Grade of "C-" or better in OIS 171 and OIS 172.</p> <p>This lecture/application course covers health information processing activities in hospital and other inpatient settings. Topics include, but are not limited to, organization of the health care industry, legal issues related to health information processing; assembly, analysis, filing, storage and retrieval of health information; and computer applications in health information processing.</p>	<p>OIS 291 Medical Transcription Internship 2 cr. Offered: Winter Prerequisites: Grade of C- or better in OIS 171, OIS 172 and OIS 266 or instructor's permission.</p> <p>This course is designed to enable students to develop proficiency as an entry-level medical transcriptionist through a medical transcription placement experience and a post-placement seminar.</p>

OIS 293 Integrated Office 4 cr.
 Offered: Fall, Winter
 Prerequisites: OIS 183, OIS 190, OIS 261 and OIS 262.

This course is designed to enable the student to reinforce office skills and develop new office skills through employment testing experiences, an office placement experience and comprehensive exit examinations. Students will gain experience in problem solving, performance appraisal and accepting responsibility. In addition, students will further develop communication skills and have the opportunity to develop and demonstrate initiative and a positive work attitude.

OIS 295 Special Topics in Office Information Systems 1-4 cr.
 Offered: Contact department for information.

A detailed study of one or more special topics in Office Information Systems.

OIS 296 Special Topics in Office Information Systems 1-4 cr.
 Offered: Contact department for information.
 Graded S/U

Detailed study of one or more special topics in Office Information Systems.

OIS 350 Methods and Materials in Teaching Business Education 4 cr.
 Offered: Fall
 Prerequisites: Admission to the methods phase of teacher education.

Orientation to the field of business education with attention given to objectives, procedures, instructional materials and evaluation as well as to keyboarding/typewriting, accounting, basic business subjects, economics, marketing, management, information technologies and office procedures/office block courses.

Note: May not be applied toward a non-teaching major or any minor in the College of Business.

OIS 450 Advanced Desktop Publishing 3 cr.
 Offered: Contact department for information.
 Prerequisites: IS 107, IS 207 and junior standing or instructor's permission.

This course builds on IS 107 Beginning Desktop Publishing and IS 207 Intermediate Desktop Publishing. Students will produce printed materials including brochures, newsletters, flyers and other communication documents in camera ready format for publication and distribution. Emphasis will be on understanding the printing process, planning the printed piece, design for effective communication and the use of color.

OIS 483 Studies in Business and Industry 1-4 cr.
 Offered: Contact department for information.
 Prerequisites: Junior standing and College of Business permission.

Coordinated work experience providing up-to-date skills in the area of specialization. Work experience evaluated for vocational endorsement. Each hour of work will apply as five hours toward vocational endorsement.

OIS 495 Special Topics in Office Systems and Business Education 1-4 cr.
 Offered: Contact department for information.
 Prerequisites: Junior standing or instructor's permission.

Topics based on the special interests of the students.

OIS 498 Directed Study 1-4 cr.
 Offered: Contact department for information.
 Prerequisites: Junior standing and College of Business permission.

Special individual project.

PE - PHYSICAL EDUCATION

Health, Physical Education and Recreation Department

PE 100 Rhythmic Movement Fundamental 0.5 cr.
 Offered: Fall

Students learn the skills, techniques and teaching aspects of rhythmic movement.

PE 101 Volleyball 0.5 cr.
 Offered: Winter

Students learn the skills, techniques and teaching aspects of volleyball.

PE 103 Tumbling Activities 0.5 cr.
 Offered: Winter

Students learn the skills, techniques and teaching aspects of tumbling.

PE 110 Introduction to Physical Education 2 cr.
 Offered: Fall, Winter

Designed for first year physical education majors/minors.

The heritage, philosophies, basic concepts, objectives, careers and educational interrelationships of physical education. Emphasis is upon the foundations of physical education and career alternatives.

PE 111 Introduction to Sports Science 1 cr.
 Offered: Winter

This course provides an overview of basic and applied research questions and career alternatives in the specific disciplines of sports science, including anatomical kinesiology, biomechanics, exercise physiology and sports nutrition. Since entry-level career positions usually require, as a minimum, graduate studies to the master of science level, a survey of graduate program designs and current related programs in North America will also be covered.

PE 199 Team Sports 0.5 cr.
 Offered: Fall

Students learn the skills, techniques and teaching aspects of team sports.

PE 200 Track and Field 0.5 cr.
 Offered: Winter

Students learn the skills, techniques and teaching aspects of track and field.

PE 201 Strength Training and Conditioning 0.5 cr.
 Offered: Winter

Students learn the skills, techniques and teaching aspects of strength training and conditioning.

<p>PE 205 Tennis 0.5 cr. Offered: Fall Students learn the skills, techniques and teaching aspects of tennis.</p>	<p>PE 296 Special Programs in Physical Education 1-4 cr. Offered: On demand. Graded S/U Prerequisites: Instructor's permission.</p>
<p>PE 207 Badminton 0.5 cr. Offered: Fall Students learn the skills, techniques and teaching aspects of badminton.</p>	<p>One or more special problems in physical education, explored and studied in detail.</p>
<p>PE 211 Dance Survey 1 cr. Offered: Fall A broad survey of traditional and exploratory dance experiences used in education, recreation and therapeutic settings for children and adults. PE 211 is intended primarily for physical education majors and minors.</p>	<p>PE 310 Measurement and Evaluation in Physical Education 3 cr. (2-0-2) Offered: Fall Prerequisite: PE 110 Analysis of the various kinds of tests and evaluative procedures used in physical education, with an emphasis on test selection, methods of administration and interpretation of results. Methods of improving grading practices in physical education are discussed.</p>
<p>PE 217 Motor Development and Elementary School Physical Education 3 cr. Offered: Winter Study of the growth and development characteristics of elementary school children and identification of suitable program content organized in a sequence of activities. In the lab period, students learn suitable teaching techniques and develop sequences of activities in the gymnasium. In addition, students work with a small number of elementary students on implementation of the proposed activities and evaluation of their suitability.</p>	<p>PE 315 Physiology of Exercise 4 cr. (3-0-2) Offered: Fall, Winter Prerequisites: BI 104, or BI 201 and BI 202, and HP 200. A basic course in exercise physiology designed to provide an understanding of the effect of exercise and human motion on the body and the adaptation of the body to physiological stress.</p>
<p>PE 224 Developmental Physical Education for Elementary Teachers 2 cr. Offered: Fall, Winter, Summer A study of the developmental characteristics of children, preschool through eighth grade and the appropriate types and kinds of physical activity that educate the child. This course is for elementary education majors only.</p>	<p>PE 317 Anatomical Kinesiology 2 cr. (1-0-2) Offered: Fall, Winter Prerequisites: BI 104 or BI 201. Theories relating to anatomical principles of human movement will be reviewed with applications to physical education, fitness and sports science. The primary focus will be on how muscular attachments impact the actions of muscles resulting in human movement.</p>
<p>PE 230 Fitness Leadership 2 cr. Offered: Fall, Winter Prerequisite: HP 200 and PE 201 or equivalent. An introduction to the skills and abilities necessary to effectively lead fitness activities in group and individual setting.</p>	<p>PE 318 Motor Learning and Secondary School Physical Education 3 cr. (2-0-2) Offered: Winter Prerequisite: PE 110 Study of motor learning and teaching methods applicable at the secondary level with emphasis on program selection and progression in the physical education curriculum. Students participate in motor learning experiments and on the development of suitable teaching techniques and sequences of activities in lab sessions.</p>
<p>PE 241 Prevention and Care of Injuries 2 cr. (1-0-2) Offered: Fall, Winter Prerequisite: BI 104 Study of symptoms, causes, prevention and immediate treatment of accidents and sudden illnesses that occur in the physical education and athletic setting.</p>	<p>PE 321 Athletic Officiating 2 cr. Offered: On demand. The mechanics and techniques of officiating sports, along with knowledge of the rules, interpretation and ethical procedures in handling controversial decisions.</p>
<p>PE 295 Special Programs in Physical Education 1-4 cr. Offered: On demand. Prerequisites: Instructor's permission. One or more special problems in physical education, explored and studied in detail.</p>	<p>PE 322 Theory of Basketball 2 cr. Offered: Fall, Winter Coaching philosophy, organization, individual skills, team techniques, rules and strategy of basketball.</p>

<p>PE 323 Theory of Football 2 cr. Offered: Winter</p> <p>Coaching philosophy, organization, individual skills, team techniques, rules and strategy of football.</p>	<p>PE 381 History of Dance 2 cr. Offered: On demand.</p> <p>Prerequisites: If taken as upper division liberal studies course, sophomore standing and completion of foundations of communication requirements.</p> <ul style="list-style-type: none"> • Satisfies part of the foundations of visual and performing arts requirement (minimum 3 credit hours needed to satisfy this requirement). • Satisfies part of the upper division liberal studies requirement (minimum 3 credit hours needed to satisfy this requirement). <p>Survey of the world history and pictorial records of dance in its ritual, social, recreational and aesthetic contexts. This course provides a basis for the study of twentieth century dance theories and forms.</p>
<p>PE 325 Theory of Swimming 2 cr. Offered: On demand.</p> <p>Analysis of fundamentals and techniques of coaching swimming, with emphasis on development of a team, conditioning, selection of candidates, organization of practice sessions, diet, strategy and promotion.</p>	<p>PE 383 Theory of Dance 2 cr. Offered: Winter</p> <p>Prerequisites: If taken as upper division liberal studies course, sophomore standing and completion of foundations of communication requirements.</p> <ul style="list-style-type: none"> • Satisfies part of the foundations of visual and performing arts requirement (minimum 3 credit hours needed to satisfy this requirement). • Satisfies part of the upper division liberal studies requirement (minimum 3 credit hours needed to satisfy this requirement). <p>Dance works of twentieth century artists, viewed from the perspective of the audience. The dances will be analyzed in terms of historic, social and aesthetic context. It is recommended that PE 381 and PE 383 be taken during the same semester.</p>
<p>PE 335 Theory of Volleyball 2 cr. Offered: On demand.</p> <p>Coaching philosophy, organization, individual skills, techniques, rules and strategy of volleyball.</p>	<p>PE 407 Apprentice Teaching 1 cr. Offered: Fall, Winter</p> <p>Prerequisite: Junior standing or instructor's permission.</p> <p>A field experience that physical education majors take just prior to student teaching. It involves a teaching experience in one of the following settings: (1) NMU activity classes, (2) NMU outreach classes, (3) public school physical education enrichment classes.</p>
<p>PE 340 Principles of Coaching 2 cr. Offered: Fall, Winter</p> <p>Students will learn concepts and principles of how to be an effective coach. Topics include organization, positive reinforcement, decision making, group cohesiveness and effective communication.</p>	<p>PE 411 Organization and Administration of Physical Education and Athletics 2 cr. Offered: Winter</p> <p>Prerequisite: PE 110, junior standing or instructor's permission.</p> <p>Discussion of budgets, facilities, equipment, supplies, scheduling, liability, coordinating areas and public relations.</p>
<p>PE 346 Adapted Physical Education 2 cr. Offered: Fall</p> <p>Prerequisite: PE 110</p> <p>Focuses on the preparation of physical education teachers to assist handicapped students who are participating in segregated classroom settings and mainstreamed or inclusive education. Included is an introduction to a variety of handicapping conditions and related medical terminology commonly found within the K-12 educational setting.</p>	<p>PE 417 Biomechanics 2 cr. Offered: Every other Winter.</p> <p>Prerequisites: PE 317 and PH 201 or PH 220, junior standing or instructor's permission.</p> <p>This course will provide the student who has a background in physics and anatomical principles with the opportunity to further develop these theories in movement analysis of exercise patterns, sports activity and everyday life. Current concepts and methods in biomechanics, including kinematics and kinetic techniques, will be studied and practiced.</p>
<p>PE 350 Methods and Materials in Teaching Physical Education 3 cr. Offered: Fall</p> <p>Prerequisites: Admission to the methods phase of teacher education and PE 110, PE 217 and PE 318.</p> <p>Focus on teaching methodology and synthesizing materials covered in PE 217 and PE 318. Lesson plans and units are developed and presented in an instructional setting.</p> <p><i>Note: May not be applied toward a non-teaching major or minor in physical education. May be applied to a secondary education physical education minor if required.</i></p>	

<p>PE 421 Physiological Aspects of Conditioning for Sport and Exercise 3 cr. Offered: Winter Prerequisite: PE 315, junior standing or instructor's permission.</p> <p>An in-depth review of the physiological bases of training to optimize performance in sport and physical activity, with practical guidelines for developing and modifying specific training programs for athletes and performers in a variety of sports and activities.</p>	<p>PE 489 Related Arts: Dance, Music, Art 2 cr. Offered: On demand. Prerequisites: Junior standing or instructor's permission.</p> <p>Introduction to the elements of basic design in the three arts, with special emphasis on the relationship of music and art to dance. The course is intended for prospective and practicing teachers of school arts and humanities programs; for leaders of creative, therapeutic and recreational programs; and for upper level students desiring interdisciplinary study in the fine and performing arts.</p>
<p>PE 422 Sport Biomechanics 2 cr. Offered: Every other Fall. Prerequisites: PE 317, PH 201, junior standing or instructor's permission.</p> <p>Provide student with technical knowledge of movement techniques in a variety of sports with a biomechanical perspective.</p>	<p>PE 491 Workshop in Physical Education 1-2 cr. Offered: On demand. Prerequisites: Junior standing or instructor's permission.</p> <p>Opportunities for concentrated study on selected professional content offered in a practical workshop format.</p>
<p>PE 444 Perceptual-Motor Learning 2 cr. Offered: On demand. Prerequisites: Junior standing or instructor's permission.</p> <p>Development of an understanding of perceptual-motor phenomena in learning. Intended for physical educators and persons responsible for conducting programs for children with learning disabilities. Emphasis is placed on the scientific foundations of development of programs and activities that enhance perceptual-motor development.</p>	<p>PE 492 Internship in Physical Education 1-2 cr. Offered: Fall, Winter. Prerequisites: instructor's permission.</p> <p>Supervised, practical experience in teaching physical education activities in an instructional setting or coaching.</p>
<p>PE 470 Psychological Aspects of Athletic Performance 2 cr. Offered: Winter Prerequisites: PY 100S, L, H, or G, junior standing or instructor's permission. Cross listed as PY 470.</p> <p>Study of psychological applications in the field of sports and coaching. Topics include behavioral coaching of motor skills, competition anxiety analysis and management, mental rehearsal techniques and aggression control.</p>	<p>PE 495 Special Programs in Physical Education 1-4 cr. Offered: On demand. Prerequisites: Junior standing or instructor's permission.</p> <p>One or more special problems in physical education, explored and studied in detail.</p>
<p>PE 471 Exercise Specialization in Adult Fitness and Cardiac Rehabilitation 2 cr. Offered: Fall Prerequisites: PE 315 and HP 200, junior standing or instructor's permission.</p> <p>Introduction to the theory and basis of graded exercise stress testing, exercise prescription and program development. Contemporary issues in the fitness field as well as the enhancement of professional credentials will be discussed.</p>	<p>PE 496 Special Programs in Physical Education 1-4 cr. Offered: On demand. Graded S/U Prerequisites: Junior standing or instructor's permission.</p> <p>One or more special problems in physical education, explored and studied in detail.</p>
<p>PE 472 Health and Exercise Leadership Skills 2 cr. Offered: Winter Prerequisite: PE 471, junior standing or instructor's permission.</p> <p>This course emphasizes practical application of the theoretical bases of health and fitness in the design and conduct of safe, effective and relevant health and fitness programs for a variety of populations.</p>	<p>PE 497 Directed Study in Physical Education 1-4 cr. Offered: On demand. Graded S/U Prerequisites: Junior standing or instructor's permission.</p> <p>Independent study in the subject area.</p>
	<p>PE 498 Directed Study in Physical Education 1-4 cr. Offered: On demand. Prerequisites: Junior standing or instructor's permission.</p> <p>Independent study in the subject area.</p>

PH - PHYSICS

Physics Department

PH 101 Eureka: Einstein, the Universe and Everything 3 cr.

Offered: Fall

- Satisfies the foundations of natural sciences/mathematics requirement.

A course in the "great ideas" of physics, for people with little or no technical background. The emphasis is on major concepts, how they were developed and how they affect our understanding of the natural world. It also includes some discussion of how they affect fields outside the sciences. Concepts include cause and effect, conservation laws, fields, relativity, cosmology, and quantum mechanics/uncertainty. The approach is primarily descriptive; an average ability in high-school algebra is sufficient for the mathematical aspects.

Note: This course may not be taken for credit toward the Physics major or minor.

PH 102 Physics of Sound and Music 3 cr. (2-0-2)

Offered: Winter

Prerequisite: High school algebra (freshmen year).

- Satisfies the foundations of natural sciences/mathematics requirement.
- Satisfies the laboratory course graduation requirement.

A course for students interested in learning about different aspects of sound: physical properties, generation, physiology of voice and hearing, how wind, string and percussion instruments work, concert hall acoustics, electronic generation of sound, recording (tape, cd), studio production. Included will be laboratory exercises involving the nature of waves, measurement and simple analysis.

Note: This course may not be taken for credit toward the Physics major or minor.

PH 201 College Physics I 5 cr. (3-1-3)

Offered: Fall, Winter, Summer

Prerequisite: College algebra or math placement equivalency.

Trigonometry highly recommended.

- Satisfies the foundations of natural sciences/mathematics requirement.
- Satisfies the laboratory course graduation requirement.

A first semester general introductory physics course. Topics include vectors, particle motion, Newton's laws of motion, conservation laws, gravitation, rotation, harmonic motion, sound, thermodynamics and fluids.

Note: This course may not be taken for credit toward the physics major or minor.

PH 202 College Physics II 5 cr. (3-1-3)

Offered: Fall, Winter

Prerequisite: PH 201

- Satisfies the foundations of natural sciences/mathematics requirement.
- Satisfies the laboratory course graduation requirement.

Topics include electricity, magnetism, DC and AC circuits, light, optical instruments, atomic structure and spectra, nuclear physics and radiation.

Note: This course may not be taken for credit toward the physics major or minor.

PH 220 Introductory Physics I 5 cr. (4-0-2)

Offered: Winter

Prerequisite: MA 161

- Satisfies the foundations of natural sciences/mathematics requirement.
- Satisfies the laboratory course graduation requirement.

The first semester of the introductory physics sequence designed for students majoring in physics, a physical science or engineering. Topics include vectors, kinematics, Newton's Law, dynamics, conservation laws, heat, thermodynamics, sound and fluids.

PH 221 Introductory Physics II 5 cr. (4-0-2)

Offered: Fall

Prerequisites: PH 220 and MA 163 or instructor's permission.

- Satisfies the foundations of natural sciences/mathematics requirement.
- Satisfies the laboratory course graduation requirement.

Continuation of PH 220. Topics include electrostatics, fields, potentials, current, magnetism, DC and AC circuits, electrical waves and geometrical and physical optics.

PH 295 Special Topics in Physics 1-4 cr.

Offered: On demand.

Prerequisites: instructor's permission.

Topics reflecting the special interests and needs of students. Designed for freshmen, sophomores and non-physics majors.

PH 320 Physical Electronics 4 cr. (3-0-3)

Offered: Every other Winter, odd years.

Prerequisite: PH 221

A course on electronic circuits with primary emphasis on basic building blocks of electronic instruments used in physical research. Topics include solid state devices, operational amplifiers, feedback, pulse forming networks, digital circuits and practical construction.

PH 322 Modern Physics 4 cr. (3-0-3)

Offered: Winter

Prerequisites: PH 221, MA 163 or instructor's permission.

Topics include the special theory of relativity, atomic physics, atomic spectra, nuclear physics, introductory quantum ideas and particle physics.

PH 330 Optics 4 cr. (3-0-3)

Offered: Every other Winter, even years.
Prerequisites: PH 221 and MA 163.

An intermediate lecture, problem and laboratory course dealing with geometrical and physical optics, physical principles underlying modern optical instruments and introductory quantum optics.

PH 360 Thermodynamics and Statistical Physics 3 cr.

Offered: Every other Winter, even years.
Prerequisite: PH 221, MA 361 is recommended.

A lecture and problem course on thermodynamics and statistical physics dealing with the laws of thermodynamics, kinetic theory, ensemble theory and the partition functions, including applications to chemical kinetics, phase transitions and low temperature processes.

PH 370 Mathematical Methods of Physics 3 cr.

Offered: Every other Fall, even years.
Prerequisites: MA 163 and PH 221.

Advanced mathematical techniques used extensively in physics will be presented. For example; vector operators, tensors, complex numbers and functions, special linear and partial differential equations and Fourier analysis.

PH 375 Analytical Mechanics 3 cr.

Offered: Every other Fall, even years.
Prerequisites: PH 220, concurrent or prior enrollment in MA 361 recommended. PH 370 recommended.

A classical (Newtonian) mechanics course covering particle motion in several dimensions, motions of systems of particles, rigid body motion, moving coordinate systems and mechanics of continuous media. Uses vector methods extensively.

PH 380 Intermediate Electricity and Magnetism 3 cr.

Offered: Every other Fall, odd years.
Prerequisites: PH 221 and MA 265. MA 361 and PH 370 recommended.

A course in classical electrodynamics. Topics include the development of Maxwell's equations and their solutions, including boundary value problems and radiation.

PH 393 Experimental Instrumentation and Analysis 4 cr. (3-0-3)

Offered: Every other Fall, odd years.
Prerequisite: A natural science laboratory class; CS120 or equivalent; MA 115 or MA 171 or equivalent.

A course designed for students planning careers in natural science beyond the technician level. Techniques for experimental data measurement and analysis are presented. These include data measurement, calibration and validity determination along with graphical and statistical analysis procedures. Particular emphasis will be given to computer interfacing for experiment control, data acquisition and analysis and display.

PH 410 Introductory Quantum Mechanics 3 cr.

Offered: Every other Winter, odd years.
Prerequisites: PH 322, PH 375 and MA 361. PH 375 may be taken concurrently; PH 370 is recommended, junior standing or instructor's permission.

An introduction to quantum mechanics. Topics include physical quantity determination in quantum physics, photons, material particles, quantum statistics, Schrodinger's equation and applications to simple systems, the eigenvalue-eigenvector equation of quantum physics and field quantization concepts.

PH 480 Senior Physics Seminar 1-2 cr.

Offered: Fall, Winter
Prerequisites: Senior class standing or instructor's permission and declared physics major.

Students will prepare and deliver a series of presentations on topics related to physics, astronomy or other interdisciplinary subjects approved by the Physics Department. The number of seminars will be determined by the number of credits for which the student is enrolled. The course may be taken for a maximum of two credits.

PH 495 Special Topics in Physics 1-4 cr.

Offered: On demand.
Prerequisites: Junior standing and department permission.
A course devoted to a special topic selected either for its current interest value or as a major piece of physics not covered in the normal curriculum.

PH 498 Directed Studies in Physics 1-4 cr.

Offered: On demand.
Prerequisites: Junior standing and department permission.
A course involving either 1) assisting a faculty member in research; 2) devising an advanced undergraduate physics laboratory experiment; or 3) preparing a written scholarly exposition of some physics related topic approved by the faculty adviser or research director. If option three is selected, the paper must be read and approved by three department faculty members.

Note: May be taken only once.

PIA - PARAPROFESSIONAL INSTRUCTOR'S AID

School of Education

PIA 100 Developmental, Physical and Cognitive Disabilities 2 cr.

Offered: Contact department for information.
Graded S/U
Prerequisite: Instructor's permission.

Designed to review specific types of developmental, physical and cognitive disabilities through an in-depth exploration of social and cultural issues. Specific disabilities which will be reviewed include: cerebral palsy, autism, mental retardation, epilepsy, Prade Willi, traumatic brain injury and various dual diagnoses disabilities.

<p>PIA 101 The Early Elementary Student 2 cr. Offered: Contact department for information. Graded S/U Prerequisite: Instructor's permission.</p> <p>An introduction to specific roles and responsibilities of early elementary special education (K through 3rd grade) instructional support professionals. Participants will become familiar with legislation and educational settings for early elementary special education children.</p>	<p>PIA 106 Positive Behavioral Supports 2 cr. Offered: Contact department for information. Graded S/U Prerequisite: Instructor's permission.</p> <p>An in-depth look at positive supports for children and young adults with challenging behaviors. Emphasis is placed on understanding behavior and responding to behavior through the use of positive supports. Participants acquire knowledge and skills related to behavioral principles, complete various types of functional assessments and learn to use a variety of non-aversive interventions and behavioral support techniques.</p>
<p>PIA 102 The K-12 General Education Curriculum 2 cr. Offered: Contact department for information. Graded S/U Prerequisite: Instructor's permission.</p> <p>An introduction to the fundamental elements of the K-12 academic curriculum including writing, language, mathematics and reading. Emphasis will be on the use of a variety of teaching strategies to facilitate learning (e.g. using computers or other teaching devices with students).</p>	<p>PIA 107 Person-Centered Planning: Transition Planning 1 cr. Offered: Contact department for information. Graded S/U Prerequisite: Instructor's permission.</p> <p>Outlines and illustrates person-centered planning as a means of translating the personal choices, desires and strengths of the special-needs student in planning for the future. The transition structure and support network will be explored.</p>
<p>PIA 103 Roles and Responsibilities of Paraprofessionals in the K-12 Setting 1 cr. Offered: Contact department for information. Graded S/U Prerequisite: Instructor's permission.</p> <p>An overview of the K-12 public school environment and the role of an instructional support paraprofessional in that structure. The course will introduce the concepts of team networking systems in the elementary, middle and high schools, e.g. who is on the special education team, their function, team effectiveness and the importance of communication in building teams.</p>	<p>PIA 108 The Educational "Team" 2 cr. Offered: Contact department for information. Graded S/U Prerequisite: Instructor's permission.</p> <p>Utilizes team building techniques to help the K-12 classroom teacher and the instructional support paraprofessional develop the optimal educational network system. Emphasis will be directed to team dynamics, effective communication skills, techniques for working with families and problem solving strategies.</p>
<p>PIA 104 Diversity in Human Development 2 cr. Offered: Contact department for information. Graded S/U Prerequisite: Instructor's permission.</p> <p>An overview of social and developmental issues related to the diversity of learning styles that exist among elementary school and secondary school learners. Participants will gain an understanding of kinds of learning styles and their impact on the delivery of course material in K-12 settings.</p>	<p>PIA 109 Practicum 4 cr. Offered: Fall, Winter, Summer Graded S/U Prerequisite: PIA 100 through PIA 108 and instructor's permission.</p> <p>A 60 clock-hour supervised "work experience" for paraprofessional staff with students with cognitive impairments or multiple impairments. The students will develop a program portfolio consisting of examples of their learning. A seminar format will be used in the delivery of the practicum.</p>
<p>PIA 105 The Legal and Service System 2 cr. Offered: Contact department for information. Graded S/U Prerequisite: Instructor's permission.</p> <p>Provides the participant with an overview of the various regulatory systems which govern, fund and evaluate children/adults with disabilities. Emphasis is placed on how direct service providers and instructional support professionals can support families.</p>	<p>PIA 110 Field Experience 2 cr. Offered: Fall, Winter, Summer. Graded S/U Prerequisite: PIA 100 through PIA 109 and instructor's permission.</p> <p>A 30 clock-hour supervised field experience for paraprofessional staff. The experience will include "best practice" classrooms (at the elementary and secondary levels) with students with visual impairments, hearing impairments or physical/health impairments.</p>

PL - PHILOSOPHY

Philosophy Department

PL 100 Introduction to Philosophy 4 cr.

Offered: Fall, Winter, Summer.

- Satisfies the foundations of humanities requirement.

Examination of some of the philosophical problems involved in understanding the relationship of humans to the world, the nature of existence, the problem of human existence, the problems of knowledge, logic and language, mind and matter and the nature of art, science and religion.

PL 160 Introduction to Logic 4 cr.

Offered: Fall, Winter.

- Satisfies the formal communication studies requirement.

An introduction to the basic principles of traditional and formal logic. Topics covered will include the nature of validity and proof, theory of the syllogism, propositional logic and quantification theory.

PL 180 Fundamentals of Ethical Theory 2 cr.

Offered: Fall, Winter, Summer.

- Satisfies the foundations of humanities requirement.

A study of the major approaches to such fundamental ethical questions as "What is the good of life?" and "What are our moral obligations?" By introducing students to the major approaches to ethics, this course prepares students to bring a theoretical perspective to the moral dilemmas discussed in the applied ethics courses for which it is a prerequisite. (PL 181 through PL 186.) This course is taught as a block course during the first half of each semester, so the typical student can register at the beginning of the semester for one of the other two-credit applied ethics courses as well as PL 180.

PL 181 Issues in Business Ethics 2 cr.

Offered: Fall

Prerequisite: PL 180

- Satisfies the foundations of humanities requirement.

An examination of such issues as the moral justification of the free market system, the ethics of advertising, employee rights and responsibilities, sexual harassment in the workplace, the moral responsibilities of the corporation and ethical issues of international business.

PL 182 Issues in Computer Ethics 2 cr.

Offered: Every third semester, Winter.

Prerequisite: PL 180

- Satisfies the foundations of humanities requirement.

An examination of such issues as protecting the right to privacy in the computer age, property rights in computer software, hacker ethics, determining responsibility for computer unreliability and freedom of expression on the Internet.

PL 183 Issues in the History of Ethics 2 cr.

Offered: Every third semester, Winter.

Prerequisite: PL 180

- Satisfies the foundations of humanities requirement.

A study of the writing of the great philosophers of the past and an exploration of questions such as the following: Are our moral judgments a product of reason as Kant claimed, or are they rooted in emotions as Hume argued? Are moral virtues the result of moral knowledge as Socrates claimed, or do they also require practice and strength of will?

PL 184 Issues in Legal Ethics 2 cr.

Offered: Fall

Prerequisite: PL 180

- Satisfies the foundations of humanities requirement.

An examination of such issues as legislating morality, pornography, plea bargaining, capital punishment, the legalization of drugs, ethics of punishment and ethics of police work.

PL 185 Issues in Medical Ethics 2 cr.

Offered: Winter

Prerequisite: PL 180

- Satisfies the foundations of humanities requirement.

An examination of such issues as abortion, euthanasia, the use of humans in medical experiments, justice in the distribution of health care, informed consent, the role and responsibilities of doctors and nurses, genetic engineering, mental illness and involuntary commitment.

PL 186 Topics in Theoretical Ethics 2 cr.

Offered: Every third semester, Fall.

Prerequisite: PL 180

- Satisfies the foundations of humanities requirement.

An examination of such issues as contemporary theories of justice, the search for objective moral standards in a multi-cultural world and the interconnection between science and ethics.

PL 200 History of Ancient and Medieval Philosophy 4 cr.

Offered: Every other Winter, even years.

- Satisfies the foundations of humanities requirement.

Introduction to the way people have understood themselves and the world. This course examines some of the main philosophic concepts, issues and problems and their earliest beginnings through a study of leading philosophers.

PL 210 History of Modern Philosophy 4 cr.

Offered: Every other Fall, odd years.

- Satisfies the foundations of humanities requirement.

The development of philosophy in the modern period, particularly from the seventeenth to the end of the nineteenth century. The primary focus of the course will be metaphysics and theory of knowledge. The development of social and political thought will also be discussed.

PL 270 World Religions 4 cr.

Offered: Fall, Winter.

- Satisfies the foundations of humanities requirement.
- Satisfies the world cultures requirement.

Study of the doctrines and the historical development of the major religions of the world. Included in this study are Christianity, Judaism, Islam, Hinduism, Buddhism, Confucianism and Taoism.

PL 280 Philosophy of Religion 4 cr.

Offered: Winter

- Satisfies the foundations of humanities requirement.

Pursuit of an understanding of the nature and meaning of religion and religious experience. The course deals with the problems of the nature and existence of God, the meaning of religious assertions and the nature of religious faith. Readings are drawn from traditional and contemporary sources.

PL 295 Special Topics in Philosophy 2-4 cr.

Offered: Contact department for information.

A study of a particular topic in philosophy. Primarily designed as a service course for those with limited backgrounds in philosophy who have an interest in a particular topic. The precise topic will be announced in the *Schedule of Classes* booklet.

Note: May be repeated for credit if topic varies.

PL 310 Social and Political Philosophy 4 cr.

Offered: Every third semester, Fall.

Prerequisites: Completion of the foundations of communication requirement and sophomore standing.

- Satisfies the foundations of humanities requirement.
- Satisfies the upper division liberal studies requirement.

An evaluation of personal conduct in relation to political, social and economic systems. Classical and modern texts are used to examine concepts such as individual rights, social duty, authority of the state, social justice and anarchy and to evaluate the ends of social organization.

PL 320 Philosophy of Science 4 cr.

Offered: Contact department for information.

Close examination of some of the basic concepts of the physical and social sciences and problems in the logic of scientific explanation, methodology, the character of scientific laws and theories, meaning and verifiability, inductions and probability, and causality.

PL 330 Existentialism 4 cr.

Offered: Every third semester, Winter.

Prerequisites: Completion of the foundations of communication requirement and sophomore standing.

- Satisfies the foundations of humanities requirement.
- Satisfies the upper division liberal studies requirement.

An analysis of human existence, an attempt to produce an objective description of what it is to be a human being. The origins of the movement in the writings of Kierkegaard and Nietzsche and the adoption of the phenomenological method by Heidegger and Jaspers are among the topics discussed.

PL 370 Theory of Knowledge: Classical and Contemporary 4 cr.

Offered: Contact department for information.

Pursuit of an understanding of the sources, nature, validity and significance of human knowledge. Epistemology examines the form of cognition, the problem of other minds, probability and induction, rationalism, British empiricism from Locke to Russell, logical empiricism and pragmatism.

PL 495 Special Topics in Philosophy 2-4 cr.

Offered: Contact department for information.

Prerequisites: Junior standing or instructor's permission.

A detailed study of an important philosopher, important text or philosophical problem. It is designed primarily for students majoring or minor-ing in philosophy.

Note: May be repeated for credit if topic varies.

PL 498 Directed Study in Philosophy 1-4 cr.

Offered: Contact department for information.

Prerequisites: Junior standing, at least one philosophy course and approval of the instructor.

Independent study by an individual or small group in an area, to be defined by student and instructor, not normally covered by the department's regular courses.

PMD - PRE MEDICAL/DENTAL SEMINAR

Physics Department

PMD 100 Premedical Predental Seminar 1 cr.

A series of presentations by health care professionals, designed to introduce students to available career options, professional school experience, training, ethics and government in health care.

Note: This course may not be taken for credit toward a major or minor in biology, biochemistry, chemistry or physics.

PN - PRACTICAL NURSING

Practical Nursing Department

PN 100 Introduction to Practical Nursing 2 cr.

Offered: Fall, Winter

Introduces students to the role and responsibilities of the practical nurse. Student study the history and trends of nursing and health care, ethical/legal issues, cultural aspects and therapeutic communication. The content includes stress/time management, current health care issues and leadership roles of practical nursing.

Note: Must be taken prior to PN 114 and PN 116.

PN 103 Basic Pharmacology Skills 1 cr.
Offered: Fall, Winter

Introduction to a core of knowledge basic to the safe administration of drugs to the hospitalized client. The course consists chiefly of theory, with several lecture sessions devoted to laboratory practice. Information gained about drug therapy from this course is reinforced in the following two semesters by additional theory and actual clinical practice.

PN 114 Fundamentals of Nursing-Lecture 4 cr. (8-0-0)
Offered: Fall

Prerequisite: Completion of the six prerequisite courses with a 2.0 or better. Blocked course taken the first 7 1/2 weeks fall semester.

Course represents the fundamental principles upon which nursing care is based and the nurse's role in carrying out the nursing process. Patient care is taught from the perspective of human needs and stages of development.

PN 116 Fundamentals of Nursing-Clinical 4 cr. (0-0-16)
Offered: Fall

Graded S/U

Co-requisite: Must be taken with PN 114.

Blocked course taken the first 7 1/2 weeks of fall semester.

Students will apply theoretical nursing knowledge to the mastering of basic nursing skills. The learning experience takes place in both the nursing arts lab and in health care facilities.

PN 117 Maternal/Child Nursing-Lecture 4 cr. (8-0-0)
Offered: Fall

Prerequisite: Completion of PN 114 and PN 116 with a 2.0 or better.
Co-requisite: PN 118

Blocked course taken the second 7 1/2 weeks of fall semester.

The study of the nursing care needs of maternity patients. Topics include the prenatal experience, labor experience and the postpartum experience. The needs of the newborn child through adolescence will be discussed.

PN 118 Maternal/Child Nursing-Clinical 4 cr. (0-0-16)
Offered: Fall

Graded S/U

Prerequisite: Completion of PN 114 and PN 116 with a 2.00 or better.
Co-requisite: PN 117

Blocked course taken the second 7 1/2 weeks of fall semester.

In this course the student cares for women who are pregnant, in labor and experiencing postpartum. The care of the normal newborn and special needs newborn is experienced. The care of the pediatric patient is experienced in acute care, ambulatory care and in community settings.

PN 119 Medical Surgical Nursing-Lecture 8 cr. (8-0-0)
Offered: Winter

Prerequisite: PN 114, PN 116, PN 117 and PN 118.
Co-requisite: PN 120

This course introduces students to major medical diseases and surgical experiences of the adult. Students will learn that nursing care is given in a variety of settings.

PN 120 Medical Surgical Nursing-Clinical 8 cr. (0-0-16)
Offered: Winter

Graded S/U

Co-requisite: PN 119

The student provides nursing care of the adult in medical, surgical, ambulatory and home care settings.

POR - PORTUGUESE

Modern Languages and Literatures Department

POR 110 Elementary Portuguese 4 cr.

Offered: Every other Fall, odd years.

Prerequisites: Completion of SN 102 or instructor's permission.

- Satisfies the formal communication studies requirement.

An introduction to all aspects of the Portuguese language (Brazilian). Students with an intermediate level of Spanish learn at an accelerated pace because of the similarities it shares with Portuguese. The emphasis in this course is on survival skills in everyday life situations and will cover present and past verb tenses and a basic vocabulary. The course will also include exposure to substantial components of Brazilian culture (music, art, film).

Note: SN 102 has the prerequisite of SN 101 or high school language experience.

POR 210 Intermediate Portuguese 4 cr.

Offered: Every other Winter, even years.

Prerequisites: POR 110 or instructor's permission.

- Satisfies the formal communication studies requirement.

An accelerated intermediate Portuguese course and a continuation of POR 110. It continues coverage of verb tenses, broadens students' Portuguese vocabulary and deepens student exposure to Brazilian culture.

PR - PUBLIC RELATIONS

Communication and Performance Studies Department

PR 231 Introduction to Public Relations 4 cr.

Offered: Fall

Co-requisite: PR 250

The theory and practice of public relations, its function in organizations and its role in society. Topics include the history, communication theories and ethics of public relations, areas of practice in public relations and career opportunities.

PR 250 Research in Public Relations 4 cr.

Offered: Fall

Prerequisite: Completion of EN 111 with a grade of "C-" or better.

Co-requisite: PR 231

This course introduces students majoring or minoring in public relations to the research and writing requirements of the field. Writing proposals is emphasized, as is consideration of career options in the field of public relations.

PR 295 Special Topics in Public Relations 1-4 cr.

Offered: On demand.
 Prerequisite: Instructor's permission.
 Study of a particular topic or problem in the area of public relations.
Note: May be repeated if topic differs.

PR 298 Directed Study in Public Relations 1-4 cr.

Offered: On demand.
 Prerequisites: Instructor and department head permission.
 Independent study in an area of public relations defined by the student and instructor.
Note: May be repeated for up to eight credits.

PR 330 Public Relations Message Design 4 cr.

Offered: Winter
 Prerequisites: EN 211, successful completion of the writing proficiency examination and a "C" or better in PR 231 and PR 250. instructor's permission will be granted only after an interview.
 Development of entry level skills in the preparation of messages unique to public relations practice. Included are: news release design, background reports, speech writing, brochure design, advocacy advertising, special event design and research designs appropriate to public relations. The emphasis is on professional development as students learn the techniques of message design, work under deadlines and examine the variety of message designs used by organizations.

PR 430 Public Relations Case Studies 4 cr.

Offered: Fall
 Prerequisites: A "C" or better in PR 330, junior standing or instructor's permission.
 Examination of how public relations is done by agencies and organizations. Both internal (employee-member) and external campaigns are examined to determine what standards of excellence exist in the practice of public relations. Expands the discussion of types of public relations practice begun in PR 231. Students will research, write and give an oral presentation of an original case study.

PR 431 Campaigns 4 cr.

Offered: Winter
 Prerequisites: PR 430 or ESPR 360 with a minimum grade of "C" and a speech theory course (SP 300, SP 310 or SP 401), junior standing or instructor's permission.
 Cross listed as ESPR 431.
 Focus on the technical and theoretical aspects of creating communication campaigns. Students are expected to develop a campaign and present it to a "client." Students will be assigned "clients" at the beginning of the semester and develop a five-phase campaign assignment including research designs, budgets, campaign concepts, post-campaign evaluation and an oral presentation.

PR 491 Practicum in Public Relations 1-8 cr.

Offered: On demand.
 Graded S/U
 Prerequisite: Junior standing and instructor's permission.
 Projects in the area of public relations under the supervision of a faculty member.

PR 492 Internship in Public Relations 1-8 cr.

Offered: On demand.
 Graded S/U
 Prerequisites: Grade point average of 2.75 or better, junior standing and instructor's permission.
 Practical, applied experience involving placement in a job situation.

PR 495 Special Topics in Public Relations 2-4 cr.

Offered: On demand.
 Prerequisite: Junior standing and instructor's permission.
 Study of a particular topic or problem in the area of public relations.
Note: May be repeated if topic differs.

PR 498 Directed Study in Public Relations 1-4 cr.

Offered: On demand.
 Prerequisites: Junior standing and instructor and department head permission.
 Independent study in an area of public relations to be defined by the student and instructor.
Note: May be repeated for up to eight credits.

PS - POLITICAL SCIENCE

Political Science and Public Administration Department

PS 101 Introduction to Political Science 4 cr.

Offered: Fall, Winter
 • Satisfies the foundations of social sciences requirement.

Study of theory, processes and institutions of politics and government in the modern world, with an emphasis on American institutions and politics.

PS 105 American Government 4 cr.

Offered: Fall, Winter
 • Satisfies the foundations of social sciences requirement.

Examination of the nature and workings of American government, with references to its federal character and practical applications.

PS 201 Methods of Public Policy Analysis 4 cr.

Offered: Fall
 Introduction to fundamentals of analyzing public policy problems, including consideration of analytical models and training in research and reporting methods. Students analyze a public policy problem through the use of qualitative and quantitative methods of research and reporting.

<p>PS 203 Comparative Government and Politics 4 cr. Offered: Fall</p> <p>Introduction to political institutions and processes as seen from a comparative perspective; consideration of the political development process in modern industrial society; comparative study of public policy. European case materials are emphasized.</p>	<p>PS 298 Directed Study in Political Science 1-4 cr. Offered: Contact department for information. Prerequisites: Instructor and department head permission.</p> <p>Individual directed study. Topic to be selected by the student and the instructor.</p>
<p>PS 206 International Relations 4 cr. Offered: Winter</p> <p>Study of the basic principles of international politics, international law, international organization and the theories of international relations. Influences shaping the foreign policy of states and patterns observable in state behavior are studied.</p>	<p>PS 299 Model U.N. 2 cr. Offered: Winter Prerequisite: PS 101 or PS 203 or PS 206 or instructor's permission.</p> <p>A simulation which involves a comparative analysis of the governments and policies of various nations of the world and how they interact with one another on a variety of issue areas in the setting of an international organization. Students accepted for this course will represent NMU at either a regional or national Model U.N. conference.</p> <p><i>Note: May be repeated for credit if topic differs. On transcripts, the course will appear as: Model U.N.-(country's name).</i></p>
<p>PS 207 History of Political Theory 4 cr. Offered: Winter</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. <p>Political philosophers and their philosophies, from Plato to the present. Studying their assumptions and their reasoning should help students to clarify their thinking. Class discussion is emphasized.</p>	<p>PS 303 Public Opinion and Voting Behavior 4 cr. Offered: Fall</p> <p>Survey of the determinants of voting behavior. The topics of public opinion and voting behavior are approached through a combination of reading and research. Students are provided a basic understanding of appropriate research techniques.</p>
<p>PS 215 Introduction to Law 4 cr. Offered: Fall, Winter</p> <p>An introductory course focusing on the main areas of law and the legal process. Primary emphasis is placed on the nature of law, the structure of the legal system, judicial recruitment and such specialized areas of law as civil and criminal procedure, torts, administrative law and contracts. Students learn to use such legal resources as court cases, legal digests, compiled laws and other governmental documents. Writing of appellate legal briefs and a moot court trial are also featured.</p>	<p>PS 309 State and Local Government 4 cr. Offered: Fall</p> <p>Study of state and local governments, including political systems and politics. Major emphasis is placed on the structure and operation of Michigan government and politics.</p>
<p>PS 294 Campaign Practicum 2-4 cr. Offered: Every other Fall.</p> <p>Students gain practical experience working on a local, state or national campaign, read from books and articles on political parties and elections, attend lectures, participate in discussions and write a reflective paper on their campaign experience.</p>	<p>PS 312 War and Peace in the 21st Century 4 cr. Offered: Every other Fall. Prerequisites: Completion of the foundations of communication requirement and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of social sciences requirement. • Satisfies the upper division liberal studies requirement. <p>Survey of factors shaping the development of strategic and tactical nuclear forces, combined with the study of theories of nuclear deterrence, arms control and disarmament.</p>
<p>PS 295 Special Topics in Political Science 1-4 cr. Offered: On demand.</p> <p>Individual or group study of a significant topic or problem in political science. The requirements of this course may be met by completing a course not ordinarily offered or through participation in seminars, colloquia, workshops, study abroad or directed reading.</p>	<p>PS 331 Judicial Process 4 cr. Offered: Fall</p> <p>An introduction to the judiciaries' participation in the resolution of social conflict. Topics covered include a study of the organization and staffing of courts, an examination of judicial power, an analysis of the distinctive methods that characterize judicial decision making and an appraisal of the proper functions of judges in a constitutional democracy.</p>
<p>PS 297 Mock Trial 2 cr. Offered: Fall Prerequisite: Instructor's permission.</p> <p>Students gain experience in civil and criminal litigation. All aspects of case preparation and trial advocacy, including legal research, witness examination, opening statements and closing arguments, are experienced. Students are required to role play as both attorneys and witnesses.</p>	

<p>PS 332 Administrative Law 4 cr. Offered: Every other Winter.</p> <p>Review of the legal and political influences on administrative decision-making. General topics include administrative rule-making, due process of law, the Administrative Procedures Act, judicial and congressional checks on administrative agencies and examination of specific areas of administrative law, such as fair employment practices, environmental protection, handicapped law and sex discrimination.</p>	<p>PS 402 Political Economy 4 cr. Offered: Summer Prerequisites: Junior standing or instructor's permission.</p> <p>Political economy studies the interplay between the political and the economic. This course surveys several dimensions: 1) the distributional impact of government; 2) a topic in comparative or international political economy; and 3) the application of the "economics model" to American social and political phenomena. Students will also have the opportunity to pursue a topic of their choosing.</p>
<p>PS 340 International Organizations 4 cr. Offered: Winter</p> <p>A study of the structures, roles and function of international governmental and non-governmental organizations. Organizations studies will include the United Nations, the World Trade Organization, the International Monetary Fund and global environmental regimes.</p>	<p>PS 404 Politics of East and Southeast Asia 4 cr. Offered: Every other Fall. Prerequisite: PS 101 or PS 203 or PS 206 , junior standing or instructor's permission.</p> <ul style="list-style-type: none"> • Satisfies the world cultures requirement. • Does not satisfy the upper division liberal studies requirement. <p>A comparative analysis of the governments and politics in the nations of East and Southeast Asia. This objective is accomplished through a series of readings, discussions, lectures and papers on topics of current political importance as they relate to the nations of the "Pacific Rim" (China, Japan, Korea, Taiwan, Vietnam, Thailand, Malaysia, Indonesia, the Philippines, etc.).</p>
<p>PS 341 Social Welfare Policy 4 cr. Offered: Fall, Winter. Prerequisites: SW 240 or instructor's permission. Primarily for social work majors and social welfare minors. Cross listed as SW 341.</p> <p>Study of issues in current social welfare policy and of the significance of social, economic and political factors that influence policy-making and implementation. In addition, students also learn various techniques of policy evaluation and review.</p>	<p>PS 406 Legislative Politics 4 cr. Offered: Winter Prerequisites: Junior standing or instructor's permission.</p> <p>Study of the role and functions of legislative bodies in the American political system. Through emphasis on contemporary problems, the course clarifies the struggle between Congress and President for control of the decision-making capability.</p>
<p>PS 350 Methods and Materials in Teaching Social Studies Education 4 cr. Offered: Fall Prerequisites: Admission to the methods phase of teacher education. Co-requisite: Concurrent enrollment in ED 349.</p> <p>Study of the objectives of social studies at the secondary level. The organization of subject matter, the use and evaluation of materials and the development of classroom procedures and techniques.</p> <p><i>Note: May not be applied toward a non-teaching major or minor in political science. May be applied to a secondary education political science minor if required.</i></p>	<p>PS 407 Principles of Public Administration 4 cr. Offered: Winter Prerequisites: Junior standing or instructor's permission.</p> <p>Introduction to theory and practice in the management of public affairs. Particular emphasis is placed upon several themes and conceptual problems consistently appearing in the professional literature of public administration, such as politics of administration, bureaucratic efficiency and administrative responsiveness and responsibility. Selected case studies are used where appropriate.</p>
<p>PS 401 Seminar in Public Policy Analysis 4 cr. Offered: Every other Fall. Prerequisites: Junior standing or instructor's permission.</p> <p>Basic theories and methods of public policy analysis. Student understanding is accomplished through a series of readings, projects, discussions and lectures on topics of current political importance, such as health, environment, transportation, education and welfare.</p>	<p>PS 411 American Political Thought 4 cr. Offered: Fall Prerequisites: Completion of the foundations of communication requirement, junior standing or instructor's permission.</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. • Satisfies the upper division liberal studies requirement. <p>An overview of American political thought. The focus of the course will be on critical formative periods such as the American Revolution, the Civil War and the Industrial Revolution. Readings will include selected writings and speeches of key American statesmen. Class discussion is emphasized.</p>

PS 415 Politics of American Foreign Policy 4 cr.

Offered: Every other Fall.

Prerequisites: Completion of the foundations of communication requirement, junior standing or instructor's permission.

- Satisfies the foundations of social sciences requirement.
- Satisfies the upper division liberal studies requirement.

Development of an analytical capability for understanding and evaluation of American foreign policy today and in the immediate future. Study is focused on contemporary institutions and regional problem areas.

PS 430 American Constitutional Law and Politics 4 cr.

Offered: Winter

Prerequisites: Junior standing or instructor's permission.

Study of the basis of constitutional government and the judicial exposition of its principles, with emphasis on the freedom of expression, defendants' rights, religious liberty, due process of law and the application of equal protection of the laws and minority rights.

PS 490 Senior Seminar 2 cr.

Offered: Winter

Prerequisites: Senior standing, Political Science Department major or minor.

Students will demonstrate their understanding of political administration, legal concepts and theories.

PS 491 Internship in Public Policy or Law 2-12 cr.

Offered: On demand.

Graded S/U

Prerequisites: Junior standing or instructor's permission.

Practical experience working in a national, state or local government office, public interest group, corporate office, or a public or private law office. Participation in the course may involve a full commitment of time for the entire semester. Only eight credits may be applied toward a political science or public administration major. Only four credits may be applied toward a political science or public administration minor.

PS 495 Special Problems in Political Science 1-4 cr.

Offered: On demand.

Prerequisites: Junior standing or instructor's permission.

Individual or group study of a significant topic or problem in political science. The requirement of this course may be met by completing a course not ordinarily offered or through participation in seminars, colloquia, workshops, study abroad or directed reading.

PS 498 Directed Study in Political Science 1-4 cr.

Offered: On demand.

Prerequisites: Junior standing and instructor and department head permission.

Individual directed study on a topic to be selected by the student and the instructor.

PSCR-PUBLIC SAFETY/LOCAL CORRECTIONS

Technology and Occupational Sciences Department

PSCR 010 Corrections Academy 10 cr.

Offered: On demand.

A 160-hour program designed to prepare individuals for employment as local corrections officers through their fulfillment of all the basic training objectives set forth by the Michigan Correctional Officers Training Council (MCOTC).

PSCR 011 Legal Update Training 0.5 cr.

Offered: On demand.

An eight-hour program designed to make local corrections officers aware of the latest changes in the laws, which govern their actions.

PSCR 012 Special Topics in Local Correction 0.5-4 cr.

Offered: On demand.

A variable-credit course designed to accommodate the treatment of, among others, current issues, trends and technological developments in law enforcement.

PSLE-PUBLIC SAFETY/LAW ENFORCEMENT

Technology and Occupational Sciences Department

PSLE 010 Legal Update Training 0.5 cr.

Offered: On demand.

An eight-hour program designed to make the officers aware of the latest changes in the laws which they enforce and which govern their actions.

PSLE 011 Precision Driving 1.5 cr.

Offered: On demand.

A 24-hour program designed to teach participants safe and competent emergency vehicle operation within the parameters of the motor vehicle code.

PSLE 012 Precision Driving Update 0.5 cr.

Offered: On demand.

An eight-hour refresher program designed to refresh participant's understanding of safe and competent emergency vehicle operation within the parameters of the motor vehicle code.

PSLE 013 Evidence Technician Update/Crime Scene Processing 1.5 cr.

Offered: On demand.

A 24-hour program designed to teach participants new or improved methods of evidence collection, preservation, packaging and health related concerns. The program will also evaluate the participant's ability to process a crime scene correctly.

<p>PSLE 014 Advanced Law Enforcement Training 2 cr. Offered: On demand.</p> <p>A 32-hour multifaceted program designed to expand upon participant's basic police training in a condensed highly effective time sensitive manner. Modules included in the training are: first aid and CPR techniques, blood and airborne pathogens, AED training, domestic violence update, hazardous materials update, building searches/alarm calls, defensive tactics, drug identification, ethics, vehicle searches for contraband, crime scene for the patrol officer, precision driving update, felony stops.</p>	<p>PSLE 020 Standard Field Sobriety Tests 1.5 cr. Offered: On demand.</p> <p>A 24-hour course designed to give the officer a better understanding of the effects of alcohol and other drugs have on an individual's ability to operate a vehicle in a safe and legal manner. Every department in the State of Michigan will be required to utilize the MSP Alcohol reporting form. This form utilizes the SFST form of field sobriety checks. The Upper Peninsula will have the need to train most of their officers in this technique.</p>
<p>PSLE 015 Evidence Technician Training 5 cr. Offered: On demand.</p> <p>An 80-hour program designed to prepare the participants for their role in the locating, identifying, photographing, collecting, preserving and packaging evidence found at a crime scene. The program will also evaluate the participant's ability to process a crime scene correctly.</p>	<p>PSLE 021 At Scene Crash Investigation 5 cr. Offered: On demand.</p> <p>An 80-hour course designed to familiarize the trainee with the necessary techniques and methods used in processing a crash scene.</p>
<p>PSLE 016 Internal Affairs and Handling Discipline 1.5 cr. Offered: On demand.</p> <p>A 24-hour course containing a 16-hour program designed to teach participants new or improved methods of conducting internal affairs investigations and an eight-hour program designed to help administrators design internal discipline plans. The program will also evaluate the participant's ability to properly document the information gathered.</p>	<p>PSLE 022 Firearms Instructor School 2.5 cr. Offered: On demand.</p> <p>A 40-hour program designed to prepare participants to effectively conduct in-service training programs.</p>
<p>PSLE 017 Computer Fraud/Computer Related Crimes 1.5 cr. Offered: On demand.</p> <p>A 24-hour course containing an eight-hour program designed to teach participants methods of conducting computer crimes investigations for the novice and a 16-hour program designed to demonstrate advanced investigative techniques in computer related crimes. The program will also evaluate the participant's ability to properly conduct and document the information gathered.</p>	<p>PSLE 023 Terrorism Awareness for the First Responder 0.5 cr. Offered: On demand.</p> <p>A four-hour program designed to inform first responders (Law Enforcement Officers) of proper procedures in handling a terrorist incident.</p>
<p>PSLE 018 Basic Mountain Bike Patrol Course 2 cr. Offered: On demand.</p> <p>A 32-hour program designed to teach participants new or improved methods of providing bicycle patrol and safe, effective operation. The program will also evaluate the participant's ability to operate a mountain bike during varying conditions and types of patrol which will reduce liability to municipalities.</p>	<p>PSLE 024 Clandestine Drug Lab Awareness 0.5 cr. Offered: On demand.</p> <p>A four-hour program designed to inform law enforcement officers about the signs, precautions and handling of illegal drug labs.</p>
<p>PSLE 019 Prism Weapons Simulator 0.5 cr. Offered: On demand.</p> <p>An eight-hour program made from 400 available one-hour sessions designed to assist the officer with firearm skills, departmental policies and shoot/don't shoot decision making.</p>	<p>PSLE 025 Advanced Tactical Pistol Course 2.5 cr. Offered: On demand.</p> <p>A 40-hour program designed to enhance the officer's ability to utilize his or her handgun in varying situations.</p>
	<p>PSLE 026 Patrol Rifle/Shotgun Course 2.5 cr. Offered: On demand.</p> <p>A 40-hour program designed to prepare participants in the use of those rifles and shotguns suitable for law enforcement.</p>
	<p>PSLE 027 First Line Supervisors Training 1 cr. Offered: On demand.</p> <p>A 16-hour program to introduce the new law enforcement supervisor to the most important aspects of supervision. The new supervisor will learn the importance of communication and interpersonal relationship skills in dealing with subordinates and management. After the seminar, the new supervisor will be empowered to confidently and competently perform his or her duties within the agency.</p>
	<p>PSLE 028 Ethics: Principles of Policing 0.5 cr. Offered: On demand.</p> <p>A six-hour program designed to familiarize the participants with the ethical issues of police work and its related effects on the officer.</p>

PSLE 029 Basic Radar Operator 2.5 cr.
Offered: On demand.

A 40-hour program designed to teach the participants the proper set-up and operation of a traffic radar instrument.

PSLE 030 Basic Photography 1.5 cr.
Offered: On demand.

A 28-hour course designed to instruct the trainee on the proper use of his or her cameras to consistently take the best possible pictures by taking advantage of all the camera controls, lens and films available to them.

PSLE 031 Reid Technique of Interviewing and Interrogation 1.5 cr.
Offered: On demand.

A 24-hour course designed to give the participant tools necessary to conduct thorough interviews and interrogations.

PSLE 032 Advanced Reid Technique of Interviewing and Interrogation 0.5 cr.
Offered: On demand.

An eight-hour course designed to give the participant tools necessary to conduct thorough advanced interviews and interrogations. Demonstrate the skills necessary to bring the REID Techniques to the next level through advanced techniques.

PSLE 033 Special Topics in Law Enforcement 0.5-4 cr.
Offered: On demand.

A variable credit course designed to accommodate the treatment of, among others, current issues, trends and technological developments in law enforcement.

PT-POWER AND TRANSPORTATION

Technology and Occupational Sciences Department

PT 160 Basic Automotive Repair for Consumers 4 cr. (2-0-4)
Offered: Fall, Winter

A course to provide an opportunity for the consumer of automotive goods and services to be aware of the operation, service and maintenance of basic automotive systems. It also provides students with the basic skills necessary to maintain and service automobiles and light trucks.

PT 162 Steering, Suspension and Alignment 4 cr. (2-0-6)
Offered: Winter

Introduction to the theories and service techniques of the many different steering, suspension and alignment systems used on today's cars and light trucks. Systems include conventional and power assisted steering systems, traditional and more advanced suspension control systems and alignment techniques.

PT 163 Vehicle Brake Systems 4 cr. (2-0-6)
Offered: Fall

Introduction to the theories and repair techniques of vehicle braking control systems. Units of instruction in theory and service to drum, disk, anti-lock and support systems found on domestic and import automobiles and light trucks.

PT 164 Major Engine Repair-Gas and Light Diesel 4 cr. (2-0-6)
Offered: Fall

A course in the service, repair and design principles of gasoline and light diesel engines. Units include operating principles, systems and design of major engine components. Other units deal with diagnostics, replacement, repair and reconditioning (including machine processes) of the major engine components.

PT 166 Automotive Power Trains 4 cr. (2-0-6)
Offered: Fall

A course in the theory, service and repair of power train components used in passenger cars and light trucks. Units of instruction include standard transmissions, drive lines, axles, transaxles, differentials and four wheel drive systems.

PT 170 Basic Automotive Electricity 4 cr. (2-0-4)
Offered: Fall

This course is a prerequisite for PT 264 and PT 272. Areas of instruction will cover basic electricity, magnetism, basic electronic components, fundamentals of batteries and automotive wiring systems.

PT 260 Automatic Transmission Repair 4 cr. (2-0-6)
Offered: Winter

A study into automatic transmissions, their components and systems. Instruction is provided in the repair, service and diagnostic procedures used in servicing vehicle automatic transmissions.

PT 262 Automotive Fuel and Emission Control Systems 4 cr. (2-0-6)
Offered: Fall

This course is designed to provide instruction in fundamentals, operation, trouble shooting, testing and servicing of the fuel and emission control systems.

PT 264 Engine Performance and Diagnostics 4 cr. (2-0-6)
Offered: Winter

Prerequisite: PT 170 or instructor's permission.

This course is designed to provide students with skills in troubleshooting and repairing drive ability problems with automobile computerized engine management systems. The use of scan tools and computer self-diagnosis will be stressed.

PT 268A Automotive Service Repair 4 cr. (2-0-6)

Offered: Winter

This course is designed to explore the various areas of automotive service. Students will practice making repairs and participate in all aspects of an auto service facility. Operation, managing, customer relations, tools, equipment and actual repair techniques used in an auto service center will be stressed. This course will be the capstone for the automotive service students, giving them the opportunity to practice and apply information learned in all previous automotive courses.

PT 268B Automotive Service Repair 4 cr. (2-0-6)

Offered: Winter

Students participating in the internship are responsible for finding a position working under a Master Technician for a minimum of eight hours per week for 15 weeks. The department and automotive faculty monitor the student's progress to ensure the student is gaining knowledge and experience comparable to the lab objectives of the PT 268 class. The student is required to attend the lecture segment of the class and meet all other requirements of the course syllabus.

PT 272 Advanced Automotive Electrical and Electronics 4 cr. (2-0-4)

Offered: Winter

Prerequisite: PT 170

This course gives students the opportunity to develop the technical knowledge and skills necessary to diagnose and service modern automotive electrical systems. Emphasis will be placed on electrical testing techniques and the use of test equipment.

PY-PSYCHOLOGY

Psychology Department

PY 100S Psychology as a Natural Science 4 cr.

Offered: Fall, Winter

Repeats PY 100L, H or G.

- Satisfies the foundations of natural sciences/mathematics requirement.

Introduction to the natural science of behavior and to the scientific principles and content areas of psychology. This course includes a focus on the philosophy and methodology of science, using selected problems from psychology as examples for application and demonstration.

Note: Does not meet the laboratory course graduation requirement.

PY 100L Psychology as a Natural Science with Laboratory 4 cr. (3-0-2)

Offered: Fall, Winter, Summer

Repeats PY 100S, H or G.

- Satisfies the foundations of natural sciences/mathematics requirement.
- Satisfies the laboratory course graduation requirement.

Content similar to PY 100S with added laboratory experience.

PY 100H Honors Psychology as a Natural Science 4 cr. (3-0-2)

Offered: Fall

Repeats PY 100S, L or G.

- Satisfies the foundations of natural sciences/mathematics requirement.
- Satisfies the laboratory course graduation requirement.

Content similar to PY 100S with added laboratory experience and individual research opportunities.

PY 100G Psychology as a Social Science 4 cr.

Offered: Contact department for information.

Repeats PY 100S, L or H.

- Satisfies the foundations of social sciences requirement.

Content similar to PY 100S. This course is more general in approach than PY 100S, L or H and does not provide laboratory experiences or demonstrations.

Note: Usually offered only as an off-campus course.

PY 102 Individual and Family Relationships 3 cr.

Offered: Fall

Use of personal and family resources, human and material, to achieve more satisfying individual and family living. Consideration of relationships within the family. Needs, responsibilities, human sexuality and changing roles of members throughout the family life cycle.

PY 156 Developmental Child-Related Services 2 cr.

Offered: Winter

This course is designed to acquaint students with the specific services that are available for young children and their families. The major emphasis of this course will be on the special needs child and the legislation that has impacted the kind and extent of services provided by the early childhood caregiver.

PY 170 Educating the Young Child 2 cr.

Offered: Fall, Winter

An overview of the early childhood education field, including an introduction to its historical roots, current theories/practices, program models and issues and trends in the field. It is designed to give students a comprehensive view of the critical educational elements pertinent to working with young children.

PY 203 Applied Behavior Analysis 4 cr.

Offered: Fall, Summer

Prerequisite: PY 100S, L, H or G.

The study and application of learning and conditioning procedures to human behavior. An emphasis on management and modification of behavior in various situations as influenced by the needs of the class.

PY 204 Physiological Psychology 4 cr. (3-0-2)

Offered: Fall, Winter

Prerequisite: PY 100S, L, H or G or BI 111.

- Satisfies the foundations of natural sciences/mathematics requirement.
- Satisfies the laboratory course graduation requirement.

Study of the biological bases of behavior with emphasis on central nervous system anatomy and physiology and its relation to various psychological functions, drug effects and neuropsychological disorders, with structured laboratory experience.

PY 205 Introduction to Research Methods in Psychology 4 cr.

Offered: Winter

Prerequisite: PY 100S, L, G or H or BI 111.

An introduction to the methods and designs used to acquire knowledge within the psychological sciences, both causal (i.e., controlled experimental) and non-causal (e.g., survey, correlation, naturalistic observation). Design and methodology will be presented, as will a discussion of the strengths and weaknesses of each. Additional topics will include literature searching and evaluation, scientific report writing and research ethics.

PY 211 Learning 4 cr. (3-0-2)

Offered: Fall, Winter, Summer

Prerequisite: PY 100S, L, H or G.

The study of basic learning processes from simple conditioning to thinking and understanding, with laboratory replication of important animal and human learning phenomena.

PY 235 Psychology of Gender 4 cr.

Offered: Fall

Prerequisite: PY 100S, L, H or G or instructor's permission.

Review of research on gender and an examination of its impact on personal lives. Topics include biological aspects of sex differences and similarities, social development and maintenance of sex role stereotypes, consequences of sex roles, and sex role influences in mental health. Both female and male perspectives will be examined.

PY 241 Child Psychology 4 cr. (4-0-Arr)

Offered: Fall, Summer

Prerequisite: PY 100S, L, H or G.

Survey of topics in child psychology from prenatal development through adolescence with emphasis on current empirical data and practical applications for parenting, education and nursing. Interpretation of research reports and techniques for objective analysis of children's behavior are also included. Laboratory experience is included when appropriate.

PY 245 Infant/Toddler Development 4 cr. (3-0-2)

Offered: Winter

Prerequisite: PY 241

Examines the theoretical/empirical research and practical experience relating to the first three years of life. The course will trace the ontogenesis of various developmental processes including parent-child relationships; peer relationships; early socialization patterns of young children; individualized learning, language and personality; and motor, social and other abilities. Observing and recording the behavior/development of an infant or young child is also included.

PY 247 Infant/Toddler Programming 2 cr. (1-0-2)

Offered: Fall

Prerequisite: PY 241

This course is intended to provide students with an in-depth view of programming requirements, administration, planning and curriculum for infants/toddlers, ages zero to three, in a child-care setting. Areas covered are administration, staffing, developmental curriculum, working with families and program evaluation.

PY 255 Sexual Behavior: Psychological Perspectives 4 cr.

Offered: Winter

Prerequisite: PY 100S, L, H or G.

Examination of sexual behavior from historical, cross-cultural and contemporary viewpoints. The focus is on psychological perspectives and implications of this material for the student so as to lead to knowledgeable personal decision making. Additional emphasis is placed on current sex therapies and sex research.

PY 270 Activity Planning I: The Creative Arts 2 cr.

Offered: Winter

Prerequisite: PY 170; PY 241 or instructor's permission.

The purpose of the course is to develop active learning experiences that reflect the interest, impulses and capacities of the young child. The course will emphasize the creative arts—drama, movement, fine arts and language arts—of the early childhood curriculum.

PY 272 Activity Planning II: The Sciences 2 cr.

Offered: Winter

Prerequisite: Taken concurrently with PY 270; PY 241.

This course is the application of teaching concepts used in the teaching of the sciences to young children. Emphasis will focus on incorporating a foundational knowledge of the sciences—physical, social and natural into the early childhood curriculum.

PY 285 Developmentally Appropriate Program/Practice (DAPP) 4 cr.

Offered: Winter

Prerequisite: PY 241; can be taken concurrently with PY 270 and PY 272.

The purpose of this course is to prepare the student for the role of classroom teacher in an early childhood setting. Emphasis will be placed on the generation of developmentally appropriate teaching strategies/materials used in effective early childhood programs.

<p>PY 290 DAPP Field Experience 4 cr. (1-0-12) Offered: Fall, Winter Graded S/U Prerequisite: PY 270; PY 272; PY 285.</p> <p>This course will provide the opportunity for students to practice and integrate the skills taught in the previously taken courses through a mentor providing quality child care programming. The field experience provides a minimum of 180 clock hours of supervised time with young children at an identified child-care site. A weekly seminar will aid in problem-solving classroom experiences. Students will be supervised by both an on-site child-care provider and a university field coordinator.</p>	<p>PY 302 Causes and Control of Aggression 4 cr. Offered: Fall Prerequisites: PY 100L, S, H or G and one of the following: PY 203, PY 204, PY 211 or PY 241 or instructor's permission.</p> <p>Study of the factors that influence aggression, including possible biological, environmental and social influences. The aggression and violence that occur in various settings will be considered in light of these influences, and methods for preventing and controlling aggression will be discussed.</p>
<p>PY 291 Topics in Applied Psychology 1-4 cr. Offered: On demand. Prerequisites: PY 100S, L, H or G and instructor's permission.</p> <p>A series of courses and workshops varying in type of applied topic.</p> <p><i>Note: May be repeated. When taught as Junior Seminar, enrollment is limited to majors in psychology.</i></p>	<p>PY 304 Animal Behavior 4 cr. (4-0-2) Offered: Fall Prerequisite: PY 204 or PY 211 or instructor's permission.</p> <p>An ethological survey of behavioral forms and mechanisms displayed by various animal species, taken from a psycho-biological and evolutionary point of view. Laboratory and field investigations included.</p>
<p>PY 295 Special Topics in Psychology 1-4 cr. Offered: On demand. Prerequisite: PY 100S, L, H or G.</p> <p>The formal study of content areas of psychology that have a research or theoretical base but that are not regularly offered as part of the curriculum.</p> <p><i>Note: May be repeated if topic differs.</i></p>	<p>PY 305 Psychological Statistics 4 cr. (4-0-Arr) Offered: Fall, Winter, Summer Prerequisite: Junior standing or instructor's permission.</p> <ul style="list-style-type: none"> • Satisfies the formal communication studies requirement. • Satisfies the upper division liberal studies requirement. <p>The interpretation and application of basic descriptive statistics and an introduction to statistical inference, including chi square and analysis of variance. Computer laboratory experience included when appropriate.</p>
<p>PY 296 Special Topics 1-4 cr. Offered: On demand. Graded S/U Prerequisite: Freshmen or sophomore standing only.</p> <p>Basic course in area of study.</p>	<p>PY 311 Thinking and Cognition 4 cr. (4-0-Arr) Offered: Fall Prerequisite: PY 100S, L, H or G. PY 204 or PY 211 recommended.</p> <p>Survey of methods, findings and theories regarding cognitive functions, including such topics as perception, attention, memory, language, thought, judgment and choice. Laboratory investigations included.</p>
<p>PY 297 Directed Research/Directed Study 1-4 cr. Offered: On demand. Graded S/U Prerequisite: Written department permission.</p> <p>Directed individual laboratory research of current problems in psychology.</p>	<p>PY 313 Introduction to Linguistic Theory 4 cr. Offered: Every other Fall. Prerequisite: EN 211, junior standing or instructor's permission. Cross listed with EN 313.</p> <p>An introduction to modern (Chomskyan) linguistics as the foundation of empirical psycholinguistics. This course emphasizes morphological, syntactic and semantic analyses of language and language behavior.</p>
<p>PY 298 Directed Research/Directed Study 1-4 cr. Offered: On demand. Prerequisite: Written department permission.</p> <p>Directed individual laboratory research of current problems in psychology.</p>	<p>PY 320 Psychological Measurement 4 cr. (4-0-Arr) Offered: Contact department for information. Prerequisites: PY 100S, L, H or G and junior standing.</p> <p>The basic theory of measurement techniques, including test selection and construction, interpretation and use of test results, and types of testing programs. Lab experience is included when appropriate.</p>
<p>PY 299 Apprenticeship 1-2 cr. Offered: Fall, Winter, Summer and on demand. Prerequisite: Written department permission.</p> <p>Directed apprentice activities in laboratory sections of courses, in research and in service.</p> <p><i>Note: May be taken twice.</i></p>	<p>PY 335 Social Psychology 4 cr. (3-0-2) Offered: Fall, Winter, Summer Prerequisite: PY 100S, L, H or G.</p> <p>A focus on social facilitation, interpersonal attraction, group processes, leader behavior, attitude measurement and attitude change, inter-group conflict, helping behavior and environmental psychology with both field and laboratory research.</p>

<p>PY 344 Lifespan Developmental Psychology 4 cr. Offered: Fall Prerequisite: PY 100S, L, H or G.</p> <p>The study of lifespan development brings together and applies knowledge from psychology (e.g., physiological, perceptual, personality, cognitive and social psychology) and related fields (e.g., developmental neurology, genetics) to better understand the needs and critical issues facing humans from conception through old age and death. Physical, intellectual and socioemotional domains of development and the interaction between domains will be the focus of discussion, as will the importance of environmental variables (e.g., parenting styles, socioeconomic status, culture) in ensuring healthy development and adaptive behavioral, cognitive and emotional adjustment across the lifespan.</p>	<p>PY 353 Psychology of Aging in the Family 4 cr. Offered: Every other Winter.</p> <p>A human needs approach to the aging process with focus upon individual, family and community planning for the middle and later years of life. Emphasis is placed upon the following topics: developing potentialities, building interpersonal relationships, fulfilling housing, recreation and life enrichment needs, understanding and maintaining health and nutritional needs, study of clothing style and construction, alterations in housing and household needs, resource management and concerns of the caretaker role and community service for successful aging.</p>
<p>PY 345 Psychology of Exceptional Children 4 cr. Offered: Every other Winter. Prerequisites: PY 100S, L, H or G and junior standing.</p> <p>Examination of selected principles, procedures and issues pertaining to the etiology, diagnosis and treatment of children who have intellectual, physical or social-emotional impairments.</p>	<p>PY 355 Abnormal Psychology 4 cr. Offered: Fall Prerequisites: PY 100S, L, H or G and junior standing, or instructor's permission.</p> <p>Examination of the variety of patterns of disordered or dysfunctional behavior and the perspectives through which they may be understood and a consideration of relevant theory, research and treatment techniques.</p>
<p>PY 350 Observation/Assessment of Children 2 cr. (1-0-2) Offered: Fall Prerequisite: PY 241</p> <p>This course is designed to acquaint the early childhood professional with a variety of methods/procedures used to observe, record and assess the behavior of young children. Observational techniques are compared, and their applications to the curricular problems and research issues faced by teachers are identified. Critical issues in early developmental assessment are identified and addressed. The course assists students in becoming knowledgeable in types of assessment measures and diagnostic support services available for families.</p>	<p>PY 358 Meaning and Development of Play 4 cr. (3-0-2) Offered: Fall Prerequisite: PY 241</p> <p>This course will explore the meaning and development of play from infancy through adulthood. It will also examine the various manifestations of play, (solitary activity, socio-dramatic play and games with rules) in light of developmental and education concerns.</p>
<p>PY 351 Psychology of Personality 4 cr. Offered: Winter Prerequisites: PY 100S, L, H or G and junior standing or instructor's permission.</p> <p>The basic principles of psychology involved in the development, assessment and modification of personality and a description and analysis of major personality theories.</p>	<p>PY 360 Introduction to Clinical Psychology 4 cr. Offered: Fall Prerequisites: PY 351 or PY 355 and junior standing, or instructor's permission.</p> <p>An introduction to the field of clinical psychology including the history, current trends, educational requirements, training, assessment procedures and therapeutic interventions.</p>
<p>PY 352 Child Guidance Techniques 4 cr. Offered: Fall Prerequisite: PY 241</p> <p>Techniques for organizing and sustaining a positive atmosphere for children and adults in the preschool learning environment.</p>	<p>PY 390 Western Childhood 4 cr. Offered: Fall Prerequisites: Completion of the foundations of communication requirement and junior standing.</p> <p>Study of childhood in a historical perspective, which explores how images of children and childhood reflect the prejudices and aspirations of human culture. Includes readings and viewings in history, literature, anthropology, art and film.</p>
	<p>PY 399 Advanced Apprenticeship 1-2 cr. Offered: On demand. Prerequisite: Written department permission.</p> <p>Directed apprentice activities in laboratory sections of courses, in research and in service.</p> <p><i>Note: May be repeated for a total of four credits. However, the total combined credit for PY 299 and PY 399 may not exceed six credits.</i></p>

<p>PY 400 History and Systems 4 cr. Offered: Fall, Winter Prerequisites: PY 204 or PY 211 and junior standing or instructor's permission. Majors should take this course in their senior year. Examination of the philosophical and historical roots of psychology culminating in an analysis of current major theoretical perspectives of modern scientific psychology.</p>	<p>PY 435 Advanced Social Psychology 4 cr. (3-1-2) Offered: Winter Prerequisites: PY 335 and junior standing, or instructor's permission. Focus on researched topics in social psychology, with attention to research design, development of a research proposal and independent laboratory and field research activity.</p>
<p>PY 401 Behavior-Genetic Analysis 4 cr. Offered: Contact department for information. Prerequisites: PY 100S, L, H or G and junior standing or instructor's permission. PY 305 and biology courses in genetics and evolutionary theory recommended. The study of the interactions of genotypes and environments in the production of phenotypes and behavior. This course explores the biological and environmental evidence for the concept of individuality; the definition and misinterpretation of interactions; the use and misuse of measurement in description, classification, prediction and control of human behavior; and the implications of a behavior-genetic analysis for science, psychology, society and the individual. Understanding of the biological and psychological perspectives of individuality will be emphasized throughout this course.</p>	<p>PY 436 The Psychology of Organizational Behavior 4 cr. (3-1-0) Offered: Winter Prerequisite: PY 335 recommended, junior standing or instructor's permission. A focus on empirically researched areas of organizational behavior, including performance management, leader behavior, organizational environments, feedback, etc., and on implementing programmatic changes through the use of researched psychological techniques. Field and laboratory investigations included when appropriate.</p>
<p>PY 403 Behavior Assessment and Evaluation 4 cr. (4-0-2) Offered: Winter Prerequisites: PY 203, one 300-level psychology course and junior standing, or instructor's permission. Analysis of the behavior of individuals and society with emphasis on intervention procedures that are effective in bringing about behavior change. Where applicable, the course includes opportunities for students to engage in field experience and research with strong emphasis on reviews of research exploring effectiveness of intervention strategies and techniques.</p>	<p>PY 441 Individual Differences In Development 4 cr. Offered: Contact department for information. Prerequisites: PY 205, PY 241, PY 305, PY 320 or equivalents and junior standing or instructor's permission. The application of the idiosyncratic methodological approach as applied to the understanding of individual differences in development, incorporating multi-disciplinary study of physical, cognitive and psychosocial domains of development.</p>
<p>PY 404 Advanced Physiological Psychology 4 cr. (3-0-2) Offered: Fall Prerequisites: PY 204 and junior standing or instructor's permission. Seminars on relevant topics, selected by students, including independent laboratory experience involving bio-behavioral or sensory processes of humans or other animals.</p>	<p>PY 455 Psychopathology 4 cr. Offered: Winter Prerequisites: PY 355 and junior standing or instructor's permission. Selected topics in psychopathology central to an advanced examination of the variety of patterns of disordered or dysfunctional behavior and the perspectives through which they may be understood, as well as a consideration of relevant theory, research and treatment techniques.</p>
<p>PY 410 Sensation and Perception 4 cr. Offered: Contact department for information. Prerequisites: PY 204 and junior standing, or instructor's permission. Scientific exploration of sensory and perceptual phenomena with emphasis on relevant psychological laws, neurological mechanisms, the relationship between brain function and mental experience, and the practical implications of each. Laboratory investigation of methods and phenomena.</p>	<p>PY 458 Introduction to Small Group Processes 4 cr. Offered: Contact department for information. Prerequisite: Two 300-level psychology courses, junior standing or instructor's permission. Consideration of scientific theory and research on small group processes from both an applied and research perspective.</p>
<p>PY 411 Learning Processes 4 cr. (3-0-2) Offered: Winter Prerequisites: PY 211 and junior standing or instructor's permission. Advanced principles of learning processes, related theories and research, with laboratory and independent research activity.</p>	<p>PY 460 Administration of Preschool Programs 2 cr. Offered: Winter Prerequisites: PY 156, PY 270, PY 272 and PY 352, junior standing or instructor's permission. Study of program development, implementation and control. Operational topics include staffing, licensing, certification requirements, equipment and facilities for operating a preschool education facility.</p>

PY 470 Psychological Aspects of Athletic Performance 2 cr.
Offered: Winter
Prerequisites: PY 100S, L, H or G, junior standing or instructor's permission.
Cross listed as PE 470.

Study of psychological applications in the field of sports and coaching. Topics include behavioral coaching of motor skills, competition anxiety analysis and management, mental rehearsal techniques and aggression control.

PY 490 Seminar 1-4 cr.
Offered: Fall
Prerequisites: Junior standing and instructor's permission. When taught as Senior Seminar, enrollment is limited to psychology majors who have previously taken Junior Seminar.

Study of topics currently being researched by members of the department with special attention to the background, research findings, theoretical implications and heuristic value of the problem under study.

Note: May be repeated.

PY 491 Practicum/Seminar in Psychology 4 cr. (1-0-12)
Offered: Contact department for information.
Prerequisite: Senior standing; PY 241; 270 and 272; 290.

The purpose of this course is to reinforce and integrate the skills and knowledge that must be maintained to build on the traditions and practices used by most community agencies and child-care facilities. This course provides the opportunity to carry out practical activities with people directly employed in the human service setting, providing services for young children and families.

PY 492A Practicum 1-4 cr.
Offered: Contact department for information.
Prerequisites: PY 203 or PY 211, PY 403 junior standing and written department permission.

Experience for advanced students in applying behavioral techniques. Students are typically required to perform daily work in local settings in addition to attending course meetings. Students must demonstrate knowledge from PY 403 in the following areas: proper methodology in observing and recording behavior, ethical sensitivity and accountability through the use of single subject designs.

Note: May be repeated for a total of four credits.

PY 492B Advanced Practicum 1-4 cr.
Offered: Contact department for information.
Prerequisites: PY 492A, junior and written department permission.

Continuing and more advanced experience in applying behavioral techniques for students who have successfully completed PY 492A.

Note: May be repeated for a total of four credits.

PY 495 Special Topics in Psychology 1-4 cr.
Offered: Contact department for information.
Prerequisites: Junior standing and instructor's permission.

Formal study of content areas of psychology that have a research or theoretical base but that are not regularly offered as part of the curriculum.

Note: May be repeated if topic differs.

PY 496 Special Topics in Psychology 1-4 cr.
Offered: Contact department for information.
Graded S/U
Prerequisites: Junior standing and instructor's permission.

Formal study of content areas of psychology that have a research or theoretical base but are not regularly offered as part of the curriculum.

Note: May be repeated.

PY 497 Directed Research/Directed Study 1-4 cr.
Offered: Contact department for information.
Graded S/U

Prerequisites: Junior standing and department permission.

Directed individual laboratory research of current problems in psychology. This course requires regular meetings with the instructor throughout the semester.

Note: May be repeated.

PY 498 Directed Research/Directed Study 1-4 cr.
Offered: Contact department for information.
Prerequisites: Junior standing and department permission.

Directed individual laboratory research of current problems in psychology. This course requires regular meetings with the instructor throughout the semester.

Note: May be repeated.

RE - RECREATION

Health, Physical Education and Recreation Department

RE 110 Introduction to Leisure and Recreation 2 cr.
Offered: Fall, Winter

Introduction to leisure and recreation and the leisure service profession. Includes historical and current concepts, theories and philosophies of leisure, recreation and play; historical development of public and private resources for leisure and recreation and exploration of career opportunities.

RE 155 Outdoor Living Skills 2 cr. (1-0-2)
Offered: Fall, Winter

Introduction to basic outdoor living and camping skills. Major topic areas include tool craft, rope craft, cooking and fires, health and safety, map and compass, gear and shelters and environmental awareness. The course will require a minimum of one extended camping trip.

<p>RE 191 Professional Development Seminar I 0.5 cr. Offered: Winter Prerequisites: RE 110 and declared ORLM major or minor.</p> <p>A seminar designed to introduce new students to the major and/or minor; provide for the initial development, updating, monitoring and assessment of professional and academic portfolios; provide a forum for open dialogue among students and between faculty and students; and provide the infrastructure to conduct all course work, procedures and requirements associated with field work, internship and plans of study.</p>	<p>RE 291 Professional Development Seminar II 0.5 cr. Offered: Winter Prerequisites: RE 191</p> <p>A seminar designed to provide for the continued development, updating, monitoring and assessment of professional and academic portfolios; provide a forum for open dialogue among students and between faculty and students; and provide the infrastructure to conduct all course work, procedures and requirements associated with field work, internships and plans of study.</p>
<p>RE 250 Education in Outdoor Settings 3 cr. Offered: Fall, Winter Prerequisite: RE 110 or instructor's permission.</p> <p>An overview of the history, theory, philosophy, types, components and resources of educational programs in outdoor settings. Introduction to primary programs which include, but are not limited to outdoor education, adventure/challenge education, experiential education, environmental education and organized camping. Introduces students to basic natural environmental concepts. Provides an overview of the professional field and career opportunities in those settings.</p>	<p>RE 294 Field Work (A, B, C and/or D) 1-2 cr. Offered: Fall, Winter, Summer Prerequisites: RE 110, RE 191, RE 250 and/or RE 270 strongly recommended or concurrent enrollment. ORLM majors only. Grade point average of 2.50 required in major core courses.</p> <p>This course is designed to give students supervised practical experience in a professional setting. Emphasis is placed on leadership responsibilities of planning, conducting and evaluating activities.</p> <p><i>Note: May be repeated for a total of 3 credit hours.</i></p>
<p>RE 251 Adventure Activities, Facilitation and Group Behavior 3 cr. Offered: Fall, Winter Prerequisites: RE 110 and RE 250.</p> <p>This course will cover areas relating to group process and development, as well as group facilitation skills, including attending, reflecting, framing, use of metaphor, front-loading and debriefing. Discussion includes the transfer of learning and the direct experience and skill development of facilitating adventure type activities such as new games, initiatives, low and high ropes courses and the climbing wall.</p>	<p>RE 295 Special Topics in Leisure 1-4 cr. Offered: On demand.</p> <p>Detailed study of one or more special problems in leisure.</p>
<p>RE 261 Leadership and Pedagogy in Leisure Services 3 cr. Offered: Fall, Winter Prerequisites: RE 110 and RE 250.</p> <p>Fundamentals and techniques of recreation and educational leadership in leisure services. Focus is on leadership theory, development of basic leadership and programming skills, teaching approaches and strategies and related legal issues. Provides hands-on leadership and teaching experiences.</p>	<p>RE 296 Special Topics in Leisure 1-4 cr. Offered: On demand. Graded S/U</p> <p>Detailed study of one or more special problems in leisure.</p>
<p>RE 270 Outdoor Recreation Resources, Behavior and Values 3 cr. Offered: Fall, Winter Prerequisite: RE 110</p> <p>Studies resources, policies and history of governmental agencies and non-governmental organizations with involvement in outdoor recreation opportunity provision. Examines human behavior in the natural environment and the benefits that humans as individuals and as a society derive from this interaction. Course content set in context of Outdoor Recreation Systems Model. Provides an overview of career opportunities.</p>	<p>RE 297 Directed Study in Leisure 1-4 cr. Offered: On demand. Graded S/U</p> <p>Independent study with research.</p>
<p>RE 277 Introduction to Wild Land Firefighting 2 cr. Offered: Winter</p> <p>An introduction to wild land fire designed to train firefighters in basic fire behavior and tactics that will aid them in the safe and effective control of wild land fires.</p>	<p>RE 298 Directed Study in Leisure 1-4 cr. Offered: Contact department for information.</p> <p>Independent study with research.</p>
	<p>RE 352 Wilderness First Responder 3 cr. (2-0-2) Offered: Fall</p> <p>Covers CPR, body systems, trauma management for extended periods, environmental emergencies, equipment improvisation, patient assessment, toxins, wilderness rescue and backcountry medicine. CPR and WFR certifications offered. Includes lectures, practical sessions and rescue simulations.</p>

- RE 356 Wilderness Education Association Wilderness Stewardship** 2 cr.
 Offered: Summer
 Prerequisites: RE 155 strongly recommended. Department permission required.
 An extended trip in a local area based upon the Wilderness Education Association's 18-point curriculum. The course focuses on outdoor leadership, group dynamics, expedition behavior, low-impact camping and environmental ethics. Students successfully completing this course receive a one-year membership in the Wilderness Education Association and a Wilderness Steward Program Certificate of Completion. Extra fees required for food, equipment use and WEA fees.
- RE 357 Teaching of Canoeing** 2 cr.
 Offered: Fall
 Prerequisites: instructor's permission, RE 155, current certification from HL 242 or in WFR, EMT or WEMT. Successful completion of a swimming test administered in conjunction with the class.
 Coverage of all aspects of tandem and solo flat water canoeing and the basics of FreeStyle canoeing and Omering. Focuses on the development of skills and judgment needed to teach safe canoeing and lead day canoe trips. Includes equipment selection and care, transportation, trim, strokes and maneuvers, safety and rescue, tripping, canoe games and teaching experiences. Counts as an American Canoe Association (ACA) Instructor Development Workshop for students who meet ACA requirements. The course is conducted in the field at various canoeing sites.
- RE 358 Teaching of Rock Climbing** 2 cr.
 Offered: Contact department for information.
 Prerequisites: RE 155 and instructor's permission.
 An experiential introduction into all aspects of technical free rock climbing. Starts with basic techniques and progresses through beginner climbs to more difficult routes requiring intermediate climbing techniques. A primary objective is the development of skills and judgments necessary to teach the activity to others. The core is conducted in the field over an eight day period at one or more climbing areas during early summer (spring) session.
- RE 362 Program Design in Leisure Services** 3 cr.
 Offered: Winter
 Prerequisites: RE 110, RE 250, RE 251, RE 261 and RE 270.
 Study of the principles, practices and organization of leisure programs. Major topics include program classification systems, activity selection, program formats, needs assessments, program operation strategies and evaluation of programs. The course includes the selection, development, implementation and evaluation of a leisure service program.
- RE 371 Protected Area Management** 3 cr.
 Offered: Winter
 Prerequisites: RE 270 or instructor's permission and eight credits of natural science (non-human biology, earth science, chemistry, physics or astronomy).
 Studies the techniques and strategies used to manage the physical resources, visitors and services in protected areas. Course content set in the context of the Outdoor Recreation Systems Model.
- RE 381 Interpretation I: Foundations and Guided Services** 4 cr.
 Offered: Fall
 Prerequisites: AIS 101, RE 261 and RE 270. Four to eight credits from history or anthropology and four to eight credits from natural science (non-human biology, earth science, chemistry, physics or astronomy) for a total of twelve credits.
 Develops skills and knowledge in environmental and historical interpretive services. Explores foundations and primary elements of interpretation. Students gain theoretical understanding of and practical experience in planning, implementing and evaluating all types of performance interpretation including interpretive talks, conducted walks and tours and interpretive events. Includes living history.
- RE 382 Interpretation II: Self-guided Media** 3 cr.
 Offered: Winter
 Prerequisites: RE 381; competency in computer presentation and publication software; EN 211 and completion of the writing proficiency exam; sixteen credits in a mix of natural science and history and/or anthropology courses.
 Develops skills and knowledge in environmental and historical interpretive services. Students gain theoretical understanding of and practical experience in planning, implementing and evaluating all types of self-guided interpretive services including publications, exhibits, signs, self-guided tours and trails and multimedia presentations.
- RE 391 Professional Development Seminar III** 0.5 cr.
 Offered: Winter
 Prerequisites: RE 291
 A seminar designed to provide for the distribution, development, updating, monitoring and assessment of professional and academic portfolios; provide a forum for open dialogue among students and between faculty and students; provide the infrastructure to conduct all course work, procedures and requirements associated with field work, internships, and plans of study; and provide an infrastructure for students to prepare for RE 491.
Note: May be repeated.
- RE 410 Leisure Through the Ages** 2 cr.
 Offered: Fall
 Prerequisite: Senior standing or instructor's permission.
 Survey course of the literature, art, music and media that impacts the leisure and outdoor recreation profession.

<p>RE 450 Adventure Program Planning and Management 3 cr. Offered: On demand. Prerequisites: RE 110, RE 250, RE 251, RE 261, RE 270, RE 362, and concurrent or after RE 461, junior standing or instructor's permission.</p> <p>Theoretical, philosophical and historical perspectives of outdoor adventure programs. Provides experience in planning and developing adventure program components. Examines selected aspects of administration and management of adventure programs, including legal concerns.</p>	<p>RE 467 Evaluation/Research in Leisure Services 3 cr. Offered: Fall Prerequisites: RE 362 or RE 371 or RE 381; PY 305 or equivalent and junior standing.</p> <p>Principles and procedures for conducting evaluation and evaluation research in leisure services and resources.</p>
<p>RE 455 WEA National Standard Program I 2 cr. Offered: Summer Prerequisites: Junior/Senior standing and instructor's permission; RE 155, RE 250, RE 356, HL 242 or RE 352, or WFR, or WEMT; RE 251 or RE 261 strongly recommended.</p> <p>An introduction to expedition planning. Major topics include: route selection, menu planning and rations, transportation and logistics, equipment, emergency procedures and forms, liability and risk management, expedition behavior, and leadership and judgment. Students will plan and organize expeditions (RE 456 WEA National Standard Program II; and RE 457 WEA National Standard Program III). This is the first in a three-course series to meet WEA requirements for outdoor leadership certification.</p>	<p>RE 480 Interpretive Services Planning and Management 4 cr. Offered: Contact department for information. Prerequisites: RE 371, RE 381, RE 382, GC 225; concurrent with or after RE 461. Computer mapping competencies recommended (GC 230 recommended), junior standing or instructor's permission.</p> <p>Examines and practices the process of interpretive master planning for new and existing protected areas. Applies management practices and procedures to issues that arise at interpretive centers.</p>
<p>RE 456 WEA National Standard Program II 2 cr. Offered: Summer Prerequisites: RE 455, junior standing or instructor's permission.</p> <p>An extended expedition designed to learn, practice and teach specific land and/or water-based outdoor skills. This is the second in a three-course series to meet WEA National Standard Program for outdoor leadership certification requirements and is planned and organized in RE 455. Extra fees required for food, equipment use, WEA membership fees and program/camping fees.</p>	<p>RE 491 Professional Assessment Seminar 0.5 cr. Offered: Contact department for information. Prerequisites: Declared ORLM major, senior standing and instructor's permission required.</p> <p>The Outdoor Recreation Division Comprehensive Exam and other assessment instruments will be administered.</p>
<p>RE 457 WEA National Standard Program III 2 cr. Offered: Summer Prerequisites: RE 455, junior standing or instructor's permission.</p> <p>An extended expedition designed to learn, practice and teach specific land and/or water based outdoor skills. This is the third in a three-course series to meet WEA National Standard Program for outdoor leadership certification requirements and is planned and organized in RE 455. Extra fees required for food, equipment use, WEA membership fees and program/camping fees.</p>	<p>RE 494 Internship 12 cr. Offered: Fall, Winter, Summer Prerequisites: RE 491; approval of intern site, all required core and other required courses completed, and overall grade point average of 2.50 in the major, junior standing or instructor's permission.</p> <p>This course involves supervised field work in a professional setting with emphasis on administration, supervision, programming and leadership.</p>
<p>RE 461 Management and Supervision of Leisure Services 4 cr. Offered: Winter Prerequisites: MKT 230; RE 362 or RE 381; RE 371 and senior standing.</p> <p>Examines the principles and practices of supervision and management of leisure services and resources. Requires writing a funding proposal.</p>	<p>RE 495 Special Problems in Leisure 1-4 cr. Offered: On demand. Prerequisites: Junior standing or instructor's permission.</p> <p>Detailed study of one or more special problems in leisure.</p>
<p>RE 466 Area and Facility Planning and Management 3 cr. Offered: Contact department for information. Prerequisites: RE 371; RE 461 strongly recommended, junior standing or instructor's permission.</p> <p>Principles, terminology, standards of planning, construction, use and maintenance of areas and facilities for varied leisure programs.</p>	<p>RE 496 Special Problems in Leisure 1-4 cr. Offered: On demand. Graded S/U Prerequisites: Junior standing or instructor's permission.</p> <p>Detailed study of one or more special problems in leisure.</p>
<p>RE 467 Evaluation/Research in Leisure Services 3 cr. Offered: Fall Prerequisites: RE 362 or RE 371 or RE 381; PY 305 or equivalent and junior standing.</p> <p>Principles and procedures for conducting evaluation and evaluation research in leisure services and resources.</p>	<p>RE 497 Directed Study in Leisure 1-4 cr. Offered: On demand. Graded S/U Prerequisites: Junior standing or instructor's permission.</p> <p>Independent study with research.</p>
<p>RE 450 Adventure Program Planning and Management 3 cr. Offered: On demand. Prerequisites: RE 110, RE 250, RE 251, RE 261, RE 270, RE 362, and concurrent or after RE 461, junior standing or instructor's permission.</p> <p>Theoretical, philosophical and historical perspectives of outdoor adventure programs. Provides experience in planning and developing adventure program components. Examines selected aspects of administration and management of adventure programs, including legal concerns.</p>	<p>RE 498 Directed Study in Leisure 1-4 cr. Offered: On demand. Prerequisites: Junior standing or instructor's permission.</p> <p>Independent study with research.</p>

SN - SPANISH

Modern Languages and Literatures Department

SN 101 Elementary Spanish I 4 cr.
Offered: Fall, Winter, Summer

- Satisfies the formal communication studies requirement.

SN 101 is an introduction to the Spanish language and cultures of the people who speak it. Students learn rudimentary "survival" skills such as social pleasantries, shopping, exchanging money, eating in restaurants, talking about family and school, and weather.

SN 102 Elementary Spanish II 4 cr.
Offered: Fall, Winter

Prerequisite: SN 101 or one year of high school Spanish.

- Satisfies the formal communication studies requirement.

SN 102 is a continuation of SN 101. Students add to their proficiency in matters such as those related to health, free time, employment, travel and talking about the past cultures of the Hispanic world.

SN 201 Intermediate Spanish I 4 cr.
Offered: Fall, Winter

Prerequisite: SN 102 or two years of high school Spanish.

- Satisfies the formal communication studies requirement.

SN 201 reviews all grammar and major topics from SN 101 and 102. This course incorporates more reading, writing and conversation than first-year courses and explores more matters dealing with Hispanic cultures. Students expand their proficiency into areas such as expressing opinions and persuading.

SN 202 Intermediate Spanish II 4 cr.
Offered: Fall, Winter

Prerequisite: SN 201 or three years of high school Spanish.

- Satisfies the formal communication studies requirement.

SN 202 is a continuation of SN 201. Students do considerably more reading and writing than in prior courses. The course expands their cultural and linguistic proficiency.

SN 299 Apprenticeship 1-2 cr.
Offered: Fall, Winter

Graded S/U

Prerequisite: Written department permission.

Apprentice work and activities which require students to use their knowledge of Spanish and develop their competency in the language. This includes such things as oral expression, appreciation of grammatical structure, proofreading and editing skills, research skills in Spanish and skills in teaching Spanish to others.

Note: May be taken for a maximum of 2 credits.

SN 300 Reading and Writing 4 cr.

Offered: Fall

Prerequisite: SN 202 or instructor's permission.

This course teaches essential reading and writing skills in Spanish (use of dictionary, root analysis, decoding, comparison of sentence structure, identification of meaning through analysis, use of contextual cues). Materials will consist of Spanish newspapers, magazines, short stories and will prepare students for subsequent upper level courses.

SN 305 Conversational Spanish 4 cr.

Offered: Winter

Prerequisite: SN 202, completion of the foundations of communication requirement, sophomore standing or instructor's permission.

- Satisfies the formal communication studies requirement.
- Satisfies the upper division liberal studies requirement.

SN 305 focuses on improving the conversational abilities of students through practice within various discourse strategies. Role-playing, films, multimedia materials, soap operas and radio and television transmissions supplement daily conversational practice. This course also includes an advanced grammar review.

SN 310 Introduction to Spanish Civilization and Culture 4 cr.

Offered: Winter

Prerequisite: SN 300 or instructor's permission.

This course is a multidisciplinary introduction to the culture and civilization of Spain. It offers a comprehensive view of the historical, geographical, political and economic factors which have helped shape today's Spanish society.

Note: SN 310 is taught in Spanish.

SN 312 Introduction to Spanish America 4 cr.

Offered: Fall

Prerequisites: SN 300 or equivalent, completion of the foundations of communication requirement and sophomore standing.

- Satisfies the foundations of humanities requirement.
- Satisfies the upper division liberal studies requirement.

This course is a multidisciplinary introduction to the culture and civilization of Spanish America. It offers a comprehensive view of the historical, geographical, political and economic factors which have helped shape today's Spanish American societies and the cultural expressions which have resulted.

Note: SN 312 is taught in Spanish.

SN 314 Contemporary Latin American Culture 4 cr.

Offered: Winter, Summer

Prerequisites: Completion of the foundations of communication requirement and sophomore standing.

- Satisfies the foundations of humanities requirement.
- Satisfies the world cultures requirement.
- Satisfies the upper division liberal studies requirement.

Presentation of Latin American intellectual, social and political issues as reflected in contemporary literature, music, art, film and other cultural forms from the various regions of Latin America. This course cannot be applied toward a Spanish major or minor.

*Note: SN 314 is taught in English.***SN 400 Advanced Spanish Composition and Grammar** 4 cr.

Offered: Winter

Prerequisite: SN 300, junior standing or instructor's permission.

A review of all major points of the Spanish grammar system, with an especially intense focus on the rich verb system and common problems native English speakers have in Spanish. In an interrelated way, it also provides the opportunity for students to improve their writing skills through composition of essays, letters and resumes.

SN 425 Masterpieces of the Golden Age of Spanish Literature 4 cr.

Offered: Every other Fall.

Prerequisite: SN 300 or instructor's permission.

Students examine some of the masterpieces of Spain's Golden Age literature. The texts studied serve as springboards to consideration of art, culture, language, history and humanity.

SN 428 Twentieth Century Literature of Spain 4 cr.

Offered: Every other Fall.

Prerequisite: SN 300 or instructor's permission.

An examination of some of the masterpieces of Spain's twentieth century literature. The texts studied serve as springboards to consideration of art, culture, language, history and humanity.

SN 429 Twentieth Century Literature of Spanish-America 4 cr.

Offered: Every other Fall.

Prerequisite: SN 300 or instructor's permission.

Students examine some of the masterpieces of Spanish-American's twentieth century literature. The texts studied serve as springboards to consideration of art, culture, language, history and humanity.

SN 495 Special Topics in Spanish 1-4 cr.

Offered: Every other Fall.

Prerequisite: SN 300 or instructor's permission.

- Satisfies the world cultures requirement.

This is an experimental course based on linguistics, cultures, authors, genres or literary periods not covered in other regularly approved Spanish courses.

*Note: May be repeated for credit if topic varies.***SN 498 Directed Study in Spanish** 1-4 cr.

Offered: On demand.

Prerequisite: Instructor and department head permission.

A directed study course designed to meet a specific academic requirement of the student who is unable to earn the credit during regularly scheduled course offerings. The student and professor agree to the specific topic and requirements needed to earn the credit.

SO - SOCIOLOGY**Sociology and Social Work Department****SO 101 Introductory Sociology** 4 cr.

Offered: Fall, Winter, Summer

- Satisfies the foundations of social sciences requirement.

A study of social organization, culture and social interaction with particular emphasis on American society. The sociological approach is developed through such concepts as status and role, social stratification, socialization and social change. This approach is used to study crime, population, family, religion, education and other areas.

SO 101H Introductory Sociology Honors 4 cr.

Offered: Fall

Prerequisite: Instructor's permission.

- Satisfies the foundations of social sciences requirement.

A survey, with individual topics covered by members of the sociology faculty specializing in those areas. Emphasis is placed on classroom discussion and writing covering both examinations and a term project. In completing the project, students are introduced to the computer as a research tool.

SO 111 Civil Life in Democratic Society 2 cr.

Offered: Winter

- Satisfies the foundations of social sciences requirement.

This course focuses on civil society and civil engagement—the involvement of ordinary citizens in organizations and associations that shape and govern democratic societies. It addresses such topics as leadership, volunteerism and community and grassroots organizing, and encourages students to explore these issues in their own communities.

SO 113 Social Problems 4 cr.

Offered: Fall, Winter, Summer

- Satisfies the foundations of social sciences requirement.

Survey of the major social problems in contemporary American society including urban problems, population, environment, power, family, health care, work and leisure, aging, poverty, race and ethnic relations, sex roles, war, deviant behavior, drugs and alcohol, social movements, crime and delinquency, and others.

Note: Cannot be applied toward a sociology major.

<p>SO 201 Sociology of Aging 4 cr. Offered: Contact department for information. Prerequisite: SO 101</p> <p>A theoretical and multicultural approach to the social aspects of aging, including basic theoretical perspectives and methods, demographic trends, inter-generational relations, family life, housing and living environments, retirement and leisure, the legal system and the elderly, political behavior, income distribution, social service models, prospects for the elderly in the future, and death and dying in a social context.</p> <p>Empathetic understanding of the experience of growing old is acquired by requiring students to visit an elderly person and explore the manner in which the person copes with old age.</p>	<p>SO 262 Women, Men and Social Inequality 4 cr. Offered: Contact department for information. Prerequisite: SO 101 or instructor's permission.</p> <p>Addresses the significance of gender/sex roles in American society. This course focuses on cultural and social ingredients in people's perception of themselves as men and women. The implications of gender for social inequality are examined in depth.</p>
<p>SO 208 Methods of Social Research I 4 cr. Offered: Fall, Winter Prerequisite: SO 101 or instructor's permission.</p> <ul style="list-style-type: none"> • Satisfies the formal communication studies requirement. <p>Introduction to techniques of data analysis for social research. Applied uses of descriptive and inferential statistics are emphasized. Computers and statistical software are used as part of the instruction process.</p>	<p>SO 263 Criminology 4 cr. Offered: Fall Prerequisites: SO 101 or SO 113 and CJ 110; or instructor's permission. Cross listed with CJ 263.</p> <p>This course explores the nature, extent, causes and methods of treatment and prevention of crime. Emphasis is placed on the theories and methods of studying crime and criminal behavior as social phenomena.</p>
<p>SO 222 Social Inequality 2 cr. Offered: Winter</p> <ul style="list-style-type: none"> • Satisfies the foundations of social sciences requirement. <p>The course introduces students to issues related to social inequality. The goal of the course is to discuss how power influences the distribution of resources in the United States and globally. The primary focus of the course is on social class inequality in terms of the distribution of wealth, political power and status-honor. Dimensions of racial and gender inequality are also related to class inequality.</p>	<p>SO 282 Minority Groups 4 cr. Offered: Fall, Winter Prerequisite: SO 101</p> <ul style="list-style-type: none"> • Satisfies the foundations of social sciences requirement. <p>Survey of selected ethnic minorities in the United States. Special attention is given to the structural sources of prejudice, discrimination and social conflict in America.</p>
<p>SO 232 Marriage and the Family 4 cr. Offered: Fall, Winter, Summer Prerequisite: SO 101</p> <ul style="list-style-type: none"> • Satisfies the foundations of social sciences requirement. <p>Examination of social changes that have affected family relations in western culture; examines the multifaceted effects of these changes and the social significance of these changes in a complex social order; examines many of the issues and problems confronting contemporary families.</p>	<p>SO 295 Special Topics in Sociology 1-4 cr. Offered: Contact department for information. Prerequisite: SO 101 or instructor's permission.</p> <p>Topic varies with the area of specialization of the faculty member teaching the course.</p> <p><i>Note: May be repeated if topic differs.</i></p>
<p>SO 251 Sport in American Society 2 cr. Offered: Every other Winter, even years.</p> <ul style="list-style-type: none"> • Satisfies the foundations of social sciences requirement. <p>This course is designed to help students develop an understanding of the structure, processes and problems of sport as an institutionalized social system. The theory and methodology of the discipline of sociology are utilized to understand, explain and predict social behavior in a sport milieu. Finally, the course is aimed at developing a greater awareness and appreciation of the social significance of sport in contemporary society.</p>	<p>SO 301 Urban Sociology 4 cr. Offered: Winter Prerequisite: SO 101</p> <p>The development of cities, their ecological characteristics and the impact of urbanization on a society and the way of life of its people. The social aspects of urban planning and urban renewal are considered.</p>
	<p>SO 302 Life Cycle and Social Structure 4 cr. Offered: Contact department for information. Prerequisites: Social work major and SO 101 or instructor's permission.</p> <p>A review of alternative definitions of the life cycle. The life cycle is described with respect to its different periods: adolescence, middle age and old age. The social psychology of these different stages is examined with consideration given to the effects of differential age or sex and the impact of different historical periods.</p>

<p>SO 308 Methods of Social Research II 4 cr. Offered: Fall, Winter Prerequisite: SO 208 or equivalent or instructor's permission. Cross listed as SW 308.</p> <p>Introduction to methods, concepts and techniques of social research, including sampling, questionnaire and interview design, experiments, observation, evaluation research and ethics. Students apply these methods in producing a complete research project on some social science issues. Computers and statistical software are used as part of the instruction process.</p>	<p>SO 343 Sociology of Deviant Behavior 4 cr. Offered: Fall, Winter, Summer Prerequisite: SO 101</p> <p>A survey of groups and individuals that are considered "deviant" in our society. Various theories and research methods will be utilized to study the nature and extent of social deviance in American society. Additionally, processes of social reaction and social control will be analyzed.</p>
<p>SO 311 The Community and Human Service Organizations 4 cr. Offered: Contact department for information. Prerequisites: SO 101 and admission to the social work program or instructor's permission.</p> <p>Examination of the community and its human service organizations. Various approaches are used in developing an understanding of the dynamic relationship between the community and the organizational field. The social systems approach is emphasized at the level of the community and the individual organizations operating within its boundaries.</p>	<p>SO 351 Social Change 4 cr. Offered: Fall Prerequisite: SO 101. If taken as upper division liberal studies course, completion of foundations of communication requirement and sophomore standing also are required.</p> <ul style="list-style-type: none"> • Satisfies the foundations of social sciences requirement. • Satisfies the upper division liberal studies requirement. <p>Examine at the global level social changes driven by the triangulated interactions between population, technology and the environment. Topics include theories of social change, globalization, urbanization, population change, resource depletion, desertification, deforestation, ethnic, religious and civilization conflicts, terrorism, genocide, famines, immigration and migration trends, international drug trade, international trade agreements, impacts of international organizations such the United Nations, the European Union, WTO, and other topics.</p>
<p>SO 312 Religion and Society 4 cr. Offered: Fall Prerequisites: SO 101 or instructor's permission.</p> <p>This course is designed to provide an understanding of the place, function and impact of religion as a social institution and a moral force within society. It will also examine the interplay between religion and politics, technology, social movements, minorities and the other institutions of American society.</p>	<p>SO 355 Introduction to Social Psychology 4 cr. Offered: Fall Prerequisite: SO 101. If taken as upper division liberal studies course, completion of foundations of communication requirement and sophomore standing also are required.</p> <ul style="list-style-type: none"> • Satisfies the foundations of social sciences requirement. • Satisfies the upper division liberal studies requirement. <p>Social basis of human behavior, with emphasis on symbolic interaction theory. People are shown to possess a "mind" and "self" not possessed by other organisms. Further, human behavior is shown to depend upon the use of language and learning through social interaction that language makes possible.</p>
<p>SO 322 Social Class, Power and Mobility 4 cr. Offered: Every other Fall. Prerequisite: SO 101. If taken as upper division liberal studies course, completion of foundations of communication requirement and sophomore standing also are required.</p> <ul style="list-style-type: none"> • Satisfies the foundations of social sciences requirement. • Satisfies the upper division liberal studies requirement. <p>The development and organization of systems of social stratification. Relationship of social mobility to social stratification. A survey of theories, methods, class characteristics and the channels, types and forms of social mobility.</p>	<p>SO 382 Health, Society and Culture 4 cr. Offered: Every other Fall. Prerequisite: SO 101 or AN 100 or instructor's permission. Cross listed as AN 382.</p> <p>Analysis of behavioral science dimensions of health systems and health institutions at a national level, with special emphasis on the United States. The behavioral science approach to problems of health and disease is discussed, along with social and cultural factors relating to the occurrence and distribution of disease. American medical systems and institutions are analyzed in terms of political and economic factors, types of practitioners, the distribution of health services and personnel and in comparison with medical systems in other societies.</p>
<p>SO 332 The Study of Population 4 cr. Offered: Contact department for information. Prerequisite: SO 101</p> <p>A general description of the work of population scholars and demographers, followed by consideration of basic population theory, analytical techniques and the dynamics of population change. Some emphasis is placed on population growth as a problem as it relates to the food supply and other resources at the world, regional and national levels.</p>	

SO 407 Sociological Theory 4 cr.
Offered: Fall
Prerequisites: SO 101 and eight credit hours in other sociology courses, junior standing or instructor's permission.

Emphasis on the development of theory in the discipline and its application in solving problems. The modern schools of theory are also examined.

SO 408 Survey Research, Design and Analysis 4 cr.
Offered: Winter
Prerequisites: SO 208 and SO 308 or equivalent courses, junior standing or instructor's permission.

This course builds on the competencies established in SO 208 and SO 308 by having students design and carry out a large-scale survey research project, culminating in the presentation of the results and conduct focus groups. Students learn advanced computer usage in both the collection and analysis of data, interviewing skills, advanced techniques for data manipulation and transformation and report preparation and presentation.

SO 412 Sociology of Education 4 cr.
Offered: Contact department for information.
Prerequisites: SO 101, junior standing or instructor's permission.

An application of sociological principles to the education process; the relationship between social stratification and education, the importance of interaction patterns on the educational process, the effect of other institutions on education and the role of education as a dynamic institution in a changing society.

SO 432 Seminar on Changing American Family 4 cr.
Offered: Winter
Prerequisites: SO 232 and senior standing; or instructor's permission.

Seminar provides an in-depth analysis of family change, focusing on both macro and micro level perspectives and including multiple theoretical foundations. Particular attention is given to the impact of rapid family change on both relationship instability and structural strain. Characteristics of family strength, stability and continuity are also addressed.

SO 472 Occupational Stress 4 cr.
Offered: Contact department for information.
Prerequisites: SO 101 or SO 113, junior standing or instructor's permission.

Focuses on theories of occupational stress, methods of measuring work stress, stressors in the work environment, the effects of occupational stress and individual and organizational strategies for managing and preventing work stress.

SO 473 Juvenile Delinquency 4 cr.
Offered: Every other Winter.
Prerequisite: SO 263, junior standing or instructor's permission.

Taught as a seminar. The nature, extent, causes and societal reaction to juvenile delinquency. Emphasis is placed on selected theories and methods for the systematic analysis of juvenile offenders and the juvenile justice system. This is an advanced course for students who have a special interest in delinquency.

SO 491 Internship in Sociology 4-12 cr.
Offered: Contact department for information
Graded S/U
Prerequisites: SO 308, senior standing and department permission.

Students interested in doing a sociology internship should contact the department's internship coordinator during the second semester of their junior year. Internships usually involve working with a client agency or a research need. The nature of the project, as well as the credit hours earned is negotiated with the internship coordinator.

Note: Can be taken for two consecutive semesters, but not for more than a total of 12 credits.

SO 495 Special Topics in Sociology 1-4 cr.
Offered: On demand.
Prerequisite: SO 101, junior standing or instructor's permission.

The study of a significant topic or problem in sociology that is not regularly offered as part of the curriculum not otherwise emphasized in undergraduate courses.

Note: May be taken more than once if topic varies.

SO 498 Directed Study in Sociology 1-4 cr.
Offered: On demand.
Prerequisites: Two sociology courses, a "B" average in sociology courses, junior standing and instructor's permission.

Study of content not available in the regular course offerings.

SP - SPEECH COMMUNICATION

Communication and Performance Studies Department

SP 100 Public Address 4 cr.
Offered: Fall, Winter, Summer

Theory and practice of public address as found in formal and informal speaking situations that confront people in business and other professions. Course requirements include presenting original speeches.

SP 110 Interpersonal Communication 4 cr.
Offered: Fall, Winter, Summer

Study of theories of interpersonal communication and human resources to make students aware of major problems in communicating with others and to enable them to improve their understanding of themselves and others.

SP 120 Small Group Process 4 cr.
Offered: Winter

Development of participation and decision-making skills in small groups. Classes combine lectures on group theory with laboratory application and practical experience.

<p>SP 200 Argumentation 4 cr. Offered: Fall, Winter</p> <p>Study of argumentation stressing research, reasoning, organization, composition and presentation.</p>	<p>SP 401 Persuasion 4 cr. Offered: Winter Prerequisites: Junior standing or instructor's permission.</p> <p>The study of persuasion through communication. Topics include audience analysis, experimental design of studies in persuasion and the application of persuasive theory to various examples of communication.</p>
<p>SP 203 Advanced Public Address 4 cr. Offered: Every third Winter. Prerequisite: SP 100</p> <p>Enhancing the student's applied knowledge of the practice of public address with the intent of building a high degree of language skill. Emphasis is placed upon clarity, interest, concreteness, as well as other style variables. Students write, polish and deliver informative and persuasive messages.</p>	<p>SP 402 Communication Criticism 4 cr. Offered: Every other Winter. Prerequisites: Completion of the foundations of communication requirement and junior standing or instructor's permission.</p> <ul style="list-style-type: none"> • Satisfies the upper division liberal studies requirement. • Satisfies the foundations of humanities requirement. <p>Communication criticism instructs students in the process of formally evaluating rhetorical activity, judging communication on the basis of results, ethics, truth and aesthetics. American history is rich with rhetorical activity in the form of speeches, songs, humor, films and television. As they learn the process of criticism, students are also provided with a survey of significant communication events that have had a lasting impact on American culture.</p>
<p>SP 220 Interviewing 4 cr. Offered: Every third Fall.</p> <p>Dyadic communication principles with major emphasis on learning how to function as interviewees and interviewers. Preparation of questions, role playing, case studies and participation in various types of interviews (informational, employment, persuasive and appraisal) are considered.</p>	<p>SP 404 Communication and the Arts 4 cr. Offered: Every third semester. Prerequisites: Junior standing or instructor's permission.</p> <p>Exploration into the study of communication aesthetics. The course examines a range of communication processes, concepts and techniques using the arts as its primary data base. Course includes some discussion of interpretive methods and consideration of various aesthetic mediums.</p>
<p>SP 240 Oral Interpretation of Literature 4 cr. Offered: Every third Fall. Prerequisite: At least one course in literature or completion of the foundations of communication requirement.</p> <ul style="list-style-type: none"> • Satisfies the foundations of humanities requirement. <p>Interpretive approach to literature including analysis, adaptation and presentation. Course includes reading a variety of literature in the classroom, with cutting, arranging and presenting of formal programs.</p>	<p>SP 405 Negotiating 4 cr. Offered: Every third semester. Prerequisites: Junior standing or instructor's permission.</p> <p>This course studies the ways and means of negotiating for goods, services and resources from the perspective of both buyers and sellers. Students learn business negotiation strategies and tactics that can be applied in personal, social, political and international contexts. The course work includes paper presentations, exams and experimental negotiations. Students conduct virtual business negotiations over the Internet with students in other countries with different personal, social, political and international backgrounds.</p>
<p>SP 250 Research in Speech Communication 4 cr. Offered: Fall Prerequisites: Completion of EN 111 with a grade of "C-" or better. Speech communication majors must have completed two of the three core courses (SP 100, 110 and 120).</p> <p>An introduction to the research and writing requirements of the field of speech communication. Career options in the field are also considered.</p>	<p>SP 410 Advanced Interpersonal Communication 4 cr. Offered: Every third semester Prerequisite: SP 110, junior standing or instructor's permission.</p> <p>Exploration and development of one's awareness of, and conscious ability to use, various aspects of the speech communication discipline. Both intrapersonal and interpersonal communication are stressed.</p>
<p>SP 295 Special Topics in Speech Communication 1-4 cr. Offered: On demand.</p> <p>Investigation of a significant topic or theme. Intended for underclassmen. <i>Note: May be repeated if the topic differs.</i></p>	
<p>SP 300 Rhetorical Theory 4 cr. Offered: Fall</p> <p>Study of the rhetorical tradition from classical to contemporary theories of rhetoric.</p>	
<p>SP 310 Communication Theory 4 cr. Offered: Winter</p> <p>A survey of contemporary theories and paradigms relating to human communication. Principles of theory construction are also discussed.</p>	

SP 412 Nonverbal Communication 4 cr.

Offered: Every third semester
Prerequisite: SP 110, junior standing or instructor's permission.

Development of an understanding of the range of phenomena included in the study of nonverbal communication. A study of the relationship of proxemics, kinesics, chronemics and haptics to the total human communication process.

SP 421 Organizational Communication 4 cr.

Offered: Fall
Prerequisites: SP 110, SP 120, junior standing or instructor's permission.

Organizational communication is designed to acquaint students with the theories and principles of effective communication within organizational settings. An historical overview of theoretical approaches to structuring and managing communication activities is followed by more specific application of behavioral theories to the contexts of communication relevant to organizations: interpersonal, groups and teams, speech making, media relations, crisis. A consideration of communication in a wide range of organizations—labor unions, hospitals, government agencies, business, military and educational institutions is included.

SP 425 Communication Ethics 4 cr.

Offered: Infrequently
Prerequisite: SP 110 or SP 300 or PL 180 or equivalent, junior standing or instructor's permission.

Principles and perspectives of ethical communication will be studied and applied to a variety of private and public communication situations. Ethical decision making will be examined from varied contexts: the individual, groups, organizations, the media, etc.. Students will analyze case studies, study relevant literature, engage in class discussion and examine video and popular film, in order to understand the fundamental ethical elements in human and mediated communication. The impact of honest versus deceptive communication on the individual and society is evaluated.

SP 432 Environmental Communication 4 cr.

Offered: Every third semester.
Prerequisites: Junior standing or instructor's permission.

Focus on developing an understanding of the social and cultural foundations for, strategic and tactical dimensions of and case studies associated with the effective promotion of environmental policy. Topics include: the psychology of environmental communication; historical and cultural analyses of environmental rhetoric; environmental communication in government, business and communities; and the role of the media in shaping public responses to information campaigns. Students research an issue related to their personal or professional interests, explore the communication implications of the subject and produce a detailed analysis of how the issue might be approached in the context of contemporary social interaction.

SP 485 Outcomes Assessment 0 cr.

Offered: Fall, Winter
Graded S/U
Prerequisites: Senior standing or instructor's permission.

A senior qualifying exam and graduation presentation. Students register during their final semester before graduation.

SP 491 Practicum in Speech Communication 1-8 cr.

Offered: On demand.
Graded S/U
Prerequisite: Junior standing and instructor's permission.

Projects in the areas of speech carried on under the supervision of a faculty member.

SP 492 Internship in Speech Communication 1-8 cr.

Offered: On demand.
Graded S/U
Prerequisite: Junior standing and instructor's permission.

Practical, applied experience involving placement in a job situation.

SP 495 Special Topics in Speech Communication 2-4 cr.

Offered: On demand.
Prerequisite: Junior standing and instructor's permission.

Study of a particular topic or problem in an area of speech.

Note: May be repeated if topic differs.

SP 498 Directed Study in Speech Communication 1-4 cr.

Offered: On demand.
Prerequisite: Junior standing, instructor and department head permission.

Independent study by qualified undergraduates in an area to be defined by the student and instructor.

Note: May be repeated for up to eight credits.

ST-SURGICAL TECHNOLOGY

Clinical Laboratory Sciences Department

ST 104 Introduction to Surgical Technology 1 cr.

Offered: Fall
Introduction to the role of the surgical technologist and to the surgical team members. A study of health care facilities, the role of health team members, communication between members of the health care team and the development of modern surgery. Discussion of the ethical, moral and legal responsibilities of the surgical technologist.

ST 111 Basic Surgical Concepts and Techniques 5 cr.

Offered: Winter
Prerequisites: Admission into surgical technology program and completion of the following courses with a "C" or better: EN 111, BI 104, HP 200, OIS 171 and ST 104.

This course will cover the theoretical basis for surgical procedures and operating room standards. Topics include the study of microbiology and pharmacology and its relation to the surgical patient as well as to sterilization procedures and the processes themselves; a review of anatomy and physiology and its relation to surgical procedures as well as common disease processes requiring surgical intervention; and an in-depth study of surgical techniques as well as the surgical technologist's role throughout. The course will also include the study of the pharmacological agents used in the surgical patient.

ST 112 Surgical Technology I 2 cr.

Offered: Winter

Prerequisites: Admission into surgical technology program and completion of the following courses with a "C" or better: EN 111, BI 104, HP 200, OIS 171 and ST 104.

This is a four week block class that prepares students for clinical rotations. Students will experience practical, hands on experience in setting up and maintaining the sterile field, learn basic instrument names as well as their care, the handling of instruments and other supplies during the operative procedure. This is accomplished through simulation in the lab and practice in the operative setting.

ST 113 Surgical Technology I Practicum 6 cr. (0-0-24)

Offered: Winter

Graded S/U

Prerequisites: Admission into surgical technology program and completion of the following courses with a "C" or better: EN 111, BI 104, HP 200, OIS 171 and ST 104.

Co-requisite: ST 111 and ST 112.

The practicum will be in the operating room during which time students will gain experience with selected surgical procedures under the supervision of a clinical preceptor.

ST 114 Surgical Technology II 2 cr.

Offered: Summer

Prerequisites: Completion of ST 111 and ST 112 with a "C" or better and a grade of "S" in ST 113.

This lecture course will cover the theoretical basis for advanced specialty surgical procedures. It is a continuation of Surgical Technology I.

ST 115 Surgical Technology II Practicum 10 cr. (0-0-30)

Offered: Summer

Graded S/U

Prerequisites: Completion of ST 111 and 112 with a "C" or better and a grade of "S" in ST 113.

The practicum will be in the operating room during which time students will gain experience in advanced and complex surgical procedures under the supervision of a clinical preceptor.

SW - SOCIAL WORK**Sociology and Social Work Department****SW 100 Exploring Social Work** 4 cr.

Offered: Fall, Winter

The course introduces students to the social work profession; it is a broad survey course covering the educational requirements of the profession and its many fields of practice. The course assists students in making career choices about social work. Those enrolled in the course are required to do 20 hours of volunteer work in addition to scheduled class sessions.

SW 230 Human Behavior in the Social Environment I 4 cr.

Offered: Fall, Winter

Prerequisite: SO 101, PY 100 or instructor's permission.

Examination of social and behavioral science applications to practice. Presents social systems model for analyzing human functioning in the social environment. (Formerly SW 330.)

SW 240 Social Welfare: Historical Perspectives 2 cr.

Offered: Fall, Winter

Prerequisites: SO 101, EC 101 or instructor's permission.

Historical overview of the development of social welfare as society's reluctant response to human need and as a mechanism for social control. Events which promote societal attitudes and in turn hinder or promote the quest for a humane welfare system are examined.

SW 308 Methods of Social Research II 4 cr.

Offered: Fall, Winter

Prerequisites: SO 208 or equivalent or instructor's permission.

Cross listed as SO 308.

Introduction to methods, concepts and techniques of social research, including sampling, questionnaire and interview design, experiments, observation, evaluation research and ethics. Students apply these methods in producing a complete research project on some social science issues. Computers and statistical software are used as part of the instruction process.

SW 331 Human Behavior in the Social Environment II 4 cr.

Offered: Fall, Winter

Prerequisite: SW 230

Theories and research literature on life stages (childhood through old age) are explored in a variety of historical, cultural, class, gender, racial and community contexts. Emphasis is placed on how the self interacts with the legacies of biological variables, cultural history, social system, life history, personal social environment and the impact of one's view of future life stages. Social structures of race, ethnicity, family and social class are assessed as the framework of developmental development.

SW 341 Social Welfare Policy 4 cr.

Offered: Fall, Winter

Prerequisites: SW 240 or instructor's permission. Primarily for social work majors and social welfare minors.

Cross listed as PS 341.

Study of issues in current social welfare policy and of the significance of social, economic and political factors that influence policy-making and implementation. In addition, students also learn various techniques of policy evaluation and review.

<p>SW 370 Generalist Practice Methods I 4 cr. Offered: Winter Prerequisite: BSW program admission.</p> <p>Introduction to a generalist practice perspective including a common set of values, skills and tasks essential to helping people in their social environment. Emphasizes assessment skills and intervention strategies. Requires participation in skill practice including 14 lab hours of videotaping for classroom criteria.</p>	<p>SW 411 Social Work in the Health Fields 4 cr. Offered: Contact department for information. Prerequisite: BSW program admission, junior standing or instructor's permission.</p> <p>Examination of the role of social work in relation to health care services. Considers social policy issues associated with health services and the application of social work practice principles to a variety of case situations such as adolescent pregnancy and terminal illness.</p>
<p>SW 371 Apprenticeship 1-2 cr. Offered: Contact department for information. Prerequisite: Completion of SW 370 and written department permission.</p> <p>Directed apprenticeship activities in the human skills laboratory. Apprentices work with lab groups supervising lab sessions and assist in the feedback process.</p> <p><i>Note: May be taken twice.</i></p>	<p>SW 412 Domestic Violence 4 cr. Offered: Fall, Winter Prerequisite: BSW program admission, junior standing or instructor's permission.</p> <p>Study of spouse abuse, child abuse, sexual abuse of children and less common forms of violence within the family. Emphasis is on understanding the dynamics of violence, the victim and perpetrator and especially on service delivery issues including legal sanctions, protective services, crisis intervention and long-term treatment of both victims and perpetrators.</p>
<p>SW 372 Generalist Practice Methods II 4 cr. Offered: Winter Prerequisite: Admission to the Social Work Program and completion of SW 370.</p> <p>A continuation of Generalist Practice I and required of all social work majors. This course covers practice methods content from mezzo to macro level perspectives. Specifically, the systems of families, groups, organizations and communities will be highlighted. Theoretical perspectives will receive attention, though emphasis will be placed on actual intervention strategies. The use of video labs (as in Generalist Practice Methods I) will provide students with relevant practice situations.</p>	<p>SW 415 Addictions: Diagnosis, Treatment and Prevention 4 cr. Offered: Fall Prerequisite: BSW program admission, junior standing or instructor's permission.</p> <p>Alternative conceptualizations of addictions such as alcoholism; the impact of alcohol abuse on the individual, the family and social relationships. Skill is developed in recognizing situations in which alcoholism is a factor and in selecting appropriate intervention strategies.</p>
<p>SW 401 Child Welfare 4 cr. Offered: Fall Prerequisite: BSW program admission, junior standing or instructor's permission.</p> <p>Study of program and social work procedures related to child welfare, particularly in reference to dependent and neglected children, children of unwed parents and children with behavior problems and special needs.</p>	<p>SW 416 Substance Abuse Counseling 4 cr. Offered: Winter Prerequisites: SW 370, SW 415, junior standing or instructor's permission.</p> <p>A specialized social work course for students who anticipate working with chemically dependent and affected populations. Functional conceptualizations of substance abuse are integrated with methods for assessment and intervention. Attention is directed to building skills involved in individual, group and family service delivery. Professional role, ethics, accountability and agency function are also explored.</p>
<p>SW 405 Aging Public Policies and Programs 4 cr. Offered: Every other Fall semester. Prerequisite: BSW program admission or gerontology minor, junior standing or instructor's permission.</p> <p>This course provides an overview of aging public policies and programs. It will examine the origin, current program structure and delivery system of various policies such as Social Security, Medicare and the Older Americans Act that provide income security, health care and social services to older adults in the United States. Current reform proposals and changes within these programs will be examined, as well as their impact on the social, health and economic status of this population.</p>	<p>SW 417 Social Work in Mental Health 4 cr. Offered: Contact department for information. Prerequisite: BSW program admission, junior standing or instructor's permission.</p> <p>An elective course which deals with social work functions within psychiatric settings. This course will include theoretical concepts, yet is designed for practical social work applications. Three distinct social work involvement stages will be addressed: Preadmission/admission screening procedures, interdisciplinary treatment team planning and discharge planning. Both community-based and institutional care will be emphasized.</p>

<p>SW 421 Family Intervention in Social Work Practice 4 cr. Offered: Winter Prerequisite: BSW program admission, junior standing or instructor's permission.</p> <p>A course designed to address the needs of helping professionals understand and deal with family problems. Focus is on societal influences on the family, defining what constitutes a healthy family system, learning how to intervene with families to enhance their problem-solving skills and learning how to understand and intervene with families with specific problems.</p>	<p>SW 474 Integrative Seminar II 2 cr. Offered: Winter Prerequisite: BSW Program Admission, SW 330, SW 370, SW 473 and SW 480. Taken concurrent with SW 481, junior standing or instructor's permission.</p> <p>Capstone Seminar focusing on personal strengths in a professional role as a social worker. Individual field experiences will be shared and discussed regularly with an emphasis on differing roles and responsibilities in professional practice settings. Students will assemble a professional portfolio integrating learning experiences in areas designated by the Council on Social Work Education. Professional goals will be identified and students will engage in structured activities to achieve these goals.</p>
<p>SW 440 Social Work Policy Analysis 2 cr. Offered: Winter Prerequisites: SW 341, SW major or social welfare minor.</p> <p>The study of the impact of social policy at the local, state and national levels on the development, implementation and delivery of social/health services in fields of practice where social workers are employed. Emphasis will be placed on current policy changes directly impacting clients, practitioners, agencies and their communities.</p>	<p>SW 480 Senior Field Placement I 4 cr. Offered: Fall Graded S/U Prerequisites: BSW program admission, 2.50 grade point average and concurrent enrollment in SW 470, junior standing or instructor's permission. Application deadline for following fall: February 1.</p> <p>Practice skill instruction provided through university-arranged placements in social work agencies. Emphasizes demonstration of skill mastery through agency-supervised practice experience of 15-20 hours per week.</p>
<p>SW 461 Social Work Practice Evaluation I 2 cr. Offered: Fall Prerequisites: Concurrent enrollment in SW 480 or SW 481, junior standing or instructor's permission.</p> <p>Application of research methods to planning and evaluation of human service programs and to assessment and intervention with clients. Single subject techniques, needs assessment and strategies for program outcome assessment are reviewed. (Formerly SW 360.)</p>	<p>SW 481 Senior Field Placement II 4 cr. Offered: Winter Graded S/U Prerequisite: SW 480 and concurrent enrollment in SW 471, junior standing or instructor's permission.</p> <p>Continuation of SW 480.</p>
<p>SW 462 Social Work Practice Evaluation II 2 cr. Offered: Winter Prerequisites: SW 461, junior standing or instructor's permission.</p> <p>Application of research methods to planning and evaluation of human service programs and to assessment and intervention with clients. Single subject techniques, needs assessment and strategies for program outcome assessment are reviewed.</p>	<p>SW 495 Special Topics in Social Work 1-4 cr. Offered: Contact department for information. Prerequisites: Junior standing and instructor's permission.</p> <p>Review of a topic of relevance to social work. The content varies according to expertise of the faculty member.</p> <p><i>Note: May be repeated if topic differs.</i></p>
<p>SW 472 Social Work Practice with Diverse Populations 2 cr. Offered: Fall Prerequisites: Junior standing or instructor's permission. Co-requisite: SW 480 or SW 481.</p> <p>The study of the impact of race, class and gender on the delivery of social services. The course emphasizes learning to work cross-culturally from a solution-focused, strengths perspective. Students will develop a multi-cultural perspective and multi-cultural competencies.</p>	<p>SW 498 Directed Study in Social Work 1-4 cr. Offered: Contact department for information. Prerequisites: Junior standing and instructor's permission.</p> <p>Independent study in an area of social work to be defined by the student and supervising instructor.</p>
<p>SW 473 Integrative Seminar 2 cr. Offered: Fall Prerequisite: BSW Program Admission, SW 330 and SW 370, taken concurrent with SW 480, junior standing or instructor's permission.</p> <p>Integration of field education experiences with an emphasis on the values and ethics of generalist social work practice. Specific topics will include role conflicts, values clarification and ethical practice concerns of beginning generalist social work practitioners with an emphasis on self evaluation. Individual field experiences will be shared and regularly discussed.</p>	

TE-TECHNOLOGY EDUCATION

Engineering Technology Department

TE 100 Graphic Arts Printing 2 cr. (1-0-2)
Offered: Winter

An introductory graphic arts course that focuses on the knowledge and skills appropriate for teaching a graphic arts course at the secondary school level. Course content includes an overview of the printing industry, offset printing fundamentals along with basic copy preparation, gravure printing and finishing operations.

TE 295 Special Topics in Industry and Technology 1-4 cr.
Offered: Contact department for information.
Prerequisite: Adviser permission; for qualified industrial education majors.
Specialized work not covered by other courses.

TE 298 Directed Study and Research 1-4 cr.
Offered: Contact department for information.
Prerequisite: Department permission.

Selection of problem in area of emphasis, specialized instruction and experiences to reinforce technical skill and knowledge. Written reports of work are required.

TE 350 Methods and Materials in Industrial Technology Education 3 cr.
Offered: Fall
Prerequisite: Admission to the methods phase of Teacher Education.
Co-requisite: Concurrent enrollment in ED 349.

Techniques of teaching applied to individual, group and class instruction in industrial education; includes organization of the school shop with special application to its function in the total school program.

Note: May not be applied toward any non-teaching major or minor.

TE 351 Humanity and Technology 4 cr.
Offered: Summer
Prerequisites: Completion of the foundations of communication requirement and junior standing.

- Satisfies the foundations of humanities requirement.
- Satisfies the upper division liberal studies requirement.

Designed to trace the evolution of mankind as a user of tools, with attention directed to the impact of these tools on intellectual and ethical development. Course work addresses the history, literature and philosophy related to technology and its impact on man.

TE 483 Studies in Business and Industry 4 cr.
Offered: Contact department for information.
Prerequisite: Junior standing and instructor's permission.
Cross listed as IT 483.

Cooperative work experience to provide up-to-date technical skills in the area of specialization; includes work experience with business and industrial operations, services and materials, processes and techniques.

TE 490 Workshops and Seminars in Education 2-4 cr.
Offered: Contact department for information.
Prerequisite: Junior standing and instructor's permission.

Opportunities for the concentrated study of selected professional education problems.

TE 495 Special Topics in Industry and Technology 1-4 cr.
Offered: Contact department for information.
Prerequisite: Junior standing and adviser permission. For qualified industrial education majors.
Specialized work not covered by other courses.

TE 498 Directed Study and Research 1-4 cr.
Offered: Contact department for information.
Prerequisite: Junior standing and department permission.

Independent research of a special technical topic. Written reports of work are required.

TH-THEATRE

Communication and Performance Studies Department

TH 130 Introduction to Theatre 4 cr.
Offered: Fall, Winter, Summer
• Satisfies the foundations of visual and performing arts requirement.

Study of theatre as an art form, including history, aesthetics, production and dramatic literature.

TH 131 Stagecraft 4 cr. (2-0-4)
Offered: Three of every four Fall, Winter.

Theoretical and applied aspects of set construction, painting, lighting, properties and special effects for the stage. Weekly laboratory assignments.

TH 132 Acting I 4 cr.
Offered: Fall, Winter

Introduction to theoretical and applied aspects of acting. Applied on-stage exercises include solo and ensemble acting assignments.

TH 141 Methods of Design Presentation 4 cr.
Offered: Infrequently
Prerequisite: TH 131 or instructor's permission.

Introduction to methods used in the visual presentation of designs for the stage, including analysis, drafting, rendering and model making.

TH 232 Stage Costume 3 cr. (2-0-4)
Offered: Infrequently

A study of costume materials, design and construction. Laboratory assignments supplement lectures.

<p>TH 234 Stage Makeup 3 cr. Offered: Every third Fall.</p> <p>Theory and application of theatrical makeup. An investigation of makeup design, materials and supplies with laboratory assignments.</p>	<p>TH 360 History of Theatre 4 cr. Offered: Fall</p> <p>Prerequisites: Completion of the foundations of communication requirement and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of visual and performing arts requirement. • Satisfies the upper division liberal studies requirement. <p>Study of all major historic periods to indicate the physical development of the stage, the playwrights, their plays, dramatic criticism and aesthetics.</p>
<p>TH 241 Scenic Design 3 cr. Offered: Contact department for information. Prerequisite: TH 141 or instructor's permission.</p> <p>Theory, methods and practical aspects of designing scenery.</p>	<p>TH 361 Modern Drama 4 cr. Offered: Winter</p> <p>Prerequisites: Completion of the foundations of communication requirement and sophomore standing.</p> <ul style="list-style-type: none"> • Satisfies the foundations of visual and performing arts requirement. • Satisfies the upper division liberal studies requirement. <p>Modern playwrights and their plays, the physical stage, dramatic criticism and aesthetics from 1850 to the present.</p>
<p>TH 245 Voice and Diction 4 cr. Offered: Every other Winter.</p> <p>Development of communication skills for all performance areas. Practical exercises cover vocal production, articulation, International Phonetic Alphabet and selected stage dialects. Recommended for all CAPS majors.</p>	<p>TH 385 Theatre in Perspective: The Stratford Festival Stage 3 cr. Offered: Summer</p> <p>Prerequisites: Completion of the foundations of communication requirement or instructor's permission. Cross listed with EN 385.</p> <ul style="list-style-type: none"> • Satisfies the foundations of visual and performing arts requirement. • Satisfies the upper division liberal studies requirement. <p>This summer session course offers an interdisciplinary approach to four or five plays that will be performed at the Stratford Theatre Festival in Stratford, Ontario. Students who register for EN 385/TH 385 will be encouraged to register at the same time for TH 493, Field Studies, so that they will also be able to view these same plays in performance in Stratford.</p>
<p>TH 295 Special Topics in Theatre 1-4 cr. Offered: On demand..</p> <p>Investigation of a significant topic or theme.</p> <p><i>Note: May be repeated if topic differs.</i></p>	<p>TH 404 American Musical Theatre 4 cr. (3-3-0) Offered: Infrequently</p> <p>Prerequisite: TH 130, junior standing or instructor's permission.</p> <p>A survey of the genre, covering history, theory and technique including the libretto, song purposes and types and musical programming.</p>
<p>TH 330 Intermediate Acting 4 cr. Offered: Fall Prerequisite: TH 132</p> <p>A performance-centered course with emphasis on the analysis, development and portrayal of character in production.</p>	<p>TH 432 Audition 1 cr. Offered: Every other Winter. Prerequisite: TH 131 or TH 132, junior standing and instructor's permission.</p> <p>Preparation of both performance and non-performance students for nationwide theatre auditions and how to get a job in the theatre profession.</p>
<p>TH 340 Stage Lighting 3 cr. Offered: Every other Winter. Prerequisite: TH 131 or instructor's permission.</p> <p>History and function of lighting and control equipment. Color theory, modern lighting practice; methods of design and design presentation. Experience in set lighting.</p>	<p>TH 435 Advanced Acting 4 cr. (3-3-0) Offered: Every other Winter Prerequisite: TH 132, junior standing and instructor's permission.</p> <p>An advanced performance-centered course emphasizing period and experimental acting styles.</p>
<p>TH 341 Stage Properties 4 cr. Offered: Every other Winter. Prerequisite: TH 131 or instructor's permission.</p> <p>Design and construction of properties for theatrical productions. Construction, painting and finishing techniques. Experience in creating properties.</p>	<p>TH 445 Advanced Directing Practicum 2 cr. Offered: On demand. Prerequisites: TH 358, junior standing and theatre faculty permission.</p> <p>Studio production experience.</p>
<p>TH 352 Directing Theory 4 cr. (3-3-0) Offered: Fall Prerequisite: TH 132 or instructor's permission.</p> <p>Introduction to the theoretical and practical aspects of stage direction.</p>	
<p>TH 358 Directing Practicum 1 cr. Offered: Fall, Winter Prerequisites: TH 352 and theatre faculty permission.</p> <p>Production directing experience under faculty supervision.</p>	

<p>TH 454 Acting: Shakespeare 4 cr. Offered: Every third Fall Prerequisite: TH 132, junior standing and instructor's permission.</p> <p>Scene work in Elizabethan drama. Covers analysis and performance techniques.</p>	<p>TH 495 Special Topics in Theatre 2-4 cr. Offered: On demand. Prerequisite: Instructor's permission.</p> <p>A study of a particular topic or problem in theatre. <i>Note: May be repeated for a maximum of eight credits if topic differs.</i></p>
<p>TH 456 Theatre Management 4 cr. Offered: Every third Winter Prerequisite: Junior standing and instructor's permission.</p> <p>Aims and objectives of theatre management, including selection of a theatrical season, advertising and publicity, box office procedures and development.</p>	<p>TH 498 Independent Study in Theatre 1-8 cr. Offered: On demand. Prerequisite: Theatre faculty permission.</p> <p>Independent study in an area of drama to be specified by the student and the instructor.</p>
<p>TH 457 Theatre Workshop 1-4 cr. Offered: On demand. Prerequisite: Junior standing and instructor's permission.</p> <p>Integrated course in theatre production for advanced undergraduates, graduates and teachers. <i>Note: May be repeated if topic differs.</i></p>	<p>TS - TRAFFIC SAFETY Engineering Technology Department</p> <p>TS 415 Driver Education and Traffic Safety 4 cr. Offered: On demand. Prerequisite: Junior standing and instructor's permission.</p> <p>Basic course for secondary driver education teachers.</p>
<p>TH 458 Theory of Drama 4 cr. Offered: Infrequently Prerequisite: Junior standing and instructor's permission.</p> <p>Special problems in theatre such as contemporary and experimental drama, the absurdist movement, tragedy, comedy and play writing.</p>	<p>TS 416 Advanced Driver Education and Traffic Safety 4 cr. Offered: On demand. Prerequisite: TS 415, junior standing or instructor's permission.</p> <p>Personality factors related to driver behavior. Traffic planning and control. Includes behind-the-wheel instruction.</p>
<p>TH 490 Senior Seminar in Drama 4 cr. Offered: Infrequently Prerequisite: Junior standing and instructor's permission.</p> <p>Designed to stimulate students to unify all areas of their discipline. Emphasis on student creativity and originality.</p>	<p>TS 495 Special Topics in Driver Education and Traffic Safety 1-4 cr. Offered: Contact department for information. Prerequisite: Junior standing and instructor's permission.</p> <p>Specialized work not covered in other courses.</p>
<p>TH 491 Practicum in Theatre 1-2 cr. Offered: Fall, Winter Prerequisite: Junior standing and instructor's permission.</p> <p>Projects in production under the supervision of a faculty member. <i>Note: May be repeated for a maximum of eight credits.</i></p>	<p>TS 498 Directed Study 1-4 cr. Offered: Contact department for information. Prerequisite: Junior standing and department permission.</p> <p>Specialized instruction in traffic and safety education. <i>Note: The satisfactory completion of TS 415 and TS 416 is needed to meet the requirements for school teachers to teach driver education in Michigan.</i></p>
<p>TH 492 Internship in Theatre 1-8 cr. Offered: On demand. Prerequisite: Junior standing and theatre faculty permission.</p> <p>Practical, applied experience involving placement in a job situation.</p>	<p>UN - GENERAL UNIVERSITY</p> <p>University courses are not specifically attached to a department but serve the entire academic community.</p>
<p>TH 493 Field Studies 1 cr. Offered: Winter, Summer Prerequisite: Junior standing and instructor's permission.</p> <p>A theatre study trip to a major theatrical center. <i>Note: May be repeated if topic differs.</i></p>	<p>UN 100 Freshman Seminar 2 cr. Offered: Fall, Winter</p> <p>A course which focuses on the academic strategies, resource knowledge and social networking necessary for freshmen to make the transition to college. The course is designed to empower students with the life skills necessary for success in college. To be taken in conjunction with the First Year Experience (FYE) Program.</p>

UN 101 Personal Career Development 1 cr.

Offered: Fall, Winter

Development of career planning skills and an introduction to career history. Students will learn how to choose careers that match their personal characteristics and interests. Attendance and careful work are stressed to prepare students for the world of work. This course is designed for students with little or no experience with career planning. However, students should have a semester of college credits or at least two years of career experience past high school.

UN 200 Introduction to Gender Studies 4 cr.

Offered: Fall, Winter

- Satisfies the foundations of humanities requirement.

An interdisciplinary examination of the importance of gender in human experience, with an emphasis on the historical development of feminist and gender theory, as well as the application of such theories in the humanities and social sciences.

UN 250 Leadership Theory and Practice 2 cr.

Offered: Fall

Prerequisite: Application and selection into the Student Leader Fellowship Program. (Applications are available at the beginning of the winter semester in the Student Activities and Leadership Programs Office.)

Course content includes leadership and motivation theories, group dynamics, ethics, leadership applications in communities, and cultural and gender differences as they apply to leadership. Through class discussion, concepts are related to the student's experience with leadership on campus. The course offers a highly interactive format of small group discussions, role-plays, stimulation exercises and case studies.

UN 391 FYE Teaching Internship Seminar 1 cr.

Offered: Fall, Winter

Prerequisites: Students taking the course must apply and be selected to serve as a Teaching Intern for the FYE Program. Qualified students must have junior status or have completed at least 56 credits toward graduation. They must also carry a minimum grade point average of 2.50 and be free of any academic or disciplinary probation.

This internship will provide participating upperclassmen with direct experience leading and facilitating groups of students enrolled in the UN 100, First Year Experience Seminar. Students will work directly with faculty members to plan and "co-teach" their respective UN 100 sections.

WD - WELDING**Technology and Occupational Sciences Department****WD 140 Introduction to Welding** 4 cr. (2-0-6)

Offered: Fall, Winter

This is a lecture-laboratory course covering the basic joining processes used in a variety of metal fabrication industries. Students will be introduced to the most commonly used basic welding processes and gain experience in the laboratory which will enable them to set up commonly used welding equipment and to make simple welds.

WD 243 Advanced Arc Welding 3 cr. (1-0-4)

Offered: Winter

Prerequisite: WD 140

This is an advanced course in shielded metal arc (Stick) welding, gas shielded flux core arch welding (GS-FCAW) and gas metal arc welding (GMAW). Emphasis is placed on welding in preparation for the AWS plate qualification test. An introduction to the air-carbon arc cutting process. The joining of high-strength low alloyed steels is covered.

WD 244 Welding Inspection and Assessment 1 cr.

Offered: Winter

Prerequisite: WD 140 or equivalent experience.

This course introduces students to the responsibilities and duties of the welding inspector. Student will develop the skills necessary to interpret welding codes and specifications, evaluate weld discontinuities and the weldment testing methods applicable to the majority of the construction and manufacturing fields.

WD 147 Construction Rigging and Equipment Installation 2 cr. (1-0-3)

Offered: Winter

This course is designed to introduce students to the tools, equipment and techniques used in hoisting and relocating loads. Student develops skills with slings and chokers in making proper load hook-ups, identifying tools and equipment, crane signaling and estimating load weights. The use of scaffolding and ladders will be covered.

WD 295 Special Topics in Welding 1-4 cr.

Offered: Contact department for information.

Prerequisite: Adviser permission.

Specialized work not covered by other courses.

WD 298 Directed Study and Research 1-4 cr.

Prerequisite: Department permission.

Selection of problem in area of emphasis, specialized instruction and experiences to reinforce technical skill and knowledge. Written reports of work are required.

WT - WOOD TECHNOLOGY**Technology and Occupational Sciences Department****WT 161 Wood Processes I** 2 cr. (1-0-2)

Offered: Fall

An introductory course intended to acquaint students with some of the carpentry tools, terminology and standard practices utilized in today's industry.