



# Graduate Courses of Instruction

## ABBREVIATIONS

PR:	Prerequisite
CR:	Corequisite
REC:	Recommended
I,II,S:	I-Fall semester; II-Spring semester; S-Summer
-lec. -lab	lecture and laboratory hours per week (e.g., 2 lec-4 lab means two hours lecture and four hours laboratory per week)
S/U:	Graded Satisfactory/Unsatisfactory.

<b>A &amp; S</b>	<b>ARTS AND SOCIETY .....</b>	<b>187</b>	<b>CJ</b>	<b>CRIMINAL JUSTICE .....</b>	<b>158</b>
<b>ACC</b>	<b>ACCOUNTING .....</b>	<b>136</b>	<b>CL</b>	<b>CLASSICS .....</b>	<b>149</b>
<b>ACC</b>	<b>ADULT AND TECHNICAL EDUCATION ATE .....</b>	<b>137</b>	<b>CMM</b>	<b>COMMUNICATION STUDIES ...</b>	<b>150</b>
<b>ACB</b>	<b>ANATOMY, CELL AND NEUROBIOLOGY .....</b>	<b>140</b>	<b>COUN</b>	<b>COUNSELING .....</b>	<b>154</b>
<b>ANT</b>	<b>ANTHROPOLOGY .....</b>	<b>141</b>	<b>CSD</b>	<b>COMPUTER SCIENCE AND SOFTWARE DEVELOPMENT ..</b>	<b>152</b>
<b>ART</b>	<b>ART .....</b>	<b>142</b>	<b>CSE</b>	<b>CONTROL SYSTEMS .....</b>	<b>153</b>
<b>ARTS</b>	<b>STUDIO ART .....</b>	<b>189</b>	<b>CTCS</b>	<b>COMMUNITY AND TECHNICAL COLLEGE STUDIES .....</b>	<b>152</b>
<b>BIC</b>	<b>BIOCHEMISTRY AND MOLECULAR BIOLOGY ..</b>	<b>142</b>	<b>CULS</b>	<b>CULTURAL STUDIES .....</b>	<b>187</b>
<b>BMS</b>	<b>BIOMEDICAL SCIENCE .....</b>	<b>146</b>	<b>DTS</b>	<b>DIETETIC INTERNSHIP .....</b>	<b>168</b>
<b>BSC</b>	<b>BIOLOGICAL SCIENCES .....</b>	<b>144</b>	<b>ECN</b>	<b>ECONOMICS .....</b>	<b>168</b>
<b>CD</b>	<b>COMMUNICATION DISORDERS .....</b>	<b>149</b>	<b>EDF</b>	<b>EDUCATIONAL FOUNDATIONS .....</b>	<b>169</b>
<b>CHE</b>	<b>CHEMICAL ENGINEERING .....</b>	<b>147</b>	<b>EE</b>	<b>ELECTRICAL ENGINEERING ..</b>	<b>171</b>
<b>CHM</b>	<b>CHEMISTRY .....</b>	<b>148</b>	<b>EM</b>	<b>ENGINEERING MANAGEMENT</b>	<b>171</b>
<b>CI</b>	<b>CURRICULUM AND INSTRUCTION .....</b>	<b>159</b>	<b>ENG</b>	<b>ENGLISH .....</b>	<b>172</b>
<b>CIEC</b>	<b>CURRICULUM AND INSTRUCTION: EDUCATIONAL COMPUTING ..</b>	<b>161</b>	<b>ENGR</b>	<b>ENGINEERING .....</b>	<b>171</b>
<b>CIME</b>	<b>CURRICULUM AND INSTRUCTION: MATHEMATICS EDUCATION ..</b>	<b>162</b>	<b>ENVE</b>	<b>ENVIRONMENTAL ENGINEERING .....</b>	<b>174</b>
<b>CIRG</b>	<b>CURRICULUM AND INSTRUCTION: READING EDUCATION .....</b>	<b>163</b>	<b>ES</b>	<b>ENVIRONMENTAL SCIENCE ...</b>	<b>175</b>
<b>CISE</b>	<b>CURRICULUM AND INSTRUCTION: SCIENCE EDUCATION .....</b>	<b>165</b>	<b>FCS</b>	<b>FAMILY AND CONSUMER SCIENCE .....</b>	<b>177</b>
<b>CISL</b>	<b>CURRICULUM AND INSTRUCTION: ENGLISH AS A SECOND LAN- GUAGE .....</b>	<b>162</b>	<b>FIN</b>	<b>FINANCE .....</b>	<b>178</b>
<b>CISP</b>	<b>CURRICULUM AND INSTRUCTION: SPECIAL EDUCATION .....</b>	<b>165</b>	<b>FRN</b>	<b>FRENCH .....</b>	<b>180</b>
<b>CIVI</b>	<b>CURRICULUM AND INSTRUCTION: VISUAL IMPAIRMENTS .....</b>	<b>167</b>	<b>FSC</b>	<b>FORENSIC SCIENCE .....</b>	<b>179</b>
<b>CE</b>	<b>CIVIL ENGINEERING .....</b>	<b>149</b>	<b>GEO</b>	<b>GEOGRAPHY .....</b>	<b>180</b>
			<b>GLY</b>	<b>GEOLOGY .....</b>	<b>181</b>
			<b>HCA</b>	<b>HEALTH CARE ADMINISTRATION .....</b>	<b>182</b>
			<b>HE</b>	<b>HEALTH EDUCATION .....</b>	<b>183</b>
			<b>HIST</b>	<b>HISTORICAL STUDIES .....</b>	<b>188</b>
			<b>HST</b>	<b>HISTORY .....</b>	<b>184</b>
			<b>HUMN</b>	<b>HUMANITIES .....</b>	<b>186</b>
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IER	INDUSTRIAL AND EMPLOYEE RELATIONS .....	189	PHL	PHILOSOPHY .....	208
IS	INFORMATION SYSTEMS .....	190	PHS	PHYSIOLOGY .....	212
ITL	INSTRUCTIONAL TECHNOLOGY AND LIBRARY SCIENCE .....	192	PHY	PHYSICS .....	211
JMC	JOURNALISM AND MASS COMMUNICATIONS .....	192	PLS	PARK RESOURCES AND LEISURE SERVICES .....	206
LAT	LATIN .....	194	PMC	PHARMACOLOGY .....	207
LE	LEGAL ENVIRONMENT .....	197	PS	PHYSICAL SCIENCE .....	210
LITS	LITERARY STUDIES .....	188	PSC	POLITICAL SCIENCE .....	212
LS	LEADERSHIP STUDIES .....	194	PSY	PSYCHOLOGY .....	214
MCB	MICROBIOLOGY, IMMUNOLOGY AND MOLECULAR GENETICS .....	200	PTH	PATHOLOGY .....	207
MGT	MANAGEMENT .....	197	QA	QUALITY ASSURANCE .....	218
MIS	MANAGEMENT INFORMATION SYSTEMS .....	198	RST	RELIGIOUS STUDIES .....	218
MKT	MARKETING .....	199	SFT	SAFETY TECHNOLOGY .....	218
MSF	MINE SAFETY .....	201	SOC	SOCIOLOGY .....	221
MTH	MATHEMATICS .....	199	SPN	SPANISH .....	223
MUS	MUSIC .....	202	SPSY	SCHOOL PSYCHOLOGY .....	220
NUR	NURSING .....	205	TE	TECHNOLOGY AND ENGINEERING .....	224
PE	PHYSICAL EDUCATION .....	208	THE	THEATRE .....	225
			TM	TECHNOLOGY MANAGEMENT .....	224

#### ACCOUNTING (ACC)

510	<b>Financial Accounting. 3 hrs.</b> Application of accounting as an information development and communication function that supports economic decision making. Topics include principles, concepts, problems, financial analysis, personal and organizational decisions, business entities, and government.
580-583	<b>Special Topics. 4 hrs.</b>
612	<b>Accounting Functions in Business. 3 hrs.</b> A study of the generation, transformation, and presentation of quantitative data produced by the accounting process. Emphasis is given to the modern accounting system that generates information (1) for marketing, production, and financial executives in planning and controlling business operations, and (2) by investors, creditors, governmental agencies, and other external groups having an interest in the operating results and financial position of business firms. (PR: Full M.B.A. admission or permission of GSM academic advisor)
613	<b>Profit Planning and Controls. 3 hrs.</b> Determination, analysis, and reporting of data for planning and controlling operations. Includes flexible budgets, standard costs, and systems of determining historical costs. (PR: Full M.B.A. admission or permission of GSM academic advisor)
614	<b>Theory of Accounting. 3 hrs.</b> History and development of accounting principles; intensive study of theoretical problems related to determination of income and presentation of financial conditions. (PR: Accounting 613 and full M.B.A. admission or permission of GSM academic advisor)
615	<b>Auditing Theory and Practice. 3 hrs.</b> Legal and social responsibilities of the auditor. Verification of financial statements by independent public accountants and internal auditors. (PR: ACC 429 and full M.B.A. admission or permission of GSM academic advisor)
616	<b>Advanced Income Tax Procedure. 3 hrs.</b> A study of selected topics in the Internal Revenue code and regulations with emphasis on tax accounting and research. (PR: ACC 348 and full M.B.A. admission or permission of GSM academic advisor)
617	<b>Advanced Controllership. 3 hrs.</b> Functions of the modern corporate controller. Topics and problems demonstrating the integrative nature of the controller's role are investigated. The use of the computer is integrated into the course. (PR: ACC 613 and full M.B.A. admission or permission of GSM academic advisor)
618	<b>Accounting Research. 3 hrs.</b> Examination and evaluation of current theories, issues, and problems relating to accounting. Primary emphasis on accounting theory and research. (PR: ACC 312 and full M.B.A. admission or permission of GSM academic advisor)

- 650 Special Topics. 1-3, 1-3 hrs.**  
(PR: Permission of the division head and full M.B.A. admission)
- 660 Independent Study. 1-4 hrs.**  
Independent study of a specific nature under the supervision of a faculty member with graduate status. Hours determined by the magnitude of the project. (PR: Permission of the division head and full M.B.A. admission or permission of GSM academic advisor)

### **ADULT AND TECHNICAL EDUCATION (ATE)**

- 503 Introduction to Adult Learning Theory. 3 hrs.**  
Designed to acquaint the student with the field of adult education and its underpinnings and the various adult learning theories and/or approaches.
- 505 Instructional Methods in Technical Training. 3 hrs.**  
Unit and lesson planning; cooperative education as a method of instruction, project plan of instruction, classroom management and control, demonstration techniques, evaluation methods, field experience in Marketing Education classroom.
- 508 Teaching Methods in Vocational Education. 3 hrs.**  
Correlating shop/lab instruction with classroom instruction; individual and group instruction sheets and materials; the four teaching steps in vocational education; physical factors relating to classroom and shop/lab.
- 510 Developing Selling Curriculum. 3 hrs.**  
Conduct library research, review selling content, select content objectives, identify content appropriate for the target group, prepare teaching outlines, and design evaluation instruments.
- 511 Introduction to Vocational Education. 3 hrs.**  
Designed as a follow-up to Teaching Methods in Vocational Education and intended to provide the new teacher guidance and supervision in developing teacher competence.
- 512 Course Construction and Planning in Vocational Education. 3 hrs.**  
Analysis procedures for determining vocational curriculum content; determination of program goals and objectives; involvement of advisory committees; factors, principles, and techniques of developing a course of study.
- 513 Organization and Management of School Shops and Laboratories. 3 hrs.**  
Responsibilities of the teacher as a manager; methods of handling tools, equipment, and supplies; project instructional resource needs and reporting; improvement of vocational facilities; filing system, and vocational laboratory.
- 520 Principles of Cooperative Education. 3 hrs.**  
Principles for planning, implementing, and evaluating the cooperative design within the various service areas of technical education; analysis of factors which must be considered in selection of the cooperative design.
- 521 Occupational Analysis. 3 hrs.**  
Assist the vocational instructor analyze an occupation; goals and objectives to form a basis for vocational curriculum; classifying and describing occupations; analysis procedures; course content, and technical skills and knowledge.
- 522 Administration of Cooperative Programs. 3 hrs.**  
Administering cooperative education programs, recruiting, and selecting students; selecting training agencies and placing students; conducting public relations activities for the program; and advising the student organization.
- 524 Safety in Vocational Education. 3 hrs.**  
Responsibilities of the teacher in providing a safe learning/working environment; effective approaches to accident prevention; laws and regulatory agencies regarding safety management in the classroom and laboratory.
- 525 Computer Applications in Business and Marketing Education. 3 hrs.**  
Study of computer applications and software for Business and Marketing Education.
- 535 Methods of Examination in Vocational Education. 3 hrs.**  
Develop written and performance evaluation instruments; develop and use progress charts; determine appropriate grading procedures. Develop rating scales, objectives tests, classroom tests, and manipulative tests. Introduction to statistics.
- 536 Coordination of Cooperative Vocational Education. 3 hrs.**  
Background of coordination; methods of techniques for evaluating and selecting work stations; student selection, placement, and follow-up; role of advisory committees; methods of evaluating cooperative work experience.
- 540 Developing Merchandising/Sales Promotion Curriculum. 3 hrs.**  
Conduct library research, review merchandising and sales promotion content, objectives, identify content appropriate for the target group, prepare teaching outlines, and design evaluation instruments.

- 542 Principles of Prevocational Exploration. 3 hrs.**  
Study of the prevocational exploration delivery system. Develop instructional units which include goals, objectives, and criteria for evaluation of students.
- 544 Practicum in Prevocational Exploration, I. 3 hrs.**  
Participants make revisions to instructional units, organize a Career Exploration Club, and recognize apprenticeship opportunities.
- 546 Practicum in Prevocational Exploration, II. 3 hrs.**  
Participants modify the 36-lesson plan project, incorporate additional “hands-on” activities, examine teaching strategies, and design activities for community involvement utilizing an advisory committee.
- 547 Computer Applications in Vocational Education. 3 hrs.**  
Designed to introduce modern instructional technology in today’s classrooms and labs. Introduction to disk operating systems; application software for instruction and instructional management; student evaluation; record keeping, and work processing.
- 548 Applications of Basic Skills in Vocational Education. 3 hrs.**  
Methods, techniques, and strategies for incorporating basic skills in vocational instruction; emphasis on reading, writing, math, oral communication, and critical thinking skills; job seeking and job keeping skills.
- 549 Occupational Analysis and Instructional Design. 3 hrs.**  
Analyzing an occupation to identify knowledge and skills; use of the analysis to develop problem solving objectives and instructional plans; emphasis on approach to facilitate student achievement of objectives.
- 550 Interpersonal Skills in the Workplace. 3 hrs.**  
Course is designed to provide opportunities to learn in preparation for career success with supervisors, co-workers, clients, and customers. Human relations skills are examined and related to business success.
- 552 History and Philosophy of Vocational Education. 3 hrs.**  
Historical influences in the development of vocational education in America and Europe; motivating influences and the implications of philosophy in modern vocational education.
- 559 Coordination of Vocational Youth Activities. 3 hrs.**  
Organize and develop a student organization that is co-curricular; defining the purpose of the organization; plan application and integration into the vocational program; competencies in leadership and team building.
- 560-563 Professional Development. 1-4 hrs.**
- 565 Career Exploration and Development. 3 hrs.**  
Exploring principles and techniques for career planning and job search. An overview of strategies for gaining a competitive edge in the labor market and for experiencing a successful career beginning.
- 569 Business and Occupational Teaching Methods. 3 hrs.**  
Survey materials and methods for developing competencies in teaching business education and/or occupational training programs.
- 570 Practicum in Adult and Technical Education. 1-4 hrs.**  
Individually designed field experience under supervision of the faculty; such experience related to the student’s future professional role.
- 580-584 Special Topics. 1-4 hrs.**
- 585-588 Independent Study. 1-4 hrs.**
- 591-594 Workshop. 1-4 hrs.**
- 589 Grant Proposal Writing for Business and Industry. 3 hrs.**  
This course provides a step-by-step guide to the proposal writing process, from the initial stages of planning, to writing the first draft, to preparing the final document.
- 595 Historical Developments in Workforce Preparation. 3 hrs.**  
An overview of the historical evolution of technical education legislation; analysis of Technical Education Acts as they relate to state and local planning of technical education programs.
- 600 Aspects of Training and Development. 3 hrs.**  
Overview of the training and development profession and theories that support the profession; emphasis on the variety of solutions used by HRD professionals to help improve individual and organizational performance.
- 601 Philosophy of Workforce Preparation 3 hrs.**  
Overview of the historical origins of technical education and their relationship to educational philosophies; foundations of areas of technical education; analysis of questions fundamental to a philosophy of technical education.
- 603 Introduction to Adult Education and Adult Learners. 3 hrs.**  
Designed to acquaint the student with the field of adult and continuing education, its foundations and development in this country and future trends.

- 605 Foundations of Business and Marketing Education. 3 hrs.**  
Application of philosophy and principles of business and marketing education to the objectives, curriculum, guidance, and teacher preparation, emphasizing the techniques for coordination of federally aided programs.
- 609 Developing Training Plans for Business and Industry. 3 hrs.**  
Analysis of factors in developing local plans for business and industry; emphasis on implications of federal guidelines; factors which impinge upon programs during implementation; developing evaluation procedures.
- 610 Current Issues in Business and Marketing Education. 3 hrs.**  
Individual and group analysis of current issues in business and marketing; identification of issues significant to the direction of sound business education and marketing education programs.
- 614 Adult/Technical Education and Economic Development. 3 hrs.**  
Study of the sources of data on employment needs; relationship to planning techniques for conducting a community survey; organizing data for analysis and applying the findings to the planning process.
- 615 Student Career Organizations. 3 hrs.**  
A study of various facets of existing state/national student organizations. Special emphasis is placed upon the organizations of student career organizations and parliamentary procedures. (PR: ATE 542 or equivalent)
- 616 Community Relations in Adult/Technical Programs. 3 hrs.**  
Study of community organization and the relationship of adult/technical education; consideration of models for analyzing employment opportunities and occupational training needs and the process in securing community commitment.
- 618 Literature of Adult and Continuing Education. 3 hrs.**  
A program of readings and reports on specific areas in adult education or particular problems within an area of adult and continuing education. Readings to be selected cooperatively with advisor.
- 628 Adult Instruction: Environmental and Personal Aspects. 3 hrs.**  
The course examines both environmental and personal factors which may impact on the adult learning process and is designed to foster awareness, which will be translated into appropriate intervention strategies.
- 631 Survey Practicum in Computer Applications in Business and Industry. 3 hrs.**  
An introductory course for persons who want to become familiar with the application of computers in the business/industrial fields represented by adult and technical education.
- 635 Specialized Practicum in Computer Applications in Business and Industry. 3 hrs.**  
An advanced course for persons who want to further their knowledge of the application of computers in the business/industrial fields represented by adult and technical education.
- 637 Individual Computer Program Applications. 3 hrs.**  
Individually designed learning activities that involve the application of previously learned theories, processes, operations, techniques or systems. The applications are studied, analyzed, and evaluated.
- 640 Program Design in Occupational Education. 3 hrs.**  
An overview of technical education history, philosophy, legislation, certification, evaluation, and operations. Comparison to academic programs to emphasize similarities and differences.
- 650 Career Education Curriculum Development. 3 hrs.**  
Instructional unit is developed to assist children and youth achieve academic, general, or technical education and also career education goals; includes goals, objectives, procedures, student activities, resources, and evaluation.
- 651 Developing Marketing Curriculum. 3 hrs.**  
Conduct library research, review marketing content, select content objectives, identify content appropriate for the target group, prepare teaching outlines, and design evaluation instruments.
- 652 Field Based Job Analysis and Curriculum Design. 3 hrs.**  
Field study of job analysis, curriculum, course, and program design.
- 653 Developing Management Curriculum. 3 hrs.**  
Conduct library research, review management content, select content objectives, identify content appropriate for the target group, prepare teaching outlines, and design evaluation instruments.
- 655 Developing Personnel Curriculum. 3 hrs.**  
Conduct library research, review personal content, select content objectives, identify content appropriate for the target group, prepare teaching outlines, and design evaluation instruments.
- 656 Instructional Planning for Adult Populations. 3 hrs.**  
An examination and application of the process involved in the development, operation, and evaluation of adult programs in the community, business, and industry.
- 661 Practicum in Adult and Continuing Education. 3 hrs.**  
Individually designed to provide field experience under the supervision of the faculty, such experience to be related to the student's project role in adult and continuing education.

- 662 Applied Field Experience in Prevocational Exploration. 3 hrs.**  
Participants are assisted in making revisions in instructional units, organizing an advisory committee, and organizing a Career Exploration Club as an integral part of the classroom instruction. (PR: ATE 542)
- 664 Occupational Education Practicum. 3 hrs.**  
Individually designed to provide field experience under the supervision of the faculty, such experience to be related to the student's profession.
- 667 Cooperative Education Workforce Experience. 1-10 hrs.**  
Alternating or parallel periods of study and paid employment for experiential learning related to student's academic and/or professional goals (Min. 50 hours of paid work experience per credit hour)
- 668 Field Based Internship in Business and Industry. 3 hrs.**  
Internship in the technical content areas of marketing, merchandising, management or technology; evaluating methods, and procedures in marketing, merchandising, management, or technology. (PR: ATE 609, 628, 652 and 656)
- 671 Evaluation of Adult and Technical Instruction. 3 hrs.**  
An examination of the design and evaluation processes used in adult learning areas with emphasis on the T&D and technical fields as well as the general field.
- 673 Tests and Measurement in Adult/Technical Education. 3 hrs.**  
Evaluation procedures in adult/technical education including principles of test construction; survey of standardized and published tests; utilization in the classroom or training department; review of statistical methods.
- 675 Literature and Applied Research in Adult/Technical Education. 3 hrs.**  
Program of readings and reports on specific areas of adult/Technical education or particular problems within an area of adult and technical education; reading selected cooperatively with advisor.
- 677 Research Methodology and Design in Adult/Technical Education. 3 hrs.**  
Study of methodology, application, analysis and synthesis of research; a review of current studies with attention to statistical techniques, data collecting, data handling, and the impact of particular research.
- 679 Problem Report. 1-6 hrs.**
- 680 International Workforce Development. 3 hrs.**  
This course is designed for students in technical and social fields who are interested in working in development. It has three components: education and training, collaborative research, and technical assistance.
- 681 Thesis. 1-6 hrs.**
- 690-692 Seminar. 1-4 hrs.**

### ANATOMY, CELL AND NEUROBIOLOGY (ACB)

- 620 Gross Anatomy/Embryology. 8 hrs. I.**  
The course presents a comprehensive study of the structures of the human body and their development. Although the course is centered in dissection, additional learning resources include examination of non-invasive images such as CAT scans, MR images and radiographs, and the study of models and the use of computer programs. Clinical correlates and cases are used to establish the anatomical basis of the practice of medicine.
- 624 Microscopic Anatomy and Ultrastructure. 4 hrs. II.**  
Students study the functional and microscopic aspects of cell and tissue types found in different regions of the human body. Presentation of topics correlates with the physiology course, which runs concurrently and provides an organ system approach to the material. In the laboratory portion of the course, tissues from medical histology slide sets and electron micrographs are studied.
- 626 Advanced Histological Techniques. 4 hrs., II.**  
Advanced techniques of tissue preparation, staining, histochemistry and immune localization. (PR: Consent of instructor)
- 628 Anatomy of the Nervous System. 4 hrs. II.**  
The gross and fine structure of the nervous system is correlated with function at each level of the spinal cord and brain. Lectures are supplemented in the laboratory by the study of microscopic sections and gross sections of the spinal cord, brain stem and whole brain. (PR: Consent of instructor)
- 632 Principles of Mammalian Development. 3 hrs. I.**  
A course designed to present the salient features of normal human development so that students will have a basis for comprehending normal adult anatomic relations and variations, and a basis for interpreting congenital pathologic conditions. (PR: Consent of instructor)

- 639 Neuroanatomy Research Techniques. 3 hrs. S.**  
Students rotate through neuroanatomy faculty research laboratories where they have the opportunity to see state-of-the-art neuroanatomy research skills demonstrated. Each student has the opportunity to participate in neuroanatomical research. (PR: Consent of instructor)
- 640 Current Topics in Cellular Biology. 1-3 hrs. II.**  
Students carry out a guided comprehensive review of the literature on a current research topic. The topic is selected by agreement of the student and faculty member. Consent of instructor is required.
- 641 Electron Microscopy. 3 hrs. I.**  
The theory and practice of transmission electron microscopy (TEM). Sample preparation, TEM operation, darkroom work, manuscript preparation, and an individualized research project. (PR: Consent of instructor)
- 643 Independent Study in Electron Microscopy. 1-5 hrs. II.**  
Supervised individual research projects in electron microscopy and advanced EM Techniques: STEM, SEM, Diffraction, Darkfield. (PR: ACB 641 or approval of instructor)
- 650 Research in Cellular Processes. 1-4 hrs. II.**  
Provides the student with an introduction to research in cellular biology and neurobiology. The education program is arranged in consultation with an individual faculty member. Consent of instructor required.
- 655 Digital Video Imaging. 3 hrs. I, II.**  
An in-depth study of the theory and practice of fluorescence and confocal microscopy (including Image Deconvolution, Multiphoton Imaging, FRET, FRAP, and GFPs), intracellular ion measurements and Immunocytochemistry. (PR: Consent of instructor)
- 660 Current Topics in Neurobiology. 1-3 hrs. II.**  
Students carry out a guided comprehensive review of the literature on a current research topic in neurobiology. The topic is selected by agreement of the student and faculty. Consent of instructor required.
- 675 Special Topics. 1-4 hrs. I, II.**  
Present course material on special areas of research or topics which are not routinely covered in existing courses. Consent of instructor is required.
- 676 Special Topics. 1-4 hrs. I, II.**  
Present course material on special areas of research or topics which are not routinely covered in existing courses. Consent of instructor is required.
- 677 Special Topics. 1-4 hrs. I, II.**  
Present course material on special areas of research or topics which are not routinely covered in existing courses. Consent of instructor is required.

## ANTHROPOLOGY (ANT)

(See Sociology)

- 505 Applied Anthropology. 3 hrs.**  
Principles of applied anthropology in community development. (PR: 6 hours of anthropology or sociology or equivalent)
- 526 African Cultures. 3 hrs.**  
Comparative analysis of the tribal cultures of Africa. (PR: 6 hours of anthropology, or equivalent)
- 527 Ethnic Relations. 3 hrs.**  
Analysis of cultural contact situations with emphasis on the role of western Europe cultures. (PR: 6 hours of anthropology or equivalent)
- 530 The American Indian. 3 hrs.**  
Comparative analysis of Indian tribal cultures of the Americas. (PR: 6 hours of anthropology or equivalent)
- 537 World Cultures: An Anthropological View. 3 hrs.**  
Anthropological analysis of the major culture areas of the world. (PR: 6 hours of anthropology or permission)
- 541 Oceania. 3 hrs.**  
Comparative analysis of the original cultures of the Pacific Islands area. (PR: 6 hours of anthropology or permission)
- 543 Anthropological Theory. 3 hrs.**  
Introduction to ethnological theory and to the development of grounded theory. (PR: 6 credit hours of anthropology or departmental permission)
- 551 Anthropological Analysis. 3 hrs.**  
Examination of the analytical procedures utilized in ethnographic and comparative approaches to anthropological data, and an introduction to computer processing of cross-cultural data using the Human Relations Area Files. (PR: ANT 201)

- 553 Cognitive Anthropology. 3 hrs.**  
Analysis of the relations between cultural, social and personality systems. (PR: 6 hours of sociology or anthropology, 6 hours of psychology or equivalent)
- 555 Appalachian Cultures. 3 hrs.**  
Analysis of the Cultures of Appalachia. (PR: 6 hours of anthropology or departmental permission)
- 561 Theory and Analysis in Archaeology. 3 hrs.**  
An introduction to archaeological theory and its application to the material record of cultures, past and present (PR: 6 credit hours of anthropology or departmental permission)
- 570 Appalachian Field Experience I. 3 hrs.**  
Supervised field work in an Appalachian community studying the social and cultural characteristics of the area. Four afternoons each week plus one class hour. (PR: ANT 455, or equivalent)
- 571 Appalachian Field Experience II. 3 hrs.**  
Supervised field work in an Appalachian community studying the social and cultural characteristics of the area. Four afternoons each week plus one class hour. (PR: ANT 555)
- 580-583 Special Topics. 1-4 hrs.**  
Study of topics of interest not covered in regularly scheduled classes. (PR: Graduate status and permission)
- 585-588 Independent Study. 1-4 hrs.**  
Individual study of topics not offered in regularly scheduled classes. (PR: Graduate status and permission)
- 597-598 Instructional Television Course. 1-4 hrs.**  
A course based upon Instructional Television Series broadcast by public television. The student is responsible for viewing the series on the air and satisfying all course requirements announced by the department.
- 600 Ethnographic Methods. 3 hrs.**  
Introduction to anthropological data-gathering and interviewing methods (PR: ANT 201; for students who have not had ANT 333 and 343)

#### **ART (ART)**

- 500 Co-Curricular Experiences in the Visual Arts. 0 hrs.**  
Students attend distinguished lectures, exhibitions, workshops, field trips, and other co-curricular visual arts events as part of their requirement for graduation.
- 501-502 History of Art. 3; 3 hrs. I or II or S.**  
A survey of the development of architecture, sculpture, painting and the minor arts to 1400 A.D. and from 1400 A.D. to present. (Does not fulfill Art History requirements.)
- 504 Iconography of Mary. 3 hrs.**  
Traces the sources and evolution of Catholic doctrine and images of the Virgin Mary.
- 505 Art in the United States. 3 hrs. I or II or S.**  
A survey of the development of architecture, painting, and sculpture from colonial times to the present.
- 506 Figure Drawing. 3 hrs. I or II or S.**  
Practice in drawing from the posed human figure.
- 507 Tribal Arts. 3 hrs. I or II or S.**  
An introduction to the unique Arts of so-called precivilized peoples with a twofold emphasis: First, the European Pre-Historic, Second, the Non-European Primitive.
- 508 Art of the Ancient World. 3 hrs.**  
History of the visual arts and architecture in Ancient Mesopotamia, Egypt, Greece and Rome.
- 509 Nineteenth Century Art. 3 hrs. I or II or S.**  
A survey of the development of architecture, painting, and sculpture in the western world during the last century.
- 512 20th Century Art To WW II. 3 hrs.**  
A survey of the development of architecture, painting and sculpture in the Western World from 1900 to World War II.
- 513 Contemporary Art. 3 hrs.**  
A survey of the development of architecture, painting and sculpture in the Western World from World War II to the present.
- 514 The Art of the Renaissance in Italy and Northern Europe. 3 hrs. I or II or S.**  
The course discusses the art of the Renaissance in Italy and Northern Europe within the context of social, political, theological and philosophical developments.
- 519 Spinning, Dyeing, and Tapestry. 3 hrs. I or II or S.**  
Basic procedures in hand spinning, dyeing and tapestry weaving.

- 540 **Advanced Graphic Design. 3 hrs.**  
Directed study in which student may select subject from any area of commercial design with the goal of developing specific area of expertise. Emphasis on original design and research.
- 548 **Ceramic Materials and Processes. 3 hrs.**  
Practical and empirical investigation of ceramic materials, techniques and approaches to their use in clay and glazes.
- 550 **2 & 3 Dimensional Designs for Fabrics. 3 hrs.**  
Exploring the potentialities of fabric as an art experience in two and three dimensional art form.
- 554 **Designing for Multimedia. 3 hrs.**  
Current topics and techniques in multimedia design. Topics include animation, incorporating digital video and sound, interaction design, information design, Web site design and advanced image processing.
- 555-556 **Painting: Acrylic and Oil. 3; 3 hrs. I, II, S.**  
Study and practice of painting in expressing still life, landscape and the human figure.
- 557 **Figure Painting. 3 hrs. S.**  
Painting the nude model using modern and classical methods.
- 560 **History and Philosophy of Art Education, 3 hrs. I.**  
A survey of the evolution of art education and philosophy, and a study of problems related to art education on the elementary and high school level.
- 566 **Problems in Curriculum Development for Public School Art K-12, 3 hrs.**  
Exploring considerations for curriculum development in Art Education, developing individualized curriculum for specific situations on grade levels K-6 or 7-12.
- 569 **Printmaking Processes. 3 hrs. I, II, S.**  
Experiments in the media of Intaglio, Lithography, Serigraphy, Relief, Collagraphs and new techniques of printmaking.
- 570-573 **Practicum. 3 hrs. I, II, S.**  
To be used for learning activities that involve the application of previously learned processes, theories, systems or techniques
- 580-583 **Special Topics. 1-4 hrs.**  
To be used for experimental courses. By permission only.
- 585-588 **Independent Studies. 1-4 hrs.**  
To be reserved for tutorials, directed and independent research and readings, problem reports, and other activities designed to fit the needs of individual students within the major.
- 601 **Advanced Problems in Art Education (Grades K-12). 3 hrs. I, II, S.**  
For graduate students with limited experience in the arts and crafts wishing to familiarize themselves with methods and materials used in art education.
- 650-656 **Advanced Studio Sequence. 3; 3; 3; 3; 3; 3 hrs. I, II, S.**  
The student will select special studies from art education, art history, drawing, painting, sculpture, ceramics, graphics, and other related approved projects.
- 670 **Seminar. 3 hrs. II. Even years only.**  
Discussion and research in selected areas of art.
- 679 **Problem Report. 1-3 hrs. I or II or S.**
- 681 **Thesis. 1-6 hrs. I or II or S.**

### **BIOCHEMISTRY AND MOLECULAR BIOLOGY (BIC)**

- 620 **Human Biochemistry. 6 hrs. I.**  
A study of structure and metabolism of biological compounds with special reference to the human. Must be taken concurrently with BIC 621. (PR: Organic chemistry and consent of instructor; CR: BIC 621)
- 621 **Human Biochemistry Discussion. 1 hr. CR/NC.**  
Co-requisite weekly discussion group for Human Biochemistry. Selected topics from the lecture course will be covered in greater depth. Must be taken concurrently with BIC 620. (CR: BIC 620)
- 628 **Molecular Mechanisms in Growth and Differentiation. 2 hrs.**  
Advanced graduate course will acquaint students with the latest information on control of cell growth & differentiation at the molecular level. Lecture & student presentations. A short grant proposal is also required. Prerequisite: Cellular & Molecular Biology; BMS 600.
- 634 **Lipid Biochemistry. 2 hrs. II.**  
Advanced study of lipid structure and metabolism. (PR: Biochemistry and consent of instructor)
- 636 **Enzymology. 3 hrs. I.**  
A study of enzyme structure and function, including purification, kinetics, pH and temperature effects, molecular chaperones, degradation, protein engineering, and enzymes important in the cell cycle and regulation of gene expression. (PR: Biochemistry and consent)

- 638 Nucleic Acids and Protein Synthesis. 3 hrs. II.**  
An advanced course in molecular biology and molecular genetics emphasizing current research in these areas. (PR: Biochemistry and consent of instructor)
- 643 Molecular Signal Transduction. 3 hrs.**  
An advanced exploration of the newest information on cellular signalling pathways. Special emphasis will be placed on current literature in following signal transduction from the plasma membrane to the nucleus. (PR: BMS 600 or equivalent)
- 675 Special Topics. 1-4 hrs.**  
Present course material on special areas of research or topics which are not routinely covered in existing courses.

### BIOLOGICAL SCIENCES (BSC)

- 501 Ichthyology. 4 hrs. II. (Alternate years)**  
Anatomy, physiology, ecology, zoogeography, economic importance and classification of major groups and representative local species of fishes. 2 lec-4 lab and field. (PR: BSC 120-121, 214 or 310)
- 504 Cellular Physiology. 4 hrs.**  
The physio-chemical nature of intracellular processes in plant and animal cells with emphasis on the functional significance of microscopic and submicroscopic structure and organization. 3 lec-3 lab. (REC: Background in chemistry and physics; PR: 12 hours biological sciences)
- 505 Economic Botany. 3 hrs.**  
Plants used by man for food, ornamental purposes, building materials, textiles and other industrial purposes: economic importance of conservation. No laboratory. (PR: BSC 120-121 or equivalent)
- 506 Herpetology. 4 hrs. II, (Alternate years)**  
A survey of the reptiles and amphibians of the world with special emphasis placed on forms resident to West Virginia including aspects of zoogeography, morphology, taxonomy, and behavior. 2 lec-4 lab. (PR: BSC 120-121, 214)
- 507 Genetics. 4 hrs. I, II.**  
The fundamental principles and mechanisms of inheritance. 3 lec-4 lab. (PR: BSC 120-121 or equivalent)
- 508 Ornithology. 4 hrs. II, (Alternate years)**  
An introduction to avian biology: Identification, distribution, migration and breeding activities of birds. 2 lec-4 lab. (PR: BSC 120, 121; REC: BSC 214)
- 509 Mammalogy. 4 hrs. I (Alternate years).**  
Study of morphology, evolution and classification, zoogeography, ecology, economic importance; survey techniques and recognition of native mammals of West Virginia. (PR: BSC 121 plus an additional 8 hours of BSC courses)
- 510 Remote Sensing/GIS Applications. 4 hrs. I.**  
A study of the physical systems for collecting remotely sensed data. Statistical/spatial analysis and modeling using image processing/geographic information/spatial computer software systems with earth resources applications. (PR: PHY 203-204, MTH 225 or permission)
- 511 Digital Image Processing/GIS Model. 4 hrs. II.**  
A study of image processing/geographic information/spatial analysis systems, concurrent and parallel image processing 3-D modeling scenarios utilizing geophysical data for computer simulation modeling. (PR: BSC/PS 410 or BSC 510)
- 513 Principles of Organic Evolution. 3 hrs. II.**  
The facts and possible mechanisms underlying the unity and diversity of life with emphasis on Neo-Darwinian concepts of the role of species in evolutionary phenomena. (PR: 16 hours BSC)
- 514 Entomology. 4 hrs.**  
Entomology, anatomy, physiology, identification, classification, life histories and economic importance of representative insect groups. 2 lec-4 lab. (PR: BSC 120-121 or equivalent)
- 515 Morphology of Plants and Fungi. 4 hrs. I, II, S.**  
Form, structure, and development of plants and fungi. 2 lec-4 lab.. (PR: BSC 120, 121 or equivalent\_
- 516 Plant Taxonomy. 4 hrs. I, II, S.**  
Identification and classification of seed plants and ferns of eastern United States. Readings in history and principles of taxonomy, rules of nomenclature and related topics. 2 lec-4 lab. (PR: BSC 120-121 or equivalent)
- 517 Biostatistics. 3 hrs.**  
Statistical skills for biological/biomedical research, with emphasis on applications. Experimental design/survey sampling, estimation/hypothesis testing procedures, regression, ANOVA, multiple comparisons. Implementation using statistical software such as SAS, BMDP. Same as MTH 518. (PR: Permission)

- 518 Mycology. 4 hrs. I.**  
Nature, cause and control of plant diseases. 2 lec-4 lab. (PR: BSC 120-121)
- 519 Plant Anatomy. 4 hrs. II.**  
Investigations in plant anatomy with emphasis on seed plants. 2 lec-4 lab. (PR: BSC 120 and 121 or permission)
- 520 Plant Physiology. 4 hrs. II. (Alternate years)**  
Experimental study of plant life processes to include applicable biophysical and biochemical principles, water relations, molecular biology, stress physiology, and growth and development. (PR: BSC 322 or equivalent)
- 521 Phycology. 4 hrs.**  
Taxonomy and morphology of algae. Techniques used in the study of algae with emphasis upon application of ecological principles to current water quality problems. 2 lec-4 lab. (PR: BSC 105 or 121)
- 522 Animal Physiology. 4 hrs. I.**  
Physiological principles operating in the organ systems of vertebrate animals. (PR: BSC 120, 121 or equivalent; BSC 322)
- 524 Animal Parasitology. 4 hrs. I, S.**  
Morphology, life histories, classification, and host relationships of common parasites. 2 lec-4 lab. (REC: BSC 212 or equivalent)
- 526 Medical Entomology. 4 hrs. II, S.**  
The characteristics and control of certain insects and other arthropods which transmit disease-causing organisms. 2 lec-4 lab. (REC: BSC 212 or equivalent)
- 530 Plant Ecology. 4 hrs. II.**  
The study of plants and their interactions with their environment at different levels of ecological organization: individuals, populations, communities, and ecosystems. Emphasis on quantitative analysis of ecological data.
- 531 Limnology. 4 hrs. I, S.**  
The study of inland waters; ecological factors affecting lake and stream productivity and various aquatic communities. 2 lec-4 lab. (PR: BSC 120-121 or equivalent; REC: BSC 212)
- 542 Advanced Microbiology. 4 hrs.**  
An advanced treatment of microbiology with emphasis on the molecular aspects of anatomy, taxonomy, and physiology of microorganisms. 2 lec-4 lab. (PR: BSC 302)
- 545 Microbial Ecology. 3 hrs. II.**  
This course introduces students to the vital roles that microbes play in sustaining life on earth. Includes both theoretical and practical concepts ranging from the origin of life to biodegradation. (PR: BSC 121 or permission)
- 546 Microbial Ecology Lab. 2 hrs. II.**  
A laboratory course emphasizing the recovery, cultivation, enumeration, and identification of bacteria from environmental samples. Also introduces students to molecular-based methods for studying microbial community structure and dynamics. (PR: BSC 121, CR: BSC 545 or consent)
- 550 Molecular Biology. 3 hrs. II.**  
Advanced principles in molecular function emphasizing current research using recombinant DNA methodology. (PR: BSC 322 or equivalent)
- 560 Conservation of Forests, Soil and Wildlife. 3 hrs. I.**  
Primarily for students in the biological sciences, general and applied sciences. Includes fieldwork, seminars, and demonstrations related to conservation. 2 lec-4 lab. (PR: BSC 105 or 121 or equivalent)
- 580-583 Special Topics. 1-4; 1-4; 1-4; 1-4 hrs.**  
(PR: Permission)
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs. CR/NC**  
(PR: Permission)
- 601 Vertebrate Embryology. 4 hrs. I.**  
Vertebrate development based on frog, chick and pig embryos. 2 lec-4 lab.
- 608 Plant Physiology: Growth and Development. 4 hrs. II. (Alternate years)**  
Comprehensive advanced study of correlative growth in plants with emphasis on germination, dormancy, growth substances and physiological phenomena associated with phases of development. (PR: BSC 322 or 420 or 520)
- 620-622 Taxonomy of Vascular Plants. 1-2; 1-2; 1-2 hrs.**  
Field studies in the taxonomy of higher plants. (Limited to 4 hours credit per student). (PR: BSC 516 or equivalent)
- 625 Advanced Physiology. 4 hrs.**  
Lecture, current literature and introduction to research in physiological systems. 3 lec-3 lab. (PR: 4 hrs. physiology or permission)

- 626 Protozoology. 4 hrs. (Offered every third semester)**  
A study of free-living and parasitic protozoa important to agriculture, wildlife, and man. Morphology, physiology, reproduction, ecology, and life histories of parasitic protozoa will be emphasized.
- 631 Animal Ecology. 4 hrs. I.**  
A study of population and behavior ecology; community dynamics and field techniques. 2 lec-4 lab.
- 650-652 Special Problems. 1-3; 1-3; 1-3 hrs.**  
By permission of adviser, graded CR/NC.
- 661 Seminar I. 2 hrs. I.**  
In depth group discussion of current biological issues.
- 662 Seminar II. 1 hr. II.**  
Oral presentation of individual topics. (PR: BSC 661)
- 679 Problem Report. 1-4 hrs.**  
Preparation and completion of a written report from experimental or field research in biological sciences. (PR: permission)
- 680 Special Topics. 1-4 hrs.**
- 681 Thesis. 1-6 hrs.**  
(PR: By permission of advisor).

### **BIOMEDICAL SCIENCE (BMS)**

- 600 Cellular and Molecular Biology. 3 hrs. I.**  
A study of the molecular biology of the cell and its organelles, cell interactions and evolution. (PR: One year of Biology and Organic Chemistry and consent of instructor)
- 614 Basic Human Genetics. 2 hrs. II.**  
This course will focus on the study of heritable human diseases. Major topics include the metabolic/molecular basis and detection of inherited disease, gene mapping and genetic risk assessment. (PR: BIC 620 or permission of instructor)
- 624 Human Genetics. 4 hrs., II.**  
An introduction to the study of heritable diseases, their molecular basis and their detection and treatment. Clinical cases will be presented in the second half of the class. (PR: Graduate status in one of the biomedical sciences)
- 630 Neuroscience. 5 hrs., II.**  
The structure and function of the nervous system. (PR: Permission of instructor)
- 631 Neuroscience Literature Review. 1 hr.**  
Published articles in the neuroscience literature will be presented by all class members. Each presentation will include background introduction methods, results, and discussion of the neuroscience research. (PR: Permission of instructor)
- 632 Neuroscience Research Techniques. 3 hrs.**  
Class participants will be exposed to state-of-the-art neuroscience research techniques while in the laboratories of the neuroscience faculty. (PR: Permission of instructor)
- 660 Communication Skills for Biomedical Sciences I. 1 hr.**  
Biomedical graduate students are trained to plan, prepare, and deliver effective scientific presentations.
- 661 Communication Skills for Biomedical Sciences I. 1 hr.**  
Biomedical graduate students are trained to plan, prepare, and deliver effective scientific presentations.
- 670 Basic Methods in Molecular Cloning. 2 hrs. II.**  
This course is designed to expose students to basic molecular cloning techniques, such as genomic library construction, preparation of plasmid DNA, subcloning, nucleic acid hybridization and DNA sequencing. (PR: Undergraduate biology or chemistry majors or graduate student status in one of the biomedical sciences or third year medical student and permission of instructor.)
- 679 Special Problems. I, II, S. CR/NC**  
Intensive study of a selected topic or problem. Emphasizes independent study. (PR: Consent of advisor)
- 680 Seminar. 1 hr. I, II. CR/NC**  
Study and discussion of current topics related to the Biomedical Sciences.
- 681 Thesis. 1-6 hrs. I, II, S. CR/NC.**
- 684 Overview of Biomedical Sciences Research. 1 hr.**  
New graduate students in Biomedical Sciences are given an overview of each of the areas of research training.
- 685 Introduction to Research. 1-6 hrs. I, II, S. CR/NC**  
Directed research activities requiring a completed prospectus for an advanced research project, a written report, or a research thesis. A minimum of three (3) hours required for all M.S. candidates. (PR: Consent of instructor)

882 **Research. 1-15 hrs. I, II, S. CR/NC**

### CHEMICAL ENGINEERING (CHE)

600 **Fluid Dynamics. 3 hrs.**

Analysis of flow of fluids; development of equations of change; introduction to constitutive equations; non-Newtonian flow; compressible flow; laminar and turbulent flow, and potential and boundary layer flow. (PR: undergraduate course in fluid flow or transport phenomena)

602 **Heat Transfer. 3 hrs.**

Analysis of transfer of energy; development of equations of change; steady and transient heat transfer by conduction; convection; radiation heat transfer; applications to process heat transfer and design. (PR: undergraduate course in transport phenomena or equivalent)

604 **Mass Transfer. 3 hrs.**

A logical development of the theory of molecular diffusion with applications to problems of interest. (PR: undergraduate course in mass transfer)

605 **Fundamentals of Separation Processes. 3 hrs.**

Fundamentals of gas-liquid, liquid-liquid, gas-solid, and liquid-solid separations. Short-cut techniques and methods for selecting the most appropriate separation process will be covered. Practical application of the principles will be emphasized.

630 **Applied Engineering Mathematics. 3 hrs.**

Mathematical modeling of applied problems, analytical solutions of ordinary differential equations, series solutions, Laplace transforms, analytical solutions of partial differential equations, complex variables. This course is recommended for all engineers. (PR: calculus)

631 **Numerical Methods. 3 hrs.**

Formulas of Newton, Bessel, Gauss, and Sterling; methods of quadrature and summation; transformations of Euler and Shank; solution of linear systems of equations; numerical solution of ordinary differential equations. (PR: knowledge of differential equations, Ch.E. 630, or equivalent)

632 **Optimization of Engineering Systems. 3 hrs.**

Unconstrained optimization and differential calculus; equality constraints; search techniques; calculus of variations; minimum principle; and Hamiltonian, including mixed constraints and state-variable constraints. Setting up and solving practical applications. (PR: knowledge of differential equations)

640 **Thermodynamics. 3 hrs.**

Basic thermodynamic principles are reviewed with the intent of showing their logical development including the laws of thermodynamics, the concept of equilibrium, the phase rule, and various auxiliary functions. (PR: Knowledge of thermodynamics or physical chemistry)

645 **Chemical Engineering Kinetics. 3 hrs.**

Review of homogenous kinetics, including kinetics of homogeneous reactions and interpretation of reactor data; reactor design for single and for multiple reactions. Nonideal flow and models. (PR: undergraduate course in kinetics)

650-653 **Special Topics. 1-4 hrs.**

Designed to increase the depth of study in a specialized area of chemical engineering. (PR: Consent)

660 **Process Synthesis & Conceptual Design. 3 hrs.**

Introduction to a systematic approach for solving process synthesis problems. Tools to help the students in reducing the large search space, which is typical in synthesis problems, down to a small and manageable size.

661 **Process Simulation. 3 hrs.**

Current simulation techniques for development, design, and operation of chemical processes. A short review of modeling and equation solving.

670 **Process Equipment Design I (Heat and Fluid Flow Equipment). 3 hrs.**

Design, sizing, and evaluating equipment used for heat transfer and fluid flow. Emphasis placed on functional performance of equipment. (PR: undergraduate courses in heat transfer and fluid flow)

671 **Process Equipment Design II (Mass Transfer Equipment). 3 hrs.**

Design of equipment for diffusional operations. Includes such topics as distillation, extraction, crystallization, drying, and absorption. Emphasis will be on practical aspects of equipment design. Computer design techniques discussed. (PR: knowledge of unit operations or distillation)

672 **Process Equipment Design III (Chemical Reaction Equipment). 3 hrs.**

Design of equipment for reacting systems. Emphasis will be placed on practical aspects of equipment design including cost, performance, characteristics, and reliability. Computer design techniques will be discussed where applicable. (PR: undergraduate course in kinetics)

675 **Process Safety. 3 hrs.**

This course is designed to introduce the broad topic of emergency relief systems design to those charged with operating, designing or managing today's and tomorrow's chemical process industry (CIP) facilities.

## CHEMISTRY (CHM)

- 510 Advanced Synthesis and Analysis. 4 hrs.**  
Advanced problems in synthesis, separation and analysis with emphasis on modern instrumental methods. 1 lec-6 lab. (REC: CHM 356 or equivalent)
- 511 Modern Instrumental Methods in Chemistry and Biochemistry. 4 hrs.**  
This course investigates the theory and functional aspects of modern analytical instrumentation. Emphasis is placed on components of instruments and the applicability of various techniques to specific analytical problems.
- 520 Fundamentals of Chemistry. 4 hrs. S. Offered on demand.**  
An introductory chemistry course for College of Education graduate students.
- 522 Spectrophotometric Methods of Analysis. 3 hrs.**  
Modern theories and methods of spectrophotometric analysis, including atomic absorption, infrared, UV-visible and colorimetric methods. 1 1/2 lec-3 lab. (PR: CHM 345 and 307 or 358)
- 523 Environmental Analytical chemistry. 4 hrs.**  
Sampling and modern instrumental analysis of water, air and sediments according to EPA methodology. (PR: Graduate standing; C or better in CHM 345 or equivalent experience.)
- 526 Chromatographic Methods of Analysis. 3 hrs.**  
Modern theories and methods of chemical separations with emphasis on gas and liquid chromatography. (PR: 345, 356, 307 or 357) 2 lec-2 lab.
- 530 Introduction to Polymer Chemistry. 3 hrs.**  
Properties of macromolecules. Methods of preparation and characterization. Industrial applications and processes. (PR: CHM 307 or 357, and 356 or permission of instructor)
- 540 Thermodynamics. 3 hrs.**  
An introduction to chemical thermodynamics and statistical mechanics. (REC: CHM 358 or equivalent)
- 542 Quantum Mechanics. 3 hrs.**  
An introductory course in quantum mechanics. (REC: MTH 231 or equivalent)
- 548 Advanced Inorganic Chemistry I. 4 hrs.**  
Study of physical properties and periodic relationships of inorganic materials. 3 lec-2 lab. (PR: CHM 356 and 307 or 357)
- 549 Advanced Inorganic Chemistry II. 3 hrs.**  
A detailed consideration of bonding, structure, reaction rates and equilibrium involving inorganic materials. (PR: CHM 448 or equivalent)
- 550 Industrial Chemistry. 3 hrs.**  
Modern industrial processes for making chemicals, with emphasis on petrochemicals. An introduction to the engineering, economic, and environmental aspects of these processes. (PR: CHM 307 or 357, and 356 or permission of instructor)
- 553 Magnetic Resonance in Chemistry. 3 hrs.**  
Applications of analysis by magnetic resonance. Emphasis will be placed on proton and heteronuclear magnetic resonance theory and applications. 2 lec-2 lab. (PR: CHM 356)
- 562 Nuclear Chemistry and Physics. 3 hrs.**  
An introduction to the phenomena of nuclear physics and chemistry. (REC: MTH 231 or equivalent)
- 563 Nuclear Chemistry and Physics Laboratory. 2 hrs. 4 lab.**  
(REC: CHM 462 or equivalent)
- 565 Advanced Organic Chemistry I. 3 hrs. I.**  
Studies of the dynamics of organic reactions with emphasis on mechanisms and stereochemistry. (REC: CHM 356 or equivalent)
- 566 Advanced Organic Chemistry II. 3 hrs.**  
A continuation of Chemistry 565 with emphasis on synthetic methods. (PR: CHM 565)
- 580-583 Special Topics. 1-4; 1-4; 1-4; 1-4 hrs.**
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**
- 604 Theories of Analytical Chemistry. 2 hrs.**  
Offered on demand. (PR: CHM 556)
- 607 Theoretical Organic Chemistry. 2 hrs.**  
The application of quantitative methods to problems in structure and dynamics. (PR: CHM 565)
- 618 Kinetics. 3 hrs.**  
An advanced study of reaction rates and mechanisms.
- 627 Physical Chemistry for Teachers. 3-5 hrs. S.**  
Offered on demand. 3 lec-6 lab. (PR: CHM 520 or equivalent)
- 628 Special Topics (Inorganic). 1-3 hrs. Offered on demand.**
- 629 Special Topics (Organic). 1-3 hrs. Offered on demand**
- 630 Special Topics (Physical). 1-3 hrs. Offered on demand**

- 631-632 Seminar. 1; 1 hr. I, II.**  
**679 Problem Report. 3 hrs.**  
 Preparation of a comprehensive written report on a topic in Chemistry of current importance. Registration only by permission of Department.
- 682 Research. 1-12 hrs. I, II, S.**  
 Credit in the course is earned by pursuing a directed original investigation in a field of chemistry. Twelve semester hours credit in research are applied toward the M.S. degree. Students may sign for one or more credit hours per semester depending upon the time to be spent on research. A grade of PR may be reported at the close of each term or semester. (PR: Approval of Department Chairman)

### CIVIL ENGINEERING (CE)

- 650-653 Special Topics. 1-4 hrs.**  
 Formal study of civil engineering topics of current interest. (PR: Consent)

### CLASSICS (CL)

These courses are given in English and require no knowledge of Greek or Latin.

- 535 Greek Civilization. 3 hrs.**  
 Study of ancient Greek culture, emphasizing parallels with present-day issues.
- 536 Roman Civilization. 3 hrs.**  
 Study of ancient Roman culture, emphasizing parallels with present-day issues.
- 580-583 Special Topics in Classics. 1-4; 1-4; 1-4; 1-4 hrs.**  
 (PR: Consent of the instructor)
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**
- 599 Humanities Seminar. 3 hrs.**

### COMMUNICATION DISORDERS (CD)

- 518 Communication Disorders of School Children. 3 hrs.**  
 A survey of the causes, symptoms, and treatment of communication disorders encountered in the classroom. Not open to communication disorders majors.
- 524 Diagnostic Processes with Communication Disorders. 3 hrs.**  
 Evaluation of procedures for securing behavioral information to differentiate among various communication disorders; a study of symptom complexes. (PR: Permission of instructor and graduate standing)
- 524L Diagnostic Processes with Communication Disorders. 3 hrs.**  
 Observation and practice in evaluating individuals with communication disorders (PR: Permission of instructor and graduate standing)
- 526 Therapeutic Procedures I. 3 hrs.**  
 Examination of therapeutic procedures relative to developmental speech disorders. (PR: Permission of instructor and graduate standing)
- 526L Therapeutic Procedures I. 1 hrs.**  
 Observation of individuals with communication disorders and introduction to analysis of the Clinical process. (PR: Permission of instructor and graduate standing)
- 527 Therapeutic Procedures II. 3 hrs.**  
 Examination of therapeutic procedures relative to speech and language disorders. Investigation into the clinician's role in case management as well as behavior management techniques. (PR: Permission of instructor and graduate standing)
- 527L Therapeutic Procedures Laboratory II. 1 hr.**  
 Observation and in-depth analysis of the clinical process. (PR: Permission of instructor and graduate standing)
- 570-571 Clinical Practicum. 1 hr.**  
 Supervised clinical practicum in the Marshall University Speech and Hearing Center. (PR: Permission of instructor)
- 580-583 Special Topics. 1-4; 1-4; 1-4; 1-4 hrs.**  
 (PR: Permission of chair)
- 585-588 Independent Study. 1-4 hrs.**  
 (PR: Permission of chair)
- 601 Introduction to Graduate Studies. 3 hrs.**  
 An introduction to graduate studies, including clinical and research applications; quantitative and qualitative research methodology; critical analysis of clinical instruments and research literature. (PR: Permission of instructor)

- 620 Communication Disorders Related to Cleft Palate and Voice. 3 hrs.**  
Intensive study of the anatomy and physiology of laryngeal and maxillofacial structures; voice production and resonance; nature and etiology of voice and resonance disorders; principles of assessment and treatment. (PR: Permission of instructor)
- 622 Phonological Processes and Disorders. 3 hrs.**  
Advanced study of the phonological component of the linguistic system. Emphasis on phonological disorders in children; social dialects; critical analysis of literature. (PR: Permission of instructor)
- 623 Fluency Disorders. 3 hrs.**  
Detailed evaluation of theories of fluency disorders and relevant therapies; critical analyses of research literature. (PR: Permission of instructor)
- 624 Motor Speech Disorders. 3 hrs.**  
Study of the neurological bases of speech; etiologies and symptoms of dysarthrias and apraxias; principles of assessment and treatment. (PR: Permission of instructor)
- 625 Acquired Aphasia. 3 hrs.**  
Advanced study of the acquired aphasia; critical analysis of research literature. (PR: Permission of instructor)
- 628 Language Acquisition. 3 hrs.**  
Advanced study of the development of language; language sampling procedures, analysis and application. (PR: Permission of instructor)
- 629 Child Language Disorders. 3 hrs.**  
Advanced study of current topics in language disorders in children; critical analysis of research literature. (PR: Permission of instructor)
- 630 Communication Disorders Associated with Neuropathologies. 3 hrs.**  
Intensive study of the nature and etiology of communication disorders associated with traumatic brain injury, right hemisphere lesions, dementia, and other neuropathologies; diagnosis and treatment; critical analysis of research literature. (PR: Permission of instructor)
- 660 Assisted Communication. 3 hrs.**  
Examination of current trends in assisted communication with emphasis on assistive strategies/devices for individuals with hearing and speech disorders; principles of assessment and treatment. (PR: Permission of instructor)
- 670-671 Advanced Clinical Practicum. 1-6 hrs.**  
Supervised clinical practicum in the Marshall University Speech and Hearing Center and in affiliated educational, rehabilitation and medical settings. (CD 671 may be repeated but cannot be applied to a master's degree in accordance with the American Speech-Language-Hearing Association's standard regarding application of practicum credits to master's degree programs. Clinical Clock hours will apply for certification. (PR: CD 570 or equivalent; Permission of instructor)
- 672-673 Clinical Practicum in the Schools. 3-6 hrs.**  
Supervised clinical practicum with school-aged children; fulfills student teaching requirements for West Virginia Certification as a Speech Language Pathologist. (PR: Permission of instructor)
- 677-678 Special Topics. 1-4 hrs. I, II.**  
Program of study not normally covered in other courses. Topics vary from semester to semester. (PR: Permission of chair)
- 681 Thesis. 1-6 hrs. I, II.**  
(PR: Permission of chair)
- 685-688 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**  
(PR: Permission of chair)
- 690-693 Seminar. 1-4; 1-4; 1-4; 1-4 hrs.**  
Topics in communication disorders not covered in other courses; topics vary from semester to semester. (PR: permission of chair)

### COMMUNICATION STUDIES (CMM)

- 501 Organizational Communication. 3 hrs.**  
Investigation of information flow in organizations with emphasis on identifying communication problems.
- 502 Rhetorical Theory. 3 hrs.**  
An exploration of theories of rhetoric from the Greek philosophers to the present. This course will examine the strategic use of symbols in persuasive discourse.
- 506 Interviewing. 3 hrs.**  
Skill development in the question-answer-response process as it applies to a variety of interviewing situations.
- 508 Leadership and Group Communication. 3 hrs.**  
A study of the variables affecting, and affected by, the communication process in small groups, with particular emphasis upon leadership variables.

- 509 Theories of Persuasion and Change. 3 hrs.**  
Study of the relationship between persuasion and social change, including theories of attitude and behavioral change and contemporary theories of persuasion.
- 511 Communication Study and Research. 3 hrs.**  
Introduction to the advanced study of theory and research areas with emphasis on communication research methods and reporting.
- 513 Theories of Interpersonal Communication. 3 hrs.**  
A survey and analysis of theories related to interpersonal communication in relationships. Emphasis is on the communication processes and contingencies underlying relationship development, maintenance, and disengagement in various interpersonal contexts.
- 520 Communication and Conflict. 3 hrs.**  
An exploration of the theory, research, and practice of communication in understanding and negotiating interpersonal conflict.
- 521 Gender and Communication. 3 hrs.**  
An exploration of gender as an organizing principle for communication.
- 541 Development and Appreciation of Film Since 1930. 3 hrs.**  
A study of important directions in modern film, including style, genre, and the relationship to contemporary society. A variety of films will be viewed for analysis.
- 550 Direction of Speech Activities. 3 hrs.**  
Direction of extracurricular speech activities/assemblies, forensic events, etc. (PR: Fifteen hours of speech or permission of departmental chairman)
- 556 Computer-Mediated Communication. 3 hrs.**  
This course explores the impact of computer-mediated communication on human organization. (PR: E-mail capability; web search capability)
- 574 Health Communication. 3 hrs.**  
Explores communication demands of human health care and health care promotion; examines communication controversies in the modern health care system, and examines communication strategies to resolve health care problems.
- 576 Communication for Classroom Teachers. 3 hrs.**  
Knowledge and utilization of interpersonal communication skills in all teaching-learning environments.
- 580-583 Special Topics. 1-4; 1-4; 1-4; 1-4 hrs.**  
(PR: Permission of chair)
- 585-588 Independent Study. 1-4 hrs.**  
(PR: Permission of chair)
- 597-598 Instructional Television Course. 1-4 hrs.**  
A course based upon Instructional Television Series broadcast by public television. The student is responsible for viewing the series on the air and satisfying all course requirements announced by the department.
- 601 Problems and Methods in Communication Research. 3 hrs.**
- 602 Communication Consultation Strategies. 3 hrs.**  
An in-depth analysis of diagnostic and intervention strategies employed by communication consultants. Strategies include communication network analysis, communication process observation and consultation, communication role and norm negotiation, and team building.
- 603 Nonverbal Communication. 3 hrs.**  
Examines the major dimensions and functions of nonverbal communication with a focus on what constitutes nonverbal competence in a variety of contexts.
- 606 Studies in Communication Theory. 3 hrs.**  
An extensive investigation into the major concepts of contemporary communication theory.
- 650 Leaders and Movements in Communication Education. 3 hrs.**  
The study of speech-communication education from the time of the Greeks to the present, with emphasis upon the evolution of communication education to meet the needs of contemporary society.
- 656 Seminar in Public Communication. 3 hrs.**
- 673 Seminar in Interpersonal Communication. 3 hrs.**  
Intensive treatment of principles and processes underlying dyadic communication. Designed to enable the student to diagnose and intervene to resolve communication problems.
- 674 Seminar in Communication Pedagogy. 3 hrs.**  
Primarily for graduate teaching assistants to develop instructional skills of preparation, presentation and evaluation; to understand instructor duties and requirements, and to exemplify interpersonal skills in dealing with students.
- 675-676 Seminar. 1-3; 1-3 hrs.**  
Program of study not normally covered in other courses. Topics vary from semester to semester.

**677-678 Special Topics. 1-3; 1-3 hrs.**

Program of study not normally covered in other courses. Topics vary from semester to semester.

**681 Thesis. 1-6 hrs.**

**685-688 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**

(PR: Permission of chair)

### COMMUNITY AND TECHNICAL COLLEGE STUDIES (CTCS)

**701 The Community and Technical College. 3 hrs.**

History, functions, and unique characteristics of the two-year college in the American education system.

**702 Analysis of Literature on Community and Technical College Teaching. 3 hrs.**

Identification and analysis of current issues in community technical college teaching with application of procedures for investigation, accompanied by a critical examination of findings and their application to local programs.

**703 Interpretation and Utilization of Applied Research in Community and Technical College Teaching. 3 hrs.**

Students will learn how to choose the appropriate statistics, interpret the outputs, and develop skills in writing about the meaning of the results.

**707 Professional Seminar I. 1 hr.**

Selected topics in program and institutional assessments related to community and technical colleges.

**708 Professional Seminar II. 1 hr.**

Selected topics in thesis proposal, overview of grantsmanship, and funding sources. Discussion of the effects of new technologies and the Internet on the proposal process.

**709 Professional Seminar III. 1 hr.**

Provides students an opportunity to synthesize prior course experiences and to prepare and present a draft thesis prospectus.

**712 Classroom Assessment for Community and Technical College Students. 3 hrs.**

Presentation of assessment principles that clearly and specifically relate to instruction, current research and new directions in the assessment field, and practical and realistic examples and suggestions.

**714 Community and Technical College Curriculum Design. 3 hrs.**

Study of the major curricular programs of the comprehensive community college, including factors that influence the design and implementation, processes for assessing, and strategies for changing the curriculum for open access colleges.

**718 Education and Employment Preparation for Diverse Populations. 3 hrs.**

The needs of diverse/special needs populations, including youth and adults with disabilities, disadvantaged, limited English proficient, displaced workers, minorities, incarcerated, and single teen parents. Specific attention to federal legislation.

**723 Perspectives and Strategies for Teaching Workforce Education. 3 hrs.**

Teaching/learning process and consideration of teaching methods employed to encourage, guide, and evaluate community and technical college students' learning.

**726 Funding, Planning, and Administrative Issues of Community and Technical Colleges. 3 hrs.**

Governance and administration of the contemporary community and technical college in the United States with a focus on planning, funding, and selected administrative issues.

**781 Thesis. 6 hrs.**

Individual research in a selected field of community and technical college teaching under the direction of a graduate faculty member of the department.

### COMPUTER SCIENCE AND SOFTWARE DEVELOPMENT (CSD)

Marshall University does not have a master of science program in CSD. Please see Information Systems and Technology Management.

**529 Introduction to Computer Graphics. 3 hrs. II.**

Introduction to underlying theory and techniques of computer graphics. Historical perspective. Display hardware technology, 2D raster operations, 2D and 3D geometric transformations, and 3D projection and viewing techniques. Project participation. (PR: MTH 330 or equivalent, or permission of instructor)

**539 Introduction to Artificial Intelligence. 3 hrs. I.**

Concepts and methods. Heuristic search, planning, hypothesis formation, modeling, knowledge acquisition and representation. Languages, methodologies, tools. Applications including automatic programming, theorem proving, machine vision, game playing, robots. Project participation. (PR: CSD 240 or equivalent, or permission of instructor)

- 542 Communication Networks and Distributed Systems. 3 hrs. II.**  
Network structures, architectures, topology. Layers, protocols, interfaces, local area networks. Coverage of current networks. Distributed processing concepts; architectural trade-offs, distributed databases. Operating system and application software issues. Project participation. (PR: CSD 322 or equivalent, or permission of instructor)
- 549 Formal Languages and Automata Theory. 3 hrs. I.**  
Concepts and formalisms of formal languages and automata theory. Fundamental mathematical concepts. Grammars and corresponding automata. Deterministic parsing of programming languages. (PR: MTH 340 ,or equivalent, or permission of instructor)
- 557 Database Systems, 3 hrs. II.**  
Basic concepts, semantic models. Data models: object-oriented and relational, lesser emphasis on network and hierarchical. Query languages and normal forms. Design issues. Security and integrity issues. (PR: Permission of instructor)
- 559 Computer Simulation and Modeling. 3 hrs. I.**  
Concepts of model building and computer-based discrete simulation. Special-purpose simulation languages. Experimental design, analysis of results. Statistical aspects, random number generation. Model validation issues and methods. Project participation. (PR: MTH 445 or equivalent, or permission of instructor)
- 567 Compiler Design. 3 hrs. I.**  
Compilation of modules, expressions, and statements. Organization of a compiler including compile-time and run-time aspects; symbol tables, lexical analysis, syntax analysis, semantic analysis, optimization, object-code generation, error diagnostics. Compiler writing tools. Participation project. (PR: CSD 325 or equivalent, or permission of instructor)
- 568 Image Processing. 3 hrs.**  
Image Processing focuses on the application of technology to scientific analysis of images. Topics include: measurement techniques, scientific methods of reconstruction and interpretation of images and video. (PR: Graduate standing in COS or the Medical School)
- 570 Introduction to Applied Automation. 3 hrs. I.**  
Introduction to production economics; programmable logic control, sensors and actuators, digital and analog I/O design. Introduction to robotics and flexible manufacturing systems. (PR: Permission of instructor)
- 579 Software Engineering. 3 hrs.**  
Current techniques in software design and development using Ada, Modula-2, or C for software projects. Formal models of structured programming, top-down design, data structure design, object-oriented design, program verification methods. (PR: CSD 239 and 320)
- 580-583 Special Topics. 1-4 hrs.**  
(PR: Permission of instructor)
- 585-588 Independent Study. 1-4 hrs.**  
(PR: Permission of instructor)
- 603 Advanced Educational Computing. 3 hrs.**  
Allows the educator to develop a more in-depth understanding of the 'BASIC programming' language and become familiar with other languages used on microcomputer.
- 610 Using the Computer as a Decision-Making Tool. 3 hrs.**  
Introduction to statistical software packages and packaged microcomputer software serving as a productivity tool for lower and middle level managers. Spreadsheet, text-editing and file management packages for microcomputers. Open to all graduate students.

### **CONTROL SYSTEMS (CSE)**

- 601 Advanced Differential Equations. 3 hrs.**  
Systems of linear ordinary differential equations and nonlinear equations. Linearization, approximation, and stability. Use of dynamic simulation software.
- 602 Modeling and Simulation. 3 hrs.**  
Process models for flow, heat transfer, mass transfer, and reactions. Analysis includes various lumped parameter and distributed parameter methods.
- 611 State Space Control-Continuous. 3 hrs.**  
State space representation of dynamic systems; dynamics of linear systems; frequency domain analyses; controllability and observability; shaping the dynamic response; linear observers and compensator design; linear, quadratic optimum control.
- 620 Digital Control. 3 hrs.**  
Discrete time systems and the Z transform; sampling and reconstruction; open-loop and closed-loop discrete systems. System time response characteristics; stability analysis techniques. Pole assignment design and state estimation.

- 621 Control Systems Design. 3 hrs.**  
Design of simple control systems. Multivariable control systems. Periodic processing. The concepts will be illustrated using chemical, electrical and mechanical engineering processes.
- 624 Advanced Control. 3 hrs.**  
Specific advanced control topics such as dead time compensation, inverse response, cascade control, ratio control, adaptive control, inferential control, decoupling control, process identification, and optimal control.
- 626 Non-Deterministic Systems. 3 hrs.**  
Probability models used in engineering, transformations of random variables, multivariate random variables, application of statistical process control. Stochastic processes for engineering applications, linear least-square estimation and regression analysis.
- 629 Nonlinear Control. 3 hrs.**  
Methods for analysis and design of nonlinear control systems. State space models, phase plane limit cycles, stability, describing functions, relay system stabilization theory, variable structure systems and advanced topics.
- 630 Optimal Control. 3 hrs.**  
General theory of optimal control; calculus of variations; Pontryagin's maximum principle; Hamilton-Jacobi theory, application of optimal control theory to design of feedback systems, using several performance criteria; advanced topics.
- 631 Adaptive Control. 3 hrs.**  
Study of developments in the field of adaptive control; stability, convergence of adaptive systems, model reference, self-tuning and robust adaptive control, adaptive observer, autotuning and gain scheduling, and advanced topics.
- 650-653 Special Topics. 3 hrs.**  
Designed to increase the depth of study in a specialized area of control systems. (PR: Consent)

### COUNSELING (COUN)

- 545 Beginning Manual Communication. 3 hrs.**  
This course provides a beginning study of the psychological characteristics of the hearing impaired and fundamental techniques of manual communication.
- 554 Advanced Manual Communication. 3 hrs.**  
This is the follow-up course to COUN 618 and provides an advanced study of the grammar, syntax and idioms of American Sign Language (ASL) and a comprehensive overview of the effect of hearing impairment. Emphasis will be upon communicating in ASL. (PR: COUN 545)
- 555 Crisis Intervention and Conflict Resolution. 3 hrs.**  
Students explore various types of crises such as situational and developmental. Specific topics include suicide and sexual assault. Requirements include a class presentation, and 30 supervised clinical hours in a crisis setting approved by instructor.
- 556 Death and Grief Counseling. 3 hrs.**  
A study of the stages of death, dying and the grief process are presented in practical, theoretical, social, and psychological aspects. Emphasis is on counseling relating to various forms of loss.
- 574 Social & Cultural Foundations. 3 hrs.**  
Examines the use of appropriate resources for effective counseling of individuals of different cultural, ethnic, social, racial, geographic, or other backgrounds. Personal, social, and cultural sources contributing to social and emotional disenfranchisement are explored, as well as the impact of using stereotypes and practicing discrimination in society and human service delivery systems. (PR: COUN 603, program admission, or permission.)
- 575 Prevention and Treatment of Addictions. 3 hrs.**  
Course surveys the field of addictions covering assessment, treatment, prevention, and education. It will explore the development of addiction theory and with particular focus on the bio-psycho-social model. (PR: COUN 600 & 603)
- 577 Stress Management Counseling. 3 hrs.**  
This course provides counseling students and others with a comprehensive analysis of stress in contemporary society. Of particular emphasis is an orientation to stress management as a counselor helping intervention. Students explore theoretical and practical alternative in helping the stressed client.
- 579 Pharmacology in Counseling. 3 hrs.**  
Provides basic understanding of the role of therapeutic drugs in the treatment of psychiatric disorders, familiarizes with most commonly used drugs, side effects, and adverse reactions in specific mental illness. (PR: COUN 600 & 601)

- 580 - 583 Special Topics. 1-4 hrs.**  
Study, reading, and research in specialized areas of counseling and human relations. Areas of interest are offered at various times by the faculty to provide specialized study for advanced students or practicing professionals in the field of counseling. (PR: Consent)
- 585-588 Independent Study. 1-4 hrs.**  
Individual or group study and research of various issues and fields of emphasis in counseling. (PR: Consent)
- 600 Professional Orientation. 1-3 hrs.**  
This course provides an understanding of all aspects of professional helping in mental health including history, roles, ethics, standards and credentialing. (PR: Program admission or permission)
- 601 Counselors in Consulting Roles. 2 hrs.**  
This course provides an exploration of consultation roles that are integrated into the various settings in which counselors work. Content includes an orientation to consultation and its historical development, theory and practice issues, and major models. Of special emphasis is the focus upon case applications and presentations. (PR: COUN 600 and 607)
- 602 Human Development and Psychopathology. 3 hrs.**  
The course will explore human growth/development from birth through adulthood. Theories of character development, social maturation, abnormalities and variations in development due to gender, culture, and environmental factors will be covered. The change processes, helping relationships, and strategies for facilitating development appropriate to various phases of the life span will be addressed. (PR: COUN 600 & 603)
- 603 Counseling Theories. 3 hrs.**  
Survey of classical and contemporary counseling philosophies, history, and techniques as related to interpersonal relationships in the counseling process. (PR: Program admission or permission. CR: COUN 607)
- 604 Group Counseling & Theories. 3 hrs.**  
An examination of group dynamics and theories of group counseling with demonstrations of specific group techniques and the practice of popular approaches in group counseling. (PR: COUN 607)
- 605 Theory and Practice of Human Appraisal. 3 hrs.**  
Provide an understanding of individual and group approaches to assessment and evaluation including history, theoretical and statistical aspects, applications to special populations, and legal and ethical concerns and issues. (PR: COUN 600 and 603)
- 606 Career and Lifestyle Development. 3 hrs.**  
A study of career development theories and decision-making models that impact career development and related life factors. (PR: COUN 600, 607, EDF 621 or 625)
- 607 Counseling Techniques in Human Relationships. 3 hrs.**  
Study of a variety of counseling and therapeutic techniques within the framework of a systematic counseling model. Emphasis on basic interviewing, assessment and counseling skills that facilitate the helping process through integration of various theoretical orientations. (PR: Program admission or permission. CR: COUN 603)
- 608 Practicum. 3 hrs.**  
A clinical experience under professional supervision preparing the student for internship; audio and video tapes, group supervision and feedback are used to achieve competency in the application of a counseling process. (PR: Consent. Students must have achieved a minimum grade of B in 606, 607, and EDF 621 or 625)
- 611 Foundations of Community Counseling. 3 hrs.**  
Examines the history of deinstitutionalization in human services with an emphasis on prevention in the delivery of such services in community agencies. Proposal writing for grants and needs assessment processes and procedures will be emphasized. (PR: COUN 603)
- 616 Domestic Violence. 3 hrs.**  
An introduction to the epidemiology, dynamics, clinical interventions and treatment of domestic violence.
- 617 Seminar in Counseling. 1-6 hrs.**  
For students in degree programs or in post-master's work who wish to discuss and study theory, principles, and techniques of counseling or other special topics. Instructor will indicate in course syllabus whether class is letter graded or S/U. (PR: Consent)
- 620 Workshop. 1 - 6 hrs.**  
Special workshops and short intensive courses on theory, methods, supervision and other special topics in counseling, designed for advanced students and professionals in the counseling field or related fields. (PR: Consent)
- 621 Introduction to Child Abuse & Neglect. 1 hr.**  
Introduction to the dynamics of child abuse and neglect and to the legal and ethical issues of persons mandated to report child abuse and neglect. (PR: COUN 600 & 603)

- 622 Parent Education. 3 hrs.**  
Study of family education skills training for conducting family education groups and parent training.
- 630 Introduction to Mental Health Counseling. 3 hrs.**  
Provides an introduction to the foundations and contextual dimensions of mental health counseling. Emphasis is given to an exploration of mental health counseling roles and functions, theories and techniques, professional standards and operations, administration, evaluation, and special issues. (PR: COUN 603 and 607)
- 631 Diagnosis and Treatment Planning in Mental Health Counseling. 3 hrs.**  
Provides an in-depth exploration of the knowledge and skills necessary for the practice of mental health counseling. Emphasis is given to the principles and practices that relate to psychopathology, DSM diagnosis, etiology and assessment, systematic treatment planning, interviewing, and short and long-term interventions. (PR: COUN 630)
- 632 Introduction to Marriage, Couples, and Family Counseling. 3 hrs.**  
A comprehensive survey of the major theoretical models of marriage, couples, and family therapy from a systems perspective and the applied practices evolving from each orientation.
- 635 Core Functions of Addiction Counseling . 3 hrs.**  
Advanced course designed to prepare students for work with clients presenting with substance abuse, and addiction disorders. The course will address the nature and treatment of addiction with attention to the core functions of the addiction counselor. (PR: COUN 575)
- 636 Couple Counseling. 3 hrs.**  
A comprehensive survey of the major theoretical models of couple counseling and the applied practices evolving from each orientation.
- 637 Adult and Family Development and Transition. 3 hrs.**  
An in-depth study of various theories of family development and interaction. Focus will be on theoretical understanding of family relationships across the stages of the family life cycle and related treatment strategies. (PR: COUN 632)
- 638 Interventions: Marriage, Couples, and Family Counseling. 3 hrs.**  
An intensive practical experience in marriage, couples, and family therapy techniques to prepare the student to enter the supervised internship of the program. (PR: Students must have achieved a minimum grade of B in COUN 637)
- 641 Correctional Counseling Seminar. 1-9 hrs.**  
A critical examination of counseling models in corrections and an appraisal of current professional trends in community corrections. The course may include field experience in correctional settings. The course is designed for visiting professors and/or consultants who offer an expertise in a correctional setting. (PR: COUN 600 & 603 or Consent)
- 646 Correctional Counseling: Client Advocacy. 3 hrs.**  
Designed to provide the counselor in a correctional setting with an integration of current contributions from related disciplines. Emphasis will be upon client advocacy, as well as the public, administrative, and legal responsibilities of correctional counselors and others who work with correctional clients. (PR: Consent)
- 651 Seminar in Career Counseling. 3 hrs.**  
For students in career counseling who wish to discuss and study theory, principles, and techniques of career counseling or to study specific topics and issues in the field of career counseling. (PR: Consent)
- 652 Career Counseling with Special Populations. 3 hrs.**  
Introduction to the special career development needs and concerns of various groups of people in a variety of settings. Emphasis will be given to the special concerns of women, various ethnic groups, the physically and mentally challenged, and person at various stages of vocational maturity. (PR: COUN 600 & 603)
- 653 Career Assessment Techniques and Report Writing. 3 hrs.**  
A study of career assessment tools needed to assist individuals in making career choices. Focus will be given to the administering, scoring, and interpreting of vocational and career instruments utilized in career decision making. (PR: COUN 605 and 606)
- 654 Ecology of Domestic Violence. 3 hrs.**  
The course will examine domestic violence from an ecological and sociocultural perspective in the context of the community infrastructure, and its response to victims, child safety, and batterer accountability.
- 655 DV 1 - Working with Victims. 3 hrs.**  
This course will focus on victim dynamics, diagnostic indicators that victims may present without revealing an abusive relationship, and interventions that empower and focus on victim strengths.
- 656 DVII - Working with Perpetrators. 3 hrs.**  
This course will focus on working with the domestic violence perpetrators, by providing guidelines for interviewing, assessment, and interventions for the cessation of violence toward victims.

- 657 DVIII – Working with Children. 3 hrs.**  
This course will address issues related to the cognitive, behavioral and emotional problems of children who witness and/or experience domestic violence, and explore appropriate interventions.
- 660 Introduction to Student Affairs. 3 hrs.**  
Provides a broad, comprehensive introduction to the field of college student affairs and its role with the context of American higher education. Various student affairs functional areas, historical, and philosophical foundations of the field, professional standards, guiding theories, and models, and competencies needed to work with diverse student populations are examined. (PR: COUN 603)
- 662 Current Issues in Student Affairs. 3 hrs.**  
To enhance the student's awareness and understanding of the educational, environmental, administrative, legal, and ethical issues in the field of Student Affairs in colleges and universities, this course provides the opportunity to discover, discuss and analyze current issues impacting student affairs practices both nationally and internationally. (PR: COUN 603 and 607)
- 670 Interventions for Current Issues in School Counseling. 3 hrs.**  
An in-depth examination of effective strategies for dealing with current issues in K-12 environment. Issues such as academic failure, substance abuse, loss, violence, multicultural factors, etc. will be explored. (PR: COUN 603 and 607)
- 672 Organization and Administration of School Counseling Programs. 3 hrs.**  
Operation and administration of elementary and secondary school counseling programs in terms of personnel functions, relationships, physical facilities, instructional integration, financial standards, laws, and regulation. (PR: COUN 670 & 671)
- 673 Counseling Children, Adolescents, and Parents. 3 hrs.**  
Consideration of effective counseling strategies and techniques appropriate for children, adolescents and parents through lecture, demonstration and laboratory experiences. Personal, social, career, academic and family related issues and dynamics will be explored. (PR: COUN 600 & 603)
- 674 Observation of School Environment (Required). 3 hrs.**  
Introduction to the roles and functions of school pupil personnel professionals (general classrooms, exceptional student environments, support staff and administration), models of operation, problems, issues, and techniques. The organization and administration of school systems and philosophy of general and special education are considered. Students will spend a minimum of one-half day a week observing in K through 12 schools.
- 691 Internship in Mental Health Counseling . 3 - 9 hrs.**  
Supervised experience in mental health counseling. Participation in seminars on specified topics. Minimum 100 clock hours for each semester hour credit. (PR: COUN 608 and 631 with minimum grade of B or permission)
- 692 Internship in Community Counseling. 1-6 hrs.**  
Supervised experience in community counseling. Minimum 100 clock hours for each semester hour credit. (PR: COUN 608 and permission)
- 693 Internship in Marriage and Family Counseling. 3 - 9 hrs.**  
Supervised experience in marriage and family counseling. Participation in seminars on specified topics. Minimum 100 clock hours for each semester hour credit. (PR: COUN 608 and 638 with a minimum grade of B or permission)
- 695 Internship in Corrections Counseling. 3 - 6 hrs.**  
Supervised experience in corrections counseling. Participation in seminars on specified topics. Minimum 100 clock hours for each semester hour credit. (PR: COUN 608 and 641 with a minimum grade of B or permission)
- 696 Internship in Career Counseling. 3 - 6 hrs.**  
Supervised experience in career counseling. Participation in seminars on specified topics. Minimum 100 clock hours for each semester hour credit. (PR: COUN 608 and 653 with a minimum grade of B or permission)
- 697 Internship in Student Affairs Counseling. 3 - 6 hrs.**  
Supervised experience in career counseling. Participation in seminars on specified topics. Minimum 100 clock hours for each semester hour credit. (PR: COUN 608 and 652 with a minimum grade of B or permission)
- 698 Internship in School Counseling 3 - 6 hrs.**  
Supervised experience in school counseling. Participation in seminars on specified topics. Minimum 100 clock hours for each semester hour credit. (PR: COUN 608 and 673 with a minimum grade of B or permission)
- 740 Internship 1-12 hrs.**  
A course designed to offer advanced graduate students an opportunity to practice under close supervision the professional skills required in the broad field of counseling in school and community settings. Instructor will indicate in course syllabus whether class is letter graded or S/U. (PR: Consent)

- 742 Current Issues in Counseling 3 hrs.**  
An examination of current issues affecting professional counselors and training in effectively dealing with the issues. Selected readings, guest speakers, and class discussion will center around professional issues relevant to counselors in various settings (i.e., legal and ethical considerations). (PR: Consent)
- 746 Systems Intervention 3 hrs.**  
Examination of the major systems which may require intervention by a supervisor of counselors and training in effective intervention strategies. (PR: Consent)
- 747 Advanced Group Counseling 3 hrs.**  
The application of counseling theories in group settings, including supervised group leadership experiences. (PR: Consent)
- 750 Seminar 3 hrs.**  
For students in post-master's work who wish to discuss and study theory, principles, and techniques of counseling or other special topics. Instructor will indicate in course syllabus whether class is letter graded of S/U. (PR: Consent)
- 755 Models of Counselor Supervision 3 hrs.**  
A survey of theoretical approaches and techniques counseling supervision. Emphasis is placed on supervision of counselors in various settings. (PR: Consent)
- 756 Residency in Counselor Supervision 6 hrs.**  
Supervised application of the knowledge and skills gained in the Ed.S. Program. Students will supervise practicing counselors in approved settings. (PR: Acceptance into the Ed.S. Program, completion of all other Ed.S. academic requirements, and consent)
- 760 Special Topics 3-6 hrs.**  
Study, reading, and research in specialized areas of counseling, human relations, guidance or other special topics.

### **CRIMINAL JUSTICE (CJ)**

- 502 Seminar in Crime Prevention. 3 hrs.**  
Techniques for crime prevention analyzed from two orientations; crime prevention by environmental engineering and crime prevention by behavior modification. (PR: CJ 211 or permission)
- 504 Theoretical Criminology. 3 hrs.**  
A critical analysis of the major criminological theories and their empirical foundations. Current theory and research receive greater emphasis than historical development.
- 510 Police Administration II. 3 hrs.**  
Police department organizations. Development of personnel and employment practices in law enforcement. Issues concerning unions and unionization. Problems and techniques of management.
- 512 Community Relations. 3 hrs.**  
Law enforcement and the community; relation to schools, public education functions of law enforcement personnel; community attitudes. (PR: CJ 211 or consent of instructor)
- 513 Business and Industry Security. 3 hrs.**  
Selection, training and staffing of a security force; security devices available, techniques of internal security; ground security; security techniques applicable to personnel selection; legal problems. (PR: CJ 211 or permission)
- 521 Corrections and the Law. 3 hrs.**  
Review of criminal law principles and theory as related to corrections. (PR: CJ 231 or permission)
- 522 Law of Evidence. 3 hrs.**  
Leading rules and principles of exclusion and selection; burden of proof, nature and effect of presumptions; proof of authenticity and contents of writings; examinations, competency and privilege of witnesses. (PR: CJ 321 or permission)
- 525 Juvenile Justice Administration. 3 hrs.**  
A survey of the juvenile justice process, police, courts and corrections, including programs, services, and the laws. (PR: CJ 321 or permission)
- 531 Criminal Rehabilitation. 3 hrs.**  
Legal and historical background of rehabilitation; roles of correctional workers; and nature of the rehabilitation process. (PR: CJ 231 or permission)
- 532 Correctional Institutions. 3 hrs.**  
Analysis of the theory of organizations and administration of correctional institutions; principles of institutional corrections. (PR: CJ 231 or permission)
- 533 Correctional Administration. 3 hrs.**  
Objectives of correctional institutions; records; personnel, program development, security; educational programs. (PR: CJ 231 or permission)

- 580-583 Special Topics in Criminal Justice. 1-4; 1-4; 1-4; 1-4 hrs.**  
A study of special interest criminal justice topics under the supervision of a qualified faculty member. (PR: Consent of instructor)
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**  
This course permits the student to undertake supervised research (field or library) in any area where there is no appropriate course. (PR: Consent of instructor)
- 590 Internship. 1-6 hrs.**  
The placement of an individual into a criminal justice agency (police, probation, courts, jails) to observe and participate in its operation. Grading is CR/NC. (PR: Consent of instructor)
- 601 Seminar in Criminal Justice. 3 hrs.**  
A forum to acquaint students, faculty and guests with each others' research and experiences in dealing with criminal justice issues.
- 602 Law and Social Control. 3 hrs.**  
An examination of the nature of law and crime with a view towards determining the nature of control of social behavior by the legal system.
- 603 Criminal Justice Planning. 3 hrs.**  
A systematic review of procedures to plan and evaluate criminal justice organizations and their operations.
- 604 Advanced Theory in Criminal Justice. 3 hrs.**  
Course is designed to provide the student already familiar with the basic concepts of criminological theory the opportunity to examine in depth a selected set of theories (PR: CJ 504, its equivalent, or permission of instructor)
- 605 Juvenile Delinquency. 3 hrs.**  
Juvenile delinquency in the modern world; nature, extent, causes, treatment, and control.
- 620 Criminology. 3 hrs.**  
Seminar in crime and delinquency. (Same as SOC 620)
- 621 Advanced Criminal Law and Procedure. 3 hrs.**  
A review of contemporary legislation and court decisions relating to criminal law and procedure. (CJ 322 or permission)
- 632 Community Corrections. 3 hrs.**  
A survey of probation, parole, pre-release centers, halfway houses and other forms of community corrections as elements of a total correctional system. Historical development, contemporary organization, and legal issues are emphasized.
- 655 Research Methods in Criminal Justice. 3 hrs.**  
Elements of scientific research; interaction between research and theory; use of data processing resources. (PR: Undergraduate Statistics Course, CJ 656 and permission)
- 656 Applied Statistics in Criminal Justice. 3 hrs.**  
Principles of statistical techniques with emphasis upon their application in the Criminal Justice system. (PR: Undergraduate statistics course and permission)
- 679 Problem Report. 3 hrs.**  
The preparation of a written report on a research problem or field study in Criminal Justice. (PR: CJ 655 and permission)
- 681 Thesis, 1-6 hrs.**

#### **CURRICULUM AND INSTRUCTION (CI)**

- 501 Middle Childhood Curriculum. 3 hrs. I, II, S.**  
The study of procedures for creating a functional middle childhood curriculum with emphasis upon the needs of middle childhood learners.
- 503 Methods and Materials of Teaching in the Middle Childhood Grades. 3 hrs. I, II, S.**  
The study of methods appropriate for teaching in the middle childhood grades and the production and utilization of materials and resources in these grades. Middle school clinical experience is required (PR or CR: CI 501)
- 511 Analysis of Teaching in Early Years. 2 hrs.**  
The analysis and appraisal of teaching strategies employed in the teaching of young children. (CR: CI 630)
- 515 Integrated Methods and Materials: Secondary Education. 3 hrs.**  
General secondary/middle school course with emphasis on instructional standards and objectives, methods, and materials of the disciplines. A clinical experience provides observation and teaching. *MAT students only.* (PR: EDF 537; CR: EDF 637)
- 517 Comprehensive Classroom Discipline Techniques. 3 hrs.**  
Identification of common classroom discipline problems and techniques for dealing with behavioral incidents in school settings K-12.

- 518 Classroom Motivation. 1-3 hrs. I, II, S.**  
Classroom motivation with an emphasis on theoretical constructs and practical applications for teachers of students from early childhood through adolescence.
- 539 Language Arts and Literature. 3 hrs.**  
An examination of theory, research, and practical strategies for integrating language arts and teaching literature for students K-8.
- 542 Instructional and Classroom Management in Elementary Education. 3 hrs.**  
This course allows elementary education students to critically examine a variety of classroom management strategies and educational issues that impact instruction.
- 549 Instructional and Classroom Management in Secondary Education. 3 hrs.**  
Classroom management with an emphasis on practical techniques for dealing with management problems in secondary and middle school settings.
- 550 Teaching Writing, K-12. 3 hrs.**  
Designed to help teachers examine problems in the teaching of writing, successful approaches and techniques, study current theory and research, and write papers in various modes.
- 551 Writing to Learn in Content Areas. 3 hrs.**  
Designed to introduce teachers to successful approaches and strategies to foster thinking and learning through writing, and experiment with a variety of approaches and techniques in their classrooms.
- 552 Summer Institute: The National Writing Project Model. 6 hrs.**  
Participants will examine problems in the teaching of writing, present and demonstrate approaches to the teaching of writing, study current and past research in the field.
- 557 Elementary Education: Teaching Contemporary Mathematics. 3 hrs.**  
Application of modern methods and techniques in the implementation of a contemporary elementary mathematics program.
- 559 Multicultural Influences in Education: Materials and Techniques. 3 hrs. I, S.**  
Multicultural education with an emphasis on methods and materials for teaching students from diverse cultural backgrounds.
- 560-564 Staff Development: (Identifying content title to be added). I-4; 1-4; 1-4; 1-4; 1-4 hrs. I, II, S.**  
Courses and activities designed to meet the specific inservice needs of public school personnel. Credit in these courses may be used for certificate renewal and salary upgrading if approved but not in degree programs. CR/NC grading.
- 580-583 Special Topics. 1-6 hrs. I, II, S.**
- 585-588 Independent Study. 1-4 hrs. I, II, S.**  
Permission of Chair and GPA 3.0 to take class. Limit of 6 hrs. of Independent Study to be used in master's degree program.
- 591-594 Workshop. 1-4 hrs.**  
A study of practical applications in teacher education and related fields for advanced students and professionals. Experience in new techniques and application of new knowledge.
- 597-598 Instructional Television Course. 1-4 hrs.**  
A course based upon Instructional Television Series broadcast by public television. The student is responsible for viewing the series on the air and satisfying all course requirements announced by the department.
- 609 Elementary Education: Curriculum in the Modern Elementary School. 3 hrs. I, II, S.**  
Examination of traditional and current assumptions undergirding the modern elementary school curriculum with emphasis on converting theoretical bases into plans for curriculum change and modernization.
- 610 Secondary Education: Curriculum in the Modern Secondary School. 3 hrs. II, S.**  
Analysis of the social and political factors which affect secondary school curriculum with emphasis upon trends and developments in high schools today.
- 618 Elementary Education: Informal Learning in Primary and Middle Schools. 3 hrs.**  
Informal learning in the primary and middle school with emphasis on the significance of natural child development, learning through games and play, and the British model for infant and junior schools, and related activities for the middle years (ages 10-14) in middle school settings.
- 623 Instructional Models and Assessment Techniques. 3 hrs.**  
Selected teaching models are analyzed with implications for the role of the teacher; assessment of influences of the teacher.
- 624 Advanced Instructional Strategies. 3 hrs.**  
Performance-based laboratory experiences in a micro-teaching laboratory development of a personalized teaching repertoire.
- 630 Early Childhood Education: Practicum in Early Childhood Education. 1-4 hrs.**  
Supervised experience in teaching kindergarten with a concurrent seminar in organization and administration.

- 631 Early Childhood Education: Current Influences on Early Childhood Education. 3 hrs.**  
A study of recent findings in the behavioral sciences and their implications for early childhood education.
- 632 Early Childhood Education: Early Childhood Programs. 3 hrs.**  
An examination of past and present programs for young children with opportunity provided for curricular development.
- 633 Early Childhood Education: Adult Involvement in Early Education. 3 hrs.**  
Ways of communicating and involving paraprofessionals, parents, volunteers, staff in the education of young children.
- 634 Language and Cognition in Early Childhood. 3 hrs.**  
Examination of selected studies in language acquisition and cognitive development of children from birth to eight years of age.
- 638 Curriculum Planning. 3 hrs.**  
A study of the fundamental skills needed to evaluate educational progress at the classroom, program, and school levels.
- 640 Literature. 1-3 hrs. I, II, S.**  
A program of reading, either extensive or intensive, and reports on a group of outstanding contributions to education; readings selected with guidance of advisor. Only one registration for Curriculum and Instruction 640 is permitted. (PR: Permission of chair)
- 641 Seminar. 3 hrs. I, II, S.**  
A guided program of readings, reports and discussions. No student may register for this course a second time. (PR: Permission of chair)
- 656 Elementary Education: Teaching Language Arts. 3 hrs.**  
A unified Reading-Language instructional approach to develop a basic understanding of reading-language related principles derived from disciplines, research, and innovative classroom practices.
- 657 Elementary Education: Advanced Techniques in Teaching Elementary Mathematics. 3 hrs. II, S.**  
Historical, social, psychological, and philosophical foundations of mathematics education; investigation of current trends and issues in contemporary programs.
- 659 Symposium-Elementary and Secondary Education, Part I. 3 hrs.**  
The symposium is the culmination of the master's degree program in Elementary Education, Secondary Education, and Early Childhood Education. This is the first of a two-part sequence. (PR: Consent)
- 670 Elementary Education: Teaching Social Studies in Elementary Schools. 3 hrs.**  
Materials and procedures for teaching social studies with emphasis on a survey of successful programs of instruction.
- 671 Elementary Education: Advanced Techniques in Teaching Science. 3 hrs.**  
Intensive concentration on helping children inquire into the earth, physical, and biological sciences through modern methods and media.
- 672 Practicum in Education. 3-6 hrs.**  
Clinical Experience: Directed activity in a clinical setting. (PR: Permission)
- 675 Curriculum Theory. 3 hrs.**  
Analysis of the assumptions undergirding curriculum development.
- 676 Program Evaluation. 1 hr.**  
An examination of program evaluation models and techniques for instructional supervisors.
- 677 Writing for Publication in Professional Education. 3 hrs.**  
For professional educators and students who wish to study and practice writing articles for publication in scholarly journals in the field of education.
- 678 The Supervising Teacher. 3 hrs.**  
Duties and responsibilities of the teacher who supervises student teachers.
- 679 Classroom Management for Elementary Teachers. 3 hrs.**  
This course is designed for elementary teachers. The content includes methods of managing the physical and social environment in the classroom.
- 680 Symposium-Elementary and Secondary Education, Part II. 3 hrs.**  
The comprehensive assessment requirement is met within the framework of this course. (PR: Consent.)
- 681 Thesis. 1-6 hrs. I, II, S.**  
Students completing 681 must defend their thesis in an oral examination.

#### **CURRICULUM AND INSTRUCTION: EDUCATIONAL COMPUTING (CIEC)**

- 530 Computer Software and Methodology in Education. 3 hrs.**  
This course is designed for inservice teachers who want to become familiar with how to use the microcomputer to improve their instruction.

- 534 Applications Software in the Classroom Curriculum Area. 3 hrs.**  
A hands-on overview of major classes of applications software. A range of computing topics such as hardware, communications, ethics, and types of software will be discussed.
- 560-564 Staff Development. 1-4 hrs.**  
Courses and activities designed to meet the inservice needs of public school personnel. Credit in these courses may be used for certificate renewal and salary upgrades if approved, but may not be used a degree programs. CR\NC grading.
- 580-583 Special Topics. 1-4 hrs.**
- 585-588 Independent Study. 1-4 hrs.**
- 591-594 Workshop. 1-4 hrs.**
- 600 Computing and Instructional Design. 3 hrs.**  
An analysis of current systems of educational computing based on models of instruction, learning modalities, and desired learning outcomes. (PR: CIEC 534 or equivalent or consent).
- 610 Local Area Networks and Telecommunications in the School. 3 hrs.**  
A hands-on approach to managing and using local area networks and telecommunications to meet the instructional needs of the school. (PR: CIEC 534 or equivalent or consent).
- 620 Software Evaluation and Selection. 3 hrs.**  
In-depth evaluation of software based on student-developed criteria. (PR: CIEC 600 or equivalent).
- 630 Authoring Systems and Multimedia. 3 hrs.**  
A hands-on approach to authoring systems, including stackware, and the integration of other technologies such as CD-ROM, video disk, still video, and video and audio cassette recordings. (PR: CIEC 620 or equivalent).
- 660 Using Computers to Improve Instruction in the Classroom. 3 hrs.**  
This course is designed for inservice teachers who are familiar with the "BASIC programming" language and who want to learn how the microcomputer can be utilized in a content area. (PR: CI 530)
- 699 Final Project in Curriculum Area. 3 hrs.**  
A final project related to the student's curriculum area which demonstrates the ability to design and implement a computer-based curriculum application. (PR: CIEC 630 or equivalent).

#### **CURRICULUM AND INSTRUCTION: ENGLISH AS A SECOND LANGUAGE (CISL)**

- CISL 550 Second Language Acquisition. 3 hrs.**  
This course examines current theories of second language acquisition and their implications for second language teaching and learning.
- CISL 551 Linguistics for ESL. 3 hrs.**  
This course examines major linguistic theories on first- and second-language acquisition, emphasizing acquisition of English by non-native students in prekindergarten through twelfth grade. (PR: CISL 550)
- CISL 552 Intercultural Communication. 3 hrs.**  
This course focuses on the interrelationship of language and culture and includes analyses of world cultures, with literature and arts as bridges. Participants develop teaching materials for ESL classrooms.
- CISL 553 Methods and Materials for ESL: Language Development. 3 hrs.**  
Approaches to developing and assessing listening and speaking skills among second language populations at different stages in academic development, with an overview of traditional ESL methods. (PR: CISL 550)
- CISL 554 Methods and Materials for ESL: Literacy Acquisition. 3 hrs.**  
Approaches to developing and assessing writing and reading skills among second language populations at different stages in academic development. Focus also includes literacy acquisition in content areas. (PR: CISL 550)
- CISL 555 ESL Practicum for Teaching ESL. 3 hrs.**  
A culminating practicum that involves participation in ESL curriculum evaluation and development. (PR: CISL 550, 551, 552, 553, 554)

#### **CURRICULUM AND INSTRUCTION MATH EDUCATION (CIME)**

- 500 Mathematics for the Elementary Teacher I. 3 hrs.**  
Systems of numeration, sets, relations, binary operations, decimal and other base systems, natural numbers, integers, rational numbers, and real numbers with emphasis on the algebraic structure.
- 501 Mathematics for the Elementary Teacher II. 3 hrs.**  
Continuation of CIME 500. PR: CIME 500

- 555 Technical Mathematics for Mathematics Educators. 3 hrs.**  
This course will cover the objectives of applied and technical preparation mathematics for teachers, with an emphasis on methodologies appropriate for those students who are likely to comprise these classes.
- 556 Finite Mathematics for Mathematics Educators. 3 hrs.**  
This course will cover the methods and objectives of business and technical preparation mathematics courses with an emphasis on teaching methodologies appropriate for those students who are likely to comprise these classes.
- 557 Precalculus for Mathematics Educators. 4 hrs.**  
A progressive development of algebraic concepts, skills, and applications. Problem solving techniques and calculator usage will be integrated throughout the program.
- 558 Geometry for Mathematics Educators. 3 hrs.**  
Basic concepts of logic and mathematical proofs. Topics include angle relationships, parallel, and perpendicular lines, circles, polygons, solids, triangles, and elementary trigonometry. (PR: CIME 557)
- 560-564 Staff Development. 1-4 hrs.**  
Courses and activities designed to meet the inservice needs of public school personnel. Credit in these courses may be used for certificate renewal and salary upgrades if approved, but may not be used a degree programs. CR\NC grading.
- 570 Teaching Mathematics to Early Adolescents. 2 hrs.**  
An examination of the interrelationships of the physical, intellectual, and socio-emotional development of the pre- and early adolescent and their impact on the teaching and learning of mathematics. (PR: Any two of the following: CIME 555, 556, 557 or 558; or permission)
- 575 Supervised Field Practicum/Seminar in Mathematics, 5-9. 3 hrs.**  
Supervised practicum in which the student demonstrates and is assessed in mathematics teaching skills in a clinical setting in grades 5-9. (PR: any two of the following—CIME 555, 556, 557, 558; or permission)
- 577 Supervised Field Practicum/Seminar in Mathematics, 9-12. 3 hrs.**  
Supervised practicum in which the student demonstrates and is assessed in mathematics teaching skills in a clinical setting in grades 9-12. (PR: any two of the following CIME 555, 556, 557, 558, or permission)
- 580-582 Special Topics. 1-4 hrs.**
- 585-588 Independent Study. 1-4 hrs.**
- 591-594 Workshop. 1-4 hrs.**

### **CURRICULUM AND INSTRUCTION: READING EDUCATION (CIRG)**

- 500 Building Supportive Classrooms for Early Literacy Learning. 3 hrs.**  
This is a field-based course designed for schools that are adjusting the literacy curriculum to support literacy acquisition. Participants learn to provide appropriate assessment and instruction to foster the development of learning strategies for reading and writing for their pupils.
- 506 Introduction to Reading Recovery. 3 hrs.**  
A course designed for Reading Recovery Teachers-in-Training including the basic concepts, practices, theory, and philosophy. Participants will administer, score, and interpret an observation survey.
- 507 Reading Recovery: Theory and Practice. 6 hrs.**  
Provides information, direction, and supervision in implementing Reading Recovery within the school setting. This course includes a daily practicum and weekly seminar session relating theory to practice. (PR: CIRG 506)
- 560-564 Staff Development. 1-4 hrs.**  
Courses and activities designed to meet the inservice needs of public school personnel. Credit in these courses may be used for certificate renewal and salary upgrades if approved, but may not be used a degree programs. CR\NC grading.
- 565 Reading for Supervisors of Instruction. 1 hr**  
A course for individuals seeking certification as a supervisor of instruction. Attention will be given to comprehensive reading programs, approaches to reading instruction, and inservice programs. (PR: Consent)
- 580-583 Special Topics. 1-4 hrs.**
- 585-588 Independent Study. 1-4 hrs.**
- 613 Children's Literature. 3 hrs.**  
An examination of teaching methods and of children's literature that are conducive to promoting permanent interests, skills, and interests in reading for ECE and MCE.

- 614 Adolescent Literature. 3 hrs.**  
Analysis of the roles of the teacher in developing a reading program for the late adolescent and adult. The utilization of children's literature as a medium for bridging the content fields with the process of reading will be a major concept that will be utilized.
- 619 Reading Leadership: Roles, Responsibilities, and Problems. 3 hrs. S.**  
Analyses of administrators/supervisor's roles, responsibilities, problems, and practices in reading programs K-12. Presents practical solutions for problems encountered in a comprehensive reading program.
- 621 Current Issues and Problems in Reading. 3 hrs.**  
A seminar course especially designed to explore problems and issues in reading, K-12. Professional literature, empirical research, and practical experience will be used to identify problems and solutions. (PR: CIRG 643)
- 636 Modern Developmental Reading Program. 3 hrs.**  
Principles and practices of teaching developmental reading.
- 637 Reading Education: Diagnosis and Correction of Reading Difficulties I. 3 hrs.**  
Study and the causes of reading difficulties, diagnostic devices and techniques, and remedial methods and materials. (PR: CIRG 636 and 644)
- 639 Reading Education Seminar: Planning, Organizing and Supervising a Reading Program. 3 hrs.**  
This course is designed as an in-depth study and analysis of the planning and organizing of reading programs at various administrative levels. (PR: CI 643)
- 642 Reading Education Seminar: Reading Instruction for Individuals with Special Needs. 3 hrs.**  
Study of research findings, methodology and instructional materials for atypical learners, illiterate adults and others.
- 643 Practicum in the Diagnosis and Correction of Reading Difficulties - Elementary and Secondary. 3 hrs.**  
Clinical experiences in the diagnosis and corrective treatment of reading disabilities. (PR: CIRG 654)
- 644 Teaching Content Reading. 3 hrs.**  
Principles underlying the teaching of reading in the content fields.
- 653 Literacy Acquisition. 3 hrs.**  
Literacy acquisition is a foundation course open to professionals whose interests require understanding of the process involved in becoming literate.
- 654 Reading Education: Diagnosis and Correction of Reading Difficulties II. 3 hrs.**  
Experiences in analyzing diagnostic test results, preparing diagnostic reports, and selecting appropriate materials and procedures to meet specific reading needs. (PR: CIRG 637)
- 701 Reading Education Seminar I. 3 hrs.**  
An investigation of research in reading that has made a difference in education, pupil achievement in reading, the role of reading, and the role of the reading specialist. (PR: Master's degree, consent of instructor)
- 702 Reading Education Seminar II. 3 hrs.**  
An examination of research that has the potential to bring about changes in reading education and school curriculum.
- 703 Reading and Reading-Related Tests and Techniques. 3 hrs.**  
An examination of research related to the development of reading and reading-related diagnostic procedures. Detailed study will be made of standardized tests, the Informal Reading Inventory (IRI) and other similar diagnostic measures and competency-based instruments.
- 704 Advanced Instructional Reading Processes. 3 hrs.**  
A study of advanced instructional techniques in reading. Attention will be given to such concepts as self-concept, intelligence, nature/nurture, interaction, perception, physiological differences, and exceptionalities.
- 705-706 Applied Research in Reading Education I and II. 3-6 hrs.**  
Planning and implementing a study investigating aspects of reading theory. The study will necessitate deriving empirical data under field conditions.
- 707 Issues in Reading. 3 hrs.**  
A review of trends and issues in reading education focusing on the complexity of the reading process.
- 708 Philosophy and History of Reading Education. 3 hrs.**  
A study of the philosophical foundation of current reading programs. This course will review the historical background and progress in reading education.
- 709 Field Experience: An Aspect of Reading Education. 3 hrs.**  
A field-based course designed to study the theory, preparation, presentation, and evaluation of inservice education. Emphasis will be placed on the refinement of teacher education in specialized areas of the curriculum.

- 710 Independent Study. 3 hrs.**  
Individualized study of advanced topics in reading.

### **CURRICULUM AND INSTRUCTION: SCIENCE EDUCATION (CISE)**

- 560-564 Professional Development. 1-4 hrs.**  
Courses and activities designed to meet the inservice needs of public school personnel. Credit in these courses may be used for certificate renewal and salary upgrades if approved, but may not be used a degree programs. CR\NC grading.
- 570 Flora and Fauna for the Elementary/Middle School. 3 hrs.**  
A study of the flora, fauna, and physical geography of West Virginia. Field-based experiences will lead to a greater understanding of the forces that shaped Appalachia and the flora and fauna that live here.
- 571 Developing Thematic Science in the Elementary/Middle School. 3 hrs.**  
A study of the strategies and techniques needed to plan, implement and evaluate a thematic, coordinated, and integrated science program in the schools.
- 572 Environmental Education for the Elementary/Middle School Teacher. 3 hrs.**  
A study of man's interactions with the environment. Awareness, conservation, problem-solving and stressed using strategies and techniques appropriate for the elementary/middle school student.
- 573 Chemistry for the Elementary/Middle School. 3 hrs.**  
A study of the fundamental principles of chemistry focusing on developmentally appropriate methods, strategies and techniques to assist with concept development and attainment.
- 574 Integrated Science for the Elementary School. 3 hrs.**  
Study and application of the concepts and activities included in an integrated science program for the elementary school.
- 575 Integrated Science for the Middle School. 3 hrs.**  
Study and applications of the concepts and activities included in an integrated science program for the middle school.
- 576 Wave Phenomena and Electricity for the Elementary/Middle School. 3 hrs.**  
A study of the fundamental principals of physics focusing on wave phenomena and electricity for the elementary/middle school teacher.
- 577 Energy and Matter for the Elementary/Middle School. 3 hrs.**  
A study of the fundamental principles of physics focusing on energy and matter for elementary and middle school teachers.
- 580-582 Special Topics. 1-4 hrs.**
- 585-588 Independent Study. 1-4 hrs.**
- 591-594 Workshop. 1-4 hrs.**

### **CURRICULUM AND INSTRUCTION: SPECIAL EDUCATION (CISP)**

- 520 Introduction to Exceptional Children. 3 hrs.**  
An introduction to the study of children who deviate from the average in mental, physical, and social characteristics, including a study of the characteristics of such children and the adaptation of educational procedures to their abilities and disabilities.
- 521 Children with Exceptionalities. 3 hrs.**  
Behavioral characteristics of children with exceptional development, dynamics of family- community interaction, and attitudes toward exceptional conditions. Implications for amelioration and educational planning. (Not for Special Education majors)
- 523 Introduction to Learning Disabilities. 3 hrs.**  
An integrated, concise overview of specific learning disabilities; definitions, etiology; observable and identifiable symptoms and implications for amelioration.
- 524 Introduction to Emotional Disturbances. 3 hrs.**  
Characteristics of emotional-social disturbances in children; dysfunction in behavior, academic achievement, and social relationships, etiology and educational implications are presented.
- 526 Introduction to the Gifted. 3 hrs.**  
An overview of giftedness in children, definitions, etiology, observable characteristics and implications for educational agencies.
- 527 Introduction to Autism. 3 hrs.**  
This is a lecture-discussion course designed to survey current autism definitions, rates of incidence conceptual models and educational designs relating to autistic children, youth, and adults. (PR: Permission)

- 529 Introduction to the Physically Handicapped. 3 hrs.**  
An introduction to the characteristics and needs of crippled and other health impaired children. The medical aspects of physically handicapping conditions are considered. (PR: CI 520; CR: Field Experience)
- 533 Special Education: Introduction to Mental Retardation. 3 hrs.**  
Acquaints teachers with the characteristics and needs of the mentally retarded child. The status of the mentally retarded in our society and the impact of mental retardation on education (PR: CI 520. CR: Field Experience)
- 535 General Special Education Programming. 3 hrs.**  
Address the educational/curricular needs of students with mild learning problems in the categorical areas of mental retardation, behavior disorders, and specific learning disabilities. (PR: CI 320/520 and 433/533 or 423/523 or 424/524 or permission of instructor)
- 553 Special Education: Education of the Mentally Retarded. 3 hrs.**  
Principles and current trends in curriculum development are reviewed and evaluated toward the development of specific curricula for the mentally retarded. Methods and materials are presented in relation to this development. (PR: CI 520 and 533)
- 554 Working with Families of Exceptional Students. 3 hrs.**  
Principles and information designed to give the student an understanding of the needs and rights of parents of exceptional children and techniques to involve parents successfully in their child's education.
- 560-564 Staff Development. 1-4 hrs.**  
Courses and activities designed to meet the inservice needs of public school personnel. Credit in these courses may be used for certificate renewal and salary upgrades if approved, but may not be used a degree programs. CR\NC grading.
- 580-583 Special Topics. 1-4 hrs.**
- 585-588 Independent Study. 1-4 hrs.**
- 600 Grant Writing in Special Education. 3 hrs.**  
A review of the federal and state guidelines for writing grants in Special Education. The priority areas of special education in which monies are currently available will also be examined.
- 601 Psychological Foundations of Giftedness. 3 hrs.**  
A study of measures used to identify the gifted and interpretation of results, psychological development of the gifted and psychological pressures, problems and adjustments strategies towards mental health in the gifted child.
- 602 Education of the Gifted. 3 hrs.**  
Educational models, identification techniques, teaching strategies and resources available for gifted children. Current trends in curriculum development for the gifted are also examined. (PR: CISP 526)
- 603 Field Experience: Gifted. 3 hrs.**  
Supervised experiences (one semester) in field work with children who exhibit potential giftedness.
- 604 Practicum in Emotional Disturbances. 3 hrs.**  
An initial participation and observation experience with children experiencing behavior problems. Course evolves around bi-weekly seminar and selected projects.
- 611 Special Education Research, Part I. 3 hrs.**  
The study of problems related to the area of exceptionality receiving emphasis in the student's degree program. (PR: CI 603, 649, 651 or 674, EDF 621 or 625)
- 615 Special Education Research, Part II. 3 hrs.**  
As a part of the requirements for this course, the student will submit a written, bound document, which will be added to the college library collection. (PR: CISP 611)
- 626 Special Education: Diagnostic-Clinical Practices. 3 hrs.**  
Team approach to diagnosis and treatment of exceptional children. (PR: CISP 520)
- 627 Trends and Issues in Special Education. 3 hrs.**  
An in-depth look at current issues affecting all areas of special education as well as issues specific to each special education category.
- 629 Special Education: Seminar 3 hrs.**  
Research methods and current significant findings in special education. Guest speakers. Advanced special education students only.
- 645 Special Education: Education of Emotional Disturbances. 3 hrs.**  
Recognition of emotional-social, disturbances, assessment of educational needs, establishment of programs to implement behavioral change and provide necessary modification in educational programs to remediate learning and behavioral difficulties of children. (PR: CISP 524)
- 646 Special Education: Field Experiences: Learning Disabilities. 3 hrs. S.**  
Supervised experiences of one semester in field work with children or youth who exhibit symptoms of problems in learning.

- 647 Special Education: Education of Learning Disabilities. 3 hrs. I.**  
Theories, diagnosis, and teaching strategies concerning children who exhibit symptoms of any or several learning disabilities.
- 649 Special Education: Field Experiences: Emotional Disturbances. 3 hrs.**  
Supervised field experiences (one semester) working with children who exhibit symptoms of emotional disturbances-behavioral disorders. (PR: CISP 524 and CISP 645)
- 650 Special Education: Diagnostic Evaluation and Prescriptive Teaching Techniques. 3 hrs.**  
Educational assessment and diagnostic evaluation for remediation-amelioration; advanced course for providing understanding and utilization of evaluation, teacher assessment, and analysis for programming for exceptional individuals. (PR: CISP 626)
- 651 Special Education: Field Experience: Mental Retardation. 3 hrs.**  
All-day supervised teaching in special classes in the public schools required of all students who are completing curriculum for teachers of mentally retarded children. (PR: CI 533 and CI 553)
- 661 Introduction to Preschool Special Education. 3 hrs.**  
An overview of early childhood special education programs including historical events, legislation, the population served, program models and components and current issues and trends.
- 662 Instructional Characteristics of Autism. 3 hrs.**  
A lecture-discussion course, designed to provide students with an understanding of the learning characteristics of autistic children and research-based instructional techniques for teaching and managing behavior. (PR: CI 427 or 527)
- 663 Developmental Issues in Preschool Special Education. 3 hrs.**  
An examination of the normal development of young children, the interrelated effects of impairment in various areas of development and strategies for intervention.
- 664 Practicum in Autism. 3 hrs.**  
This course contains two components: a competency-based practicum experience with autistic students and a seminar with regular discussions and readings on practical issues concerning the education of autistic children. (PR: CI 427 or CI 527 and 662)
- 665 Assessment in Preschool Special Education. 3 hrs.**  
An overview of issues in the identification, screening and assessment of young handicapped children, specific assessment techniques for working with families and interdisciplinary teams in the assessment process.
- 666 Curriculum and Methods in Preschool Special Education. 3 hrs.**  
A review of curriculum development and methodology used to teach young children with handicaps. Evaluation techniques, program development and management, adaptation of materials and equipment and program models are presented.
- 673 Field Experience: Preschool Special Education. 3 hrs.**  
Supervised participation and directed teaching activities in an early childhood special education program across ages, disabilities and severity levels. Activities with non-handicapped preschoolers are also required.
- 674 Practicum: Preschool Special Education. 3 hrs.**  
Supervised teaching in a variety of early childhood special education programs across ages, disabilities, and severity levels. Experiences with non-handicapped preschoolers are required. Specific competencies will be individually determined.

#### **CURRICULUM AND INSTRUCTION: VISUAL IMPAIRMENTS (CIVI)**

- 500 Introduction to Visual Impairments. 3 hrs.**  
Introduction to educational programs and services for students with visual impairments, history, definitions, incidence and prevalence, development, psychosocial aspects, service delivery models, issues, and professionalism.
- 501 Braille Reading and Writing. 3 hrs.**  
Knowledge and skills in reading and writing literary braille code, braillewriter, slate and stylus, proofreading, interlining, basic Nemeth mathematics code, textbook formatting, computer translation, overview of other braille codes.
- 502 Structures and Functions of the Human Visual System. 3 hrs.**  
Structure and function of the eye, development of the visual system, causes of eye conditions, vision assessments, environmental modifications, relationship to other disabilities, and neurological aspects of visual impairment.
- 503 Instructional Strategies for Teaching Students with Visual Impairments. 3 hrs.**  
Design and adaptation of instruction for students with visual impairments, expanded core curriculum, teaching literacy and other communication skills, assessment, early childhood intervention, parent involvement, and collaboration.

- 504 Instructional Strategies for Teaching Students with Multiple Impairments. 3 hrs.**  
Strategies for students with visual impairments and severe/multiple disabilities, interaction of sensory disabilities with other disabilities, functional curricula, alternative communication and mobility systems, and collaboration.
- 505 Basic Orientation and Mobility Skills. 3 hrs.**  
Strategies for teaching and reinforcing orientation mobility skills, basic concept development, movement, exploration of space in the home and school environment, environmental orientation, and collaboration with O & M specialists.
- 506 Practicum in Visual Impairment. 1-6 hrs.**  
Three hundred documented hours of supervised practicum experiences with students with visual impairments, including those with severe/multiple disabilities ranging from infancy to early adulthood. (PR: Permission of instructor)
- 507 Advanced Braille and Technology for Teaching Students with Visual Impairments. 3 hrs.**  
Codes and techniques for advanced braille. Essential skills in transcribing Nemeth code for mathematics and science, formatting techniques, and computer translation. (PR: CIVI 501 or equivalent)

### DIETETIC INTERNSHIP (DTS)

- 560 Professional Development. 1-4 hrs.**  
Activities designed to meet the supervised practice needs of dietetic interns. CR/NC grading.
- 580-583 Special Topics. 1-4; 1-4; 1-4; 1-4 hrs.**
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**
- 591-594 Workshop. 2-3; 2-3; 2-3; 2-3 hrs.**  
Workshop in selected areas of dietetics.
- 670 Nutrition Intervention in Dietetics. 3 hrs.**  
Integrates normal and clinical nutrition with behavioral, natural, and social sciences to enhance dietary compliance among populations at nutritional risk. Systematic approach to assessment, instruction, and evaluation. Applied research in dietetics. (PR: Dietetic Internship Students or permission)
- 673 Administrative Dietetics. 3 hrs.**  
Overview of management/administrative concepts for directing resources within a variety of food and nutritional service/programs. Planning, implementing, and evaluation techniques to measure organizational performance. Applied research in dietetics. (PR: Dietetic Internship Students or permission)
- 675 Dietetic Internship Practicum I. 3 hrs.**  
Supervised practice experience focusing on the nutritional screening assessment and education of individuals and groups across the lifespan in a variety of community and long-term settings.
- 676 Dietetic Internship Practicum II. 3 hrs.**  
Supervised practice experience focusing on the procurement, production, distribution, and service within school- and hospital-based food service management systems.
- 677 Dietetic Internship Practicum III. 3 hrs.**  
Supervised practice experience focusing on skills required to become a dietitian in a clinical setting. Nutritional screening, assessment, and education of individuals with complex medical conditions will be emphasized.
- 679 Nutrition Interventions II. 3 hrs.**  
Utilizes current technologies for information and communication related to selected acute and chronic diseases. Individual educational plans are designed and implemented.
- 690 Seminar in Research and Communication. 1-3; 1-3 hrs.**  
Extensive reading and reports from current literature in selected areas of dietetics.

### ECONOMICS (ECN)

- 501 Economic Analysis. 3 hrs.**  
Overview of the basic principles of both microeconomics and macroeconomics.
- 505 Environmental Economics. 3 hrs.**  
The application of basic economic theory to a wide range of environmental problems, including pollution, natural resource exhaustion, population and economic growth. (PR: ECN 253 or permission of GSM academic advisor)
- 508 Comparative Economic Systems. 3 hrs.**  
Marxism, capitalism, communism, fascism and socialism considered as theories, movements and actual political economics. (PR: ECN 253, or permission of GSM academic advisor)

- 515 Regional Economics. 3 hrs.**  
A study of location theory and regional development within a framework of economic theory. (PR: ECN 253 or permission of GSM academic advisor)
- 520 International Economics. 3 hrs.**  
Movement of goods and balance of payments among nations; exchange rates; exchange controls and tariffs; problems and policies. (PR: ECN 253 or permission of GSM academic advisor)
- 522 Introduction to Mathematical Economics. 3 hrs.**  
Modern mathematical methods for use in economics and other social sciences. (PR: ECN 253 and Mathematics 203, or permission of GSM academic advisor)
- 540 History of Economic Thought. 3 hrs.**  
Economic theories and ideas from the earliest economists to those of Marshall and Keynes. (PR: ECN 253 or permission of GSM academic advisor)
- 550 Public Finance. 3 hrs.**  
Analysis of governmental activities pertaining to raising of revenue and expenditure of monies; analysis of public debt and fiscal programs at all levels of government. (PR: ECN 253 or permission of GSM academic advisor)
- 560 Economic Development. 3 hrs.**  
A study of the problems, dynamics and policies of economic growth and development in underdeveloped and developed countries. (PR: ECN 253 or permission of GSM academic advisor)
- 561 Economics Education Workshop. 3 hrs.**  
Intensive review of subject matter and teaching methods in economics for elementary and high school teachers. (PR: Consent of instructor or grant scholarship)
- 562 Economics Education Workshop 1-3 hrs.**  
Intensive review of subject matter and teaching methods in economics for elementary and high school teachers. (PR: Consent of instructor or grant scholarship)  
Note: Students who have taken the Social Studies workshop in American Capitalism Seminar for credit may not take ECN 561 and 562, American Capitalism Seminar, for credit.
- 620 The United States and The Global Economy. 3 hrs.**  
A study of the interdependent and transnational nature of the global economy with an emphasis on contemporary global economic issues, commercial policies, trading blocs, developing countries and world economic agencies. (PR: GSM admission)
- 630 Managerial Economics. 3 hrs.**  
Utilization of microeconomic theory and optimization techniques for management decision making. (PR: Full M.B.A. admission)
- 650-651 Special Topics. 1-3; 1-3 hrs.**  
Members of the department may teach, when necessary, any economics subject not listed among current course offerings. (PR: Nine hours of economics and permission of division head and of GSM academic advisor)
- 656 Labor Economics. 3 hrs.**  
Theoretical and empirical analysis of labor markets, wage determination, hours of work, unemployment and inflation, unions and collective bargaining and related subjects in their social and legal contexts. (PR: Full M.B.A. admission)
- 660 Independent Study. 1-4 hrs.**  
Independent study of a specific nature under the supervision of a qualified faculty member. Hours of credit are determined by the magnitude of the project. (PR: Permission of division head and of GSM academic advisor)

## EDUCATION

(See Curriculum and Instruction)

### EDUCATIONAL FOUNDATIONS (EDF)

- 502 Psychology of the Middle Childhood Student. 3 hrs.**  
A course in the study of developmental principles relating to the physical, cognitive, social, and moral development of the middle childhood student 10-14 years old.
- 510 Contemporary Issues in Education. 3 hrs.**  
The impact of contemporary forces in education with emphasis on current educational issues.
- 513 Human Growth and Development Birth-8. 3 hrs.**  
A study of various topics and instructional implications for birth-8
- 514 Human Growth and Development Adolescents. 3 hrs.**  
A study of various topics and instructional implications for adolescents.

- 515 History of Modern Education. 3 hrs.**  
Our debt to the ancient Hebrews, Greeks, and Romans. Emphasis also is placed upon the movements since the beginning of the Renaissance.
- 517 Statistical Methods. 3 hrs.**  
A foundation course in descriptive and inferential statistics as applied in education and the social sciences.
- 535 Tests and Measurements. 3 hrs.**  
History, philosophy and elementary statistical methods for testing, measuring and evaluating pupil behavior are studied.
- 537 MAT Level I Clinical Experience. 0 hrs.**  
Twenty-hour public school clinical experience in middle/secondary schools designed to provide an opportunity for MAT students to work with faculty, staff and students in a teaching environment. (CR: EDF 616)
- 580-583 Special Topics. 1-4 hrs.**
- 585-588 Independent Studies. 1-4 hrs.**
- 610 Trends and Issues in Education. 3 hrs.**  
An investigation of current trends and issues in education through extensive reading, research and discussions. Implications for schools, classrooms, and teachers are the focus of the course.
- 612 Educational Evaluation. 3 hrs.**  
A study of the fundamental skills needed to evaluate educational progress at the individual, classroom, program, and school levels.
- 615 History of Education in the United States. 3 hrs.**  
Development of public and private educational systems in the United States.
- 616 Advanced Studies in Human Development. 3 hrs.**  
The nature of human growth and development from infancy through adulthood. *MAT students only.* (CR: EDF 537)
- 617 Multiple Regression. 3 hrs.**  
A first course in Multiple Regression Analysis and its application. Designed to be cross-disciplinary. Of interest to students in Education, the Social, Behavioral and Natural Sciences.
- 619 Educational Psychology. 3 hrs.**  
Study of learning theories and their applications to teaching.
- 621 Educational Research and Writing. 3 hrs.**  
Research methods, techniques, and their application to education.
- 625 Qualitative Research in Education. 3 hrs.**  
Study of qualitative research methods: understanding historical and philosophical foundations of qualitative research and developing expertise in qualitative research strategies including participant observation, interviewing and inductive content analysis of data.
- 626 Advanced Qualitative Research in Education. 3 hrs.**  
Advanced study of selected topics in qualitative research. Emphasis on application of qualitative research knowledge and skills. (PR: EDF 625)
- 630 Comparative Education. 3 hrs.**  
The study of the origins, nature, scope, basic literature and methodology of comparative education.
- 631 Gender and Education. 3 hrs.**  
The course focuses on gender relations in education and schooling. The course addresses gender in relation to curriculum and knowledge, pedagogy and instructional arrangements, and administration and policy issues. (PR: EDF 621 or equivalent)
- 635 Policy Studies in Education. 3 hrs.**  
The course focuses on current policy issues facing educators today. The course offers conceptual and analytical tools for a critical examination of the uncertain political environment of schooling.
- 637 MAT Level II Clinical Experience. 0 hrs.**  
Thirty-hour secondary public school experience provides opportunity for preservice, master's-level teachers to put theory into classroom practice through observation, participation, reflection, individual/small group teaching, and up-front classroom teaching. (PR: EDF 537; CR: CI 515)
- 640 Literature. 1-3 hrs.**  
A program of reading, either extensive or intensive, and reports on a group of outstanding contributions to education; readings selected with guidance of advisor. Only one registration for this course is permitted. (CR: Permission of instructor)
- 641 Seminar. 2-3 hrs.**  
A guided program of readings, reports and discussions. No student may register for this course a second time.
- 660 Philosophy of Education. 3 hrs.**  
Surveys basic philosophy schools and concepts and their application to educational practice.

- 665 Sociology of American Schools. 3 hrs.**  
American school organizational patterns interpreted sociologically; role of power and bureaucracy, social and cultural change, stratification and social mobility, and values; analysis of school rituals and ceremonies.
- 677 MAT Level III Clinical Experience. 3-6 hrs.**  
Culminating clinical experience through directed activity in a clinical setting for MAT students. (PR: EDF 537 and EDF 637)
- 679 Problem Report. 1-3 hrs.**  
The preparation of a written report on a research problem, experiment or field project in education. This report is not a thesis; students must complete an additional 33 credit hours unless 697 is followed by 681 for 3 hours credit.
- 681 Thesis. 3-6 hrs.**  
May be taken for 3 hours of credit by students whose reports in 679 were excellent and are of such character as to warrant further research. Students completing 679 and 681 for a total of 6 hours may qualify for the master's degree by earning an additional 26 hours of credit. Students completing 681 must defend their thesis in an oral examination.

### **ELECTRICAL ENGINEERING (EE)**

- 650-653 Special Topics. 1-4 hrs.**  
Formal study of electrical engineering topics of current interest. (PR: Consent)

### **ENGINEERING (ENGR)**

- 610 Applied Statistics 3 hrs.**  
Practical application of statistical techniques to decision-making, forecasting, optimization, experimental design. Interpretation of data using central tendency and dispersion, t-test, F-test, variance analysis, correlation, and linear regression. (PR: Permission)
- 620 Computer Applications 3 hrs.**  
Introduction to current software technology to solve problems of interest to technical professionals. Covers the use of tables, databases, modeling, curve fitting, and solution of equations. (PR: Permission)
- 650-653 Special Topics. 1-4 hrs.**  
Formal study of engineering topics of current interest. (PR: Consent)
- 685-688 Independent Study. 1-4 hrs.**  
An approved study of special interest concerning engineering, under the supervision of a faculty member. (PR: Consent)

### **ENGINEERING MANAGEMENT (EM)**

- 620 Management of Technical Human Resources and Organizations. 3 hrs.**  
Principles leading to better management and development of technical human resources and organizations. Included are concepts technical managers need to change themselves positively and to lead others toward desired behaviors.
- 650-653 Special Topics. 1-4 hrs.**  
Study of special topics of an advanced nature. (PR: Consent)
- 660 Project Management. 3 hrs.**  
Provides the student with a practical knowledge of how to integrate effectively the functional efforts of many in the execution of programs and projects.
- 664 Management of Research & Development Organizations. 3 hrs.**  
Techniques and methods for effective management of research and development organizations, projects, and personnel. (PR: EM 601)
- 665 Management of Engineering Organizations. 3 hrs.**  
Techniques and methods for effective management of engineering firms, departments, and personnel. (PR: EM 601)
- 670 Seminar in Engineering Management. 3 hrs.**  
Provides the student an opportunity to examine issues in engineering management and to evaluate their consequences in organizations, in the profession, and in society. (PR: Consent)
- 675 Engineering Economics. 3 hrs.**  
The concepts and methods for the financial calculations involving time value of money and uncertainty. Capital and departmental budgeting processes and engineering inputs to cost accounting. (PR: Consent)

- 694 **Engineering Law. 3 hrs.**  
The American legal system, contracts and specifications, liability of professional engineers, product liability, agency relationships, patent and proprietary rights, and special problems in contracts are studied.

### ENGLISH (ENG)

- 502 **Composition and Rhetoric for Teachers. 3 hrs. S.**  
Study of rhetorical invention and models of composing process, with intensive practice in writing.
- 508 **Advanced Expository Writing. 3 hrs.**  
An advanced general composition course. Practice in the rhetorical types and styles used by professionals in all fields. Assignments adapted to the student's major.
- 509 **Milton. 3 hrs.**  
Biographical and critical study, including Milton's English poetry and prose, and his literary and intellectual milieu.
- 510 **Shakespeare's Comedies, Tragicomedies, and Romances. 3 hrs.**  
Intensive study of Shakespeare's comedies, tragicomedies, and late romances. Also includes the Sonnets and Venus and Adonis.
- 511 **Chaucer. 3 hrs.**  
The poetry of Chaucer, including the Canterbury Tales, in the light of medieval tradition and critical analysis.
- 512 **Shakespeare's Histories and Tragedies. 3 hrs.**  
Intensive study of Shakespeare's Histories and Tragedies.
- 513 **English Novel to 1800. 3 hrs.**  
Defoe, Richardson, Fielding, Smollett, and Sterne, with supporting study of their most important predecessors and contemporaries.
- 514 **Nineteenth Century English Novel. 3 hrs.**  
Austen, Scott, the Brontes, Eliot, Dickens, Thackeray, Trollope, Meredith, Hardy, Butler, Wilde, and their contemporaries.
- 515 **Victorian Poetry. 3 hrs.**  
Emphasis on Tennyson, the Brownings, Arnold, Hopkins, Christina Rossetti, Hardy and the pre-Raphaelites.
- 517 **English Drama to 1642. 3 hrs.**  
Non-Shakespearean English drama from its beginnings to the closing of the theatres.
- 519 **Approaches to Teaching Literature. 3 hrs.**  
The intensive study of the pedagogy of literature and literary critical theory and its classroom applications.
- 521 **American Literature to 1830. 3 hrs.**  
Study of American literature of the Puritan, Colonial, and Federal periods, including such authors as Jonathan Edwards, Edward Taylor, Anne Bradstreet, Benjamin Franklin, Phillis Wheatley, Washington Irving, and Catharine Maria Sedgwick.
- 522 **American Literature, 1830-1865. 3 hrs.**  
American literature of the Romantic Period, including such authors as Emerson, Poe, Melville, Hawthorne, Dickinson, Whitman, Fuller, Douglass, Stowe, and other figures of the period.
- 523 **American Literature, 1865-1914. 3 hrs.**  
American literature of the Realistic and Naturalistic periods, including such authors as Howells, Twain, James, Dreiser, Chesnut, Wharton, Crane, and Chopin.
- 524 **American Literature, 1914-1945. 3 hrs.**  
A survey of American writers of the Modern period to World War II.
- 525 **Southern Writers. 3 hrs.**  
A survey of the poetry, fiction, nonfiction, and drama indigenous to the American South, including Old South, post-Civil War, and Modern periods, and emphasizing the Southern Literary Renaissance.
- 528 **International Literature. 3 hrs.**  
Readings in contemporary literature from the non Anglo-European world. Texts will be taken from Asian, African, South American, Australian, and other authors. (PR: ENG 102 or 302 or 201H)
- 533 **Contemporary British Poetry. 3 hrs.**  
British poetry since the Victorian period.
- 534 **Contemporary American Poetry. 3 hrs.**  
American poetry since 1900.
- 535 **Modernism. 3 hrs.**  
A study of trans-Atlantic Modernist writers, including both poetry and prose.
- 536 **Medieval Literature. 3 hrs.**  
Old English elegiac and heroic poetry; Middle English lyrics and romances; the Ricardian poets and Malory.

- 537 Tudor Literature: Poetry and Prose of the Sixteenth Century. 3 hrs.**  
Survey may include works by More, Skelton, Wyatt, Sidney, Spenser, Nashe, Marlowe, Raleigh, Lyly, Sidney, Mary Sidney, and Shakespeare, excluding drama.
- 538 Seventeenth Century Literature: Poetry and Prose. 3 hrs.**  
Survey may include Donne and the Metaphysical poets, the Cavalier lyricists, Bacon, Browne, Wroth, Cary, Lanyer, Herbert, Jonson, Burton, Walton, Hobbes, and Bunyan.
- 544 Rendering the Landscape. 3 hrs.**  
Historical and contemporary approaches to the representation of landscape in art and writing (poetry, fiction, non-fiction, etc.). Joins with course in Art department for a one-week trip to a West Virginia state park for field work (lodging fee required).
- 546 Drama of the Restoration and 18th Century. 3 hrs.**  
Trends, movements, and dramatic types in the British theatre of this period.
- 547 British Romantic Poets. 3 hrs.**  
Emphasis on Blake, Wordsworth, Coleridge, Byron, Shelley, and Keats.
- 555 Literary Criticism. 3 hrs.**  
Historical study, with application of principles.
- 558 Contemporary Fiction: Form & Theory. 3 hrs.**  
Readings in contemporary fiction addressing the work in terms of the formal and theoretical concerns that drive it. Texts that challenge our notions of genre, form, theory, and practice. (PR: ENG 102 or 302 or 201H)
- 562 Restoration and Eighteenth Century British Poetry and Prose. 3 hrs.**  
British poetry and prose of the Restoration and eighteenth century (1660-1800), exclusive of the novel. Authors studied include Dryden, Swift, Pope, Johnson, Boswell, Wollstonecraft. Emphasis on satire, biography, essay. (PR: English 102 and 201H)
- 565 Literature of War: (specific war). 3 hrs.**  
Examines the literary responses to an individual war and discusses the artistic, cultural, and historical contexts of those responses.
- 575 Introduction to Linguistics. 3 hrs.**  
The structural and descriptive approach to the study of the English language.
- 576 Modern Grammar. 3 hrs.**  
A descriptive analysis of the structure of present-day American English, utilizing the basic theory of generative transformational grammar.
- 578 Introduction to Sociolinguistics. 3 hrs.**  
Sociolinguistics is the study of the effects of language in society, relevant to discourse practices, language attitudes, variations, shifts, and changes.
- 580-583 Special Topics. 1-4 hrs. each.**  
(PR: Permission of the chair)
- 585-588 Independent Study. 1-4 hrs.**  
(PR: Permission of the chair)
- 591 Creative Writing: Poetry Workshop. 3 hrs.**  
A practical and intensive class in exploring the varieties of creative expression; exercises on the creating of verse in different forms and styles.
- 592 Creative Writing: Fiction Workshop. 3 hrs.**  
A forum for presentation, discussion, and refinement of the student's work, either short stories or novels.
- 601 Folk and Popular Literature. 3 hrs.**  
A study of types, variants, backgrounds, and influences.
- 610 Readings in English and American Literature. 2-3 hrs.**  
Independent reading in a field not covered by regularly scheduled courses. Limited to English majors who have been admitted to candidacy. (PR: Permission of the chair)
- 611 Independent Readings. 3 hrs.**  
Independent readings and research. Open only to students with an M.A. degree with a major in English or English Education.
- 620 Twentieth Century Drama. 3 hrs.**  
Major British and American dramatists since 1870.
- 624 Twentieth Century British Novel. 3 hrs.**  
Major British novelists of the twentieth century.
- 625 Twentieth Century American Novel. 3 hrs.**  
Major American novelists of the twentieth century.
- 628 Twentieth Century African-American Literature. 3 hrs.**  
An intensive study of selected novels, plays and poems of the period.

- 630 Materials and Methods of Research. 4 hrs.**  
Instruction and practice in scholarly literary research. Required among first 12 hours of coursework and prior to admission to candidacy for the Master of Arts degree with a major in English.
- 631 Major American Authors. 3 hrs.**  
An intensive study of selected American authors. (PR: ENG 630 or permission of the chair)
- 632 Topics in American Literature. 3 hrs.**  
Concentrated study of continuing themes or influences in American literature; for example, narrative perspectives, regional influences, or conflicting agrarian and industrial values. (PR: ENG 630 or permission of the chair)
- 636 Selected British Writers. 3 hrs.**  
An intensive study of selected British writers such as the Metaphysical Poets, the Cavalier Poets, or the Bloomsbury Group. (PR: ENG 630 or permission of the chair)
- 637 Topics in British Literature. 3 hrs.**  
A concentrated study of themes or influences in British literature; for example, narrative strategies, medievalism, the pastoral mode, or conflicting moral, social or literary values. (PR: ENG 630 or permission of the chair)
- 640 Teaching College English. 3 hrs.**  
Required for graduate assistants in English.

*The following four courses are for inservice teachers only and require permission of the chair and the Director of Writing.*

- 641 Advanced Composition Institute I. 3 hrs.**  
The study of characteristics of effective writing instruction; strategies of effective writers; an introduction to teaching writing with technology; an introduction to field research in writing. (PR: Graduate School Acceptance and Permission)
- 642 Advanced Composition Institute II. 3 hrs.**  
Advanced Composition Institute II is a seminar course, a follow-up to the intensive summer Advanced Composition Institute I. (PR: ENG 641)
- 643 Electronic Writing Project. 3 hrs.**  
Study in the application of teaching writing with technology. Teachers create online syllawebs, databases, peer responses, and conferencing environments, and use technology for research, for teaching research, and for publication. (PR: Graduate School Acceptance and Permission)
- 644 Teacher Inquiry. 3 hrs.**  
An intensive study of composition research methodologies (ethnographic study, classroom based inquiry, reflective practice, qualitative research) with a proposal for an inquiry project. Upon completion, Fellow becomes part of Teacher Inquiry Community (TIC). (PR: ENG 641, 642, and permission)
- 650-653 Special Topics.**  
(PR: ENG 630 or permission of the chair)
- 681 Thesis. 1-6 hrs.**

### ENVIRONMENTAL ENGINEERING (ENVE)

- 611 Air Pollution Design I: Control of Gaseous Emissions. 3 hrs.**  
An introduction to adsorption, condensation, incineration, absorption, and process modification relevant to the design of abatement systems for gaseous air pollutant emissions. (PR: unit operations, thermodynamics and calculus)
- 612 Air Pollution Design II: Control of Particulate Emissions. 3 hrs.**  
An introduction to equipment, processes, and basic principles relevant to the design of particulate collection systems including electrostatic precipitators, fabric filtration units, cyclones, and high energy scrubbers. (PR: ES 604 or courses in physics, fluid mechanics, and process design)
- 615 Environmental Chemistry. 3 hrs.**  
Fundamental principles governing the various aspects of chemistry relevant to the environment will be addressed. The chemistry of waste treatment, cyclical processes and other applications will be evaluated. (PR: Consent)
- 616 Principles of Biological Waste Treatment. 3 hrs.**  
Principles and practices of the process design of biological systems employed in wastewater treatment, including such topics as microbial metabolism, oxygen transfer, and biomass-separation. Lectures, laboratory, and field trips. (PR: ES 651)
- 617 Physiochemical Treatment of Water and Wastewater. 3 hrs.**  
A unit operation/unit process approach to industrial and advanced waste treatment covering physical and chemical methods. Application of methods to specific waters and wastes. Lectures and laboratory sessions. (Prerequisite: ENVE. 615)

- 618 Pollution Prevention. 3 hrs.**  
Introduces the student to the basic understanding and criteria required for establishing a pollution prevention program, including a review of successful industry practices. Emphasis on management strategies. (PR: undergraduate degree in science or engineering)
- 620 Solid Waste Management. 3 hrs.**  
Solid waste management and minimization: options, methods, laws and regulations. Landfill design, testing, operation, monitoring, and closure. Use of composting in landfills. Incinerator design and operation. Separation and recycling approaches.
- 625 Hazardous Waste Management. 3 hrs.**  
Options and methods of managing hazardous waste. Landfill design, testing, operation, monitoring, and closure. Incinerator design, testing, operation, and monitoring. Design and operation of treatment facilities. Waste reduction practices.
- 650-653 Special Topics**  
Occasional special offerings in Environmental Engineering. (PR: Consent)
- 663 Environmental Permitting. 3 hrs.**  
The permit process for the construction and operation of facilities, including stream crossing, wetlands, etc.; permits under Clean Air Act, Clean Water Act, NPDES, RCRA and TSCA.
- 673 Industrial Ventilation. 3 hrs.**  
The design and analysis of industrial ventilation systems, including properties of air contaminants; hood, duct and fan design; system performance; mine ventilation; air cleaning devices; testing; diagnosis; troubleshooting, cost analysis. (PR: Consent.)
- 675 Industrial Noise Control. 3 hrs.**  
Physics of sound, absorption and reflection, sound level measurements and instruments, and noise control criteria; audiometry and the physiology of hearing; community noise abatement; laws and regulations. (PR: undergraduate degree in science or engineering)
- 680 Air Pollutant Dispersion and Meteorological Modeling. 3 hrs.**  
Meteorological concepts with emphasis on air pollution; atmospheric dynamics, adiabatic processes; temperature profiles, behavior of stack effluent, atmospheric chemistry, attenuation of solar radiation, and climatology application to dispersion models. (PR: undergraduate course in physics, and spreadsheet capability)
- 681 Environmental Engineering Design. 3 hrs.**  
Principles of engineering design of water and wastewater treatment systems and processes, including physical, chemical, and biological treatment and handling of treatment residuals. Includes coverage of relevant water quality concepts. (PR: Engineering degree or permission)
- 682 Environmental Remediation Technologies. 3 hrs.**  
Decontamination or removal of pollutants from soil. Aeration of excavated soil on site. Use of solvents and surfactants as removal aids. Removal of soil for treatment at an off-site facility. (PR: ES 651)
- 683 Environmental Geotechnology. 3 hrs.**  
Surface and subsurface geology; geotechnical properties of soil and rock. Geotechnical engineering design aspects of landfills, groundwater barriers, tunneling. Mechanics of ground movement; sediment and erosion control. (PR: engineering or geology degree)

## ENVIRONMENTAL SCIENCE (ES)

- 582-83 Special Topics. 1-4 hrs.**  
Occasional offerings of current topics in environmental sciences, providing important supplementary material for participating students.
- 586-88 Independent Study. 1-4 hrs.**  
An approved study of special interest concerning environmental science that is appropriate for the student's program of study. Carried out under the supervision of a faculty member.
- 600 Introduction to Environmental Science. 3 hrs.**  
The principles of chemistry, geology, and mathematics used in pollution analysis and control. Topographic maps, environmental regulations, field testing, and compliance. Economics of use of pollution control devices.
- 602 A Study of the West Virginia Environment. 3 hrs.**  
An overview of the diversity of the local natural environment, including the plants, insects, amphibians, reptiles, other wildlife, and the impact of human activities on the local environment.
- 603 Seminar In Current Environmental Issues. 3 hrs.**  
The influence of environmental laws, common law, contract law, tort law, and regulatory interpretations, as well as the impact of citizens' groups, professional societies, and trade associations on current practice. (PR: Consent)

- 604 Air Pollution. 3 hrs.**  
Major air pollution sources; meteorological concepts; physical and chemical characterization; effects on plant and animal life; and development of air pollution laws, with emphasis on West Virginia regulations. (PR: Consent)
- 605 Analytical Principles of Environmental Sampling. 3 hrs.**  
Identifying and measuring contaminants in air, water, soil, and sludge. Methods of analysis including gas chromatography, nuclear magnetic resonance, colorimetry, infrared absorption, ultraviolet absorption, atomic absorption, and mass spectroscopy. (PR: Chemistry and ES 600, or equivalent experience)
- 609 Topics in Bioscience Education. 1-6 hrs**  
Selected topics of interest to teachers of biology. (PR: Consent)
- 610 Environmental Sampling Practice. 3 hrs.**  
Current practice in environmental testing and monitoring. Traditional wastewater tests, bioassay analysis, aquatic toxicity. Current procedures in gas chromatographic analysis, mass spectrometry. Sample preservation, quality control, and quality assurance. (PR: analytical chemistry and instrumental methods, or ES 605)
- 614 Environmental Risk Assessment. 3 hrs.**  
The course will provide a comprehensive review of currently used methods and applications of risk assessment in environmental science and engineering. The course will focus on the analysis of potential risks in all media, and will include state and federal requirements and guidelines for human health and ecological risk assessment. (PR: Consent)
- 620 Environmental Management Systems. 3 hrs.**  
EMS principles and elements; environmental, health and safety regulatory issues; ISO 14000 EMS specifications and guidelines; environmental auditing; environmental performance evaluation; life cycle assessment and environmental labeling.
- 626 Remote Sensing and Map Use. 3 hrs.**  
Introduction to topographic, soil, and geologic maps and aerial and satellite photography as sources of environmental information. Application of various data sources to specific types of environmental problems.
- 630 Environmental Site Assessment. 3 hrs.**  
Site inspection and investigation, emphasizing the "due diligence" clause of Section 107 of the Comprehensive Environmental Response Compensation Liability Act of 1980, site remediation, and data analysis and reporting.
- 640 Groundwater Principles and Monitoring. 3 hrs.**  
Introduction to groundwater hydrogeology; including porosity, hydraulic conductivity, aquifers, groundwater flow, well hydraulics, groundwater geology, and water chemistry. (PR: A background in environmental science or geology is recommended)
- 645 Applied Hydrogeology. 3 hrs.**  
The fundamentals of hydrogeology are utilized to implement a case study investigation of a contaminated groundwater site from the planning stage through a final report. (PR: ES 640 or equivalent experience)
- 646 Dynamics of Ecosystems. 3 hrs**  
Species interaction; population, community and ecosystem ecology; productivity; nutrient cycling; physiological ecology, population dynamics; pollution and conservation; and aquatic, marine, and terrestrial ecosystems. (PR: Consent)
- 648 Vegetation of West Virginia. 3 hrs.**  
Introduces the student with a minimal biology background to basic field and laboratory botany. Introduction to science of plant taxonomy and community ecology, with emphasis given to West Virginia. (PR: Consent)
- 650-653 Special Topics in Environmental Science. 1-4 hrs.**  
(PR: Consent)
- 654 Environmental Microbiology. 3 hrs.**  
Microbiology of the environment; ecology of the microbial cell; microbial ecosystems; the microbe's interaction with other micro-organisms and macro-organisms; how micro-organisms obtain nutrients, and the effect on the environment. (PR: General biology and general chemistry or consent)
- 655 Environmental Ethics. 3 hrs.**  
Introduction to the subject of ethics, environmental ethical theory, moral reasoning, free market regulation, right to know, proprietary information, product liability, cost-benefit analysis, risk assessment, waste disposal, and resource depletion. (PR: Consent)
- 656 Preparation and Evaluation of Environmental Impact Statements. 3 hrs.**  
A practical course designed to provide students with the ability to prepare and evaluate impact statements. The course is based on the concepts of the environment as a single interrelated system.

- 660 Environmental Law I. 3 hrs.**  
Introduction to major federal environmental legislation and related state programs, including policy issues, judicial review, and practical effects. Includes CERCLA, RCRA, Clean Water Act, Clean Air Act, NEPA, ESA, and SDWA. (PR: Consent)
- 661 Environmental Regulations 3 hrs.**  
Practical applications and concentrated study of regulations under all major federal environmental programs, including permitting, reporting, and other compliance issues. Includes discussion of procedures used in development of regulations. (PR: ES 660)
- 662 Environmental Policy 3 hrs.**  
Introduction to processes for formulation and development of env. policy, including administrative procedure and the policy process. Discussion of current env. policy issues in relevant political, legal, social, and scientific contexts.
- 663 Environmental Law II. 3 hrs.**  
Course covers three general topic areas: environmental assessment and biodiversity (NEPA and ESA), risk management and regulation of toxic substances (TSCA, FIFRA, and SDWA), and international environmental law. (PR: ES 660)
- 674 Epidemiological Health Research Techniques. 3 hrs.**  
An introduction to techniques of epidemiological health research. The primary focus will be health problems in the industrial setting.

### **FAMILY AND CONSUMER SCIENCE (FCS)**

- 501 Maternal and Child Nutrition. 3 hrs.**  
Nutritional requirements during prenatal and early growth periods; surveys of nutritional status.
- 502 Foods of the World. 3 hrs.**  
Characteristics and cultural aspects of the foods of the world.
- 505 Quantity Food Production. 3 hrs.**  
Basic principles of quantity food selection, preparation, and service. Laboratory application in local food institutions.
- 507 Food Service Systems Management. 3 hrs.**  
Administration of food service in institutions.
- 510 Nutrition in Aging. 3 hrs.**  
Nutritional needs of the elderly and diseases responding to nutritional therapy. Government food programs for the elderly.
- 515 Family Relationships. 3 hrs.**  
Relationships in the family during its life cycle, with some consideration of family life in other cultures.
- 516 Prenatal and Infant Care. 3 hrs.**  
Prenatal and postnatal care for mothers, development of the fetus and care of the infant throughout the first three years.
- 531 Guidance of the Young Child: Practicum. 3 hrs.**  
Techniques of guidance of young children with emphasis on adult child interaction.
- 532 Parenting. 3 hrs.**  
Examination of current challenges, problems, and issues in the field; analysis of effective strategies for parenting.
- 535 Administration of Day Care Centers. 3 hrs.**  
Instruction and practice in the development of day care centers for three and four year old children and administration of programs in these centers. Laboratory participation required.
- 540 Nutrition in the Home and School. 3 hrs.**  
Fundamental principles of human nutrition and their application in the home and school. Designed primarily for elementary teachers.
- 544 Consumer Education. 3 hrs.**  
Analysis of economic factors related to provision of consumer goods and services; investigation of sources of consumer information; and means of providing economic security for families.
- 560 Professional Development. 1-4 hrs.**  
Courses and activities designed to meet the specific inservice needs of public school personnel. Credit may be used for certificate renewal and salary upgrading, if approved, but not in degree programs. CR/NC grading.
- 562-564 Professional Development. 1-4; 1-4; 1-4 hrs.**  
Courses and activities designed to meet the specific inservice needs of public school personnel. Credit may be used for certificate renewal and salary upgrading, if approved, but not in degree programs. CR/NC.

- 580-583 Special Topics. 1-4; 1-4; 1-4; 1-4 hrs.**  
**585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**  
**591-594 Workshop. 2-3; 2-3; 2-3; 2-3 hrs.**  
 Workshop in selected areas of family and consumer sciences. Credit for not more than two workshops may be counted for the master's degree.
- 600 Philosophy and Trends in Family and Consumer Sciences. 3 hrs.**  
 Major contemporary educational theories and their relationship to trends in the field of family and consumer sciences. (PR or CR: EDF 621)
- 601 Evaluation in Family and Consumer Sciences. 3 hrs.**  
 Procedures for appraising student progress in the attainment of objectives; construction of evaluation instruments; analysis and interpretation of data.
- 602 Curriculum Development in Family and Consumer Sciences. 3 hrs.**  
 Examination of bases for family and consumer sciences curricula; development of curricula for junior and senior high school programs, utilizing various organizational patterns.
- 603 Current Issues in Child Development. 3 hrs.**  
 A study of current issues and research in child development. Designed for students with a background in child development seeking updated information or more in-depth study.
- 605 Recent Developments in Clothing. 3 hrs.**  
 Survey of recent literature and theory in the field of clothing.
- 606 Recent Developments in Foods. 3 hrs.**  
 Survey of recent literature and theory in the field of foods.
- 661 Family Economics. 3 hrs.**  
 Factors affecting material level of living for families, expenditure patterns, and impact of social change on resource allocation. (PR: FCS 544)
- 665 Family Resource Management Theory and Research. 3 hrs.**  
 Analysis of home management theory and concepts as revealed through current research in the field. (PR: FCS 527)
- 679 Problem Report. 1-3 hrs.**  
**681 Thesis. 1-6 hrs.**  
**684-685 Special Problems in Family and Consumer Sciences. 1-3; 1-3 hrs.**  
 Problems of particular interest to the graduate student. Registration by permission of advisor. Not more than four hours of seminar credit may be counted toward a master's degree.
- 690-691 Seminar. 1-3; 1-3 hrs.**  
 Extensive readings and reports from current literature in selected areas of Family and Consumer Sciences. Not more than six hours of seminar credit may be counted toward a master's degree.

### **FINANCE (FIN)**

- 510 Principles of Business Finance. 3 hrs.**  
 Business finance from the viewpoint of the financial manager. Use of financial statements, tools, and concepts for measuring and planning for profitability and liquidity. (PR: ACC 216 or ACC 510, ECN 253 or ECN 501, MGT 218, and MTH 203 or MGT 500)
- 580 Special Topics. 1-4 hrs.**  
**620 Financial Management. 3 hrs.**  
 An examination of business corporations practicing at the level of the individual firm with emphasis on quantitative analysis of the variables which affect liquidity and profitability. (PR: MGT 601, ACC 613 and full M.B.A. admission or permission of GSM academic advisor)
- 625 Financial Problems in Business. 3 hrs.**  
 Recognizing and solving financial problems through the use of case presentations and/or corporate annual and interim reports. (PR: FIN 620 and full M.B.A. admission or permission of GSM academic advisor)
- 626 Security Analysis and Portfolio Management. 3 hrs.**  
 Analytical procedures used by institutional portfolio managers to measure both past performance of holdings and anticipated market performance of current offerings. Emphasis in this course may be expected to be more centralized in the area of fundamental analysis. (PR: FIN 620 and full M.B.A. admission or permission of GSM academic advisor)
- 627 Financial Institutions and Markets. 3 hrs.**  
 An in-depth study of the flow of funds in aggregate financial systems, with emphasis on those in the United States. Because interest rates and bank reserve requirements of Federal Reserve System are all dynamic in character, the content of this course may be expected to vary as financial events of the future dictate. (PR: FIN 620 and full M.B.A. admission or permission of GSM academic advisor)

- 650 Special Topics. 1-3 hrs.**  
(PR: Permission of the division head, full M.B.A. admission, and permission of GSM academic advisor)
- 660 Independent Study. 1-4 hrs.**  
Independent study of a specific nature under the supervision of a qualified faculty member. Hours of credit are determined by the magnitude of the project. (PR: FIN 620 and permission of division head or permission of GSM academic advisor)

### **FORENSIC SCIENCE (FSC)**

- 602 Fingerprints. 1 hr.**  
Analysis of inked prints by the modified Henry System, detection of latent finger & palm prints using chemical and optical methods. (PR: Consent of Instructor)
- 604 Genetics and DNA Technology. 3 hrs.**  
An introduction to crime scene investigations, physical evidence collection, inorganic and organic analysis, serology, fingerprints, arson, drugs, documents, firearms and DNA technologies.
- 605 Forensic Science Digital Imaging. 3 hrs.**  
Introductory course in digital image processing. Covers techniques used in forensic laboratory to enhance, analyze, and catalog digital images. Instruction in laboratory setting.
- 606 Crime Death Investigation. 2 hrs.**  
Establishes foundations and techniques for proper crime scene investigation with or without a victim's body. Logical approach for collecting evidence and documenting scene and collection process.
- 608 Forensic Science II. 3 hrs.**  
An in-depth analysis of both clinical and forensic aspects of toxicology from the viewpoint of the forensic and medical examiner's toxicology laboratories. This course also serves as the basis for taking more advanced courses offered as electives through the Department of Pharmacology.
- 612 Introduction to Forensic Microscopy/Trace. 2 hrs.**  
Introduction to various types of microscopy used in forensics, including scanning electron microscopy, light and fluorescence microscopy and polarizing microscopy.
- 614 Forensic Science Technologies. 4 hrs.**  
A course covering multiple topics in forensic science including infrared spectroscopy, paint analysis, ballistics, explosives, arson, glass fracture, and questioned documents. This course affords students the opportunity to learn about a wide variety of topics that will help them in their future careers. (PR: Consent of Instructor)
- 616 Forensic Laboratory Techniques I. 4 hrs.**  
Introduction to laboratory techniques used to test evidentiary materials collected at crime scenes.
- 620 Forensic Laboratory Techniques II. 4 hrs.**  
A continuation of FLT I, but with emphasis on DNA technologies and toxicological procedures.
- 626 Forensic Drug Analysis. 2 hrs.**  
Concentration on modern analytical methods used in the isolation and the identification of illicit drugs and their metabolites in biological samples and other forensic evidence. (PR: FSC 622 or permission of instructor)
- 650-653 Special Topics. 1-4 hrs.**  
Present course material on special areas of research or topics which are not routinely covered in existing courses.
- 665 Legal Issues, Court Procedures for Forensic Scientists. 3 hrs.**  
Covers the American legal system with specific emphasis on expert witnessing by forensic scientists. Both the federal and state systems of justice are addressed, plus topics such as the federal rules of evidence and discovery. Frye and Daubert considerations on admissibility of scientific evidence and expert witnessing are discussed. Mock trials provide experience in the courtroom. (PR: CJ 321, Consent of Instructor)
- 679 Special Problems. 1-4 hrs.**  
Students will be assigned specific areas of study for independent investigation. (PR: Consent of advisor)
- 680 Seminar. 1 hr.**  
Faculty, student and guest speaker presentations of topics pertinent to forensic science and molecular biology and toxicology.
- 681 Thesis. 1-6 hrs.**  
Research conducted in the laboratories at Marshall University which is focused on a problem of forensic importance. The original research problem will be written up as a formal document and submitted as part of the requirements to fulfill a Master of Science degree in the research track.
- 685 Introduction to Research. 1-6 Hrs.**  
Directed research which can be used to satisfy requirements for a Master of Science Degree in Forensic Science.

## FRENCH (FRN)

The following courses may serve as a minor in some programs.

- 535 19th Century Literature. 3 hrs.**  
The French romantic movement as exemplified in the poetry, drama, and the novel of the period. (PR: 6 hours of literature numbered 317 or above or equivalent)
- 536 19th Century Literature. 3 hrs.**  
Realistic and naturalistic fiction, realism in the theatre, and selected poems of Baudelaire, the Parnassians, and the Symbolists. (PR: 6 hours of literature numbered 317 or above or equivalent)
- 580-583 Special Topics. 1-4; 1-4; 1-4; 1-4 hrs. On demand.**  
A course for advanced students sufficiently prepared to do constructive work in phases of the language or literature of interest to them. (PR: 6 hours of literature numbered 317 or above or equivalent and consent of instructor.)
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**

## GEOGRAPHY (GEO)

- 501 Historical Geography of the United States. 3 hrs.**  
Study of coastal settlements, the population spread through Appalachia and the Mississippi Valley, and the development of intermountain and Pacific Coast centers.
- 502 Geography of Appalachia. 3 hrs.**  
A study of settlement, transportation, manufacturing, agriculture and resource potential.
- 503 Geography of Asia. 3 hrs.**  
Special attention given activities and environment in continental countries and nearby islands.
- 505 World Political Geography. 3 hrs.**  
A systematic and regional survey of world political problems and international relations stressing studies of the United States, Europe, and the Soviet Union.
- 508 Geography of Mexico and Central America. 3 hrs.**  
A geographical study of agriculture, transportation, settlement, geopolitics, and natural resources.
- 510 Urban Geography. 3 hrs.**  
Study of city function, patterns, past and current problems confronting the city including planning, zoning, housing, and urban renewal.
- 512 Geography of Russia and CIS. 3 hrs.**  
Geographical appraisal of cultural, political, and economic aspects of Russia and the Commonwealth of Independent States.
- 514 Methods and Techniques of Regional Planning. 3 hrs.**  
Introductory planning with emphasis on methods, techniques, tools and principles necessary to accomplish objective regional planning.
- 515 Regional Planning and Development. 3 hrs.**  
The philosophy, theories, and principles involved in planning of urban and rural areas.
- 516 Environmental Planning. 3 hrs.**  
A study of the principles and techniques of urban-rural land use, and the problems and issues encountered in the practices of land use.
- 517 Coal Industries Studies: Past & Present. 3 hrs.**  
An interdisciplinary study for all facets of the coal industry within a historic perspective. Emphasis is placed upon coal industry of West Virginia and the tri-state region.
- 518 Geography for Teachers. 3 hrs.**  
A study of elements of geography most essential for effective teaching of geographic content in elementary education and the social studies.
- 520 Geographic Field Research. 3 hrs.**  
Type areas in lumbering, mining, agriculture, and industry studied through field methods.
- 525 Climatology. 3 hrs.**  
A study of elements of weather and climate, methods of climatic classification, and distribution and characteristics of world climatic regions.
- 529 Cartography. 3 hrs.**  
Understanding principles and developing skills in the use of cartographic drafting equipment and in map making.
- 530 Cartography and Geographic Information Systems. 3 hrs.**  
Introduction to computer use in mapping and geographic information systems.
- 580-584 Special Topics. 1-4 hrs.**  
Selected geography subjects to cover unusual geography topics not in the regular course offerings of the department

- 585-588 **Independent Study. 1-4 hrs.**
- 601 **Problems in Geography of the Far East. 3 hrs.**  
Agriculture, industry, transportation, and trade of selected regions in eastern Asia and the islands of the western Pacific Ocean.
- 602 **Problems in Geography of Europe. 3 hrs.**  
Consideration of problems in selected countries following a geographical review.
- 603 **Problems in Geography of North America. 3 hrs.**  
Relationship of human activities to natural environment in selected regions.
- 604 **Problems in Geography of Latin America. 3 hrs.**  
Problems studied in each country following a geographical review.
- 605 **Geography in World Political Affairs. 3 hrs.**  
Key nations of world studied in light of significance of geographic items and their effects on international relations.
- 606 **Field Problems in Geography of the Tri-State Area. 3 hrs.**
- 607 **Problems in World Economic Geography. 3 hrs.**  
Problems of world exchange of outstanding trade items.
- 608 **Problems in Geography of Africa and Australia. 3 hrs.**  
Selected regions studied in both continents.
- 609 **Geographical Research. 3 hrs.**  
Research methods stressed with special attention given to a consideration of the literature of the field.
- 620 **Conservation Education. 3 hrs.**  
Presents elements of conservation education in the specific areas of soil, water, and human conservation.
- 679 **Problem Report. 1-3 hrs.**
- 681 **Thesis. 1-6 hrs.**
- 690 **Internship in Geography. 3 hrs. I, II.**  
Professional work experience in applied geography with an approved agency.

## GEOLOGY (GLY)

- 518 **Invertebrate Paleontology. 4 hrs. II. Alternate years (odd numbers)**  
Taxonomy, morphology, and paleoecology of body and trace fossils representing the major invertebrate phyla; analysis and interpretation of faunal assemblages; theories on evolution and extinction of species.
- 521 **Petrology. 4 hrs. I. Alternate years (even numbers)**  
Identification and classification of igneous, sedimentary and metamorphic rocks; their origin and occurrence; their geologic and economic importance. 3 lec-2 lab. (PR: GLY 200, 314 or consent)
- 522 **Economic Geology. 4 hrs.**  
Origin, distribution and economics of the metallic and nonmetallic ore deposits. 3 lec-2 lab. Course taught on a demand basis only. (REC: GLY 201, 314, or equivalent)
- 523 **Sedimentary Petrography. 4 hrs. I., Alternate years (odd numbers)**  
Megascopic and microscopic identification and a depositional and post-depositional interpretation of the sedimentary rocks. 3 lec-2 lab (PR: GLY 201 and 314 or consent)
- 525 **Geochemistry. 4 hrs. II., Alternate years (odd numbers)**  
Introduction to the principles of geochemistry. The application of chemistry to the study of the Earth and to geologic problems. Laboratory work includes analysis of rocks, soils, and waters. 3 lec - 2 lab (PR: GLY 200, CHM 211 & 217 or permission)
- 526 **Geophysics. 4 hrs.**  
Development of seismic, gravity, magnetism, electrical and thermal methods to study the structure and dynamics of the earth. 3 lec-2 lab. Course taught on a demand basis only. (PR: GLY 200, PHY 201, MTH 229)
- 527 **Fossil Fuels. 4 hrs. II, Alternate years (even numbers)**  
The origin and occurrence of petroleum, coal, and natural gas; the relationships of accumulations to depositional environments and structural history; methods used in exploration, evaluation and recovery. 3 lec-2 lab. (PR: GLY 313, 325 or consent)
- 530 **Computer Methods in Geology. 4 hrs. II. Alternate years (odd numbers).**  
The computer will be used for compilation, reduction, data analysis and modeling from a wide range of geological problems. Existing and student-developed programs will be used. 3 lec-2 lab. (PR: 12 hrs. GLY and MTH 130.)
- 551 **Principles of Geomorphology. 3 hrs. I., Alternate years (odd numbers).**  
Principles of identification and analysis of the world's superficial features in terms of stratigraphy, structure, processes, tectonics and time. 3 lec. (REC: GLY 200, 210 or equivalent)

- 551L Principles of Geomorphology Laboratory. 1 hr. I, Alternate years (odd numbers).**  
Identification and analysis of landforms from aerial photos and topographic maps. (CR: GLY 551, required of majors, non-majors elective).
- 555 Hydrogeology. 3 hrs. I, Alternate years (odd numbers)**  
The properties of water, the hydrologic cycle with emphasis on surface and groundwater processes. The uses, needs and problems associated with water resources. 3 lec. (PR: GLY 200; CR: GLY 555L for geology majors)
- 555L Hydrogeology Laboratory. 1 hr. I, Alternate years (odd numbers)**  
A two hour laboratory of practical hydrogeologic problem solving. (PR: GLY 200; CR: GLY 555, required of majors, non-majors elective)
- 556 Environmental Geology. 3 hrs. II, Alternate years (even numbers)**  
The interactions of man and the earth, dealing with natural resources, natural hazards, cultural and urban geology and future planning. (PR: GLY 200, 210L)
- 556L Environmental Geology Laboratory. 1 hr. II, Alternate years (even numbers)**  
Current solutions to environmental problems through real life exercises (PR: GLY 200, 210L, 451, 451L; CR 556 for Geology majors).
- 557 Engineering Geology. 3 hrs. I, alternate years (even numbers).**  
Geological principles and methods to solve geotechnical engineering problems. (PR: GLY 200, 210L, 451, 451L or by permission of instructor)
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**
- 640 Physical Aspects of Geology. 1-4 hrs. I, II.**
- 641 Biological Aspects of Geology. 1-4 hrs. I, II.**
- 642 Chemical Aspects of Geology. 1-4 hrs.**
- 681 Thesis. 1-6 hrs. I, II, S.**

### **HEALTH CARE ADMINISTRATION (HCA)**

- 600 The Health Care System. 3 hrs.**  
This course is designed to provide managers with in-depth knowledge of the current health care system, covering the structure and delivery of care, the providers and payers, and the various players in the system. The internal and external forces impacting the system are discussed. Problems in the health care system are explored and evaluated with respect to the issues of access, cost, and effectiveness. (PR: GSM admission or permission of GSM academic advisor)
- 610 Health Care Financial Management. 3 hrs. I.**  
Course provides an overview of health care financial management, with special emphasis upon the aspects of financial systems in hospitals that differ from typical financial systems. It includes analysis of capital formation, cash flow management and determination of working capital requirements. (PR: HCA 600)
- 615 Health Care Economics. 3 hrs. II.**  
The health care industry is unique. Unlike in other markets, the consumer finds it difficult to evaluate quantity, quality, and pricing. Traditional market forces are modified by government, third-party payers, and professional interests. This course applies economic principles to this unique environment. (PR: HCA 600)
- 620 The Ethical Dimension of Health Care Management. 3 hrs. II.**  
Emphasis in this course is on the way managers in health care settings incorporate ethical dimensions into their decision-making. It looks at the wide variety of ethical issues faced by these managers, focusing on those related specifically in the decisions they make about their organization, personnel, and services. Specifically covered are issues regarding the allocation of scarce resources, the type and availability of care for special populations, and conflicts of interest. (PR: HCA 600)
- 630 Legal Issues in Health Care Management. 3 hrs. I.**  
This course provides students with a legal framework to analyze health care organizations and their operations. The federal and state legal systems are reviewed and regulatory programs and their requirements discussed. Topics include: tax exemptions, antitrust laws, corporate liability, provider-patient legal issues (contracts and negligence), patient rights, facilities licensure and accreditation, and reimbursement issues. Court cases, as well as governmental agency rulings and findings, are analyzed for their applications to health care management. (PR: HCA 600)
- 640 The Health Care Professional. 3 hrs.**  
This course presents an overview of various professional and managerial topics relevant to the health care professional. Each offering of the course focuses on a particular health profession. Emphasis is on defining the profession, understanding its historical development and evolution, examining professional roles, tasks, responsibilities, and accountabilities in current practice, studying the interaction with other professionals, delineating the parameters of the professional in ethical decision-making, and recognizing and responding to challenges faced in contemporary practice and in planning for the future. (PR: HCA 600)

- 650 Comparative Health Systems. 3 hrs.**  
A survey of health care provision systems throughout the world. (PR: HCA 600)
- 651 Health Care Operations Management. 3 hrs.**  
An investigation of the use of operations management techniques and methodologies that are useful in the health care industry. (PR: HCA 600)
- 652 Health Care Finance. 3 hrs.**  
An examination of the various financial systems present within the American health care systems. Special emphasis placed upon the management of assets, cost control, and budgeting. (PR: HCA 600)
- 653 Integrated Health Care Delivery Systems. 3 hrs.**  
An investigation of managed care systems within the United States. Emphasis placed on identifying practices that promote quality care at an affordable cost. (PR: HCA 600)
- 654 Human Resource Management in Health Care. 3 hrs.**  
An investigation of the human resource function found within contemporary health care provision systems. Discussion of future challenges facing the function in this turbulent environment. (PR: HCA 600)
- 655 Health Care Marketing. 3 hrs. II.**  
An investigation of the role of marketing in today's health care organizations. Specific topics include market segmentation, consumer behavior, promotion, and environmental analysis. (PR: HCA 600)
- 656 Management of Medical Technology & Information Systems. 3 hrs. I.**  
An investigation of the place technology, primarily hard technology, plays in the formulation of health care policy and strategies. Special emphasis placed on the management of medical information systems. (PR: HCA 600)
- 657 Health Care Law & Public Policy. 3 hrs.**  
An examination of the legal, regulatory, and policy-making interactions between government, society, and health care organizations and providers. (PR: HCA 600)
- 658 Long Term Care. 3 hrs.**  
An examination of the range of health and social services that are needed to compensate for the functional disabilities of people. Review of available services and governmental policies and regulations. (PR: HCA 600)
- 659 Health Care for Rural and Underserved Populations. 3 hrs.**  
An investigation of how health care is provided to rural Americans. Special attention given to the health care systems that provide medical care to the peoples of Appalachia. (PR: HCA 600)
- 671 Health Care Practicum. 1-6 hrs.**  
Project-oriented experience in health care operations and organizations. Intended for those students with insufficient experience in the field. (PR: Permission of program director and HCA 600)
- 695 Field Research in Health Care Management. 3 hrs. S.**  
In this course, each student selects an in-depth organizational research project on a particular management problem in a health care organization. In this "hands-on" project, the student serves as a consultant to the health care organization, conducting research, analyzing data, and making recommendations for the solution(s) to the management problem. Projects focus on such topics as strategic planning, productivity, quality assurance, risk management, and joint ventures. Field research projects are selected in conjunction with the program coordinator during the semester prior to course enrollment. (PR: Permission of academic advisor)
- 697 Special Topics in Health Care Management. 3 hrs.**  
The course is designed to allow group study of selected topics of current interest in health care management. (PR: Consent of instructor)
- 698 Independent Study in Health Care Management. 1-3 hrs.**  
The course is designed to facilitate individual study of selected topics of interest in health care management. (PR: HCA 600 and permission of program director)

### **HEALTH EDUCATION (HE)**

- 526 Curriculum in Health Education. 3 hrs. I.**  
A study of principles, objectives, and procedures in curriculum construction for elementary and secondary programs. Historical and philosophical perspectives. Study of existing curricular patterns. (PR: HE 220, HE 221, HE 321 and HE 325)
- 530 Health Issues in Physical Education and Athletics. 3 hrs.**  
A survey of current health issues such as sanitation, contagious diseases, substance abuse, ergogenic aids, and diet/nutrition in PE and athletics. (PR: HE 201, 215, 221, 435.)
- 540 Health Evaluation for the Athletic Trainer I. 3 hrs.**  
A study of common problems and illnesses of athletes and other physically active individuals and the proper methods of evaluating these complaints.

- 560-564 Professional Development (Plus title that identifies content). 1-4; 1-4; 1-4; 1-4; 1-4 hrs.**  
Courses and activities designed to meet the specific in-service needs of public school personnel. Credit in these courses may be used for certificate renewal and salary upgrading if approved but not for degrees.
- 580-583 Special Topics in Health Education. 1-4; 1-4; 1-4; 1-4 hrs.**  
An in-depth examination of selected Health Education topics through a course, seminar or workshop.
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**
- 640 Health Evaluation for the Athletic Trainer. 3 hrs.**  
An indepth study of common problems and complaints of athletes and the proper method of evaluating those complaints.

## HISTORY (HST)

- 502 American Intellectual History 1865 to Present. 3 hrs.**  
A critical examination of intellectual, creative and literary movements in the modern era.
- 503 American Urban History. 3 hrs.**  
A study of the political, economic, social, and intellectual impact of the city upon American History, and the impact of history upon the growth of urbanization.
- 504 American Diplomacy, 1789-1900. 3 hrs.**  
American foreign policy from colonial times to 1900 emphasizing the gradual development of the United States and its achievement of membership in the family of nations.
- 505 American Diplomacy. 1900-Present. 3 hrs.**  
American foreign relations in the in the 20<sup>th</sup>-21<sup>st</sup> centuries. The gradual retreat from isolation in the period between World Wars I and II and modern American involvement in international commitments will be stressed.
- 506 Tudor and Stuart England, 1450-1688. 3 hrs.**  
A history of England under the Tudors and Stuarts, focusing primarily on demographic, social, cultural, and political developments.
- 509 American Revolution. 3 hrs.**  
A varied view of the American Revolution and its impact on the American people.
- 510 Conquering the Continent: America's Frontier Experience. 3 hrs.**  
A survey of the American frontier experience with particular emphasis on the fate of the American Indian, the impact on the environment, and the character of the American-created culture.
- 511 American Social and Cultural History 1607 to Present. 3 hrs.**  
A study of the changes and continuities in American Social and Cultural History from 1607 to present.
- 513 History of the Old South, 1492-1860. 3 hrs. Alternate years.**  
The History of the Old South is a study of the political, economic, social, and cultural conditions in the South that led to the development of the South as a distinct section in the United States.
- 514 Civil War and Reconstruction. 3 hrs.**  
The course will include a discussion of the economic, political, social, and cultural differences leading to the Civil War, the war itself, and an analysis of the political and economic importance of reconstruction.
- 515 History of the New South, 1877 to the Present. 3 hrs.**  
The History of the New South is a study of the political, economic, social, and cultural changes in the South after Reconstruction that explain conditions in the contemporary South.
- 516 American Social Movements. 3 hrs.**  
A study of the social movements which have influenced the course of American History. Includes abolition, women's rights, Progressivism, civil rights.
- 521 The Era of the Renaissance and Reformation. 3 hrs.**  
The impact of the Renaissance upon esthetic, economic, and political developments especially in the 15th and 16th centuries. The decline of Catholicism and the growth of the Protestant movement, and the influence of the two movements upon each other is stressed.
- 522 The French Revolution and the Napoleonic Era. 3 hrs.**  
Society and government in Europe before the French Revolution and the influence of the enlightenment; ideas and changes introduced by the revolution and Napoleon and their effect on the institutions and economy of Europe.
- 523 U.S. Latin American Relations. 3 hrs.**  
An appraisal of political, economic, and cultural relations of the U.S. and Latin America in a historical context with emphasis on the period since 1945.
- 524 U.S. Science and Technology. 3 hrs.**  
A study of the development and impact of science and technology in the U.S. with special emphasis on the modern period.

- 525 European History 1814-1914. 3 hrs.**  
A century of European political, economic, and social history. Its relationship to and influence upon the history of other world areas is noted. The impact of imperialistic rivalry is emphasized.
- 526 European History 1914 to Present. 3 hrs.**  
The impact of World War I upon Europe, the era between two world wars, the search for world peace, World War II and its aftermath are major topics of consideration.
- 528 Intellectual and Cultural History of Modern Europe. 3 hrs.**  
A survey of the main currents in European thought and culture in the 19th and 20th centuries.
- 529 Russia to 1917. 3 hrs.**  
A survey of Russian history to 1917 which examines Russia before the Russians, Kievan Russia, Appanage Russia, Muscovite Russia and Imperial Russia. Emphasis is on Imperial Russia.
- 530 Soviet Russia and Beyond. 3 hrs.**  
The rise and fall of the Soviet Union, with emphasis on political and economic changes and Soviet foreign policy, and including an examination of the aftermath of the Soviet Union's collapse.
- 531 America in the Gilded Age. 3 hrs.**  
A study of America's transformation from a rural, agrarian nation into an urban, industrial world power, the final destruction of the American Indian, the settlement of the West, and the farmers' revolt.
- 532 America Matures, 1900-1945. 3 hrs.**  
An examination of the social, political, and economic trends in the U.S. in the first half of the 20th Century, emphasizing social upheavals, conflicts, and reform movements at home and abroad.
- 533 In Our Time-America Since 1945. 3 hrs.**  
A study of America since World War II focusing mainly on domestic politics, foreign affairs, the civil rights movement, the rise of minorities, and the fragmentation of American society.
- 534 The American Experience in Vietnam. 3 hrs.**  
A study of the origin and escalation of American involvement in Vietnam, the domestic impact of the war within the United States and the collapse of the South Vietnamese government.
- 535 Modern Japan. 3 hrs.**  
Begins with an overview of nineteenth century Japan and stresses the twentieth century rise of Japan to the position of world power.
- 536 Modern China. 3 hrs.**  
This course will provide an overview of Chinese history in the modern era (1600 to the present), including the major political, cultural, social, and intellectual events and trends of this period.
- 540 West Virginia History. 3 hrs.**  
An interdisciplinary study of the state, its people and its institutions within the national context.
- 545 Arab-Israeli Conflict. 3 hrs.**  
This course will examine the historical developments of the modern Arab-Israeli conflict, with emphasis placed on political, socioeconomic, and cultural change and the prospects for peace.
- 580-583 Special Topics. 1-4 hrs.**
- 585-588 Independent Study. 1-4 hrs.**
- 600 Methodology: Seminar in Historical Methods. 3 hrs.**  
A research and writing seminar in which students are taught and must exhibit the skills and methodologies of practicing research historians.
- 601 Tudor England 1485-1603. 3 hrs.**  
In this course, students will examine in-depth several selected themes in Tudor history through reading, class discussions, examinations, and a research paper.
- 602 Stuart England, 1603-1714. 3 hrs.**  
An analysis of the Social, Intellectual, Economic, Cultural, and Political History of England in the Stuart Century.
- 603 Seminar in U.S. Economic History. 3 hrs.**  
A reading and research course in which a student investigates topics related to the economic and business growth of the United States in the context of America's legal, government and social institutions. Emphasis will be on development of international economic institutions and the American role in the global environment.
- 605 American Colonial History. 3 hrs.**  
A study of the English colonies in America with emphasis on slavery, minorities, and social and economic change.
- 607 Problems in European History, 1890-1923. 3 hrs.**  
An analysis of the politics, diplomacy and military strategy of the period of the First World War. Special emphasis is given to the origin of the war, the war itself, the peace settlement and the Russian Revolution and its aftermath.

- 610 Readings in History. 2-3 hrs.**  
Readings in topics fitted to the need of the individual student. They may deal with any graduate area. This course is ordinarily restricted to off-campus students and is used sparingly.
- 620 Seminar in American Historical Biography. 3 hrs.**  
A reading and research course in which a student investigates biographical topics regarding the men and women whose lives illuminate the American experience. The course will cover a wide range of activities, including the social, political, cultural, and economic development of the United States and the region.
- 625 Rebirth of Europe, 1939-Present. 3 hrs.**  
Background and course of World War II, European politics since 1945, developments in international affairs with emphasis on Cold War, economic and social trends, thought and culture.
- 632 Seminar in Reconstruction. 3 hrs.**  
A reading and research course in which each student investigates a specific issue related to the reunification of the nation after the Civil War.
- 633 Problems in American History, 1877-1917. 3 hrs.**  
A research course in which the student probes a selected problem within the chronological span, 1877-1917.
- 634 Problems in American History Since 1917. 3 hrs.**  
A research course in which a student probes a selected problem within the period since 1917.
- 635 Oral/Local History Seminar. 3 hrs.**  
The course examines the field of oral history. Students will apply oral methodology and other primary sources documentation in researching a local topic.
- 636 Seminar in Women's History. 3 hrs.**  
A reading and research course in which the student investigates selected topics related to the history of women in America or Europe.
- 650-651 Special Topics. 1-4; 1-4 hrs.**  
(PR: Permission of Instructor)
- 679 Problem Report. 1-3 hrs.**
- 680 Public History Internship. 1-6 hrs.**  
Internship in an approved setting in Public History, Archives, Museum, Oral History, or Historical Preservation. Interns will be supervised by on-site staff and History Faculty.
- 681 Thesis. 1-6 hrs.**

## HOME ECONOMICS (See Family and Consumer Sciences)

### HUMANITIES (HUMN)

- 530 Technology and the Humanities. 3 hrs.**  
This course surveys the effects of electronic media on the humanities and how they are taught in the postmodern society. Content will subsume both philosophical/theoretical issues and technical matters.
- 560-63 Staff Development. 1-4 hrs. S/U.**  
Courses and activities designed to meet specific needs of public school personnel. Credit may be used for certificate renewal and salary upgrading if approved but not in degree programs.
- 600 Introduction to Study in Humanities. 3 hrs.**  
Interdisciplinary core course addresses questions/concepts central to the humanities. Texts from philosophy, history, literature, the arts and the sciences provide insights into selected historical periods. Open to non-degree students.
- 601 Literary Theory and Criticism. 3 hrs.**  
Core course introduces modern critical approaches, concepts and methods of research and scholarship in the broad field of literature. Open to non-degree students.
- 602 Historical Studies. 3 hrs.**  
Core course acquaints students with problems of historical knowledge, changes in the interpretation of history, nature of historical forces, and methods of historical research. Open to non-degree students.
- 603 History and Theory of the Arts. 3 hrs.**  
Core course provides chronological survey of the arts, emphasizing the social, political and/or religious motives that underlie artistic production. Emphasis on theories of modern art. Open to non-degree students.

- 604 Expository Writing for Research. 3 hrs.**  
This core writing course develops proficiency in writing for research. Note: a degree student may demonstrate competency through an alternative assessment to have the requirement waived. Open to non-degree students.
- 605 Western Traditions and Contemporary Cultures. 3 hrs.**  
Using primary materials from different cultural periods, as well as contemporary critical analyses, this core course explores epistemological questions that underlie conflicts between cultures. Open to non-degree students.
- 650 Selected Topics. 1-9 hrs.**
- 680 Independent Research Symposium. (formerly 701), 3 hrs.**  
Prerequisite: 24 credit hours, required courses, and comprehensive examination. A pro-seminar required of all Humanities degree students who are beginning the thesis or final project. S-U grade.
- 681 Independent Research Symposium. (formerly 702), 3 hrs.**  
Prerequisite: Humanities 680. A continuation of the pro-seminar for students electing the thesis option. The student will produce a thesis suitable for submission to a committee. S-U grade.

### HUMANITIES: ARTS AND SOCIETY (A & S)

- 500 Study of Periods and Movements in Western Art and Music. 3 hrs.**  
The course relates major periods, schools, and movements to the culture of the place and time. May be repeated for a maximum of 6 hours.
- 501 Studies in Non-Western Art and Music. 3 hrs.**  
Studies emphasizing non-Western art or music (e.g., Chinese art; art of the Middle East). May be repeated for a maximum of 6 hours.
- 510 Comparative Arts. 3 hrs.**  
Study of artistic movements and specific stylistic features in art, music and literature. May be repeated for a maximum of 6 hours.
- 550 Sunrise Internship. 3 hrs.**  
A specially designed project under the guidance of specialists at Sunrise Museums (requires special permission from the program director and Sunrise Museums).
- 560 Film Art and the Popular Media (formerly Media 560). 3 hrs.**  
A consideration of films as the successor to earlier popular literatures. Relevant aspects of media history and techniques will be examined.
- 600 Selected Topics in Arts and Society. 1-6 hrs.**  
Selected topics in arts and society. The specific topic will be announced in the schedule of classes. Students may take up to nine hours in selected topics.
- 620 Selected Topics in Decorative Arts. 1-6 hrs.**  
Selected topics in history and practices of decorative arts (e.g., interior design, furniture styles, architecture).

### HUMANITIES: CULTURAL STUDIES (CULS)

- 500 Studies in Thought and Culture. 3 hrs.**  
Basic concepts and cultural expressions in words, principally of area or period studies, such as classical Western, medieval Western, modern European and American.
- 530 Fundamental Approaches to Communication Criticism. 3 hrs.**  
Course examines the theoretical approaches to criticism across the broad range of media, with focus on the philosophy behind each and on their various applications.
- 540 World Religions. 3 hrs.**  
Study of several religions as they developed within their individual times and cultures.
- 550 Ethics. 3 hrs.**  
A critical examination of ethical theories as seen in a detailed examination of several works. Theories may include naturalism, intuitionism, non-cognitivism, utilitarianism, and natural law.
- 560 History of Ideas. 3 hrs.**  
A study of the efforts of philosophers to construct general conceptions of the world. Recent approaches in the investigation of ontology and cosmology will be examined.
- 600 Selected Topics in Cultural Studies. 1-6 hrs.**  
Selected topics in an area of cultural studies. The specific topic will be announced in the schedule of classes. Students may take up to nine hours in selected topics.
- 610 Seminar in Appalachian Culture. 3 hrs.**  
Exploration of selected aspects of culture (e.g., art, music, folklore, history, literature), emphasizing regional culture from an interdisciplinary perspective.

- 620 Women, Men, and Cultural Change. 3 hrs.**  
A study of gender differences from sociological and philosophical perspectives. Topical areas covered include communications, law, literature, popular culture, ethics, and business.
- 650 Classical Foundations in Communication Studies. 3 hrs.**  
Course surveys major contributions to rhetorical theory during the classical period and the development of rhetorical criticism in the centuries since. Philosophers/writers will include Plato, Aristotle, Cicero and Quintilian.
- 652 Communication and Social Movements. 3 hrs.**  
Course examines the role of communication in successful social movements. Contemporary reform movements are analyzed to determine communication strategies, organizational issues, leadership concerns and rhetorical focus.
- 653 Media and the Political Process. 3 hrs.**  
An introduction to the study of political rhetoric, the course relates rhetorical theory to political communication and considers the impact of political communication in government, the electoral process, and society.

### HUMANITIES: HISTORICAL STUDIES (HIST)

- 580 Ethnic History of West Virginia. 3 hrs.**  
This course focuses on the contributions that individuals and groups with diverse ethnic backgrounds have made to the economic, social, and cultural history of the state.
- 585 Coal Mine Life, Work and Culture in West Virginia. 3 hrs.**  
This course provides students with a better understanding of the continuing economic, political, environmental and cultural impact which the extraction of coal has had on West Virginia.
- 600 Selected Topics in Historical Studies. 1-6 hrs.**  
Selected topics in history. The specific topic will be announced in the schedule of classes. Students may take up to nine hours in selected topics.
- 601 Historic Preservation. 3 hrs.**  
Course broadens historical awareness and provides practical applications of historical knowledge. It covers the built environment and focuses on the history, processes and legal basis of the historic preservation movement.
- 620 Civil War and Reconstruction. 3 hrs.**  
This course examines the complex causes and lasting effects of the American Civil War. Issues such as slavery, sectionalism, emancipation and Reconstruction will receive attention.

### HUMANITIES: LITERARY STUDIES (LITS)

- 510 Comparative Approaches to Literature. 3 hrs.**  
Exploration of literature via literary movements, themes, genres, or relationship to other disciplines. Specific works will be read and discussed as examples of the announced approach.
- 520 Creative Writing and Practical Criticism. 3 hrs.**  
Exploration of the possibilities for communication and expression in contemporary writing with emphasis on comprehension of structure, technique and self-criticism of the writing experience.
- 522 Selected Topics in Writing. (formerly Media 522), 3 hrs.**  
The study of selected topics in writing (e.g., the expository essay, screen-writing, techniques of editing, etc.)
- 540 Studies in Mythology/Folklore. 1-6 hrs.**  
Selected topics in mythology and folklore (e.g., folk drama, folk tale, folk art). May be repeated for a maximum of 6 hours.
- 580 Literature for Teachers. 3 hrs.**  
Study and appreciation of selected works with special reference to the high school curriculum.
- 600 Selected Topics in Literary Studies. 1-9 hrs.**
- 615 Modern Southern Literature. 3 hrs.**  
Course surveys important figures in Southern literature since the Southern Literary Renaissance of the 1920s and the Agrarian and Fugitive Movements.
- 625 Updating Shakespeare: Text, Stage, and Film. 3 hrs.**  
Focusing on selected Shakespearean plays, this course considers recent critical interpretations and explores how these have influenced stage and film productions. Contemporary adaptations of the plays will also be considered.
- 636 Literature and Society in Late 18th C. England. 3 hrs.**  
This course examines biographies, social, political and scientific writings, literary texts and the arts from 1750-1800 to understand English culture and the eighteenth-century world.

- 660 Modern Irish Novel. 3 hrs.**  
This course examines the subject matter, techniques, and critical background of the modern Anglo-Irish novel. Students will study representative examples by major novelists from the Republic and Northern Ireland.
- 662 Twentieth-Century Irish Drama. 3 hrs.**  
From the founding of the Abbey Theatre to the present, this course traces the development of Irish drama as art form and cultural artifact.
- 670 Contemporary World Fiction. 3 hrs.**  
Contemporary works of shorter fiction from around the world offer opportunities to apply cultural critiques and comparative literary perspectives, while considering the different national and cultural traditions represented.

### HUMANITIES: STUDIO ART (ARTS)

- 500 Selected Topics in Studio Arts. 1-6 hrs.**

### INDUSTRIAL AND EMPLOYEE RELATIONS (IER)

- 600 Development of Labor Relations. 3 hrs. I.**  
An historical survey of the organized labor movement in the United States and review of legislation affecting the American worker. Attention is given to the industrial relations system of the United States as it relates to those of Western Europe and other nations. (PR: GSM admission or permission of GSM academic advisor)
- 605 Human Resource Economics. 3 hrs. I.**  
Economic issues in the employment and compensation of labor. Topics emphasized include labor force composition and growth, structure and functioning of labor markets, unemployment, wage theories, wage levels and structures, the economic influence of unions, income distribution, and human capital models. (PR: ECN 253 or ECN 501 plus GSM admission)
- 610 Collective Bargaining. 3 hrs. I.**  
A comprehensive survey of collective bargaining with special emphasis given to philosophy, structure, and the process of negotiations. Attention is also given to important developments and emerging trends in collective bargaining. (PR: IER 600)
- 615 Arbitration and Grievance Procedures. 3 hrs. II (even-numbered years).**  
A study of grievance procedures and arbitration as formalized in labor-management relations, including an analysis of principles and practices of complaint handling, review of concepts and methodology in such grievance handling, review of the role of arbitration as a dispute resolution mechanism, utilization of factfinding and mediation as alternate mechanisms, the preparation and handling of materials in briefs or oral presentations, and the function or role of the arbitrator, impartial chairman, umpire, or similar neutral. (PR: IER 600)
- 630 Labor Law. 3 hrs. II (odd-numbered years).**  
A survey and analysis of the labor relations law; examination of the extent to which the law regulates and protects concerted action by employees in the labor market; considerations and analysis of the legal framework within which collective bargaining occurs; and analysis of major aspects of employer-employee law, such as wrongful discharge, discrimination, and safety and health law. (PR: IER 600)
- 640 Structural Issues in Union Management Relations. 3 hrs.**  
A study of the organizing structure found in various types of unions, their operating procedures, governing bodies, and the interrelationships existing at the local, international, and federation levels. Review of the dual role of unions as both societal institutions and employee agents. Discussion of trade union philosophy from early beginnings to the present. Consideration is given to the different philosophical, political, and structural characteristics of American unions and European/Asian unions. (PR: IER 600 and GSM admission)
- 650 Industrial Psychology. 3 hrs.**  
Survey of the applications of psychological principles and of research methodologies to the various human problems in industry, such as personnel selection and appraisal; the organizational and social context of human work; the job and work situation; human errors, accidents, and safety; and the psychological aspects of consumer behavior. (PR: GSM admission)
- 660 Administration of Compensation and Fringe Benefits. 3 hrs. S.**  
The development and administration of wage and salary programs, and an analysis of both private and public health, welfare and pension plans. Topics investigated include motivation theory, factors influencing compensation levels, forms of compensation, including incentive plans and fringe benefits, a critical examination of financing, administration, and general effectiveness of the plans, special issues of managerial compensation, comparable worth, special and related issues. (PR: MGT 620 and GSM admission)

- 670 Personnel Selection and Testing. 3 hrs.**  
A study of the personnel employment and selection processes. Emphasis is placed on the rationale for selection and placement; the procedures and problems in recruitment and selection; and the use of tests, interviews, and other selection devices. Special attention is given to the criterion problem and legislation and/or governmental regulations affecting selection procedures. (PR: GSM admission)
- 675 Human Resource Development and Training. 3 hrs.**  
This course teaches students how to develop management training modules and materials. Students also learn and use advanced techniques in training design and group facilitation. (PR: GSM admission)
- 680 Labor and Employee Relations in Public Employment. 3 hrs.**  
An examination of the development, practices and extent of collective bargaining between federal, state, and local governments and their employees. Emphasis is on the public issues related to sovereignty, unit determinations, impact on budgetary and financing processes, representation procedures, unfair practices, scope of bargaining, impasse resolution, and the strike. Some attention is devoted to the legal and ethical problems inherent in these issues. (PR: IER 600)
- 697 Special Topics in Industrial Relations. 3 hrs.**  
Selected topics of current interest in industrial relations. (PR: IER 600 and permission of program director)
- 698 Independent Study. 1-4 hrs.**  
Independent study of a specific nature under the supervision of a qualified faculty member. Hours of credit are determined by the magnitude of the project. (PR: Permission of division head or GSM academic advisor)

### **INDUSTRIAL ENGINEERING (IE)**

- 639 Operations Research I. 3 hrs.**  
Examination of the methodology of operations research, including linear programming, transportation methods, network flows, economic analysis, decision analysis, queuing theory and simulation.
- 640 Operations Research II. 3 hrs.**  
A continuation of IE 540 including an introduction to sensitivity and parametric analysis in linear programming, integer programming, nonlinear programming, dynamic programming, reliability theory, and inventory control. (PR: IE 630)
- 650-653 Special Topics. 1-4 hrs.**  
Special topics in advanced Industrial Engineering that are not offered regularly.
- 670 Operations Management. 3 hrs.**  
Examination of the quantitative and conceptual tools for generating goods and services in manufacturing and non-manufacturing organizations.

### **INFORMATION SYSTEMS (IS)**

- 580-83 Special Topics. 1-4 hrs.**  
Occasional offerings of current topics in information systems, providing important supplementary material for participating students.
- 585-88 Independent Study. 1-4 hrs.**  
An approved study of special interest concerning information systems that is appropriate for the student's program of study. Carried out under the supervision of a faculty member.
- 600 Management Information Systems. 3 hrs.**  
The course examines personal, work group, and enterprise information systems with respect to their value, their components, and the process of developing them.
- 603 Programming for Artificial Intelligence. 3 hrs.**  
An introduction to programming for artificial intelligence applications using Prolog.
- 605 Systems Analysis Techniques. 3 hrs.**  
Introduction to information systems from system implementor's viewpoint; information systems life cycle; techniques of analysis; data dictionaries and data flow diagrams; computer-oriented system description. (PR: Admission to program)
- 610 Systems Design. 3 hrs.**  
Physical design of information systems; hardware selection; software design, database considerations; program development; software structuring techniques; cost/performance trade-offs; system implementation; evaluation and optimization techniques. (PR: IS 605)
- 615 Simulation. 3 hrs.**  
An introduction to computer simulation including use of simulation languages (GPSS, GASP, etc.) and applications of simulation in business and industry. (PR: Admission to the program)

- 618 Computer Applications in Engineering and Science I. 3 hrs.**  
Computational and algorithmic methods in engineering and science, optimization and numerical analytic techniques including gradient and search methods, linear programming, simulation, and data base mechanics. (PR: Admission to the program)
- 620 Introduction to Operating Systems. 3 hrs.**  
General principles of managing jobs, processes and storage (real, virtual, auxiliary) in multiprogramming operating systems; interconnection and management of processors in multi-processing and distributed computing system configurations; operating systems comparison. (PR: IS 621 and IS 630, or consent)
- 621 Information Structures I. 3 hrs.**  
Representation and manipulation of numeric and non-numeric information, linear lists, strings, multilinked structures; sorting and searching; storage management; data structures in programming languages. Relevant aspects of discrete mathematics. (PR: IS 510 or equivalent)
- 622 Information Structures II. 3 hrs.**  
A continuation of IS 621. Tree, graph, and set structures; file structures for secondary storage; aspects of discrete mathematics. (PR: IS 621)
- 623 Database Management. 3 hrs.**  
Review of information structures and of relationships among data elements and objects. Relational database theory; design and organization of databases, retrieval structures, and query mechanisms. (Prerequisite: IS 622 or consent)
- 625 Software Engineering. 3 hrs.**  
The process of developing complex software products. Includes the software life cycle, methods and tools for life cycle phases. Application of concepts, methods, and tools in a class project. (PR: IS 510 or permission)
- 630 Computer Architecture and Assembly Language. 3 hrs.**  
An introduction to the composition and operation of electronic digital computers and to assembly language programming. (PR: IS 510 or equivalent)
- 635 Computer Graphics. 3 hrs.**  
An introduction to the areas of computer graphics that are necessary to understand, evaluate, and develop graphics applications. (PR: Admission to program)
- 640 Programming Languages. 3 hrs.**  
Definition of program environment, program sequence and control, subroutines and other secondary sequences; statement structures, parsing, grammars, etc.; classes of programming languages. (PR: IS 622 or consent)
- 645 Geographic Information Systems. 3 hrs.**  
Covers the elements of GIS hardware, software, data and infrastructure needs. Input data issues; data types, sources, error, preprocessing, manipulation and analysis, GIS tools and applications. (PR: Consent)
- 650-653 Special Topics. 1-4 hrs.**  
Occasional offerings of current topics in information systems, providing important supplementary material for participating students.
- 655 Multimedia and Electronic Information Dissemination. 3 hrs.**  
Components of multimedia, such as data, voice, pictures, animations, and videos, and their production, manipulation, dissemination processes. Technologies, processes, and services for electronic dissemination. Applications and current trends. (PR: TM 660 or permission)
- 656 Communication and Network Technologies. 3 hrs.**  
Different transmission media, digital communications, telecommunications services, types of networks and topologies, network protocols, components, and applications. (PR: IS 622, or TM 660, or permission)
- 660 Models of Computation. 3 hrs.**  
Switching algebra and relationship to computers; finite automata; Turing machines; recursion; computability and unsolvability. (PR: IS 622, math maturity)
- 670 Language Translators and Concepts. 3 hrs.**  
Formal language concepts, syntactic analysis; types of translators; detailed review of assemblers, interpreters, and compilers, and techniques of their construction. (PR: IS 622)
- 680 Social Issues in Information Systems. 3 hrs.**  
Aspects of the interaction of computer systems and society including such topics as system security, respect of privacy, changing job requirements, ergonomics, and moral and ethical considerations. (PR: completion of core, or consent of instructor)
- 685-88 Independent Study. 1-4 hrs.**  
An approved study of special interest concerning information systems that is appropriate for the student's program of study. Carried out under the supervision of a faculty member.

- 690 Principles of Artificial Intelligence. 3 hrs.**  
A survey of the fields of artificial intelligence and expert systems. Students will work together designing and implementing a project. (PR: Permission)
- 692 Image Processing for Forensics. 3 hrs.**  
Image processing focuses on the application of technology to scientific analysis of images. Topics include: measurement techniques; scientific methods of reconstruction and interpretation of images; enhancement of images and video. (PR: Permission of instructor)
- 695 Expert Systems. 3 hrs.**  
A review of expert systems techniques and applications. Participants will develop small expert systems using several different personal computer expert systems development programs (shells).

*The following courses do not count for credit toward the master's degree:*

- 500 Computer Systems and Structured Programming I. 3 hrs.**  
Introduction to programming; survey of computer information systems. (PR: Facility with algebra)
- 501 Introduction to Programming Languages. 3 hrs.**  
An introduction to a high level language such as BASIC, C, COBOL, FORTRAN, LOGO and PASCAL. The course assumes a knowledge of at least one other high level language.
- 510 Computer Systems & Structured Programming II. 3 hrs.**  
A continuation of IS 500. Topics include algorithm development, manipulation of arrays and an introduction to dynamic data structures. (PR: IS 500 or consent)
- 551 Computer Programming in Education. 3 hrs.**  
Programming with educational applications. S-U grade.
- 565 Computers in Management. 3 hrs.**  
Basic computer concepts, equipment, and use of applications programs (word processor, spreadsheet, data base).

### INSTRUCTIONAL TECHNOLOGY AND LIBRARY SCIENCE (ITL)

Certification endorsement program for those with teaching certification

- 501 History of Libraries and Informational Retrieval Systems. 3 hrs.**  
Study of the development of libraries and information-storage technology from early times to the present with emphasis on the impact of computer-based systems.
- 502 Library Materials for Adolescents. 3 hrs.**  
Addresses the selection and promotion of library materials in support of a school curriculum and issues of service, diversity and balance in the school library collection.
- 515 Reference and Bibliography. 3 hrs.**  
Study of the basic reference sources for elementary and secondary school libraries. Emphasis on materials evaluation, the reference interview, search strategies, and the impact of new technologies.
- 520 Cataloging. 3 hrs.**  
Fundamentals of cataloging and classification, applying AACR2, the Dewey Decimal system, and related aids to the organization of library materials. Implications of new technology for technical services will also be addressed.
- 525 Library Organization and Administration. 3 hrs.**  
Principles of administration for elementary and secondary school library media centers, including personnel, facilities, budgets, program planning and evaluation, publicity and public relations, audio-visual equipment and materials, computer hardware and software, and methods and materials for teaching library skills.
- 530 Technology and the Library. 3 hrs.**  
An introduction to the function, management, and the issues of computer and non-computer technology in the library. Students learn to use technology as an educational tool in the classroom.
- 550 Library Practice (Field Work). 3 hrs.**  
Experiences in the application of techniques of library service, adapted as far as possible to the student's needs.
- 580-583 Special Topics. 1-4 hrs.**
- 585-588 Independent Study. 1-4 hrs.**

### JOURNALISM AND MASS COMMUNICATIONS (JMC)

- 500 Photojournalism. 3 hrs.**  
A course in advanced techniques for newspaper and magazine photography, concentrating on the creation, design and use of photographic essays and picture stories. (PR: JMC 360)
- 502 Law of Mass Communication. 3 hrs. I, II, S.**  
Legal aspects of mass communication as they apply to the professional journalist.

- 504 History of American Journalism and Mass Communications. 3 hrs. II.**  
The development of the press in the United States, the contributions of American journalists, the rise of radio and television, and the relationship of communication developments to political, economic and social trends in America.
- 508 Advertising Research. 3 hrs. I.**  
Lectures, readings, and discussions relating to all media advertising. Students may select special areas of interest.
- 510 Magazine Editorial Practices. 3 hrs.**  
Study of the organization and functions of the magazine editorial department, with practice in planning magazine content, laying out pages and establishing production procedures.
- 514 Reporting Public Affairs. 3 hrs. II.**  
Instruction in reporting local, state and federal government; politics, finance and labor; social and environmental issues and other matters, with emphasis on background and interpretation. Course includes field trips and guest speakers.
- 525 Advertising Campaigns. 3 hrs. II.**  
Students function as an advertising agency to plan, prepare, and present local and national advertising campaigns. Problems of the advertiser and the agency are considered.
- 528 Supervision of School Publications. 3 hrs.**  
A comprehensive study of advising and producing school publications, with emphasis on methods, for teachers of journalism.
- 530 Magazine Article Writing. 3 hrs. I.**  
Fundamentals of researching and writing factual articles for popular magazines; techniques of selling articles to magazines.
- 532 Corporate and Instructional Video. 3 hrs.**  
Development of the use of video for communication and instruction in business, agencies, and education. Production and use of video units for specific objectives.
- 533 Radio-Television Programming. 3 hrs.**  
Principles of programming, including audience analysis, production, purchase, and scheduling of various formats.
- 534 Advanced Video. 3 hrs.**  
Development of the elements necessary for the production of detailed video projects. Students study the creation and production of public affairs, educational and creative video programming. (PR: JMC 332 or equivalent)
- 535 Radio-Television Law and Regulation. 3 hrs.**  
Development and current status of the legal structure of broadcasting in the United States.
- 536 International Communications. 3 hrs.**  
Development of various systems of mass communications and comparison with the United States.
- 537 Public Relations Writing. 3 hrs. I.**  
Theory and practice of various writing challenges encountered by public relations practitioners. Some consideration of publications design. (PR: JMC 201, 241 and 330 or equivalent)
- 538 Public Relations Case Studies. 3 hrs. I.**  
Examination of the handling of public relations problems and opportunities by business, educational, governmental, and social organizations, with particular emphasis on public relations analysis and problem solving. (PR: JMC 330 or equivalent)
- 539 Public Relations Campaign Management. 3 hrs. II.**  
Applying the four-step public relations process to an organization's program or campaign. Includes execution of public opinion research and development of original communication tools. Competitive agency model generally used. (PR: JMC 537 and 538)
- 540 Mass Communications Ethics. 3 hrs. I, II, S.**  
Study of basic concepts underlying contemporary American mass communications operations and practices and how those concepts affect professional ethics in the field. Examination of ethical conflicts encountered and application of ethical principles when determining solutions.
- 545 Advertising in Modern Society. 3 hrs.**  
An examination of issues and problems affecting the advertising industry and a study of advertising's impact on and responsibility to society.
- 550 Contemporary Issues in Radio and Television. 3 hrs.**  
An examination of the current political, social, economic and legal issues affecting the decision-making process in the newsrooms and programming centers of the electronic media.
- 555 Women, Minorities and the Mass Media. 3 hrs.**  
A seminar that explores the portrayals and participation of women and people of color in the mass media.

- 580-583 Special Topics. 1-4; 1-4; 1-4; 1-4 hrs.**  
**585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs. I, II, S.**  
**590 Journalism and Mass Communications Internship I. 1-3 hrs. I, II, S.**  
 Supervised journalistic work with the professional media. Course is for students without substantial professional media experience. Arrangements must be made in advance with the school's internship director.
- 591 Journalism and Mass Communications Internship II. 1-3 hrs., I, II, S.**  
 Supervised journalistic or mass communications work with professional media including newspapers, magazines, radio, television, advertising and public relations departments or agencies. Students must have completed a previous internship. (PR: Permission and JMC 590)
- 601 Theory of Mass Communication. 3 hrs. I, II.**  
 Major theoretical concepts in mass communications are studied as a basis for understanding the communication process and the institutional impact of the mass media on the individual and on society. Required of all majors.
- 602 Mass Communications Research and Methodology. 3 hrs. I, II.**  
 Research techniques applied to problems of mass communication including computer applications, with emphasis on mastery gained by participation in specialized research projects. Required of all majors.
- 603 Media Management. 3 hrs.**  
 An in-depth examination of the process and practice of media management.
- 606 Depth Reporting. 3 hrs.**  
 Depth reporting of social and environmental activities and problems, with emphasis on thorough research and documentation. Articles will be submitted for publication.
- 609 Seminar in Public Relations. 3 hrs.**  
 Theoretical and practical aspects of public relations, with special projects and readings to provide skills and insights requisite to success in the profession. Seminar discussions and research projects.
- 612 History of Mass Communication, Specialized Study. 3 hrs.**  
 Analysis of mass media development in the United States and of current media problems, with emphasis on research. (REC: JMC 504 or equivalent)
- 630 Seminar in Media Criticism. 3 hrs.**  
 Intensive critical analysis of broadcasting programs and programming procedures from the sociocultural, literary, political and industry points of view.
- 632 Seminar in Public Broadcasting. 3 hrs.**  
 Examination and evaluation of the unique content, policies, and prospects of public broadcasting.
- 634 Issues in Radio and Television. 3 hrs.**  
 Problems in the broadcast field on varied subjects which concern the industry.
- 650-651 Special Topics. 1-3 hrs.**  
**681 Thesis. 1-6 hrs. (PR: Consent of advisor)**  
**685-688 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**  
 (PR: Permission of dean)

## LATIN (LAT)

- 503 Roman Comedy. 3 hrs.**  
 (PR: 6 hours of Latin literature numbered 304 or above or equivalent)
- 504 Roman Elegy: Propertius and Tibullus. 3 hrs.**  
 Close readings in Latin of selections from elegies of Propertius and Tibullus. (PR: 6 hours of Latin literature numbered 304 or above or equivalent)
- 505 Readings in Vergil. 3 hrs.**  
 Introduction to the poetry of Vergil, especially Vergil's Aeneid, and to the culture and ideology of the Augustan principate. (PR: 6 hours of Latin literature numbered 303 or above, or equivalent)
- 506 Horace: Odes, Epodes, Epistles. 3 hrs.**  
 A close reading in Latin of selections from Horace's non-satirical poetry, with special attention to its literary context. (PR: 6 hours of Latin literature numbered 303 or above, or equivalent)
- 507 Livy's History of Rome. 3 hrs.**  
 A close reading in Latin of selections from Livy's history poetry, with special attention to its literary and cultural contexts. (PR: 6 hours of Latin literature numbered 303 or above, or equivalent)
- 509 Roman Satire: Horace, Martial, Juvenal. 3 hrs.**  
 Close readings in Latin of selections from the satires of Horace and Juvenal and the epigrams of Martial. (PR: 6 hours of Latin literature numbered 304 or above or equivalent)
- 510 Tacitus (Selections From): Annals, Agricola. 3 hrs.**  
 (PR: 6 hours of Latin literature numbered 304 or above or equivalent)

- 580-583 Special Topics in Latin. 1-4; 1-4; 1-4; 1-4 hrs. I, II.**  
(PR: 6 hours of literature numbered 304 or above or equivalent and consent of instructor)
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**

### LEADERSHIP STUDIES (LS)

- 500 Introduction to School Leadership. 3 hrs.**  
Examination of fundamental purposes, functions, and structure of public schools. It is also an introduction to the standards and to the capstone assessment process which students must complete for graduation.
- 506 Planning, Research and Evaluation for School Leaders. 3 hrs.**  
This course is designed to avail potential school administrators with an understanding of planning strategies, academic research, action research, and program evaluation methods, with the intent of their being able to write a cogent, data-based school improvement plan.
- 510 The Principalship. 3 hrs.**  
The Principalship is a study of school management as it relates to ethical behavior, and to support services, information systems, fiscal matters, and facility utilization and maintenance.
- 512 Curriculum Leadership. 3 hrs.**  
This course addresses the role of the principal in the development and implementation of school curriculum. This includes developmentally appropriate curriculum design, special education curriculum and modifications, the integration of technology, and authentic assessment.
- 515 Instructional Leadership. 3 hrs.**  
This course is designed to develop skills in instructional leadership, including instructional supervision, instructional strategies, program development, instructional evaluation, and human relations.
- 520 Administration of Elementary, Middle and Secondary Schools. 3 hrs.**  
This course addresses the concerns of the school leader, including instruction, learning, communication, discipline, parental involvement, instructional organization, climate, facilities, professional development, and personnel practices. Emphasis is placed on the physical, social/emotional, and cognitive/intellectual characteristics of children and the implications for developmentally appropriate school administration.
- 530 Human Relations. 3 hrs.**  
This course assesses and develops students' knowledge and skills in interpersonal relations and ethical practices. It provides structured experiences in group processes, verbal and non-verbal communications, leadership styles, and team building.
- 532 Human Relations in the Public Sector. 3 hrs.**  
This course is designed to help prospective leaders in the public sector establish and maintain positive interpersonal relationships with their constituents.
- 535 Technology and the Classroom. 3 hrs.**  
This course is designed to examine the effects of technology, both pedagogical and practical, on the educational process.
- 550 Schools as Systems. 3 hrs.**  
This course assesses and develops students' knowledge and skills in change strategies, school cultures, systems theory, and understanding of the school in relation to other systems, agencies and organizations.
- 561-563 Professional Development. 1-4 hrs.**  
These courses and activities are designed to meet the specific in-service needs of public school administrators. Credit in these courses may be used for certificate renewal and salary upgrading but not in degree programs.
- 585-588 Independent Study 1-4 hrs.**  
By arrangement only.
- 600 School Personnel Administration 3 hrs.**  
This course offers an examination of personnel functions including recruitment, selection, orientation, evaluation, and retention with particular emphasis on staff development.
- 610 Leadership for School Improvement. 3 hrs.**  
Leadership preparation for developing and implementing a shared vision and strategic plans focused on teaching and learning, implementing change, applying leadership theory and acting with understanding of society's influences.
- 615 Leadership in the Public Sector. 3 hrs.**  
This course will enable potential leaders in the public sector to define and evaluate personal and organizational goals and to develop strategies to achieve shared goals.
- 625 Human Resources Management. 3 hrs.**  
This course develops knowledge of the major functions and tasks necessary for the development of human resources.

- 630 School and the Community. 3 hrs.**  
This course provides students the opportunity to study the concept of community, to examine relationship patterns, to explore the possibilities for combining the resources of the school and community in the interest of school improvement, and to evaluate communication strategies designed to enhance the school-community relationship.
- 645 Community Relations in the Public Sector. 3 hrs.**  
This course examines the public perception of the justice system and how this perception impacts public support and the success of the system.
- 675 Legal and Policy Issues. 3 hrs.**  
This course examines the principal's role and responsibility related to law and administrative policy.
- 685 Internship: Portfolio Assessment. 3 hrs.**  
This course provides training and assessment experiences for students seeking initial certification as a school principal. The student's degree portfolio and capstone assessment will be completed. (PR: Completion of degree/certification courses and consent)
- 691 The Attendance Director. 3 hrs.**  
This course is designed to develop the skills needed for the school attendance director to manage attendance programs, policies, and programs.
- 692 Internship: School Social Services. 3 hrs.**  
This course will require school social service workers and attendance directors to demonstrate proficiency in those administrative and leadership skills required for managing school social services and student attendance programs.
- 700 Superintendency. 3 hrs.**  
This course examines the roles, relationships, behaviors and competencies which characterize school superintendents and their staffs.
- 705 Administrative Theory. 3 hrs.**  
This course analyzes administrative theories and their application to organizational leadership and management.
- 710 Principles of Leadership. 3 hrs.**  
This course is a study of the characteristics and behaviors of leaders. Emphasis is on the development of understandings and abilities which will work in different situations.
- 714 Administration and Organization of Higher Education. 3 hrs.**  
This course is a survey of higher education with attention to administrative functions at the campus level.
- 716 Governance of Higher Education. 3 hrs.**  
This course is designed to develop an understanding of the structure of governance of multi-campus public higher education systems.
- 717 Student Personnel Administration in Higher Education. 3 hrs.**  
This course surveys the purpose and functions of student personnel administration in higher educational institutions and the administrative procedures developed to accomplish these purposes.
- 718 History of American Higher Education. 3 hrs.**  
This course will present a historical overview of the factors that influence the development of higher education in America.
- 719 Introduction to Doctoral Studies. 3 hrs.**  
This course is designed to introduce students to the tasks and processes involved in the completion of the doctoral requirements. (PR: Admission to the Cooperative Doctoral Program)
- 720 Public School Finance. 3 hrs.**  
This courses examines concepts in the financing and economics of public education. (PR: Principal or supervisor certificate or consent)
- 724 Organizational Analysis. 3 hrs.**  
This course is an interdisciplinary approach to the study of organizational structure, relationships, and functions focusing on problems and alternatives for solving them.
- 725 Higher Education Finance 3 hrs.**  
This course examines basic concepts in the financing and economics of higher education.
- 726 Institutional Advancement in Higher Education. 3 hrs.**  
This course will require students to understand the broad area of institutional advancement, including major campaigns, donor research, donor recognition programs, restricted gifts, etc.
- 730 Facility Planning and Management. 3 hrs.**  
This course teaches the systematic collection and utilization of data in planning for educational facilities. (PR: Principal or supervisor certificate or consent)
- 740 Public School Law. 3 hrs.**  
This course presents the effect of case, statutory, and constitutional law as adjudicated in state and federal courts on public school operation. (PR: Principal or supervisor certificate or consent)

- 745 Higher Education Law. 3 hrs.**  
This course presents the effect of case, statutory, and constitutional law as adjudicated in state and federal courts on higher education operation.
- 746 Administration of Community and Technical Colleges. 3 hrs.**  
This course provides an opportunity for students to examine a specific institutional type and explore its developmental and functional relationship within the total framework of higher education.
- 748 Adult and Continuing Education Administration. 3 hrs.**  
This course develops an understanding of the principles, concepts, and processes involved in planning learning experiences for adults within the framework of higher education.
- 755 Internship: Administration in Higher Education 3 hrs.**  
This course provides a field experience in higher education administration. (PR: Consent)
- 756 Current Issues in Higher Education. 3 hrs.**  
This course focuses on current and emerging problems of higher education. It deals with both societal and internal factors which impinge on the administration of colleges and universities.
- 760 Politics of Education. 3 hrs.**  
This course explores the social process of governance in the public schools including higher education. The milieu of federal, state, and local inputs will be explored.
- 762 The Politics of Higher Education. 3 hrs.**  
This course is designed to develop an understanding of the complex internal and external forces and the political processes that affect higher education institutions.
- 764 Advanced Research I. 3 hrs.**  
This course will develop knowledge about and skills in using quantitative and qualitative methods in educational research. It will further prepare doctoral candidates for comprehensive exams as well as dissertation research.
- 765 Advanced Research II in Leadership Studies. 3 hrs.**  
This is an advanced research course directed toward the preparation of a thesis or dissertation. (PR: Consent)
- 770 Practicum. 3 hrs.**  
This is a highly individualized cooperative educational administration experience between the college and another public agency. (PR: Consent)
- 771-772 School District Leadership 3-6 hrs.**  
This is an individualized cooperative field experience in district level school administration. (PR: Consent)
- 775 Seminar. 3 hrs.**  
This course is a concentrated analysis of current problems in educational administration. (PR: Consent)
- 776 Computer Analysis in Leadership Studies Research. 3 hrs.**  
This course provides the development of skills and competencies in data analysis and management. It is designed for doctoral students in the data analysis stage of dissertation preparation. (PR: Consent)
- 780 Special Topics. 1-12 hrs.**  
This course requires study, reading and research in an approved area of education and supervision. (PR: Consent)
- 785 Externship 1-9 hrs.**  
This is a field based program designed for practicing administrators. (PR: Consent)
- 797 Doctoral Research. 1-12 hrs.**  
Dissertation research is the purpose of this course. (PR: Consent)

### LEGAL ENVIRONMENT (LE)

- 691 Government and Business Relationships. 3 hrs.**  
Preparing business executives for dealing with problems of the firm in its relationships with government. Applies case analysis to the board categories of antitrust, trade regulation, and agency regulation. (PR: GSM admission)

### MANAGEMENT (MGT)

- 500 Analytical Methods and Techniques. 3 hrs.**  
Provides competency in some of the basic quantitative skills necessary for analytical work in business administration. Required of all candidates who have had little or no undergraduate background in mathematics.
- 502 Research Methods. 3 hrs.**  
This course provides the student with the necessary knowledge to perform business research. Emphasis is placed on applicable research techniques. In addition, several statistical techniques are covered including multiple regression and analysis of variance. (PR: MGT 500)

- 520 Operations Management. 3 hrs.**  
An examination of the design and operation of systems for the creation of goods and services in both manufacturing and non-manufacturing organizations. Emphasis is placed upon the application of quantitative and conceptual decision tools for the planning and control of production systems. (PR: MGT 500 or MTH 203 and MGT 218; and MGT 320 or MKT 511; and ECN 253 or ECN 501)
- 601 Quantitative Methods for Business. 3 hrs.**  
The use of quantitative methods for managerial decision making. A review of basic calculus and statistics as required in business. Other topics include decision analysis, linear programming, and queuing. (PR: M.B.A. admission)
- 620 Human Resource Management. 3 hrs.**  
The study of policies, methods, and techniques utilized in personnel management and human relations. Specific attention is given to problems of recruitment, selection, compensation, motivation, communications, training, service and benefit programs, performance evaluation, safety, discipline, business ethics, and community relations. (PR: GSM admission or permission of GSM academic advisor)
- 630 Management and Supervisory Skills Development. 3 hrs.**  
An analysis and application of personal and organizational skills associated with the effective management of both public and private sector organizations. Skills to be developed or refined include time management, decision making, delegation, stress management, oral and written communication, team-building and others. Applied exercises, case studies, simulation, role play, films, and other learning methods are emphasized. (PR: MGT 672)
- 650-651 Special Topics. 1-3; 1-3 hrs.**  
(PR: Permission of the division head and full M.B.A. admission or permission of GSM academic advisor)
- 660 Independent Study. 1-4 hrs.**  
Independent study of a specific nature under the supervision of a qualified faculty member. Hours of credit are determined by the magnitude of the project. (PR: permission of division head or GSM academic advisor)
- 672 Organizational Behavior. 3 hrs.**  
Basic ideas and concepts for the effective management of an organization. Major topics include motivation, communication and decision-making processes, group dynamics, leadership study, conflict management, work and organizational design, and organization development. Emphasis on organizational behavior and theory. (PR: GSM admission and MKT 511)
- 673 Problems in Personnel Management. 3 hrs.**  
Principles and procedures of the personnel system in the firm; selected areas of recruitment and selection; training and development; performance appraisal and evaluation; general communications system, and role of government in manpower administration. (PR: GSM admission)
- 674 Production/Operations Management. 3 hrs.**  
A study of operations management methods used in production, manufacturing, services, and other business operations. Includes project management, capacity planning, and transportation problems. (PR: Permission of GSM academic advisor and MGT 500)
- 675 Problems in Labor-Management Relations. 3 hrs.**  
Comprehensive coverage of the development of the field of industrial relations. The impact of organized labor and federal social legislation of management decision. Alternative directions for future developments are studied. (PR: GSM admission)
- 676 Organization Theory and Design. 3 hrs.**  
An analysis of organizational systems and subsystems incorporating traditional, behavioral, and situational approaches to organizational and work unit design. Emphasizes environmental interface and interdependencies as functions of internal systems phenomena (PR: M.B.A. admission)
- 692 Ethics and Global Aspects of Business. 3 hrs.**  
An examination of the administrator's social, ethical, and environmental responsibilities to his employees, customers, and the general public and other external factors which management must be cognizant of in modern society. (PR: GSM admission)
- 699 Business Policy and Strategy. 3 hrs.**  
The study of administrative decision making under conditions of uncertainty. Policy construction at top administrative levels with emphasis on strategy and ethics with consideration of major functions of the business organization. (PR: Permission of GSM academic advisor)

### MANAGEMENT INFORMATION SYSTEMS (MIS)

- 678 Management Information Systems. 3 hrs.**  
To familiarize students with the characteristics and functions of management information systems, as well as the benefits, limitations, and applications for advanced management information systems. (PR: GSM admission)

## MARKETING (MKT)

- 511 Marketing and Management. 3 hrs.**  
A comprehensive survey of the fundamental principles of management and marketing applicable to all organizations. Provides the student with a basis for analyzing appropriate situations in a management/marketing framework.
- 580-581 Special Topics. 1-4; 1-4 hrs.**  
**650-651 Special Topics. 1-3; 1-3 hrs.**  
(PR: Permission of the division head and full M.B.A. admission)
- 660 Independent Study. 1-4 hrs.**  
Independent study of a specific nature under the supervision of a qualified faculty member. Hours of credit are determined by the magnitude of the project. (PR: MKT 682 and permission of division head and academic advisor)
- 682 Advanced Marketing Management. 3 hrs.**  
An integrated approach to marketing from a managerial point of view: making use of economic, quantitative, and behavioral concepts in analyzing and developing a framework for the decision-making and implementation of the firm's marketing program. (PR: M.B.A. admission or permission of GSM academic advisor)
- 683 Advanced Marketing Research. 3 hrs.**  
A study of research methods and procedures used in the marketing process; emphasis will be given to the sources of market data, sampling, preparation of questionnaires, collection and interpretation of data. (PR: MKT 682)
- 685 Marketing Problems. 3 hrs.**  
Determination of the marketing mix within the framework of the problem-solving and decision-making process. (PR: MKT 682)
- 687 Seminar in Marketing. 3 hrs.**  
An advanced study of basic concepts of current problems in Marketing. Seminar discussions and research projects. (PR: MKT 682)
- 688 Advanced Transportation. 3 hrs.**  
Current national transportation problems and a review of the various modes including history of the modes. (PR: MKT 682)
- 689 Advanced Physical Distribution. 3 hrs.**  
A study of activities concerned with efficient movement of products from the sources of raw materials supply, through production to the ultimate consumer. These include freight transportation, warehousing, order processing, forecasting, etc. (PR: MKT 682)

## MATHEMATICS (MTH)

- 500 Structure of Algebra. 3 hrs.**  
Informal development of modern elementary algebra. Recommended for pre-service middle school teachers and for elementary and secondary in-service teachers. May not be used for either a 5-12 mathematics specialization or for any degree offered by the Mathematics Department. (PR: MTH 130 or equivalent)
- 501 Structure of Modern Geometry. 3 hrs.**  
Informal development of geometry with an exploration of probability and statistics. Recommended for pre-service middle school teachers and for elementary and secondary in-service teachers. May not be used for either a 5-12 mathematics specialization or for a degree offered by the Mathematics Department. (PR: MTH 130 or equivalent)
- 511 Mathematical Modeling. 3 hrs.**  
Students will work in teams to construct mathematical models of various real-world situations. Problems to be modeled will be drawn from diverse areas of application and will use a wide range of undergraduate mathematics. (PR: MTH 231, or 230 and permission of instructor)
- 515 Applied Mathematics–Boundary Value Problems. 3 hrs.**  
Theory of systems of ordinary differential equations of first order. Theory of homogeneous and non-homogeneous boundary value problems. (PR: MTH 330 and 335, or permission)
- 527 Advanced Calculus I. 3 hrs.**  
A rigorous study of the real number system, continuity and differentiability of functions of a single variable, integration of functions of a single variable, infinite series. (PR: MTH 231 and 300, REC: MTH 330)
- 528 Advanced Calculus II. 3 hrs.**  
A rigorous development of algebra and topology of Euclidean spaces, differentiability and integrability of functions of several variables. (PR: MTH 427 or 527)

- 542 Numerical Linear Algebra. 3 hrs.**  
Direct and iterative methods for numerical solution of linear systems of equations. Eigenvalues and eigenvectors. Error analysis and norms. Related Topics. (PR: MTH 230, 330)
- 543 Numerical Analysis. 3 hrs.**  
The theory and technique of numerical computation involving the difference calculus, the summation calculus, interpolation methods, solutions of equations, and methods of solution of ordinary differential equations. (PR: MTH 230)
- 545-546 Introduction to Theory of Statistics I, II. 3; 3 hrs. I (545), II (546)**  
Probability spaces, conditional probability, and applications. Random variables, distributions, expectation, and moments. Parametric statistics: sampling methods, estimation of parameters, tests of hypotheses. (PR: MTH 230 for 545; MTH 445 or 545 for 546)
- 548 Fundamental Concepts of Modern Geometry. 3 hrs. I.**  
Finite geometries, basic background material for the modern development of Euclidean Geometry, other geometries. (PR: MTH 230)
- 549 Projective Geometry. 3 hrs.**  
Projective geometry using both synthetic and algebraic methods. (PR: MTH 230)
- 550 Fundamental Concepts of Modern Algebra. 3 hrs.**  
Structure of the abstract mathematical systems; fields, rings groups, with illustrations and applications from number theory. (PR: MTH 230; REC: MTH 300)
- 580-583 Special Topics in Mathematics. 1-4; 1-4; 1-4; 1-4 hrs.**  
Courses on special topics not listed among the current course offerings. (PR: Permission of instructor)
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**  
(PR: Consent of instructor and department chairman)
- 589 Seminar for Teaching Assistants. 1 hr.**  
An introduction to techniques of teaching mathematics with emphasis on lower-level mathematics courses. (PR: Assignment to teach mathematics as a teaching assistant; CR/NC)
- 591 Master's Essay. 3 hrs.**  
In-depth exploration of topics related to a theme chosen by the instructor; experience in reading, speaking, and writing mathematics. (PR: Any two of MTH 527, 545, 550, or equivalents.)
- 610 Modern Algebra. 3 hrs.**  
The structure of semigroups, groups, rings, fields, modules, vector spaces, lattices and related topics. (PR: MTH 450 or 550 or equivalent)
- 630 Topology. 3 hrs.**  
General topology including separation axioms, connectedness, compactness, convergence, continuity, metric spaces, product and quotient spaces. (PR: MTH 427 or 527 or 450 or 550)
- 640 Theory of Functions of Complex Variables. 3 hrs.**  
A study of algebra, topology, and geometry of the complex plane; holomorphic functions; conformal mapping; analytic functions and analytic continuation; complex integration; representation theorems; convergence theorems and related topics. (PR: MTH 427 or 527)
- 650 Theory of Functions of Real Variables. 3 hrs.**  
A study of measure and integration and related topics. (PR: MTH 528 or 428)
- 660 Stochastic Processes. 3 hrs.**  
Theory and applications of Markov chains. (PR: MTH 445 or 545)
- 661 Advanced Mathematical Statistics. 3 hrs.**  
Topics in mathematical statistics including distribution theory for functions of random variables, convergence concepts, sufficient statistics, finding optimal estimates for parameters, optimal tests of hypotheses. (PR: MTH 446 or 546 or permission of instructor)
- 665 Optimization Mathematics. 3 hrs.**  
Classical optimization of functions of several variables. Theory and methods of linear and nonlinear programming. (PR: MTH 231 and consent of department; MTH 427 recommended)
- 670 Independent Study. 1-4 hrs.**  
An independent program of study of advanced topics not normally covered in other courses. The topics are chosen upon mutual agreement between the student and the instructor. (PR: Consent of instructor and Department Chairman)
- 681 Thesis. 1-6 hrs.**
- 690-693 Special Topics. 1-4 hrs.**

## MICROBIOLOGY, IMMUNOLOGY AND MOLECULAR GENETICS (MCB)

- 620 Principles of Medical Microbiology. 6 hrs. I.**  
The study of microorganisms, immunobiology, immunologic diseases, host resistance and the means by which diseases are produced and prevented. (PR: Organic Chemistry, General Microbiology and consent of instructor)

- 622 Current Topics in Molecular Biology. 1 hr.**  
Critical discussion of current literature/concepts. Participants present published research papers on topic(s) with a molecular biology component. Presentations are followed by discussion/evaluation of the contribution of the research.
- 642 Graduate Microbiology I (Physiology/Genetics). 4 hrs. II.**  
An advanced treatment of microbiology with emphasis on the molecular aspects of anatomy, taxonomy, and physiology and genetics of microorganisms.
- 643 Principles of Immunology. 3 hrs. I.**  
Basic principles of the immune response system of humans and related mammals. Concepts of B & T cell function and interrelationships emphasized. (PR: Cellular and Molecular Biology)
- 648 Molecular Aspects of Pathogenesis. 3 hrs.**  
An in depth study of molecular mechanisms of bacterial, viral, and immunemediated disease processes. Course Requirements: BMS 600 and BIC 620
- 660 Diagnostic Virology. 3 hrs., II.**  
A comprehensive survey of methodologies used to detect and characterize viral specific antibodies and antigens and the status of cellular immunity in virus infected hosts. (PR: MCB 620)

### **MINE SAFETY (MSF)**

- 510 Survey of Mining. 3 hrs.**  
An overview of mining to provide the participant with a general understanding of mining history, development systems terminology, procedures, methods and safety and health activities.
- 511 Mine Safety Program Analysis. 3 hrs.**  
This course prepares the participant for the effective analysis of safety programs and provides some specific applications in the mining environment.
- 512 Mine Safety and Health Legislation. 3 hrs.**  
A survey of the legislation that has affected safety and health in mining with special emphasis of the Federal Mine Safety and Health Act of 1977.
- 513 Mine Safety and Health Management. 3 hrs.**  
This course covers the principles, functions and philosophies of mine management.
- 514 Hazard Control in Mining. 3 hrs.**  
A study of how to recognize accident potential throughout the mining industry.
- 525 Statistics/Biostatistics, Epidemiology and Industrial Hygiene. 3 hrs.**  
Statistics/Biostatistics, Epidemiology and Industrial Hygiene as these subjects relate to health hazards in the mining environment. (PR: Module #1 of the Advanced Industrial Hygiene Program)
- 526 Industrial Toxicology and Airborne Contamination in Mining Environments. 3 hrs.**  
Principles of Toxicology: biochemistry, biological monitoring, biological transformation and chemical hazards. Properties, behavior and measurement of airborne particles. Special topics: sampling and evaluating airborne asbestos dust. (PR: Module #1 of the Advanced Industrial Hygiene Program)
- 527 Physical and Biological Health Hazards in Mining and Milling Operations. 3 hrs.**  
Physical hazards: heat, noise and radiation. Biological hazards: atmospheric transport of microorganisms that cause disease. (PR: Module #1 of the Advanced Industrial Hygiene Program)
- 580-583 Special Topics. 1-4; 1-4; 1-4; 1-4 hrs.**  
A study of special topics not offered in regularly scheduled courses.
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**
- 591-594 Workshop (Selected Topics). 1-4; 1-4; 1-4; hrs.**
- 621 System Safety Engineering in the Mining Industry. 3 hrs.**  
A study of the analytical tools used in the recognition, evaluation and control of exposure to hazards in the Mining Industry.
- 622 Accident Prevention in the Mining Industry. 3 hrs.**  
A survey course which discusses why and how mining accidents occur, factors in successful safety programs and the recognition, evaluation, and control of accident causes.
- 624 Mine Haulage and Transportation. 3 hrs.**  
A study of the operation of hoisting haulage equipment used in the mining industry.
- 625 Philosophical Concepts of Mine Safety and Health. 3 hrs.**  
An analysis of the philosophies of mine safety and health; application of these philosophies to actual mining situations.
- 626 Safety and Health Research in the Mining Industry. 3 hrs.**  
An analysis and study of selected works of national and international authors concerning mine safety and health.
- 627 Health Hazards in Mining. 3 hrs.**  
A broad spectrum approach to the mine health field which includes: the principles for recognition, evaluation and control of health hazards in mining.

- 628 Man, Machines and the Environment in the Mining Industry. 3 hrs.**  
A study of the interactions of man, machines and the environment. The role of these interactions in causing or in preventing accidents.
- 629 Problem Analysis and Consultation in Mine Safety and Health. 3 hrs.**  
A study of the rational process of problem solving decision making consultation with emphasis on realistic case studies.
- 631 Mine Accident Investigation and Reporting. 3 hrs.**  
A study of the principles, techniques and procedures of investigations of mine accidents including attendance in court and report writing.
- 635 Sampling, Industrial Ventilation, and Respiratory Protective Equipment for Mining and Milling Operations. 3 hrs.**  
Gas, vapor and particulate sampling - industrial ventilation for control of health hazards. Use of respiratory protective equipment to control health hazards. (PR: Module #1 of the Advanced Industrial Hygiene Program)
- 636 Threshold Limit Values: Sampling and Analytical Techniques. 3 hrs.**  
Threshold limit values and material safety data sheets. Hands-on experience in collecting industrial hygiene samples and subsequent laboratory analysis of the samples. (PR: Module #1 of the Advanced Industrial Hygiene Program)
- 637 Stress and its Impact on Safety and Health in Mining. 3 hrs.**  
A study on stress and its impact of safety and health in mining. Activities will be scheduled to enable the student to apply, in a work setting, some of the basic stress concepts.
- 679 Problem Report. 3 hrs.**
- 681 Thesis. 1-6 hrs.**  
Individual research on a specific problem of concern to the student and of significance to mine safety.
- 690-692 Seminar. 1-4 hrs.**

## MUSIC (MUS)

- 510 Introduction to World Music. 3 hrs.**  
This course will survey native musics of Africa, Asia, and the Americas as an aspect of culture. No formal background in music is required, as students will learn techniques for listening and articulating responses to music.
- 526 American Music and Its Influences. 3 hrs.**  
Musical and cultural influences of European, West Africa, Caribbean, and Native American societies on United States music from 1650-1920. Specific application to concert music. (PR: Graduate standing or permission of instructor)
- 540 Graduate Theory Review. 2 hrs.**  
Review of undergraduate music theory for entering graduate students who are deficient or wish to review music theory skills.
- 550 Guitar Literature. 2 hrs.**  
A survey of the literature for guitar from c. 1400 to the twentieth century; to expose the guitarist to many of the important composers and their works.
- 551 Guitar Pedagogy. 2 hrs.**  
A survey of guitar pedagogy materials, and a practicum in teaching classical guitar.
- 570 Music Production Practicum. 1 hr.**  
Application of musical production processes, theories, and techniques. Specialized practical experience in all musical aspects of rehearsal and performance.
- 580-583 Special Topics. 1-4; 1-4; 1-4; 1-4 hrs.**
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**
- 591-594 Workshop. 1-4; 1-4; 1-4; 1-4 hrs.**
- 601 Symphonic Literature. 3 hrs.**  
A survey of orchestral literature beginning with the 16th century; the Mannheim composers, Viennese classics, the Romanticists, the national schools, and late European, South American and American developments.
- 604a Keyboard Literature. 2 hrs.**  
A survey of keyboard literature from the 14th to the 20th century. Emphasis is on stylistic developments and formal procedures.
- 604b Chamber Music Literature. 2 hrs.**  
A survey of chamber music literature from the Baroque Era to the 20th century. Analysis of form emphasized in the study of string quartet trio, quintet, and various other combinations.

- 604c Song Literature. 2 hrs.**  
The song literature of Western Europe and America, also including contemporary material from other countries; interpretation, song study, program building, languages, and interpretation of accompaniments. For singers and accompanists.
- 604d Choral Literature. 2 hrs.**  
A comprehensive study of the forms and styles of Choral Composition from Renaissance to present day.
- 610 Philosophy of Music Education. 3 hrs.**  
Basic concepts of music education and their application to problems of music teaching, supervision and administration.
- 611 Psychology of Music. 3 hrs.**  
Vibrational stimuli, resultant reactions, and factors involved in development of musical skills, as well as measures of aptitude and achievement.
- 612 Projects and Problems in Music. 3 hrs.**  
Special problems and projects chosen by the student for investigation. Extensive study of a single problem or project in detail.
- 614 The Teaching of Music Appreciation. 2 hrs.**  
Advanced methods and materials for teaching appreciation of music in grades 1-12.
- 615 Band Maneuvers and Pageantry. 2 hrs.**  
The marching band. The marching and musical problems which are encountered in training and operating a band for football games and other events involving marching and playing.
- 616 Curriculum Construction and Revision. 3 hrs.**  
Survey of recent developments in public school curricula and their effect on music offerings. Preparation of course and curricular content.
- 617 Seminar in Music Education. 3 hrs.**  
An advanced study of basic concepts of current problems in music education.
- 618a Administration of Instrumental Music. 3 hrs.**  
The planning and operation of the instrumental program and the details of programming the work in a school system.
- 618b Administration of Choral Music. 3 hrs.**  
A study of the organization of choral music programs including; recruitment, auditions, scheduling, rehearsal arrangement, programming, touring, and budget.
- 619a Seminar in Vocal Pedagogy. 2 hrs.**  
A study of the techniques of singing and their application to private and class instruction. Emphasis placed upon diagnosis of problems, and teaching under supervision.
- 619b Seminar in Piano Pedagogy. 2 hrs.**  
An analytical survey of developments in piano techniques and pedagogical procedures with open discussions on various facets of piano teaching.
- 620a Instrumental Workshop. 2 hrs.**  
Problems of the instrumental teacher at all levels; practical work in the techniques of handling beginning classes and ensembles of all types.
- 620b Choral Workshop. 2 hrs.**  
A practicum approach to problems of choral techniques and materials with special emphasis placed upon high school and junior high school levels.
- 621 Introduction to Graduate Studies in Music: Research and Writing. 3 hrs.**  
Introduction to music research with emphasis on investigative methods and applications, procedures, and bibliography. Concentration on expository writing style and format.
- 629a Choral Conducting and Interpretation. 2 hrs.** Performance analysis of choral music from the Renaissance, Baroque and Classical periods as a basis for the expansion of ability in conducting. Students will conduct university ensembles in rehearsal and performance.
- 629b Choral Conducting and Interpretation. 2 hrs.** Continuation of Music 629a with emphasis upon Romantic and Contemporary music. Some opportunity given to work with operatic conducting. Does not require Music 629a as a prerequisite.
- 630a Instrumental Conducting and Interpretation. 2 hrs.** The special problems involved in conducting and training instrumental groups at all levels.
- 630b Instrumental Conducting and Interpretation. 2 hrs.** A continuation of 630a.
- 640a Music Theory. 3 hrs.**  
Analytical and writing techniques of 19th and 20th Century music.
- 640b Music Theory. 3 hrs.**  
Continuation of Music 640a.
- 641 Advanced Counterpoint. 3 hrs.**  
An intensive study of contrapuntal techniques, styles, and forms through composition and analysis.

- 642 Procedures and Techniques for Elementary Music (Grades K-6). 3 hrs.**  
Fundamentals of Music; experience in keyboard, guitar, recorder and autoharp. Survey of materials and methodology to aid in establishing program in school music. Non-majors only.
- 645a Original Composition. 2 hrs.**
- 645b Original Composition. 2 hrs.**
- 646 Advanced Choral Arranging. 2 hrs.**  
Techniques of choral composition and arranging with emphasis on the mixed choir. Arrangements and original works sung by choral groups and conducted by students.
- 647 Advanced Band Arranging. 2 hrs.**  
A study of the scoring for modern concert and marching bands, the transcription of works for other media as well as original works; analysis of band literature, harmonic and formal.
- 648 Advanced Orchestration. 2 hrs.**  
Scoring compositions from other media for modern orchestras of various sizes.
- 649 Stage Band Arranging. 2 hrs.**  
A study of the special techniques involved in scoring for the contemporary stage band, including harmony used, voicing of the various instruments, and a study of current practices.
- 650 Ancient and Medieval Music. 3 hrs.**  
Ancient Greek musical theory, Gregorian chant and its outgrowths, secular monophony, sacred and secular polyphony and its development through the fourteenth century.
- 651 Music of the Renaissance. 3 hrs.**  
The English, Burgundian and Netherland schools; secular forms; chanson, madrigal, and lied; instrumental music; mannerism and the end of an age.
- 652 Music of the Baroque Era. 3 hrs.**  
The monodic revolution: madrigal to cantata, opera, oratorio; Italian leaders; Vivaldi, Bach, and Handel.
- 653 Music of the Classical Era. 3 hrs.**  
Pre-Classical styles and the formation of a classical style in music in symphony, concerto, opera, the sonata, and choral music through Beethoven.
- 654 Music of the Romantic Era. 3 hrs.**  
A study and evaluation of Beethoven's principal works and the life and works of Schubert, Mendelssohn, Chopin, Schumann, Brahms, and their contemporaries.
- 655 Contemporary Music. 3 hrs.**  
Musical developments since Wagner: Debussy, Stravinsky, Mahler, Strauss, Schoenberg, Bartok and their contemporaries. Developments in electronic and aleatoric music, and new notations.
- 656 Seminar in Performance Practice. 2 hrs.**  
Students will prepare and perform music from a selected style period, making their own editions with correct realization and ornamentation. May be repeated for credit.
- 670 Advanced Materials and Methods (Grades 1-6). 3 hrs.**  
A comprehensive survey of available materials in singing, reading, listening, rhythm, and creating program of school music for the elementary grades; use of such materials in the methodology of teaching. (PR: Graduate music majors only)
- 675 Creative Activity for Children. 3 hrs.**  
Ways of using creative activity in the music program, methods of presenting creative song writing, rhythms, instrument construction, instrumental expressing, dramatization, program building.
- 679 Problem Report. 1-3 hrs.**
- 681 Thesis. 1-6 hrs.**

### Applied Music

- 680 a,b,c,d. Saxophone. 1-2 hrs.**
- 682 a,b,c,d. Flute. 1-2 hrs.**
- 683 a,b,c,d. Oboe. 1-2 hrs.**
- 684 a,b,c,d. Clarinet. 1-2 hrs.**
- 685 a,b,c,d. Bassoon. 1-2 hrs.**
- 686 a,b,c,d. French Horn. 1-2 hrs.**
- 687 a,b,c,d. Trumpet. 1-2 hrs.**
- 688 a,b,c,d. Trombone. 1-2 hrs.**
- 689 a,b,c,d. Baritone. 1-2 hrs.**
- 690 a,b,c,d. Tuba. 1-2 hrs.**
- 691 a,b,c,d. Violin. 1-2 hrs.**
- 692 a,b,c,d. Viola. 1-2 hrs.**
- 693 a,b,c,d. Cello. 1-2 hrs.**
- 694 a,b,c,d. String Bass. 1-2 hrs.**

- 695 a,b,c,d. **Piano. 1-2 hrs.**  
 696 a,b,c,d. **Voice. 1-2 hrs.**  
 697 a,b,c,d. **Organ. 1-2 hrs.**  
 698 a,b,c,d. **Percussion. 1-2 hrs.**  
 699 a,b,c,d. **Guitar. 1-2 hrs.**

## NURSING (NUR)

Graduate nursing courses are open only to those students admitted to the nursing program.

- 580-584 Special Topics in Nursing. 1-4 hrs.**  
 Program of study not normally covered in other courses. Topics vary from semester to semester. (PR: Permission of instructor)
- 585-588 Independent Study in Nursing. 1-4 hrs.**  
 Courses taught by tutorials; directed independent readings or research; problem reports, and other activities designed to fill needs of individual students.
- 591-594 Nursing Workshop. 1-4 hrs.**  
 Practical, participatory courses for advanced students. Experience in new techniques and application of new knowledge.
- 602 Theoretical Foundations in Nursing. 3 hrs.**  
 Provides students with opportunity to relate a philosophical and theoretical base to concepts and processes inherent in nursing. Emphasis is on analysis of nursing theories and their relationship and application to research and practice.
- 604 Leadership in Nursing. 3 hrs.**  
 Explores the theoretical basis for effective leadership in nursing. Emphasis is placed on analysis of leadership, characteristics and behaviors of leaders, and the role of the nurse leader.
- 606 Advanced Nursing Research. 3 hrs.**  
 Provides the opportunity to develop a research approach to nursing situations. Focus is upon the development of a research proposal. (PR: or concurrent NUR 602 or Perm)
- 608 Issues in Health Care. 3 hrs.**  
 Explores and evaluates concerns germane to contemporary nursing. Focus is upon the role of nursing in addressing health issues affected by social, economic, political, and technological forces.
- 616 Curriculum Development in Nursing. 3 hrs.**  
 Introduces the various component in the curriculum development process. Emphasis is on philosophy, objectives, curriculum designs, and program evaluation. Factors influencing curriculum development, implementation, evaluation, and nursing curriculum patterns are examined.
- 618 Teaching in Nursing. 3 hrs.**  
 Investigates the responsibilities of the educator in contemporary nursing. Emphasis is upon the instructional process. Practicum allows student to practice the role of the teacher in a variety of educational experiences.
- 619 Practicum: Teaching in Nursing. 3 hrs.**  
 Guided experience in didactic teaching of nursing clinical teaching, supervision and evaluation of students.
- 622 Advanced Family Nursing I. 5 hrs.**  
 Introduction to knowledge and skills essential for comprehensive health assessments, analysis of data, formulation of diagnoses, development of the therapeutic plans, and implementation of health promotion and maintenance activities. Practicum included. (PR or concurrent: NUR 602, NUR 604)
- 624 Advanced Family Nursing II. 5 hrs.**  
 Provides advanced knowledge and nursing management of common and acute self-limiting health problems of individuals and families of various age groups. Includes pathology and therapeutic modalities related to specific health problems. Practicum included. (PR: NUR 622, PR or concurrent: NUR 606)
- 626 Advanced Family Nursing III. 5 hrs.**  
 Provides advanced knowledge of chronic illness and the long-term nursing management of health care problems. Includes pathology and therapeutic modalities related to management of chronic health problems. Practicum included. (PR: NUR 624)
- 632 School Nurse Practitioner Role in School Health I. 3 hrs.**  
 Focus is upon the role of the school nurse practitioner in the school system. (PR: NUR 602, NUR 604 or permission)
- 634 School Nurse Practitioner Role in School Health II. 3 hrs.**  
 Focus is upon the role of the school nurse practitioner in providing health care to school age children. (PR: NUR 632 or concurrent or Perm)
- 642 Organizational Dynamics in Nursing. 3 hrs.**  
 Focus is upon the organizational dynamics as they apply to the nurse manager role in health care delivery systems.

- 644 Financial Strategies in Nursing Administration. 3 hrs.**  
Examines the financial management role of the nurse administrator in relation to economic, political, and societal trends.
- 646 Nursing Management in Health Care Settings I. 6 hrs.**  
Focuses on the application of theories and principles related to nursing management. Practicum included. (PR or concurrent: NUR 604, NUR 606; PR: NUR 642, NUR 644)
- 648 Nursing Management in Health Care Settings II. 6 hrs.**  
Practicum focuses upon the application of the role components of the nurse manager in selected health care settings. Seminars included. (PR: NUR 646)
- 662 Pharmacology for Nurses in Advanced Practice. 3 hrs.**  
Focus is upon a review of the knowledge base in the basic science of drugs and on how this knowledge base can be applied to client care and education by nurses in advanced practice. (PR: Evidence of current RN license and perm)
- 679 Problem Report in Nursing. 1-3 hrs.**  
The preparation of a written report on a research problem or field of study in nursing.
- 681 Thesis. 1-6 hrs.**  
Individual research in a selected area of nursing under direction of a faculty member. (PR: NUR 606)
- 690-693 Seminar in Nursing. 1-3 hrs.**  
Topics in nursing not covered in other courses; topics will vary.
- 695 Internship: Advanced Family Nursing. 6 hrs.**  
Focus is upon the role of the family nurse practitioner using the case management approach in a supervised contractual work study arrangement with a health care agency. (450 hrs. minimum) (PR: NUR 626)
- 697-698 Instructional TV. 1-4 hrs.**  
A course based upon Instructional Television series broadcast by public television. The student is responsible for viewing the series on the air and satisfying all course requirements.

#### **PARK RESOURCES AND LEISURE SERVICES (PLS)**

- 500 Leisure and Aging. 3 hrs.**  
A course presenting an overview of leisure services for the elderly. Topics include research results, theories, and modern day trends. A wellness model will be included.
- 501 Administration of Parks and Recreation. 3 hrs.**  
Considers administrative practice and various organizational structures. Includes administrative processes, supervision of personnel, budgeting, and public relations. Requires conducting a case study of an existing park and recreation department, including fiscal and personnel policies and an analysis of the effectiveness of such policies.
- 502 Assessment and Evaluation in Recreation and Leisure Services. 3 hrs.**  
Theoretical and practical approach to evaluation as applied to recreation and leisure services. Emphasis will be upon developing sound assessment and evaluation methodology applicable to recreation and leisure studies. (PR: PLS 101 or permission)
- 510 Recreation Area and Facility Maintenance. 4 hrs.**  
A study of the knowledge and skills necessary to supervise and administer the general development and maintenance of park and recreation areas and facilities.
- 511 Recreation Areas and Facilities. 3 hrs.**  
Basic considerations in the planning and design of recreational and sport areas, facilities, and structures including associated amenities.
- 521 Recreation for Special Populations. 3 hrs.**  
Study of the use of recreation activities with disabled persons. Techniques in programming and adaptation to meet the leisure needs of special groups in today's society. In association with a therapeutic recreation institution, student must develop a new/revised procedure for providing recreation programs at that institution. (PR: PLS 120 or permission)
- 522 Therapeutic Recreation in Institutional Settings. 3 hrs.**  
Designed to acquaint students with the role and practice of therapeutic recreation in treatment centers. Requires preparation of an annotated bibliography of current literature in this field and conducting of a case study of therapeutic recreation programmatic offerings in such an institution. (PR: PLS 120 or permission)
- 530 Environmental Interpretation. 4 hrs.**  
Principles and techniques of environmental interpretation as practiced in federal, state, and private agencies. Student must develop an interpretative brochure and evaluate both a facility and a program. 3 lec.-2 lab.

- 531 Forest Recreation Planning. 4 hrs.**  
Utilizes the functional planning approach based upon demand and site capability analysis. Student conducts an in-depth recreation capability analysis in an existing park facility, presents this in written form; reviews the current literature on forest recreation development, and makes a final oral report. 3 lec.-2 lab.
- 540 Off-Highway Vehicle Recreation in America. 3 hrs.**  
A course designed to integrate off-highway vehicle recreation concepts, experiences, research trends, supply and demands, and management issues.
- 580-583 Special Topics in Recreation. 1-4; 1-4; 1-4; 1-4 hrs.**  
Study of an advanced topic not normally covered in other courses. 3 lec.-2 lab. (PR: Permission of Chairman)
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**  
Requires conducting of individual survey/research projects beyond the requirements for undergraduates. Such projects will be individualized to meet the needs of students while accomplishing some practical need in the field. (PR: Permission)

### PATHOLOGY (PTH)

- 620-621 Human Pathology. 7; 7 hrs., I, II.**  
General principles of pathology, systemic pathology, and holistic integration with laboratory medicine and autopsy-clinical-and-cytologic material. (PR: Consent of instructor)

### PHARMACOLOGY (PMC)

- 610 Introduction to Pharmacology. 3 hrs., I.**  
An indepth presentation of the history and introductory principles of pharmacology. Designed to acquaint students with pharmacology as a scientific discipline and provide the basis for more advanced courses. (PR: Consent of instructor)
- 615 Pharmacology Reviews. 1 hr., I, II.**  
A course designed for students to read and discuss recent and classic papers in pharmacological sciences. Students become acquainted with the pharmacology literature and classic advances in the field.
- 620 Medical Pharmacology. 8 hrs., II.**  
An introduction to the basic concepts of drug actions and therapeutic principles governing drug therapy. Emphasis is placed on general mechanisms, therapeutic uses and toxicity of prototypic drugs. (PR: BIC 620, PHS 629 desirable; consent of instructor)
- 625 Drug Metabolism. 3 hrs., I.**  
Topics will include a discussion of the metabolizing enzymes, enzyme induction and inhibition, toxic metabolites, prodrugs, metabolic disorders and analytical methods for studying drug metabolism. (PR: consent of instructor)
- 630 Chemical Aspects of Pharmacology. 3 hrs., I.**  
An introduction to the chemical principles of pharmacology. The chemical classification, acid-base chemistry and stereochemical properties of drugs and the reactivity of drugs with biological systems will be discussed. (PR: organic chemistry, consent of instructor)
- 633 Vistas in Pharmacology. 3 hrs., I.**  
A discussion and study of recent advances in the various fields of pharmacological investigation. This course is designed to acquaint students with state-of-the-art techniques and developing areas of pharmacology. (PR: PMC 620)
- 635 Neuropharmacology. 3 hrs., I.**  
A study of the actions of drugs on the nervous system.
- 640 Behavioral Pharmacology. 3 hrs., I.**  
Behavioral methods for assaying drug action. (PR: consent of instructor)
- 643 Introductory Cardiopulmonary Pharmacology. 3 hrs.**  
A general overview of the principles of pharmacology and the mechanisms and effects of cardiovascular and respiratory drugs. (PR: PHS 629 or BSC 522, consent of instructor)
- 645 Advanced Cardiopulmonary Pharmacology. 3 hrs., I.**  
An in-Depth presentation of pharmacological aspects of cardiovascular and pulmonary systems. Current knowledge, principles and methods used in cardiopulmonary research will be discussed. (PR: PMC 620 or PMC 643; consent of instructor)
- 650 General Toxicology. 3 hrs., I.**  
An in depth presentation of the general principles and methods of toxicology. Mechanism, distribution and organ system responses to toxins and methods of toxicological evaluation will be discussed. (PR: PMC 620 or consent of instructor)

- 676-677 Special Topics. 1-4 hrs.**  
Material on special areas of research of topics which are not routinely covered in existing courses.

### PHILOSOPHY (PHL)

- 500 Ancient Philosophy. 3 hrs.**  
Advanced study of major philosophers drawn from the ancient Greek and Roman period.
- 551 Philosophy of History and Culture. 3 hrs.**  
Ancient and modern theories of the meaning and consequence of history and culture.
- 553 Philosophy of Science. 3 hrs.**  
Crucial concepts in modern science relevant to contemporary philosophical issues concerning man and the universe; special attention to epistemological and ethical implications of natural law, induction, mathematical theory and the new physics.
- 555 Philosophy of Religion. 3 hrs.**  
Theories of the nature and functions of religion, including the meaning of religious language and problems of belief.
- 563 Philosophy of Feminism. 3 hrs.**  
An introduction to contemporary feminist theory including discussion of current gender-related issues.
- 565 Existential Philosophy. 3 hrs.**  
A survey of the contributions of leading existentialist philosophers of the past and present from Kierkegaard and Nietzsche to Sartre and Tillich; course is conducted much like a seminar.
- 580-583 Special Topics. 1-4; 1-4; 1-4; 1-4 hrs.**
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**
- 598 Directed Readings in Philosophy. 3 hrs. I, or II.**  
Advanced research adaptable to the needs of students. Regular consultations with the chairman and staff.
- 599 Humanities Seminar. 3 hrs.**

### PHYSICAL EDUCATION (PE)

- 501 Ethics in Sport. 3 hrs.**  
Philosophical and historical background to the development of values in contemporary society and examination of how these are manifested in the sports world.
- 516 Planning & Developing HPER & Athletic Facilities. 3 hrs.**  
A course designed to familiarize students with the basic concepts of facility planning and construction. Current trends and innovative designs are reviewed. (Does not fulfill state certification requirements for a superintendent's license.)
- 522 Prevention, Care and Treatment of Athletic Injuries. 3 hrs.**  
This course is designed to prepare the athlete for competition, the prevention and protection of the athlete from accidents, the etiology, examination and immediate care of the athlete, and the rehabilitation of the athlete following injury.
- 524 Sport and Physical Education in the Twentieth Century United States. 3 hrs.**  
The development of recreation, organized sport and physical education programs in the United States, 1900 to present.
- 525 Sport and Film. 3 hrs.**  
The relationships between sports and feature motion pictures are analyzed in the historical, social, and cultural contexts.
- 530 Sport Law, 3 hrs.**  
The study of the basic principles of the legal system as they operate in the environment of American sport.
- 548 Therapeutic Modalities in Sports Medicine. 4 hrs.**  
Investigation and analysis of therapeutic modalities including indications, contraindications, biophysics and procedures. Includes a lab. (PR: PE 201, 215 & Permission)
- 549 Therapeutic Exercise in Sports Medicine. 4 hrs.**  
Investigation and analysis of current trends in rehabilitation exercise, muscle testing and evaluation. Includes a lab. (PR: PE 201, 215 & Permission)
- 560-564 Professional Development. (Plus title that identifies content). 1-4; 1-4; 1-4; 1-4 hrs.**  
Courses and activities designed to meet the specific inservice needs of public school personnel. Credit in these courses may be used for certificate renewal and salary upgrading if approved but not for degrees. CR/NC grading.
- 575 Seminar in Sports Management and Marketing. 3 hrs.**  
This course is designed to provide students with an overview of all aspects involved in the Sports Management and Marketing field through classroom lectures, guest speakers, and field trips.

- 576 Theoretical and Practical Aspects of Coaching. 3 hrs.**  
An in-depth study of the principles and problems of coaching.
- 578 Energy Sources, Body Composition and Performance. 3 hrs.**  
Consideration of the energy sources and requirements for various types of physical activity as well as the impact that physical activity can have on body composition and performance. (PR: PE 621 or permission)
- 579 Trends in Athletic Training. 3 hrs.**  
To provide an in-depth analysis of current trends with regard to administration, liability and insurance. In addition, will cover current standards in surgery, rehabilitation and evaluation of sports related injuries.
- 580-583 Special Topics. 1-4; 1-4; 1-4; 1-4 hrs.**  
(PR: Approval by the department chairman, instructor and student's committee)
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**
- 591-594 Workshop in Physical Education. 1-3; 1-3; 1-3; 1-3 hrs.**
- 601 Advanced Exercise Testing. 3 hrs.**  
Exercise testing techniques presented to determine the biological responses to exercise stress and to investigate the physiological limitations to human performance as it relates to disease and/or sport performance. (PR: PE 621)
- 615 Legal Concern in PE and Athletics. 3 hrs.**  
An in-depth analysis of the legal implications of Sports and Physical Education.
- 620 Substance Abuse and the Athlete. 3 hrs.**  
An in-depth study of commonly abused substances by athletes as well as current trends in drug testing of athletes. (PR: PE 621, permission)
- 621 Scientific Aspects of Physical Education. 3 hrs.**  
The study of the scientific basis for physical activity. Consideration will be given to the psychological, sociological, neuromuscular, and physiological characteristics requisite to physical activity. (REC: PE 201 and 345 or equivalent)
- 623 Medical Aspects in Sports. 3 hrs.**  
Emphasis on the development of skills in recognition of symptoms of illness, injuries and proper procedures of medical care.
- 624 Issues in Physical Education. 3 hrs.**  
Critical selection and analysis of current controversies in physical education. Analysis includes identification of the content fostering each issue and the systematic probing of administrative tenets and philosophical positions taken by all factions. Attempts at resolution are secondary to exploration and analysis of viewpoints.
- 626 History and Philosophy of Physical Education and Sport. 3 hrs.**  
An investigation of historical events, political and social climates, and personalities as well as philosophies which have influenced physical education and sport from early civilizations to the present.
- 631-634 Performance Techniques and Analysis. 3 hrs.**  
Analysis of lead-up, intermediate and advanced techniques of a selected team, individual or dual sports. Emphasis given to mechanics of performance psychological stress components, psychological factors, strategies and teaching/coaching methodology.
- 636 Structural Kinesiology. 3 hrs.**  
Instruction and laboratory experiences involving musculoskeletal anatomy and biomechanics as applied to human movement.
- 642 Devising and Implementing Training and Conditioning Programs. 3 hrs.**  
Application of neuromuscular and physiological knowledge to the examination of the administration and content of existing exercise programs as well as the development of new programs. (PR: PE 621)
- 643 Sport in the Social Process. 3 hrs.**  
An in-depth analysis of the processes by which sport evolved as a significant component of modern American life.
- 646 Athletic Training I. 3 hrs.**  
Training in the diagnosis of injuries in athletics. The student will be expected to participate in diagnostic techniques under the supervision of a trainer.
- 647 Athletic Training II. 3 hrs.**  
Professional aspects of trainer-doctor and doctor-athlete relations will be taught and exploration of how to professionally handle injuries and cooperation with physicians.
- 651 Mechanical Analysis of Motor Skills. 3 hrs.**  
Analysis of motor skills through the application of the principles of physics. (REC: PE 321 or equivalent)

- 652 Administrative Theories in Physical Education and Athletics. 3 hrs.**  
The student is introduced to the background and development of administrative theories in physical education and athletics in a context of a social scientific milieu.
- 654 Contemporary and Comparative Physical Education. 3 hrs.**  
A study of objectives, methods, personnel, facilities, and program uniqueness of the physical education of selected nations and world regions. National sport programs, international sport programs and competition, and international professional organizations are considered.
- 660 Internship. 3-6 hrs.**  
Practical experience in a clinical setting. (PR: PE 682, 683, 684)
- 670 Research in Physical Education. 3 hrs.**  
An examination of experimental research design, laboratory methods, construction of instruments, execution of research, and presentation of research papers with an emphasis on science.
- 681 Thesis. 1-6 hrs.**
- 682 Health Promotion, Disease Prevention, and Rehabilitation: Clinical Perspectives. 3 hrs.**  
Examines disorder/disease prevalent in Westernized societies, with special emphasis on the rationale for intervention with exercise, nutrition, behavioral, and related strategies. (PR: PE 621)
- 683 Cardiovascular Assessment. 3 hrs.**  
Considers cardiovascular assessment strategies, including EKG interpretation, related medical profile variables, patient/client/athlete screening and risk stratification. (PR: PE 621)
- 684 Developing Exercise, Nutritional, and Behavioral Prescriptions. 3 hrs.**  
Examines prescription strategies for lifestyle intervention. This includes exercise, nutrition, medications, stress management, and smoke cessation. (PR: PE 621, 682, 683)
- 685 Development and Administration of Preventive and Rehabilitative Medical Programs. 3 hrs.**  
Examines health promotion, disease prevention, and rehabilitation program development and administration strategies in the commercial, corporate, clinical, and community settings. (PR: PE 621, 682, 683, 684, 687).
- 686 Behavioral Aspects of Wellness, Disease, Rehabilitation. 3 hrs. I or II.**  
Survey course to include the pathophysiology of stress, psychology of health, behavioral modification, neuromuscular relation/stress reduction techniques, program compliance improvement, and health counseling. (PR: PE 641)
- 687 Cardiac Life Support. 3 hrs.**  
Course is designed to acquaint the student with the current methods in recognizing and treating cardiac conditions. (PR: PE 683 or permission)
- 696 Seminar in Physical Education. 3 hrs.**  
A course designed for library research and discussion of critical questions in physical education. Topics to be selected will vary according to the interests of the students.

## PHYSICAL SCIENCE (PS)

- 500 Astronomy. 3 hrs.**  
A study of the stars and planets and galaxies, planetary motion, cosmology and cosmography. Designed to assist teachers and others to develop an interest in astronomy. (PR: PHY 101 or 203 or PS 109 or equivalent)
- 500L Astronomy Laboratory. 1 hr.**  
Fundamental observations in astronomy and their interpretation through physical laws. Quantitative discussion of orbital motion, time, telescopes, solar system, stars, galaxies, and limited opportunity for astronomical observation. (PR or CR: PS 500)
- 510 Physical Principles of Remote Sensing with Applications. 4 hrs.**  
A study of the physical systems for collecting remotely sensed data. Statistical/spatial analysis and modeling using image processing/geographic information/spatial analysis computer software systems with earth resource applications. (PR: PHY 203 and 204, MTH 225, or permission)
- 511 Digital Image Processing and Computer Simulation Modeling. 4 hrs.**  
A study of image processing/geographic information and spatial analysis hardware/software systems, concurrent and parallel image processing modeling scenarios utilizing geobiophysical data for computer simulation modeling and practicum. (PR: PS 410/510 or permission)
- 525 Development of Scientific Thought. 3 hrs.**  
A study of the people and ideas which have influenced science; the philosophy of their periods; the economic conditions leading to scientific advancement and the works of the foremost scientists in the field. (PR: A total of twelve hours in Physical Science, Physics, and Chemistry courses)
- 570 Practicum. 4 hrs.**  
Problem solving, geobiophysical modeling, and proposal development techniques in the physical sciences. (PR: PS 411, 511 or Permission)
- 580-583 Special Topics. 1-4; 1-4; 1-4; 1-4 hrs.**
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**

- 646 Seminar on Recent Developments in the Physical Sciences. 3 hrs. Offered on demand.**  
**648 Modern Physics for Teachers. 3-5 hrs. Offered on demand.**  
 A course designed to provide additional background material in atomic and nuclear physics for teachers. Lecture and laboratory.
- 649 Electronics for Teachers. 3-5 hrs. Offered on demand.**  
 A course in basic theory of electronics for teachers. Lecture and laboratory.
- 681 Thesis Research. I, II, S. 1-6 hrs.**  
 (PR: Graduate status and approval of advisor)

### PHYSICS (PHY)

- 505 Optics Laboratory. 2 hrs.**  
 A course in optical experiments encompassing geometrical and physical optics. This course is to be taken with Physics 304.
- 512 Atmospheric Physics with Computer Simulation Modeling. 3 hrs.**  
 A general introduction to the earth's atmosphere. The physical and chemical dynamic behavior of the earth's atmosphere will be analyzed by comparing computer simulated profiles with in situ measurements.
- 515 Electronics Laboratory. 2 hrs.**  
 A course in laboratory measurements encompassing transistors, integrated circuits, and their associated circuits. This course is to be taken with Physics 314.
- 521 Modern Physics Laboratory. 2 hrs.**  
 Laboratory exercises on modern physics topics encompassing both experiments of historic significance and current applications. To be taken with Physics 320, or equivalent.
- 542 Quantum Mechanics. 3 hrs.**  
 Alternate years. Mathematical formalism of quantum mechanics, particles in potential fields, perturbation theory and other approximation methods, scattering, applications to simple systems. 3 lec. (REC: PHY 331 and MTH 335 or equivalent)
- 545 Mathematical Methods of Physics. 3 hrs.**  
 Offered on demand. An introduction to the theory of orthogonal functions, curvilinear coordinate systems, vector and tensor fields and their applications in Physics. Problems are drawn from different areas of physics. 3 lec. (PR: PHY 203.)
- 547 Mechanics for Teachers. 4 hrs.**  
 An in-depth study of mechanics for education majors specializing in physics with emphasis on problem solving techniques, demonstrations, experiments and computer applications. (PR: PHY 203, MTH 122, MTH 140)
- 550 Radiation Physics in the Life Sciences. 4 hrs. II.**  
 Alternate years. A course in radiation physics with emphasis on applications in the medical sciences. Designed for students interested in the life sciences. A field trip to the University of Michigan nuclear reactor is an integral part of the course. 3 lec-2 lab/demonstration. (PR: PHY 203 and 204, or consent of instructor)
- 562 Nuclear Chemistry and Physics. 3 hrs. II.**  
 Alternate years. An introduction or the description of nucleons, electric and magnetic properties of a nucleus, nuclear energy levels, nuclear reactions including neutron activation, interaction of particles with matter, and nuclear forces. 3 lec. (PR: PHY 320 and MTH 231 or consent of instructor). See 424d.
- 563 Nuclear Physics Laboratory. 2 hrs.**  
 Laboratory techniques for the measurement of nuclear properties, theory and characteristics of various detectors, statistics of counting, and energy determination of nuclear particles and radiation. This course is to be taken with Physics 462/562. A field trip to the University of Michigan Nuclear Reactor is an integral part of the course.
- 580-583 Special Topics. 1-4; 1-4; 1-4; 1-4 hrs.**  
**585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**
- 616 X-Ray Diffraction. 3 hrs.**  
 Offered on demand. A study of the properties of X-rays, X-ray diffraction, and crystal structure. 2 lec-3 lab. (REC: CHM 358 or equivalent)
- 631-632 Seminar. 1; 1 hr. I, II.**
- 640 Fundamentals of Physics. 4 hrs. S.**  
 Offered on demand. A course in fundamental concepts of physics. Subject content varies. Designed primarily to strengthen conceptual understanding of teachers.
- 644 Atomic Physics. 3 hrs.**  
 A historical development of the modern theories concerning the structure of matter, electricity, and light, including applications of optical spectra and X-rays. (PR: PHY 203, 204 or PHY 213, 204 or equivalent)

- 661-662 Special Topics. 1-3; 1-3 hrs.**  
**682 Thesis Research. 1-6 hrs. I, II, S.**  
 (PR: Graduate status and approval of advisor)

### PHYSIOLOGY (PHS)

- 628 Mammalian Neurophysiology. 2 hrs.**  
 This course is a basic introductory, survey course covering neurophysiology from subcellular level to behavioral level. (PR: Consent of instructor)
- 629 Mammalian Physiology. 6 hrs. II.**  
 A study of mammalian systems including pulmonary, renal, cardiovascular, gastrointestinal, endocrine and reproductive systems. Emphasis will be placed on homeostatic mechanisms and on experimental approaches to physiology. (PR: PHS 628)
- 630 Experimental Physiology. 1 hr. II.**  
 A laboratory course in mammalian physiology which includes instruction in surgical preparation, bioinstrumentation technique and open-chest surgery in dogs. (PR: PHS 629 and consent of instructor. This course may be taken concurrently with 629)
- 631 Physiology Practicum. 2 hrs. II.**  
 Experience in laboratory instruction of medical and graduate students in the mammalian physiology laboratory. (PR: PHS 630 and consent of instructor)
- 632 Physiology of Sleep. 1 hr.**  
 Detailed examination of changes in EEG, EMG, cardiorespiratory function and ocular motility during sleep. (PR: PHS 628, 629)
- 634 Advanced Neurophysiology. 1-2 hrs., I.**  
 Bioelectric potentials. A.C. and D.C. potentials, transcortical potentials, E.E.G., cornea-retinal potential, blood-CSF potential, etc. (PR: PHS 628, 629)
- 638 Advanced Cardiovascular Physiology. 1-2 hrs., I.**  
 (PR: PHS 629)
- 639 Neurophysiology Research Techniques. 3 hrs.**  
 Class participants will be exposed to state-of-the-art neurophysiology research techniques while in the laboratories of neurophysiology faculty.
- 640 Advanced Renal and Electrolyte Physiology. 1-2 hrs., I.**  
 (PR: PHS 629)
- 641 Recent Advances in Physiology. 1 hr., I., II.**  
 Recently published articles in a selected area of physiological investigation will be presented by participants in the class. Each presentation will be followed by a discussion and evaluation of the paper. (PR: Consent of instructor)
- 661 Endocrinology. 3 hrs.**  
 An in depth study of the endocrine system with special emphasis on the role of experimentation in the development of concepts in endocrine physiology (PR: BMS 600 or equivalent, consent of instructor)
- 666 Physiology of the Cell. 3 hrs.**  
 An in-depth study of selected topics in cell physiology.
- 675 Special Topics. 1-4 hrs.**  
 Present course material on special areas of research of topics which are not routinely covered in existing courses.
- 676 Special Topics. 1-4 hrs.**  
 Present course material on special areas of research or topics which are not routinely covered in existing courses.
- 677 Special Topics. 1-4 hrs.**  
 Present course material on special areas of research or topics which are not routinely covered in existing courses.

### POLITICAL SCIENCE (PSC)

- 505 International Organization. 3 hrs.**  
 Study of world and regional organizations as reflections of world politics, as instruments of foreign policies, and as forces for change and order, with emphasis on their role as channels for management of cooperation and conflict.
- 506 International Politics. 3 hrs.**  
 Study of major issues in world politics, with emphasis on theoretical approaches, problems of war and peace, and contemporary trends.
- 507 Asian Politics. 3 hrs.**  
 Study of such nations as India, China, Japan, and Korea in the contemporary setting.

- 508 **Middle Eastern Politics. 3 hrs.**  
Study of the Arab States and such nations as Israel, Iran and Turkey in the contemporary setting.
- 509 **Western Democratic Politics. 3 hrs.**  
Study of such nations as Canada and those of Western Europe, particularly Great Britain and France.
- 510 **Eastern European Politics. 3 hrs.**  
Study of Russia and Eastern Europe.
- 511 **Latin American Politics. 3 hrs.**  
This course studies Latin American politics by sectors, such as landed elites, the military, the church, etc. Various styles of governance are considered. Case examples illustrate concepts discussed.
- 515 **International Law. 3 hrs.**  
Study of theories, origins, sources, development, present state, and trends of international law as a factor in various aspects of international politics.
- 520 **Current World or Regional Issues. 3 hrs.**  
An intensive study of specific world or regional problems, such as the politics of world hunger. The role of multinational corporations, imperialism, third world communist movements, etc.
- 521 **American Political Thought. 3 hrs.**  
Study of the development and influence of American Political Thought with an emphasis on the linkage of ideas to political and economic forces.
- 522 **African Political Systems. 3 hrs.**  
The study of political systems of selected countries, blocs or regions.
- 523 **American Foreign Policy. 3 hrs.**  
The study of descriptive, analytical, and normative aspects of American foreign policy with emphasis on contemporary problems and issues.
- 524 **Comparative Foreign Policy. 3 hrs.**  
Application of the comparative method to foreign policy decision-making and outputs. Comparisons within or between geographic regions.
- 525 **Ancient Medieval Political Thought. 3 hrs.**  
Selective study of classics of Western political theory from earliest times through the 15th century, such as that of Plato, Aristotle, the Romans, Augustine, and Aquinas.
- 526 **Modern Political Thought. 3 hrs.**  
Selective study of classics of Western political theory from the 16th century through the 19th century, such as that of Machiavelli, Bodin, Hobbes, Locke, Rousseau, Hume, Burke, Mill, and Marx.
- 528 **Islamic Political Ideas and Institutions. 3 hrs.**  
A study of Islamic political ideas, practices and institutions and their impact on the rise and development of contemporary Islamic movements, organizations and states.
- 529 **The Politics of Conflict and Revolution. 3 hrs.**  
Study of major theories of conflict and revolution with emphasis on cross-national explanations and outcomes.
- 533 **Public Administration and Policy Development. 3 hrs.**  
An examination of alternative theoretical approaches to the study of policy and administration and their implications for the use of policy to shape administrative practice.
- 536 **The American Judiciary. 3 hrs.**  
Structure and behavior in American national and state judicial systems, including analysis of their decision making and policy making functions, their procedures and administration, and problems and trends.
- 540 **Power in American Society. 3 hrs.**  
An examination of some of the major theoretical approaches-pluralist, elitist, etc.-to the study of power. A major concern is on the relationship between the distribution of political resources and the performance of political systems. Efforts to transform political systems are examined on the basis of cross-national research.
- 550 **Administrative Law. 3 hrs.**  
A study of the basic legal framework of administrative organization, including the problems of administrative discretion, rule making and adjudication, regulatory agencies, and administrative responsibility in the democratic state. (PR: PSC 333)
- 552 **Public Personnel Administration. 3 hrs.**  
Survey of Public Personnel Administration with particular attention on various facets of the merit system concept. Psychological and human relations aspects of the work situation and supervisor-subordinate interaction emphasized. (PR: PSC 333 or permission)
- 553 **Governmental Budgetary Administration. 3 hrs.**  
Study of organization, administration, and accountability in the management of public funds, with emphasis on the political decision-making processes of budget formulation, presentation, and execution. (PR: PSC 333 or permission)

- 554 Administrative Organization and Behavior. 3 hrs.**  
A study of the contributions of the behavioral sciences to the study of organizations with stress on such concepts as leadership, motivation, power conflict, organizational design and decision making.
- 560 Civil Rights and Liberties. 3 hrs.**  
The basic substantive and procedural elements of American constitutional liberties and civil rights with emphasis on historical development as influenced by social and political forces.
- 561 Urban Problems and Public Policy. 3 hrs.**  
Study of policy problems of metropolitan areas in terms of structures, alternatives, and outcomes.
- 580-583 Selected Topics. 1-4; 1-4; 1-4; 1-4 hrs.**  
To offer a course on some special topic which is not adequately treated in the regular course offerings.
- 584 Constitutional Law. 3 hrs. I.**  
Introduction to the principles of American constitutional law and analysis of constitutional issues, emphasizing leading Supreme Court cases.
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**  
These numbers are reserved for tutorials, directed and independent research, problem reports, etc.
- 600 Research Design. 3 hrs.**  
Philosophy of Science as applied to empirical political inquiry; elements of good research design, measurement theory, writing and critiquing research reports. (PR: PSC 211 or permission)
- 601 Readings in Political Science. 2-3 hrs.**  
Readings to meet the needs and interests of individual students.
- 604 Data Analysis. 3 hrs.**  
A study of quantitative methods used in empirical research with an emphasis upon applied statistical analysis; writing and critiquing research reports.
- 606 Seminar in Judicial Politics. 3 hrs.**
- 609 Seminar in International Relations Theory. 3 hrs.**
- 611 Seminar in the American Legislative Process. 3 hrs.**
- 612 Seminar in the American Executive Process.**
- 614 Seminar in Comparative Politics. 3 hrs.**
- 618 Seminar in Public Administration. 3 hrs.**
- 621 Urban Administration. 3 hrs.**  
Principles and methods of urban administration in the U.S.
- 629 Seminar in Political Thought. 3 hrs.**
- 648 Seminar in State Government and Politics. 3 hrs.**  
West Virginia government and political problems will receive special attention although other states may be considered.
- 650-651 Seminar. 3-6 hrs.**
- 652 Seminar in Political Behavior. 3 hrs.**
- 660 Seminar in Policy Analysis. 3 hrs.**  
Development of theoretical and methodological skills in the analysis of public problems and the use of policy in problem solving.
- 675 Legislative Internship. 6 hrs.**  
Intensive work experience in the West Virginia legislative processes coupled with a seminar involving directed reading Legislative Services with only selected students participating. (PR: One semester of graduate work and recommendation of department chairman.)
- 680 Master's Essay. 3 hrs.**
- 681 Thesis. 1-6 hrs.**

## PSYCHOLOGY (PSY)

- 502 Advanced Social Psychology. 3 hrs.**  
Advanced study of selected topics in social psychology.
- 503 Applied Social Psychology. 3 hrs.**  
Examination of the applications of social psychological methods, theories, principles and research findings to the understanding of social problems.
- 506 Psychometrics. 3 hrs.**  
Mental test theory and applications.
- 508 Abnormal Psychology. 3 hrs.**  
Study of the nature, causes and treatment of maladaptive human behavior.
- 515 Child Psychology. 3 hrs.**  
Introduction to child development with major emphasis on normal growth and development. Specific topics include theories of child development and the biological, mental, emotional, social and cognitive growth and development of children.

- 516 Psychology of Learning. 3 hrs.**  
Critical study of the major theories of learning and related research.
- 517 Intermediate Behavioral Statistics. 3 hrs.**  
An intermediate level presentation of descriptive and inferential statistics as applied in behavioral research.
- 518 Psychology of Personnel. 3 hrs.**  
Psychological principles and methods applied to functions in personnel administration.
- 519 Theories of Personality. 3 hrs.**  
Discussion of theories of personality with attention given to major philosophies of science research and methodological problems in personality theory and research.
- 520 Introduction to Industrial-Organizational Psychology. 3 hrs.**  
A systematic study of the application of psychological methods and principles in business and industry. Emphasis is on research methods, motivation, training, leadership, personnel selection, employee safety, and job satisfaction.
- 526 Cross Cultural Psychology. 3 hrs.**  
Emic and etic cultural concepts are considered from an American (subcultural) and international perspective. Cultural influences on healing, health and service are covered.
- 527 Computer Applications in Psychology. 3 hrs.**  
An introduction to computer applications in psychology, emphasizing data collection, management, organization, analysis and reporting.
- 533 Current Models of Psychotherapy. 3 hrs.**  
Introduction to theoretical models and related therapeutic strategies which influence the practice of modern psychotherapy.
- 540 Physiological Psychology. 3 hrs.**  
The relationships between physiological functions and biochemical processes and behavior.
- 543 Health Psychology. 3 hrs.**  
Introduction to the contribution of psychology to the promotion and maintenance of health and the prevention and treatment of illness. (PR: PSY 201 & 323)
- 560 History and Systems of Psychology. 3 hrs.**  
Overview of Psychology from historical perspective. (REC: 12 hours of psychology or equivalent)
- 580-583 Special Topics. 1-4; 1-4; 1-4; 1-4 hours.**
- 600 Teaching of Psychology. 3 hrs.**  
A course designed to train psychology graduate students to teach a course in introductory psychology. (PR: Graduate status in Psychology and a minimum of 9 hours Psychology Graduate credit)
- 605 Ethical, Legal, and Professional Issues in Psychology.**  
Introduction to ethical standards and issues, laws which influence psychological practice, and current challenges facing psychology as a profession.
- 608 Differential Diagnosis and Treatment Planning. 3 hrs.**  
A course using the instruments and techniques of psychological clinical assessment to explore psychopathology with an emphasis on differential diagnosis and treatment planning. Students will become competent in the use of the diagnostic and statistical manual for classification of mental disorders and will be able to translate linguistic data into the goals and objectives of a treatment plan.
- 610 Assessment of Adults. 3 hrs.**  
Principles and methods of psychological assessment for adults. Key issues in test construction, and training in report writing. (PR: Admission to Clinical Psychology Program; CR: PSY 620)
- 611 Assessment of Children. 3 hrs.**  
Principles and methods of psychological assessment for children. Key issues in test construction, and training in report writing. (PR: PSY 610; CR: PSY 621)
- 615 Advanced Developmental Psychology. 3 hrs.**  
Psychological development from conception with a focus on major developmental principles, issues, and concepts. An introduction to conducting research with developmental topics and experience in applying basic developmental principles to work situations will be provided. (PR: PSY 515 or equivalent with permission of instructor)
- 616 Human Memory and Information Processing. 3 hrs.**  
Theory and research relating to human learning, memory and decision processes. (PR: PSY 323 or equivalent)
- 617 Applied Developmental Psychology. 3 hrs.**  
Application of research in developmental psychology to issues of causes of clinical problems, issues of parenting, and factors to be taken into account in interventions. (PR: Graduate status)
- 618 Psychopharmacology. 1 hrs.**  
Survey of psychotropic drug substances with emphasis on neuropharmacological bases of drug action, current research methods and therapeutic implications. (PR: PSY 533)

- 619 Psychotherapy with Children. 3 hrs.**  
Discussion and analysis of the major theories of psychotherapy with children including psychoanalytic, client-centered, existential, and behavioral theories. Students will be expected to participate in an experiential component.
- 620 Assessment of Adults Practicum. 1 hr.**  
Students will be expected to administer, score, interpret and write reports for a battery of tests used with adults. Must be taken concurrently with PSY 610.
- 621 Assessment of Children Practicum. 1 hr.**  
Students will be expected to administer, score, interpret and write reports for a battery of tests used with children. Must be taken concurrently with PSY 611.
- 623 Experimental Design. 3 hrs.**  
An introduction to the design and interpretation of behavioral research. Emphasis is upon tests of significance and assumptions governing their application. (PR: PSY 517 or equivalent)
- 624 Multivariate Analysis. 3 hrs.**  
Multivariate analysis in behavioral research including multiple regression, analysis of variance, canonical correlation, and principal components and factor analysis. (PR: either PSY 623 or PSY 652)
- 627 Social Psychological Bases of Groups. 3 hrs.**  
Examination of the dynamics of groups such as size, cohesion, leadership, norms and communication channels and their effects on the individual members; consideration of the impact of groups on the larger social structure.
- 630 Adult Diagnosis and Therapy. 3 hrs.**  
Current diagnostic criteria for adult psychopathology, including prevalence, epidemiology and socio-cultural milieu; in-depth presentation of psychotherapy with adults, including psychodynamic, gestalt, crisis and other modalities. (PR: PSY 533 or equivalent, or permission)
- 633 Individual Psychotherapy and Interviewing. 3 hrs.**  
An introduction to the basic skills and techniques used in treating various forms of psychopathology. (PR: PSY 533 and consent of instructor)
- 634 Group Therapy. 3 hrs.**  
Different types of group psychotherapy as appropriate for various forms of psychopathology. (PR: Consent of instructor)
- 635 Child and Family Diagnosis and Therapy. 3 hrs.**  
This course covers psychopathology, diagnosis and treatment of the major child and family disorders including childhood anxiety, depression, delinquency, parent-adolescent conflict, eating disorders, and others. (PR: PSY 533 or equivalent, or permission)
- 650 Seminar in Performance Appraisal. 3 hrs.**  
The course will offer students a research-based investigation of the performance evaluation process within work organizations. Emphasis is given to human rater x ratee x appraisal system features interactions (PR: Graduate standing in Psychology; or permission of the instructor)
- 651 Advanced Nonparametric Statistics. 3 hrs.**  
An advanced survey of distribution-free statistical methods; dichotomous observations, one-sample tests, two sample tests for both independent and dependent observations, k-sample tests for both independent and dependent observations, ordinal correlational techniques, and relational measures. This course emphasizes both the theoretical constructs of distribution-free statistics and their application. Computer application of these techniques is stressed. (PR: PSY 517)
- 652 Advanced Regression Techniques. 3 hrs.**  
Survey course of the theoretical development and application of multiple regression, advanced univariate correlational techniques, covariant analysis, and an introductory factor analysis. The course emphasis is on the application of these techniques to research and data analysis within the student's professional setting. Students will be expected to design and solve problems using computer-based models. (PR: PSY 517)
- 654 Single Subject Analysis. 3 hrs.**  
Statistical analysis of small group designs as might be found in clinical and field situations. Emphasis will be on time series analysis and computer simulation of single subject and small group behaviors. (PR: PSY 517)
- 656-657 Research in Psychology. 1-3; 1-3 hrs.**  
A laboratory course designed to give advanced students experience in all aspects of conducting psychological research. (PR: Permission of instructor)
- 670-671 Clinical Practicum. 1-3; 1-3 hrs.**  
Supervised application of principles of therapy and evaluation in a clinical setting. CR/NR grading. (PR: PSY 611, 633 and consent of instructor)

- 672 Cognitive Psychology. 3 hrs.**  
Theory and research findings in the process of learning/memory, attention, problem solving, decision making, concept formation and perception. Emphasis will be on the perceptual aspects of cognitive processes as they apply to psychological practices.
- 674 Biological Bases of Behavior. 3 hrs.**  
A course designed to provide an understanding of the psychophysiological functions of the human organism as an operating entity in the environment. The areas to be covered include the basic characteristics of the nervous system and the internal physiological and biochemical environment; various models of genetic aberrations, stress, drugs and other physiological anatomical factors and their observed effects on behavior. Data will be drawn from experimental work on both human and inhuman organisms. Both theoretical and applied aspects will be considered. (PR: 6 credit hours in biology or psychology)
- 675-679 Practicum in Teaching of Psychology. 1-3 hrs. CR/NC.**  
Supervised teaching experience in introductory psychology, including development of lectures, classroom demonstrations, quizzes, tests, extra-credit activities and syllabi.
- 679 Testing in Industrial/Organizational Psychology. 3 hrs.**  
An in-depth study of psychological and educational test theory and application. Emphasis is on classical test theory, constructs, and validation, including sources of variance in test scores and prediction of individual performance. Students will be expected to design, construct, and establish reliability and validity on a test as a class project.
- 680 Clinical Internship. 1-6 hrs. CR/NC.**  
Placement in an approved mental health setting for minimum of 400 hours. Supervised by on-site personnel in addition to psychology faculty. CR/NC grading. (PR: completion of required clinical practicum sequence)
- 681 Thesis. 1-6 hrs. CR/NC.**
- 683 Internship in Industrial-Organizational Psychology. 3 hrs. CR/NC.**  
This course will offer students applied observational/research experience in Personnel/Human Resource Departments under the supervision of professionals within the fields of Industrial-Organizational Psychology and Human Resources. CR/NC grading. (PR: Advanced standing and admission into the I/O degree program)
- 685-686 Independent Study. 3 hrs.**
- 690-695 Seminar. 1-3; 1-3; 1-3; 1-3; 1-3; 1-3 hrs.**  
Reports on current problems and literature in psychology and related fields; professional ethics. (PR: consent of instructor)
- 710 Advanced Psychological Assessment. 3 hrs.**  
This course will offer coverage in advanced topics in psychological assessment. This topics will include geriatric assessment, assessment of addictions, neuropsychological screening, forensic assessment, and cross-cultural assessment issues. (PR: Admission to Psy.D. program or permission of instructor)
- 712 Geropsychology. 3 hrs.**  
An examination of normal and abnormal processes of aging, including common social, cognitive, health and psychopathological problems, will be studied. Issues of community resources, assessment, and therapy will be discussed. (PR: Admission to Psy.D. program or permission of instructor)
- 723 Clinical Research Methods in Psychology. 3 hrs.**  
This course will provide an overview in basic research methods and ethical issues prevalent in the field of clinical psychology. Use of research to document clinical outcomes will also be addressed.
- 731 Psychodynamic Therapy. 2 hrs.**  
This course presents an overview of the theory underlying psychodynamic and insight-oriented psychotherapies, with an emphasis on brief/short-term interventions. Current empirical evaluation of insight therapy is covered. (PR: Admission to Psy.D. program or permission of instructor)
- 732 Behavior Therapy. 2 hrs.**  
The course covers the methods of behavior therapy, including its use in treatment of common disorders such as depression, anxiety disorders, child conduct problems, and chronic illnesses such as schizophrenia. (PR: Admission to Psy.D. program or permission of instructor)
- 733 Cognitive Psychotherapy. 2 hrs.**  
Introduction to the literature on and profession applications of cognitive approaches to psychotherapy. Readings, case discussions, demonstrations, and seminar interactions will be used throughout. (PR: Admission to Psy.D. program or permission of instructor)
- 750 Behavioral Health. 2 hrs.**  
This course will provide an overview of common medical problems, and their related psychological issues. Adjustment issues, health behavior, family impacts, and medical compliance will also be discussed. (PR: Admission to Psy.D. program or permission of instructor)

- 752 Community Psychology. 3 hrs.**  
This course presents an overview of the philosophy, issues, methods, and interventions of community psychology practice. Students will complete field projects as part of the experience. (PR: Admission to Psy.D. program or permission of instructor)
- 755 Rural Psychology. 3 hrs.**  
This course prepares students to undertake supervised practice in rural areas, including employment of appropriate research techniques and the design of culturally and economically effective interventions. (PR: Admission to Psy.D. program or permission of instructor)
- 764 Advanced Studies in Human Sexuality. 3 hrs.**  
An examination of the knowledge and theory which explain important areas of sexual behavior. Topics emphasize sexual orientation, sexual dysfunctions, gender identity, paraphilias, and compulsive and coercive behaviors. (PR: Admission to Psy.D. program or permission of instructor)
- 770-71 Advanced Practicum in Clinical Psychology. 3 hrs.**  
Students provide supervised clinical services at an approved field site.
- 790-96 Seminar in Clinical Psychology. 1 hr.**  
Seminars on current topics and issues of interest to clinical psychologists. Topics will change for each semester. Psy.D. program students are required to enroll for six semesters of seminars; check with advisor for details.
- 799**  
Doctoral research project under the supervision of research committee and chair. (PR: Permission of program coordinator)

### QUALITY ASSURANCE (QA)

- 635 Quality Control. 3 hrs.**  
Application of statistical methods to quality control: process control charts and acceptance sampling plans by variables and by attributes. Process improvement techniques.
- 636 Reliability Estimation and Analysis. 3 hrs.**  
Failure models and distributions, graphical methods of goodness-of-fit and parameter estimation, reliability measures for components and systems, fault trees, accelerated life testing, and censoring mechanisms.
- 650-653 Special Topics. 1-4 hrs.**  
Special topics in quality assurance. (PR: Consent)
- 676 Quality Assurance. 3 hrs.**  
Provides a technical overview of quality assurance and managerial implications. Management of total quality systems will be stressed. Concepts from statistical process control will be introduced. Quality costs and audits.

### RELIGIOUS STUDIES (RST)

- 519 Religious Thought in the Western World. 3 hrs.**  
An analysis of the major schools of religious thought as they have developed in the West.
- 550 Sociology of Religion. 3 hrs.**  
An investigation into the nature of religion as a social phenomenon.
- 580-583 Special Topics. 1-4; 1-4 hrs.**
- 585-588 Independent Study. 1-4 hrs.**
- 599 Humanities Seminar. 3 hrs.**

### SAFETY TECHNOLOGY (SFT)

- 500 Traffic Law Enforcement. 3 hrs.**  
A course designed to study and evaluate the varied and complex system of laws governing the control of all forms of human traffic law and enforcement on present and future societies.
- 505 Introduction to Occupational Safety and Health. CR/NC. 1 hr.**  
Introduces students to the basic principles and emerging trends in the safety and health discipline. (All students [except safety majors] will be required to enroll.)
- 510 Problems and Practices in Traffic Safety and Driver Education. 3 hrs.**  
A survey course for supervisors of traffic accident prevention programs. Examines and evaluates problems, attitudes, activities, and administrative practices in school, city, and state traffic safety programs. Supplements basic teacher training courses in driver education. (PR: SFT 235 and 385)
- 536 Safety Education for Elementary Teachers. 1 hr.**  
Survey of accident prevention methods in the elementary school environment, with emphasis on elementary school safety curriculum, laws, personal protection and resources for elementary school teachers.

- 540 Industrial Fire Protection. 3 hr.**  
An introductory course that explores the relationship between engineering and fire prevention. Topics include: water supplies, sprinkler systems, behavior of fire and materials, fire protection, fire extinguishers, and other systems.
- 550 Traffic Engineering. 3 hrs.**  
Concerned with traffic and pedestrian flow, channelization, light coordination, intersection control, and devices as related to safe, convenient, and economical transportation of persons and goods.
- 553 International Safety and Health. 3 hrs.**  
The course covers the impact of globalization on worldwide safety and health programs, and a wide variety of safety and health programs for various countries and multi-national organizations.
- 554 Industrial Hygiene I. 3 hrs.**  
Environmental protection as related to industrial settings. Air/water quality, noise and chemical pollution and hazardous material control.
- 554L Industrial Environmental Auditing/Programming. 2 hrs.**  
Concerns development of an industrial environmental protection program for a small plant, including workplace experience in sampling/measurement of contaminants. (PR: SFT 454, or 554 or 647)
- 557 Biological Monitoring. 3 hrs.**  
The course covers the rationale for a biological monitoring program. Toxicokinetics, hazard potentials, and mechanism for exposure measurements are also covered. (PR: SFT 554)
- 558 Hospital Safety. 3 hrs.**  
The course covers the various aspects of safety and health in professional health care services.
- 560 Fundamentals of Ergonomics. 3 hrs.**  
Introduction to ergonomics with discussion of ergonomic issues in relevant office, industrial, and service work. Emphasis on anticipation, recognition, evaluation, and control of ergonomic stressors.
- 565 Accident Investigation/Reconstruction. 3 hrs.**  
An introductory course in accident investigation designed to give insight into the recognition and collection of evidence, collection and recording data and reconstructing the accident based on the facts.
- 575 System Safety Engineering. 3 hrs.**  
A study of the analytical tools used in the recognition, evaluation and control of exposure to hazards in industry. (PR: MTH 120 or higher)
- 580-583 Special Topics. 1-4 hrs.**  
Occasional offerings of current topics in safety, providing important supplementary material for participating students.
- 585-588 Independent Study. 1-4 hrs.**  
An approved study of special interest that is appropriate for the student's program of study concerning safety. Carried out under the supervision of a faculty member. (PR: Permission)
- 589 Process Safety Management. 3 hrs.**  
A study of the latest industrial safety information which will assist the student in designing a program to reduce or eliminate all incidents which downgrade the system. (PR: SFT 565)
- 591-594 Workshop. 1-4 hrs.**
- 597 Occupational Safety and Health Programs. 3 hrs.**  
Safety functions in industry. Principles of organization and application of safety programs. Prevention, correction, and control methods are outlined and evaluated.
- 599 Occupational Safety Program Management. 3 hrs.**  
A study of safety programs at the state and local levels including the administrative, instructional, and protective aspects of a comprehensive safety program in schools, occupations, home and public.
- 600 Occupational Epidemiology. 3 hrs.**  
Study of epidemiological methods to assess the patterns and determinants of health and disease in populations.
- 601 Safety in Transportation. 3 hrs.**  
Concerned with safe, efficient movement of people and goods. Involves highway, air, water, pipeline, and rails.
- 606 Field Experience for the Safety Specialist. 3 hrs.**  
Concerned with the visitation and evaluation of the safety program of various agencies in the region.
- 610 Philosophical and Psychological Concepts of Occupational Safety and Health. 3 hrs.** An analysis of the educational philosophies and the application of these philosophies to occupational safety. A study of the effect of occupational safety on modern living.
- 630 Current Literature and Research in Occupational Safety and Health. 3 hrs.** An analysis and study of selected works of national and international authors concerning significant works in Occupational Safety.

- 645 Safety Engineering and Equipment Design. 3 hrs.**  
The design and engineering of facilities and equipment to meet the physical needs of the human as well as enhancing production.
- 647 Industrial Hygiene II. 3 hrs.**  
Concerned with environmental health and safety hazards that arise out of or occur during work of employees.
- 647L Quantitative Industrial Hygiene Lab. 3 hrs.**  
A laboratory course designed to complement Industrial Hygiene. (CR: SFT 647)
- 648 Industrial Ventilation. 3 hrs.**  
The course will cover the techniques of development, design, maintenance, and trouble shooting of industrial ventilation systems. Also the types of ventilation systems used for different types of toxic materials. (PR: SFT 647 or SFT 554 or permission)
- 649 Physical and Biological Hazards. 3 hrs.**  
The course will cover sources of biological and physical hazards for various industries and occupations. Hazard controls and preventive techniques will also be covered.
- 650 Internship for the Safety Specialist. 3-12 hrs. CR/NC.**  
Supervised experience on the job site. Involves the student working under safety personnel and analyzing and writing of experiences. (Permission)
- 651 Industrial Toxicology. 3 hrs.**  
The course will emphasize the principles of toxicology, dose-response relationships, xenotoxins, the distribution of toxins, and the storage of toxins. (PR: SFT 554 or SFT 647)
- 652 Industrial Noise and Vibration. 3 hrs.**  
A study of the physical characteristics of noise and vibration, and its effects on the human body. (PR: SFT 554 or SFT 647)
- 660 Human Factors in Accident Prevention. 3 hrs.**  
A study of the psychological principles and their applications to accident causation and prevention.
- 661 Advanced Occupational Ergonomics. 3 hrs.**  
The study and application of occupational ergonomics to the design and evaluation of various work environments. (PR: SFT 660)
- 662 Methods in Work Analysis. 3 hrs.**  
To study, utilize, and critique several existing ergonomic analysis methods for specific intended purpose, and provide directions for new methodologies. (PR: SFT 660)
- 663 Work Environment Issues. 3 hrs.**  
An examination of the aspects of the work environment that can affect health: time pressure, machine pacing, control, etc. The recognition, measurement, and control of these factors will be discussed.
- 669 Traffic Safety Management. 3 hrs.**  
Concerned with the total Traffic Safety Management Program, including vehicle registration, driver licensing, motorcycle driver education, and motor vehicle registration.
- 679 Problem Report. 1-3 hrs. (Permission)**
- 681 Thesis. 1-6 hrs.**
- 690-692 Seminar. 1-4 hrs.**

### **SCHOOL PSYCHOLOGY (SPSY)**

- 601 Professional Competence I: Schools. 3 hrs.**  
Introduction to the roles and functions of school pupil personnel professionals, models of operation, problems, issues, and techniques. The organization and administration of school systems and philosophy of education are considered. Students may be expected to spend a minimum of one-half day a week observing in a local school.
- 603 Professional Competence II: Professional School Psychology. 3 hrs.**  
Examination of current professional issues, theoretical model and research related to delivery of school-based psychological services. Examination of the variety of methodologies and strategies for children of diverse backgrounds and exceptionalities. (PR: SPSY 601 or concurrently with 601).
- 606 Adolescent Substance Abuse. 3 hrs.**  
Substance abuse is a pervasive problem within our society. Mental health professionals and educators require knowledge and skills in adolescent substance abuse prevention, intervention, and treatment to address this problem.
- 616 Typical and Atypical Child Development. 3 hrs.**  
Psychological development from conception with a focus on major developmental principles, issues, and concepts. An introduction to conducting research with developmental topics and experience in applying basic developmental principles to work situations will be provided.

- 617 Indirect Service Delivery I: School Consultation. 3 hrs.**  
This course is an introduction to the theory and practice of consultation and will prepare students to serve as consultants within public schools.
- 618 Direct Service Delivery I: Instruction Methods and Behavior Modification. 3 hrs.**  
This course teaches the application of behavior modification principles to the classroom setting as well as the modification of instruction to meet the needs of atypical learners.
- 619 Direct Service Delivery I: Individual and Group Counseling. 3 hrs.**  
This course is a direct interventions course focusing on individual and group therapy for children. (PR: SPSY 616 or PSY 615)
- 620 Indirect Service Delivery II: Primary Prevention. 3 hrs.**  
This course is an introduction to the science and practice of primary prevention.
- 621 Data-Based Decision Making I. 3 hrs.**  
This course is a beginning problem-solving course designed to provide students with a variety of assessment methods they can use to start constructing their professional "tool kits."
- 622 Data-Based Decision Making II. 3 hrs.**  
This course is an intermediate problem-solving course designed to provide students with a variety of assessment measures to add to their professional "tool kits."
- 624 Data-Based Decision Making III. 3 hrs.**  
This course is an advanced problem-solving course designed to provide students with a variety of assessment methods to add to their professional "tool kits."
- 675 Survey of Psychological Foundations of School Psychology. 3 hrs.**  
PSY 675 is a reading and writing-intensive course that presents information on the psychological foundations of school psychology.
- 700 Special Topics. 1-6 hrs.**  
Courses in specialized areas of school psychology on issues in the practice of school psychology.
- 738 School Psychology Practicum I. 2 hrs. CR/NC.**  
The initial practicum in school psychology is designed to provide a structured, experiential link between early coursework and practical experience.
- 738 School Psychology Practicum II. 2 hrs. CR/NC.**  
The second practicum in school psychology is designed to provide a structured, experiential link between intermediate coursework and practical experience.
- 740 School Psychology Practicum III. 3 hrs. CR/NC.**  
Assessment behavior management and consultation experiences in a school setting, supervised by a certified school psychologist for 2 days per week. (PR: SPSY 734 or concurrent).
- 745 Internship in School Psychology. 1-12 hrs. CR/NC.**  
Students may apply for permission to enroll for this course with the Coordinator of Field-Based Experiences. Students must request internship from the program faculty at least one semester in advance of their starting dates. This requires full-time experience for one school year or one half-time experience for two consecutive school years (minimum of 1200 clock hours). Each 1 hour credit requires 100 clock hours. The internship in School Psychology requires a contractual agreement between the school system, the university, and the student that outlines the responsibilities of each party. Students will be expected to assume the roles and responsibilities of functioning school psychologists in a school. (PR: SPSY 740)
- 750 Ed.S. Thesis Research. 3 hrs.**  
Development and defense of a research proposal examining a specific hypothesis in School Psychology. Analysis of data, written presentation in thesis form, and public defense are required. (PR: 3 credit hours of 600-level statistics and approved prospectus)

## SOCIOLOGY (SOC)

- 501 Population and Human Ecology. 3 hrs.**  
The course focuses on population and its relation to characteristics of environment. Specifically, it is designed to discuss the interaction of population processes and resources.
- 503 Social Research II. 3 hrs.**  
Intermediate social research methodology with emphasis on research design. 2 lec-2 lab. (Required of all M.A. candidates). (PR: SOC 344, 345 or equivalent)
- 508 The Family. 3 hrs.**  
Theoretical analysis of the family as a primary social institution. (PR: SOC 200 or permission)
- 513 Social Movements and Social Change. 3 hrs.**  
Analysis of large-scale social change, including intentional social movements and revolutions. (PR: SOC 200)

- 520 Criminology. 3 hrs.**  
An overview of sociological criminology, including an examination of explanations of criminal behavior, types of criminal activity, and an analysis of the criminal justice system. (PR: SOC 200 and SOC 311 or permission)
- 521 Sociological Theory. 3 hrs.**  
Examination of the emergence and development of theoretical orientations in Sociology. (PR: SOC 200)
- 523 Social Class, Power and Conflict. 3 hrs.**  
Theoretical analysis of economic and political inequality and the role of social conflict in the process of large-scale social organization. (PR: SOC 200)
- 525 Race and Ethnicity. 3 hrs.**  
Diverse theoretical approaches to the meaning of race and ethnicity and the character of racial/ethnic relations, with substantive focus primarily on the U.S. (PR: SOC 200)
- 528 Medical Sociology. 3 hrs.**  
Social organization of modern medicine and allied health delivery systems. (PR: SOC 200 or departmental permission)
- 532 Sociology of Appalachia. 3 hrs.**  
Study of the economics, politics, and social relations of Appalachia, including contemporary debates. (PR: SOC 200)
- 533 Industrial Sociology. 3 hrs.**  
Study of the organization and structure of the workplant as a social system; the meaning and organization of work; managerial functions; management-labor relations; and human relations in industry. (PR: SOC 200 or permission)
- 535 Juvenile Delinquency. 3 hrs.**  
A sociological analysis of juvenile crime, including a review of the origins of juvenile delinquency, an evaluation of causal theories, and an overview of the juvenile justice system. (PR: SOC 200 and SOC 311 or permission)
- 540 Introduction to the Sociology of Aging. 3 hrs.**  
An introduction to the social processes and consequences of growing older for both the individual and society. (PR: SOC 200 )
- 542 Urban Sociology. 3 hrs.**  
The sociology of urban and metropolitan communities. (PR: SOC 200 or permission)
- 543 Evaluation Research. 3 hrs.**  
Analysis and application of theories and methods for assessing the outcomes of applied organizational services and programs to affect change in people and for social conditions. (PR: SOC 200)
- 545 Social Statistics II. 3 hrs.**  
Intermediate level statistical analysis, including analysis of variance and covariance. 2 lec-2 lab. (Required of all M.A. candidates). (PR: SOC 345 or equivalent)
- 550 Sociology of Religion. 3 hrs.**  
An investigation into the nature of religion as a social phenomenon. (PR: SOC 200 or permission)
- 552 Sociology of Death & Dying. 3 hrs.**  
The study of death and dying as a societal and cultural phenomenon. Explores how institutions within our society deal with death. (PR: SOC 200 or permission)
- 555 Sociology of Sex and Gender. 3 hrs.**  
Analysis of social differentiation and inequality by gender, with a focus on the contemporary U.S. (PR: SOC 200)
- 564 Complex Organizations. 3 hrs.**  
Analysis of complex organizations with special attention given to bureaucratic organization. (PR: SOC 200)
- 570-571 Sociological Field Experience. 3; 3 hrs.**  
Supervised field work in a social organization or community working on practical problems. (PR: SOC 406 or 506 or permission)
- 580-583 Special Topics. 1-4; 1-4; 1-4; 1-4 hrs.**  
Study of topics not covered in regularly scheduled courses. (PR: Graduate majors, SOC 200 or permission)
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**  
Individual study of topics not offered in regularly scheduled courses. (PR: For majors only; advance departmental permission is required)
- 597-598 Instructional Television Course. 1-4 hrs.**  
A course based upon Instructional Television Series broadcast by public television. The student is responsible for viewing the series on the air and satisfying all course requirements announced by the department.

- 601 Advanced Sociological Theory. 3 hrs.**  
Examination of current issues and controversies in Sociological theory. (PR: SOC 421 or SOC 521)
- 602 Contemporary Social Change. 3 hrs.**  
Theories of social change and their uses in analyzing social change of today. (PR: SOC 200 or permission)
- 603-604 Behavioral Science I and II. 3; 3 hrs.**  
Seminar in behavioral science theory. (PR: SOC 200 or permission)
- 615 Applied Demography. 3 hrs.**  
The focus of this course is to study the application of the principles and methods of demography to decision making and planning problems in both public and private setting. (PR: SOC 200 or permission)
- 620 Criminology. 3 hrs.**  
Seminar in crime and delinquency. (PR: SOC 200 or permission)
- 640 Problems and Prospects for an Aging Society. 3 hrs.**  
Seminar in current and anticipated social consequences of aging for individuals and society and societal responses to this process. (PR: SOC 200 or permission)
- 655 Feminist Social Theory. 3 hrs.**  
Diverse theoretical perspectives on the origins and nature of gender, inequality. Emphasis on contemporary debates and their political implications. (PR: SOC 200 or permission)
- 668 Seminar. 1-3 hrs.**  
Topics vary from semester to semester. (PR: SOC 200 or permission)
- 679 Problem Report. 1-3 hrs.**  
The preparation of a written report on a research problem or field study in sociology under direction of member of graduate faculty. (PR: Departmental permission)
- 681 Thesis. 1-6 hrs. I, II, S.**  
Individual research in a selected field of sociology under the direction of a graduate faculty member of the department. (PR: Admission to candidacy and staff approval of thesis proposal.)

### SPANISH (SPN)

- 505 Pedagogy and Instructional Experience in the Middle School. 3 hrs.**  
Students plan and deliver beginning Spanish instruction to middle school students.
- 506 Composition, Conversation, and Introduction to Hispanic Literature. 3 hrs.**  
Continuing supervision of students' teaching experiences. Continued attention to advanced grammar concepts, composition and conversation, and reading proficiency with an emphasis on the introduction of Hispanic literature.
- 510 Spanish Literature from the Cid Through the 17th Century. 3 hrs.**  
On demand. Readings, lectures, reports and discussions of significant literary works from the Cid through the 17th century. (PR: 6 hours of literature numbered 318 or above or equivalent)
- 560 The Modernist Movement. 3 hrs. S.**  
The precursors of the Modernist Movement, its chief exponents, and its influence on the literature of Spanish America and Spain. Readings, lectures, discussions, and reports in Spanish. (PR: 6 hours of literature numbered 318 or above or equivalent)
- 561 Advanced Syntax and Stylistics. 3 hrs. S.**  
A detailed analysis of Spanish syntax and shades of meaning with the writing of original compositions in Spanish to perfect the student's own style. (PR: SPN 204 or equivalent)
- 580-583 Special Topics. 1-4; 1-4; 1-4; 1-4 hrs.**
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**  
Independent research in selected areas of Spanish and Spanish American literature that are not available in other courses in the catalog. The student has the opportunity to become familiar with leading authorities and bibliographies. Conferences and reports in Spanish. (PR: 6 hours of literature numbered 318 or above or equivalent and permission of instructor)
- 610 Readings in Spanish or Spanish American Literature. 1-3 hrs.**  
Readings designed for the graduate student who has the interest and the ability to study in depth a certain author, genre, or literary movement. (PR: 6 hours of literature numbered 318 or above or equivalent and permission of instructor)
- 612 Spanish-American Romanticism. 3 hrs.**  
Leading writers and trends in thought and versification of the romantic period. (PR: 6 hours of literature numbered 318 or above or equivalent)
- 620 Spanish Romanticism. 3 hrs.**  
The trends and characteristics of the romantic period in the writings of its leading exponents in lyric poetry, non-dramatic prose, and the theatre. (PR: 6 hours of literature numbered 318 or above or equivalent)

- 625 Spanish Literature of the Twentieth Century. 3 hrs.**  
Emphasis on prose, poetry and the theatre since 1936, including writers in exile. (PR: 6 hours of literature numbered 318 or above or equivalent)
- 679 Problem Report. 1-3 hrs. (PR: Permission)**
- 681 Thesis. 1-6 hrs. (PR: Permission)**

**SPECIAL EDUCATION**  
(See Curriculum and Instruction)

**SPEECH**  
(See Communication Studies)

**SPEECH PATHOLOGY**  
(See Communication Disorders)

**TECHNOLOGY AND ENGINEERING (TE)**

- 580-83 Special Topics. 1-4 hrs.**  
Occasional offerings of current topics in technology and engineering, providing important supplementary material for participating students.
- 585-88 Independent Study. 1-4 hrs.**  
An approved study of special interest concerning technology and engineering that is appropriate for the student's program of study. Carried out under the supervision of a faculty member.
- 650-53 Special Topics. 1-4 hrs.**  
Occasional offerings of current topics in technology and engineering, providing important supplementary material for participating students.
- 685-88 Independent Study. 1-4 hrs.**  
An approved study of special interest concerning technology and engineering that is appropriate for the student's program of study. Carried out under the supervision of a faculty member.
- 698 Comprehensive Project Formulation. 3 hrs. S/U.**  
Comprehensive project proposal is developed and approved, and work begun under supervision. Technical report writing, oral presentations, and communication skills. (PR: EM 660 and have completed min. 18 hours toward degree)
- 699 Comprehensive Project. 3 hrs. S/U.**  
Completion of comprehensive project under the supervision of a faculty member. Includes final written submittal and public oral presentation. (PR: TE 698 and have completed minimum 27 hours toward degree)

**TECHNOLOGY MANAGEMENT (TM)**

- 600 Program Introduction Seminar. 1 hr.**  
This course reviews fundamental mathematical and statistical methods, presentations, report writing, group project skills, and use of case studies. An orientation and overview to the degree program are also provided. (PR: Full Admission to TM program, or permission of TM Program Director)
- 610 Technology and Innovation Management. 3 hrs.**  
Provides a comprehensive introduction to technology and innovation management. Considers issues relating to international markets, innovation, and rapidly changing technology. Also covers effective organizational and managerial approach to technology. (PR: Full Admission to TM program, or permission of TM Program Director)
- 612 Economic and Financial Analysis for Technology Management. 3 hrs.**  
Tools and techniques for financial analysis, cost estimation, budgeting, and control, for technology-oriented projects and organizations. Includes financial statements, economic analysis, reporting, and life-cycle costing and control principles. (PR: TM 610 or permission of Program Director)
- 615 Information Technology Strategies. 3 hrs.**  
This course provides sound principles for managing information technology-computers and telecommunication systems - as well as the processes and procedures for applying the principles. (PR: TM 610 or permission of Program Director)
- 620 Technology Planning. 3 hrs.**  
Methods of technology planning, strategic management, and forecasting for use in technology intensive organizations are discussed, including technology life cycles and strategies for commercializing products. (PR: TM 610 or permission of Program Director)

- 630 Quality and Productivity Methods. 3 hrs.**  
Study of quality and productivity improvement methods with emphasis on applications to knowledge worker organizations. Examines total quality management, and personal and organizational productivity improvement processes. (PR: TM 610 or permission of Program Director)
- 640 Intelligent Transportation Systems. 3 hrs.**  
Overview of transportation telemetrics and introduction to intelligent transportation systems. Communications and computing technologies in transportation. Overview of issues: traffic safety, public transportation.
- 650-653 Special Topics. 1-4 hrs.**  
Occasional offerings of current topics in technology management, providing important supplementary material for participating students. (PR: Full Admission to TM program or permission of TM Program Director)
- 660 Computing and Information Systems Technologies. 3 hrs.**  
Provides a broad understanding of computing and information systems technologies with emphasis on development, current trends, strategic and tactical management, and legal and regulatory issues. (PR: TM 615 or permission of Program Director)
- 685-688 Independent Study. 1-4 hrs.**  
An approved study of special interest concerning technology management, under the supervision of a faculty member. (PR: Full Admission to TM program, or permission of TM Program Director)

### THEATRE (THE)

- 510 Playwriting. 3 hrs.**  
Study of dramatic structure, characterization, dialogue, themes, sounds, and spectacle, including the writing of one-act plays. (PR: THE 101 or permission of instructor.)
- 520 Acting for the Musical Theatre. 3 hrs.**  
Analysis of musical scripts; study of spoken and musical scenes; staging musical numbers; and preparation of audition material. (PR: THE 222)
- 521 Acting for the Camera. 3 hrs.**  
Projects in acting for the camera. Video taping of selected acting exercises. (PR: THE 222)
- 523 Stanislavsky System of Acting. 3 hrs.**  
Study of the Stanislavsky System of Acting and using it in preparing and performing excerpts from plays.
- 536 Children's Theatre. 3 hrs.**  
Theory, direction, and staging of plays for children.
- 537 Directing I. 3 hrs.**  
Introduction to theories, principles, techniques, and history of directing. (PR: THE 150, 151, 152, and 222)
- 538 Directing II. 3 hrs.**  
In-depth study of directorial approaches. Analysis of contemporary movements and leaders in the field. Students must stage productions as part of class requirement. (PR: THE 537 or permission of instructor)
- 539 Directing for the Camera. 3 hrs.**  
Projects in directing for the camera. Video taping of selected directing exercises. (PR: THE 437/537 or permission of instructor)
- 540 Theatre History to 1660. 3 hrs.**  
Survey of man's activities in the theatre from primitive times to 1660. (PR: THE 101 or permission of instructor)
- 541 Theatre History since 1660. 3 hrs.**  
Survey of man's activities in the theatre from 1660 to the present. (PR: THE 101 or permission of instructor)
- 550 Stage Lighting III. 3 hrs.**  
Advanced study in the aesthetic principles of lighting design. Emphasis on design principles in non-proscenium theatres. (PR: THE 350)
- 560 Scene Design II. 3 hrs.**  
Advanced work in the process and styles of design for the stage. Emphasis on abstraction, different materials, and designing for various theatre forms. (PR: THE 261, 360)
- 580-583 Special Topics in Theatre. 1-4; 1-4; 1-4; 1-4 hrs.**  
Program of study not normally covered in other courses. Topics vary from semester to semester. (PR: Permission of chairman)
- 585-588 Independent Study. 1-4; 1-4; 1-4; 1-4 hrs.**  
Courses taught by tutorials; directed independent readings or research; problem reports, and other activities designed to fill the needs of individual students. (PR: Permission of chair)