

of Oak Ridge Associated Universities. A final written report is required. *Prereq/Coreq: CHEM 352.*

**460 (660) Advanced Synthesis** (3) Laboratory course in the application of modern experimental techniques to the synthesis and characterization of organic and inorganic compounds. One lecture hour and two labs. *Prereq: CHEM 320 and 342.*

**480 Special Topics** (1-3) The courses will consist of intensive lectures and/or laboratory work on special topics in chemistry. Course may be repeated with total credits not to exceed three hours. Topics and prerequisites will be announced.

**490 Research in Chemistry** (3) Research to be directed by a staff member assigned by the department chairman and to be on a subject of interest to the student as well as to staff members. Open only to well qualified juniors and seniors. May not be substituted for any of the specific course requirements of the chemistry major.

**700 Directed Studies in Chemistry** (3) Survey of chemical principles including their applications to the development of experimental activities for elementary school students.

**710 Selected Topics in Chemistry** (1-3) Topics to be announced.

## Child and Family Studies (CFS)

**100 Lifespan Human Development** (3) Study of human needs and developmental processes across the lifecycle. Examination of individual and family well-being using a systems perspective. (Same as WMST 100)

**211 Child Growth and Development** (3) Growth and development of children from birth to adolescence in the context of family life. Includes laboratory observations.

**303 Family Relationships** (3) Factors affecting relationships within families throughout the life cycle. Focus on current lifestyles, changing family forms, cultural diversity, and theoretical perspectives. (Same as WMST 303)

### **311 Developmentally Appropriate Activities**

(3) Planning, implementing, and evaluating activities for selected developmental stages in the human life cycle. Emphasis on physical, cognitive, social, emotional, and creative activities for young children.

### **312 Parenting Fathers, Mothers, and Children**

(3) Parent-child relationships. Emphasis on the uniqueness of parent-child relations at different stages of the life cycle, implications for child guidance, and current issues related to parenthood. *Prereq: CFS 100 or instructor's approval.*

### **313 Child Guidance and Discipline**

(3) Principles of guidance applicable to family and group situations involving children (all ages into adolescent years, with emphasis on early childhood years). Creating a desirable environment conducive to learning and behavioral development of the child as an individual member of the family and society. *Prereq: CFS 100 or instructor's approval.*

**411 Preschool Laboratory Practicum** (4) Student guidance of children in preschool setting under supervision of the program director. Development of teaching techniques, planning, implementation, and evaluation of creative group activities. *Prereq: CFS 100 or CFS 211.*

### **412 Early Childhood Program Administration**

(3) Developmentally appropriate administration and management of programs for young children. *Prereq: CFS 100 or instructor's approval.*

**421 Adult Development** (3) Development from early through late adulthood, using a human systems perspective. *Prereq: CFS 100 and 303 or permission of instructor.*

### **442 (642) Developmental Disabilities in Children**

(3) Etiological factors affecting young children with developmental delays. Cultural, familial, educational, and legal implications. Behavioral characteristics of children observed in early intervention programs. *Prereq: Six hours in child development. (Same as SPED 490/690 when title is the same)*

### **443 (643) Community Care and Curriculum Planning for Developmentally Disabled Preschool Children**

(3) Resources available for community care of children and families, differentiating individual needs, curriculum planning for home and center based intervention, laboratory experience.

*Prereq: Six hours in child development. (Same as SPED 490/690 when title is the same)*

**740 Ecology of Human Development (3)** An examination of human development through the life cycle utilizing an ecological approach.

**742 Administration of Programs for Children (3)** Organization, curriculum development, and implementation of standards, assuring quality care of children.

**744 Theories in Child and Family Studies (3)** Selected theories concerning the development of children and families. Historical views, current research, and applications to family life.

**751 Resources in Family Life Education (3)** Resources useful in developing curriculum content in child and family studies.

**753 Assessment in Child and Family Studies (3)** Applications of measurement techniques and evaluation methodologies to children and families.

**755 Advanced Laboratory Practicum in Child Development (3)** Guidance of children, program development, implementation, and evaluation.

## Communications (COMM)

**100 Survey of Mass Media (3)** A survey of the various fields of mass communications with emphasis on their structure, function, responsibilities, development, and impact on society.

**200 News Writing (3)** The evaluation of news, news gathering methods, discussions and exercises in writing leads, organizing stories, overcoming grammatical and spelling deficiencies, avoiding libel, and writing a variety of news stories. Also includes an overview of writing for public relations and broadcast. Structured primarily for communications majors and minors. This course is a prerequisite to all other journalism courses. *Prereq: Minimum grade of C in ENGL 111 and ability to type.*

**210 Introduction to Journalism (3)** An examination of the nature of news, criteria for determining news, newsroom organization, interviewing, and copy preparation. Instruction and practice in writing news stories, primarily in newspaper style. For non-communications majors only. *Prereq: Minimum grade of C in ENGL 111 and ability to type.*

**220 Voice and Diction (3)** Study of the production of vocal tone and the articulation of vowels, consonants, and diphthongs, with individual attention to developing an awareness and control of one's own voice and language habits. *Prereq: Communications majors/minors or permission of instructor.*

**230 Public Speaking (3)** Study and application of basic communication theory in the preparation and delivery of extemporaneous informative and persuasive speeches and in critical listening. *Prereq: Minimum grade of C in ENGL 111.*

**230H Honors Public Speaking (3)** An introduction to public discourse for students in good standing in Honors Programs. The course will include the intensive study and application of communication theory in the preparation and delivery of extemporaneous informative and persuasive speeches and in critical listening. Limited enrollment. *Prereq: Minimum grade of C in ENGL 111 or 111H.*

**231 Interpersonal Communication (3)** Study and practical application of principles of communication in face-to-face human interactions. General communication, self-awareness, perception, conflict, listening and interviewing. (Same as WMST 231)

**250 Introduction to Broadcasting (3)** Introduction to radio and television fundamentals with laboratory experience in writing, performance and production for broadcast media. Lecture and lab.

**300 News Gathering (3)** Practicing lessons learned in COMM 200 News Writing, producing investigative stories, solving problems in ethics and methods of news coverage, covering meetings of various levels of campus and community government, and discussing/ covering issues and events. *Prereq: COMM 200.*

**305 Copy Editing, Computerized Design and Layout (3)** Instruction and practice in editing copy for the media, including content and style, headline writing, picture editing, and basic principles of layout. *Prereq: COMM 200.*

**310 History of Mass Media (3)** Introduction to the history and development of media from the earliest records of information distribution to the technological opportunities of the 21st century.

**315 Writing for Broadcast Media** (3) Theory and techniques of writing for radio and TV. Emphasis on news, special events, commercials, and promotional material. *Prereq: COMM 200 and 250.*

**320 Writing Features and Editorials** (3) Techniques for writing feature articles for newspapers and magazines. Study of freelance markets and submission of students' articles for publication. Practice in writing editorials and analysis of editorials and editorial pages. *Prereq: COMM 200.*

**322 Desktop Publishing/Presentation Graphics** (3) Basic pre-professional, hands-on experience in desktop publishing and computer-generated presentations. Major emphasis is on desktop publishing, including producing fliers, brochures, newsletters and other publications used by public relations practitioners and persons involved in newspaper and magazine production. Graphics, design and layout considerations are stressed. *Prereq: Communications majors/minors or permission of instructor.*

**323 Communications and the World Wide Web** (3) Study and application of mass communication and media-related topics as related to the World Wide Web and the Internet. Emphasis on web site design and authoring as mass communication and the use of the Internet by broadcasters, journalists, and public relations and marketing communication practitioners.

**324 Introduction to Interactive Multimedia** (3) A merger of personal computer and audio-video production techniques to create interactive multimedia products. Use of computer authoring applications and other resources to create interactive multimedia products for education, entertainment, corporate communications, Internet commerce and other forms of marketing communication.

**325 Principles of Advertising** (3) Examination of advertising principles as they apply to print, broadcast and online media.

**326 Principles of Public Relations** (3) Basic theories and practice in public relations as a communications tool of business, government and non-profit corporations.

**327 Public Relations Techniques** (3) Examination of skills and techniques used in the practice of public relations, with particular attention given to writing for public relations, copy dissemination, media use and media network design. Techniques range across internal and external media, print, electronic and audiovisual media. *Prereq: COMM 326 or permission of instructor.*

**328 Public Relations Research** (3) Study of the process of public relations research for planning and evaluating programs of action, including programs of communication. Included: the role of evaluative research methodologies in public relations management. *Prereq: COMM 326.*

**329 Public Relations Strategy and Implementation** (3) Examination of strategic planning and implementation in public relations administration, with case studies utilized in an effort to place the student in a managerial, decision-making role. *Prereq: COMM 326 and 328.*

**332 Small Group Communication** (3) Study of systematic group communication with practical application through group participation. Communication theory and its application to small groups, small group theory, special discussion techniques and methods, group problem solving and decision making, and parliamentary procedure.

**334 International Public Relations** (3) A study of the dynamics of international public relations, including the infrastructure of international companies and organizations and the management of their global reputations. It also analyzes the barriers involved in global business and processes involved in carrying out crisis and catastrophe communications at an international level. The course provides an opportunity for observation and field study in an international setting through visits to PR firms and organizations in other countries. *Prereq: COMM 326 or permission of instructor.*

**340 Film Appreciation** (3) A study of the development of the motion picture as a business and an art form from its earliest stages to the present. Particular emphasis on the technical, social, and economic factors which have influenced motion picture development. Lecture and lab.

**341 Photojournalism** (3) Introductory and intermediate instruction in black and white photographic techniques, digital darkroom workflow, and caption-writing. Also includes an overview of film development and printing. Photographic assignments will give students experience in reporting with a still camera. Lecture and lab. *Prereq: COMM 200 or permission of instructor.*

**350 Radio Production** (3) Designed to provide advanced study in radio production. Emphasis on production of various types of radio programming, study of radio formats, and advanced production techniques. Lecture and lab. *Prereq: COMM 250 and 315.*

**360 Television Production** (3) An experience-oriented course based on the accepted theory and technique of television production. Emphasis on camera operation, audio, videotape, lighting, artistic design, and special effects. Practical experience in entertainment, public affairs, and sports programming. Lecture and lab. *Prereq: COMM 250 and 315.*

**365 Electronic Field Production** (3) A study of and practical experience in the various aspects of small-format videotape and audio recording and editing procedures. Additionally, a survey of the applications of audio and video field production for commercial, corporate, and noncommercial broadcast industries. Lecture and lab. *Prereq: COMM 315, 350 and 360 or permission of instructor.*

**370 Broadcast News** (3) Writing, reporting, and producing stories and newscasts for radio and television. Intensive field and lab work with electronic news gathering (ENG) cameras and editing equipment (both audio and video). Lecture and lab. *Prereq: COMM 315, 350, and 360 or permission of instructor.*

**381 Practicum in Radio** (1) A lecture/ lab providing supervised experience in radio. May be repeated for a maximum of three hours credit. *Prereq: COMM 350 or permission of instructor.*

**382 Practicum in Television** (1) A lecture/ lab providing supervised experience in television. May be repeated for a maximum of three hours credit. *Prereq: COMM 360 or permission of instructor.*

**383 Practicum in Journalism** (1) A lecture/lab providing practical, supervised experience in editing,

editorial writing, feature writing, newswriting, photojournalism, reporting and sports writing. Pass/Fail. May be repeated for a maximum of 3 hours credit. *Prereq: COMM 200.*

**390 Newspaper Organization and Management** (3) Study of newspaper advertising obligations, budgets, circulation, cost-cutting, equipment, financial and legal questions, production, promotion, public/internal relations, purchasing, and other aspects of newspaper ownership and management. *Prereq: Junior standing or instructor's approval.*

**399 Special Topics in Communications** (3) Intensive treatment of selected topics not found in the regular Communications curriculum. Course content varies from semester to semester. Course may be repeated for credit in different topics. *Prereq: Completion of all Communications Department lower division requirements or consent of instructor.*

**400 Computer Assisted Reporting** (3) In-depth reporting assignments, research and team reporting when appropriate based upon information generated from computer searches using the Internet, Nexus and other search tools. *Prereq: COMM 300 or instructor's permission.*

**410 Advanced Visual Communication** (3) Advanced pre-professional, hands-on experience in Visual Communication. Students will utilize all visual aspects of mass communication media to prepare final projects based upon their interest/goals in the field. The course will be project-related and flexible in that students will work either individually or in teams, where feasible, to prepare advanced publications, such as magazines, newsletters, web pages and other projects related to their interests. Advanced instruction in editing and production for all mass communication media will also be included. *Prereq: COMM 322, 323, 341.*

**419 Broadcast Programming and Audience Measurement** (3) Interpreting quantitative audience research such as Nielsen and Arbitron ratings, syndicated program/analyses and SRDS tables. Students utilize this data to successfully program a fictional broadcast station. Station and Network program strategies, tactics, and program development are discussed. *Prereq: COMM 250.*

**420 Broadcast Management and Sales (3)** A study of the operation and management of radio and television stations and analysis of station management techniques, departmental organization, and personnel practices. An examination of the sales process, the development of presentations, and the role played by sales in broadcast stations. *Prereq:* Junior standing, COMM 350 and COMM360.

**430 Business and Professional Speech (3)** Study and practical application of theories of general communication, interpersonal communication, and public communication in business and professional settings, with emphasis on presentational speaking. *Prereq:* COMM 230.

**460 Broadcast Producing and Directing (3)** Theory and practice related to producing and directing television and radio programming. Emphasis on accepted directing methodology and the producer's role in developing broadcast and corporate programming. Program development from initial concept through the completed program. Lecture and lab. *Prereq:* COMM 315, 350, and 360 or permission of instructor.

**471 Independent Study (3)** In-depth study of advanced communication principles or applied theory chosen by the student and approved by the instructor. *Prereq:* Senior standing.

**475 Internship in Communications (3)** Application of broadcasting and/or journalism skills in a supervised assignment with a broadcast, print, public relations, or corporate communications organization. Student may or may not be paid. *Prereq:* Senior standing and a B average in communications.

**491 (691) Communication Law and Ethics (3)** Examination of the constitutional underpinnings of freedom of expression and the limitations on such freedoms as enunciated by the U.S. Supreme Court. Students will focus particularly on libel, privacy, intellectual property, source protection, information gathering, obscenity, government regulation and the conflict between a free press and a fair trial. Students will also analyze and apply the ethical standards necessary for media integrity and credibility. *Undergraduate Prereq:* Senior standing.

**492 Senior Seminar in Communication Theory (3)** Examination of communication issues, theories, models, and world communications systems through research, discussion, writing, and speaking. Each student will prepare a senior portfolio. *Prereq:* Communications majors only. This capstone course must be taken during senior's final semester.

## Computer Science (CSCI)

**201 Introduction to Computer Applications (3)** Concepts of computer systems and procedures including software applications, input and output, data storage, communications and networks, internet and world wide web, and operating systems and system software. Emphasis on using integrated software tools on the microcomputer which include word processing, spreadsheet, database, presentation graphics, communications, web browsers, electronic mail, personal information management, and multimedia authoring. Credit does not apply to computer science minor requirements.

**211 Introduction to Computer Programming (3)** Introduction to principles of computer science, information systems and beginning programming techniques in Visual BASIC.net. Includes the use of Visual BASIC for Applications to customize application software such as Microsoft Office.

**221 Programming Concepts and Problem Solving I (3)** Computer history, problem solving algorithms, control structures, representation of data. Introductory programming in the C++ language. Intended for computer science majors.

**222 Programming Concepts and Problem Solving II (3)** A programming intensive continuation of CSCI 221 For computer science majors. Non-computer science majors may be admitted with departmental approval. May be used as one of the programming language requirements for a minor in computer science. *Prereq:* Grade of C or better in CSCI 221.

**226 Intermediate Programming in a Second Language (3)** Detailed study of programming in a language other than that studied in CSCI 221. Emphasis placed on competent programming in the selected language, understanding the language's main application areas, history, basis for creation,

advantages and disadvantages. May be repeated one time for a total of six (6) hours credit with a different programming language. *Prereq: CSCI 221.*

**250 COBOL Programming (3)** Introduction to Common Business Oriented Language using structured methodology. Problem solving directed toward business applications. *Prereq: CSCI 200 or 201 or 221.*

**260 RPG Programming (2)** Report Program Generator with applications and programs oriented to commercial fields. *Prereq: CSCI 200 or 201 or 221.*

**290 Special Topics in Computer Science (1-3)** Lectures and/or laboratory work relating to specialized topics in computer science. Course may be repeated with total credits not to exceed six (6) hours. May be offered on a pass/fail basis. *Prereq: Departmental approval required.*

**301 Foundations of Computer Science I (3)** Course introduces the discrete foundations of computer science, providing the appropriate theoretical background for advanced courses. Topics include: functions, relations, sets, logic, proof techniques, combinatorics, Boolean algebra and digital logic. *Prereq: CSCI 221, and MATH 185 or 251 Placement, or permission of instructor.*

**302 Foundations of Computer Science II (3)** A continuation of CSCI 301. Topics include: graph theory, finite state machines, trees, automata, sequences, series, recurrence relations and context free grammars. *Prereq: CSCI 301 or permission of instructor.*

**320 Assembler Language and Computer System Organization (3)** Structure of digital computers, introduction to machine language, number representations, symbolic coding and assembler language, register sets, instruction types, addressing modes, input-output subroutines, segmentation, paging, and introduction to operating systems. *Prereq: CSCI 222.*

**325 Data Structures (3)** Detailed study of data structures and their implementations. Strings, lists, queues, stacks, graphs, trees, B-trees, AVL trees, sparse arrays. File structures, recursion, sorting, searching, hashing. *Prereq: CSCI 222.*

**335 Object-Oriented Programming (3)** Advanced programming using an object-oriented language, classes, packages, software reusability, data abstraction and data hiding, inheritance, polymorphism, exception handling, graphics objects, graphical user interfaces, and multimedia. *Prereq: CSCI 222.*

**340 (540) Numerical Analysis (3)** Formulation of numerical problems for solution on a digital computer. Error analysis and control, nonlinear equations, differentiation, integration, systems of equations, differential equations, curve fitting and eigenvalue problems. *Prereq: CSCI 221 and MATH 252; CSCI 301 or MATH 310. (Same as MATH 340/540)*

**350 Advanced COBOL (3)** Business programming applications using advanced features of COBOL with emphasis on programming style, techniques, and structured programming. *Prereq: CSCI 250.*

**351 Object-Oriented System Analysis and Design (3)** Study of the systems development life cycle system, various types of systems including business and government. Methods of designing systems, data management, input and output design, hardware selection and methods of information processing. *Prereq: CSCI 221 or 250.*

**352 Object-Oriented Systems Development (3)** Practical applications involving an in-depth study of technical issues and design methodologies used in the design of decision support systems. *Prereq: CSCI 351.*

**360 Introduction to Computer Networks (3)** Fundamentals of Microcomputer connectivity and communications. Local and wide area network basics, networking architecture and standards. Network protocols including TCP/IP. Comparison, installation, and maintenance of Network Operating System. *Prereq: CSCI 222.*

**380 Artificial Intelligence (3)** Introduction to artificial intelligence, pattern recognition and classification, fuzzy set logic, natural language user interfaces, learning machines and adaptive systems, object oriented programming inference and rule based systems, arity, expert systems, associative systems, forward and backward chaining backtracking depth first and breadth first searching. Programming in languages appropriate to A.I. *Prereq: CSCI 222 and 301.*

**385 Parallel Computing (3)** Introduction to Fundamentals of Parallelism, Parallel computation models which include parallel algorithms and parallel architectures, performance and scalability of parallel systems, parallel algorithms and programming for well known numerical problems. *Prereq: CSCI 222 or 226.*

**410 (610) Data Base Management Systems (3)** Fundamentals of data base processing. Network, hierarchical, and relational data bases. Comparison of data base systems. Data base implementation. *Prereq: CSCI 222 or 250.*

**420 (620) Computer Organization and Architecture (3)** A study of the organization of modern computer systems, memory organization and management features, virtual memory systems interrupt service, multiprogramming, hardware and software equivalency, RISC and large instruction set machines, logic emulation, variable architectures, multilevel machines, stack and pipeline architectures. Concurrency in computation. The organization of microcomputers, medium and large computer systems. Special architectures. *Prereq: CSCI 320 and 325.*

**445 (645) Computer Graphics (3)** Frame buffers, display files, graphics primitives, transformations of two-dimensional spaces, windows, viewports, clipping, covering, transformations of three-dimensional space, parallel and perspective projections, stereoscopic views, hidden line algorithms. *Prereq: CSCI 222, CSCI 301 or MATH 341.*

**458 Decision Support and Expert Systems (3)** Introduction to principles of DSS and Expert Systems. Examine different expert systems and expert shells. Development of knowledge bases and expansion of expert shells. *Prereq: CSCI 221 or 250.*

**470 (670) Organization of Programming Languages (3)** Syntax and basic characteristics of grammars, Backus-Naur form, language constructs, dynamic and static storage allocation, binding time, interpreted versus compiled languages, lexical analysis, parsing, special purpose languages. *Prereq: CSCI 320.*

**475 Compilers, Interpreters, and Language Translators (3)** Theory of compilable languages, construction of software for compiling, interpreting,

and translating computer languages. Study of various types of translators, implementation of a translator for a language. *Prereq: CSCI 320 and 325.*

**480 Internship in Computer Science (1-6)** Supervised work experience in business establishments, institutions, or other organizations matched to the student's curriculum. Prereq: Departmental approval is required; at least junior standing. May be repeated for up to a total of 6 hours internship credit. A maximum of 3 hours may be used to fulfill upper division computer science electives.

**485 (685) Computer Operating Systems (3)** A study of operating systems, processing of I/O and interrupt service, buffering, spooling and memory management services, security and error protection, systems accounting and resource allocation, multi-programming and multi-processing, inter-process communication, includes the study and use of several operating systems. *Prereq: CSCI 320 and 325.*

**490 (690) Special Problems (1-3)** Individual projects for students exhibiting special interests and abilities in selected areas. Maximum of three hours applicable to minor requirements. Course may be repeated with total credits not to exceed six hours. Prereq: Departmental approval required.

**495 Senior Seminar Selected Topics: [Title]**  
(1) Computer science and information systems, hardware, software. Professional opportunities and issues, employment trends. Students are required to write summary reports and give oral presentations. Graded on a pass/fail basis. *Prereq: Senior standing computer science majors.*

## Consumer Resource Management (CRMG)

**202 Consumers and the Market (3)** Consumers as purchasing agents in a complex marketplace. Buyer-seller relationship, effective decision making and consumer protection practices.

**205 Cultural Etiquette (3)** Protocols and strategies integrating modern lifestyles with the proprieties of social and business conduct, interactions within multicultural and international settings. For non-departmental majors only.

**210 Leadership Roles in Resident Settings (3)** Assessment of leadership styles and skills applicable to resident settings. Development of personal competencies essential for leadership roles among persons in resident groups.

**302 Personal and Family Finance (3)** Financial planning for attaining individual and family goals. Individual and household management of resources and private measures to reduce economic risks. Federal tax system, investments, and estate planning.

**403 (603) Housing and Home Equipment (3)** Analysis of home equipment needs, selection, use, and care. Evaluation of recent developments. Space planning to maximize effective use of equipment. Two one-hour Lectures and one two-hour lab.

**413 (613) Resource Management for Special Groups (3)** Allocations and adaptations of personal and family resources for special groups: physically and mentally handicapped, aged, low-income, single heads of household, and social re-entries from institutions. *Prereq: Six hours of courses in family and consumer sciences or instructor's approval.*

**711 Consumption and Standards of Living (3)** Economic and welfare aspects of consumption. Analysis of factors associated with changes in the standard of living. Review of major consumption studies. *Prereq: CRMG 202 or consent of instructor.*

**712 Housing Programs and Policies (3)** Analysis of private and public programs and policies designed to promote realization of suitable homes and living environments for households. Economic and social problems related to national housing objectives.

**713 Environmental Design (3)** Examination of major research and theory development. Application to user needs in residential, commercial, and social institutional settings. *Prereq: INTD303 or consent of instructor.*

**722 Management and Family Resources (3)** Examination of current trends and research. Focus on effects of change in family resources on structures and heads of households.

**723 Consumer Economics (3)** Consumer functions in the economy; structure of consumer markets; government action relating to consumer;

factors affecting prices of consumer goods. *Prereq: CRMG 202 and 302 or consent of instructor.*

## Criminal Justice (CJ)

**200 Introduction to Criminal Justice (3)** An intensive examination of the philosophical and historical backgrounds, agencies and processes, purposes and functions, administration and technical problems, and career orientations of our criminal justice system. Extensive reading required. Critical thinking, problem solving and writing exercises are utilized. This course is a prerequisite to all other criminal justice courses.

**220 Criminal Justice Ethics (3)** An examination of the ethical issues encountered within the Criminal Justice System. Critical moral reasoning, criteria for ethical decision making, codes of professional ethics, and typical ethical dilemmas in the Criminal Justice System will be covered.

**300 Principles of Law Enforcement (3)** An introduction to the complex responsibilities, procedures, and policies of a law enforcement agency operating in a pluralistic, multi-culture, free market, democratic society. Extensive reading required. Critical thinking, problem solving and writing exercises geared to practical applications in law enforcement are core requirements of this course. Interaction with computer based software applications for research required. *Prereq: CJ 200, 220 with a minimum grade of C in both.*

**310 (510) Principles of Criminal Investigation (3)** An intensive examination of the foundation and principles of criminal investigation. This course examines the appropriate use of various sources of information, problem areas encountered when conducting criminal investigations within contemporary society, and the follow-through activities necessary for capitalizing on investigative efforts. Extensive reading and writing required.

**315 (515) Research and The Writing Process (3)** an overview of research and writing issues for the student who is engaged in social science or educational research. The course is designed to develop students' abilities to conduct scholarly research and report the findings of that research within both academic and professional settings.

**320 (520) Criminal Procedure (3)** An overview of the process of adjudication of a criminal case from the time of arrest to final disposition, including trial procedures, the due process requirement, and constitutional limitations. Research requirement. *Prereq: CJ 200 and 220 with minimum grade of C in both.*

**330 Serial Killers (3)** This course will provide students a detailed introduction to, and examination of, serial murder, specifically focusing on biological, psychological, and social theoretical explanations of psychopathic, sociopathic, anti-social personality disorders. Students will actively participate in the understanding of issues surrounding serial murder presented to law enforcement agencies and the public. This class is not designed to assist in the development of skills necessary for the forensic criminal profiling of offenders. Research papers and oral presentations are components of this course.

**340 (540) Criminal Investigation Techniques (3)** An extensive examination of methods of inquiry. The use of induction and deduction in scientific reasoning, sources of information available for reconstructing past events, and the investigation of common penal law crimes. Extensive reading and writing required. *Prereq: CJ 310 with minimum grade of C.*

**360 Child Abuse (3)** The goal of this course is to introduce students to the multifaceted issue of child abuse law. Students will learn about child sexual predators, child witnesses, types of child abuse and neglect, and the future of child abuse in the criminal justice system. The course will include an examination of the various courts that deal with child abuse issues.

**364 (564) Corrections (3)** Provides an overview of the history and various perspectives of incarceration, tracing the development of prisons in America from their earlier roots in Europe. An examination is placed upon prison inmates, correctional staff, correctional treatment and punishment philosophies, political perspectives regarding criminal offenders, and special interest offenders such as juveniles and females, as well as capital punishment. (Same as SOC 364/564)

**370 Juvenile Justice: Social Problems and Legal Issues for Social Work and Criminal Justice (3)** Focuses on the juvenile, the family, and the community as related to and interwoven with legal issues, practices and processes encountered by the social work and criminal justice professionals and their clients. (Same as SWRK 345)

**380 Probation and Parole (3)** Provides an in-depth examination of the field of community-based correctional supervision, which includes many options utilized by correctional agencies to supervise clients in the community. Emphasis is placed on adult and juvenile systems, major U.S. Supreme Court decisions, methods of supervision, and how this component interfaces with incarceration.

**400 (600) Criminal Law (3)** The history, purpose, and theory of criminal law. An examination of the classification of crimes and the nature of criminal liability. *Prereq: CJ 200 and 220 with minimum grade of C in both.*

**410 Victimology (3)** This course addresses the issues of crime in society by focusing on the victim. An examination of the expanding role of the victim in the criminal justice system will be the main focus of this course. Students will develop an understanding of criminal prosecutions, of the cost and extent of victimization, and will examine various types of offenses committed against victims (child maltreatment, assault, homicide, domestic violence). Extensive research and writing projects are major components of this course.

**411 (611) Special Topics (1-3)** Selected topics of current interest and importance. *Prereq: Instructor's approval.* Course may be repeated with different topics. A maximum of six credit hours can be counted toward a major or a minor in Criminal Justice.

**413 Family Law (3)** This course provides an intensive examination of the rules governing family law including but not limited to: marriage, divorce, child custody, child abuse and neglect, and adoption. Upon conclusion of this course, the successful student should be able to: 1) describe what constitutes a family; 2) describe the requirements for marriage; 3) identify the grounds for divorce; 4) identify the various aspects of obtaining custody of children; 5) think critically about the multifaceted issues of child abuse and/or neglect, and 6) describe the adoption process.

**415 American Death Penalty (3)** This course will provide an in-depth examination of the issues related to capital punishment in America. Students in this class will examine the death penalty component of the American Criminal Justice System through liberal, conservative, and critical approaches that provide opportunities to investigate and question various crime control strategies utilized in the United States. A component of this class will be the development of skills necessary to critically assess the impact the use of capital punishment has on society. Extensive reading and writing assignments required.

**420 (620) Criminal Evidence (3)** An overview of criminal evidence within the United States, furnishing a practical insight into the rules of evidence and considerations regarding the admissibility of evidence in court. Emphasis is placed on court decisions and contemporary issues within the field, and their effect upon members of society. Extensive research required.

**450 (650) Current Issues in Criminal Justice (3)** Emphasizes the professional development of criminal justice students by a critical examination of ethics, topical commentaries, articles and reports from the most recent literature in the criminal justice field. Extensive reading and writing are core requirements. A research project involving a review of current literature and/or original research is required. Interaction with computer based software applications is essential. *Prereq: CJ 200 and 220 with minimum grade of C in both.*

**455 Travel Study in Criminal Justice [Selected Topics] (1-3)** This course has been designed to provide students with educational travel either domestically or internationally focusing on specific criminal justice agencies and topics under the guidance of University instructors/professors. Specific course requirements, topics, locations, and prerequisites will be announced in advance. May be taught as either a group study tour or as an independent study abroad program. Students may repeat course with different topics.

**460 (660) Senior Seminar in Criminal Justice (3)** A critical examination of theory and practice in the Criminal Justice System. Research, writing and presentation of papers. *Prereq: Senior standing and completion of all of the Criminal Justice major requirement courses with a grade of C or above.*

**470 (670) Tennessee Criminal Law (3)** In-depth study of the current Tennessee Code Annotated sections on substantive Criminal Law and applicable sections of evidence and procedure. *Prereq: CJ 400 or permission of instructor.*

**480 Internship in Criminal Justice (3-12)** Application of criminal justice skills in a supervised workplace setting. Placement will be determined by the instructor, in consultation with the student. The student may or may not be paid. Student grades will be based on the instructor's academic evaluation as well as the work evaluation by the student's on-the-job supervisor. *Prereq: Criminal Justice major, senior standing, and a minimum 3.00 GPA in Criminal Justice coursework or permission of department chair. May only be taken once for credit.*

**485 Directed Studies in Criminal Justice (3)** Research to be directed by a member of the Criminal Justice faculty assigned by the department chairperson and to be on a subject of interest to the student as well as faculty members. *Prereq: junior or senior standing with instructor approval.*

## Dance (DANC)

**110 Understanding Dance (3)** General survey of the development of dance as an art form from primitive times to the present.

**110H Honors Understanding Dance (3)** General survey of the development of dance as an art form from primitive times to the present. For students in good standing in Honors Programs.

**120 Contemporary Dance I (2)** Analytical and practical study of beginning dance techniques. May be repeated for credit.

**130 Ballet I (2)** Introduction to the basic techniques of ballet. May be repeated for credit.

**150 Dance Ensemble (2)** Preparation and public performance of selected works of dance repertory. May be repeated for credit. *Prereq: Instructor's approval.*

**210 Music and Movement (2)** Basic rhythmic analysis for dance. Understanding the relationship between music and movement for both instruction and performance. Introduction to digital music editing and composition for dance.

**215 Movement for Performers (2)** Provides the actor/musician/dancer with a basic awareness of the human body and function for the stage by exploring various movement techniques.

**240 Choreography I (2)** Use of rhythmic, spatial, and dynamic elements in designing dance movements. Current choreographic approaches. *Prereq: Proficiency in dance and instructor's approval.*

**310 Jazz Dance (2)** Analytical and practical study in jazz dance techniques. May be repeated for credit. *Prereq: DANC 120 or 320.*

**320 Contemporary Dance II (2)** A continuing study of dance vocabulary with emphasis on analysis and discipline. May be repeated for credit. *Prereq: DANC 120.*

**330 Ballet II (2)** Continuation of training in technical skills of classical ballet. May be repeated for credit.

**350 Dance Ensemble (2)** Preparation and public performance of selected works of dance repertory. May be repeated for credit. *Prereq: Instructor's approval.*

**401 Special Projects in Dance (2)** Directed individual study. May be repeated for credit.

**415 Dance History and Contemporary Issues (3)** This course is an inquiry into varied issues that are central to how dances are created, performed, viewed, received, criticized, and analyzed in a historical context. *Prereq: DANC 110 or instructor's approval.*

**420 Advanced Contemporary Dance (2)** A continuing study of dance vocabulary with emphasis on intensive advanced level of contemporary dance technique.

**440 (640) Choreography II (2)** Advanced techniques of dance composition. *Prereq: DANC 240 and instructor's approval.*

**460 Senior Project (1)** Performance or research based projects representative of the student's interest, talents, and cumulative experience in dance. Projects are selected and prepared under the supervision of a dance faculty member. Mandatory pass/fail.

## Dance Education (DNED)

**211 Introduction to Teaching Dance (2)** A comprehensive view of dance teaching as a profession including requirements, challenges, and opportunities. The stages of children's development in dance will be covered, as well as lesson plan writing. Includes 8 clock hours of clinical laboratory experiences, directed observations, and limited participation in classroom settings.

**390 (590) Dance Pedagogy (3)** Concepts, methods, materials, and practice in teaching dance appropriate for both elementary and secondary students. Includes 12 clock hours of clinical laboratory experiences, directed observations, and limited participation in classroom settings.

**400 Senior Seminar in Dance Education (3)** Current issues in the profession of dance education, review of national standards, and the relationship of aesthetic education to the overall development of young people. Historical, philosophical, and social aspects of dance in the curriculum. Measurement and evaluation of dance instruction. Includes 10 clock hours of clinical laboratory experiences, directed observations, and limited participation in classroom settings. The senior project in dance for the dance education emphasis will be a component of this course. *Prereq: DNED 390.*

**471 Student Teaching in Dance Grades K-6 (6)** Supervised student teaching of dance in grades K-6 in off-campus centers for a minimum of 7.5 weeks. Must be taken concurrently with DNED 473. (Normally taken concurrently also with DNED 471.) *Prereq: TCED 301-302 and all other required courses in the Professional Education core.*

**472 Student Teaching in Dance Grades 7-12 (6)** Supervised student teaching of dance in grades 7-12 in off-campus centers for a minimum of 7.5 weeks. Must be taken concurrently with DNED 473. (Normally taken concurrently also with DNED 471.) *Prereq: TCED 301-302 and all other required courses in the Professional Education core.*

**473 Seminar in Teaching Dance (1)** Structured seminar for advanced discussion of instructional and classroom management, variety of methodology, discipline, school law, professionalism, and related topics. Emphasis will be placed on oral expression

and written communication. *Coreq: DNED 471-472 (student teaching courses)*

## Driver Safety Education (DSED)

**420 (620) General Safety Education (3)** A background in characteristics of effective teaching, and techniques for safety principles, practices, and procedures. The cause and prevention of accidents in the home, school, and community as related to modern living.

**430 (630) Basic Driver and Traffic Safety Education (3)** The course will explore driver education in the secondary school, paying particular attention to traffic laws and enforcement, traffic engineering, and educational theory. Lesson planning and peer teaching will be evaluated.

**435 (635) Advanced Driver and Traffic Safety Education (3)** The course will explore advanced driver education concepts of various driving activities involving instructional aids germane to Drivers Education in the public schools (i.e. simulators, range equipment). *Prereq: DSED 430 or 630.*

## Early Childhood Education (ECED)

**Note:** For student teaching courses (402-412), students should check their program of study sheet and student teaching application for other student teaching prerequisites specific to their major.

**341 Mathematics/Science in Early Childhood Education (4)** Exploration and examination of the content and concepts of the early childhood mathematics and science curriculum. It investigates a study of methods and materials, and a review of relevant research. It includes unit planning, lesson planning, simulated teaching and small group instruction in the public schools. *Prereq: Admission to Teacher Education and TCED 302.*

**351 Language Arts/Social Studies in Early Childhood Education (4)** Exploration and examination of the content and concepts of the early childhood language arts and social sciences curriculum. It investigates a study of methods and materials, and

a review of relevant research. It also includes unit planning, lesson planning, simulated teaching and small group instruction in the public schools. *Prereq: Admission to Teacher Education and TCED 302.*

**409 Student Teaching in Kindergarten (6)** Supervised student teaching in kindergarten for a minimum of 7.5 weeks. Must be taken with TCED 401 and TCED 403 or TCED 412. *Prereq: Admission to Teacher Education, TCED 301-302-303, specialized teaching strategies courses, TCED 475, 480, 485 and Reading requirements. See note above.*

**411 Student Teaching in Pre-Kindergarten (6)** Supervised student teaching in Pre-Kindergarten for a minimum of 7.5 weeks. Must be taken with TCED 412. *Prereq: Admission to Teacher Education and completion of all specialty area and professional education requirements. See note above.*

**412 Student Teaching Grades 1-3 (6)** Supervised student teaching in grades 1-3 for a minimum of 7.5 weeks. Must be taken with TCED 409 or 411. *Prereq: Admission to Teacher Education and completion of all specialty area and professional education requirements. See note above.*

**460 (660) Learning: Birth Through Age Eight Years (3)** Exploration and knowledge of the learning process in the context of parent-child, teacher-student, and school-family-child relationships are the emphases of this course. Cultural diversity and implications of diversity for children birth through age eight years and their learning are addressed. Developmentally appropriate curriculum, instructional material, environments for learning, and community resource utilization are integral components of the course. There are 15 clock hours of clinical laboratory experiences, directed observations, and limited participation in educational settings. *Prereq: Admission to Teacher Education and TCED 302 or permission of instructor.*

**475 (675) Learning and the Kindergarten Child (4)** A four-hour credit course in a state-approved kindergarten placement. It includes a weekly one hour seminar with a faculty member. *Prereq: for 475--Admission to Teacher Education and TCED 302; TCED 340 or TCED 350 (K-6 majors); ECED 341 or ECED 351 (PreK-3 majors) or permission of instructor; for 675--Admission to Teacher Education. (Same as TCED 475/675.)*

**480 (680) Emergent Literacy in the Content Areas: Language Arts, Social Studies, Math, Science, and Health** (4) A four-hour methods course addressing the content areas of language arts, social studies, math, science, and health for the young child with thematic and interdisciplinary teaching strategies appropriate for children in Pre-kindergarten through Grade Three. *Prereq: Admission to Teacher Education and TCED 302 or permission of instructor.*

**481 (681) Emergent Literacy** (3) Exploration and examination of appropriate resources and strategies for emergent readers from ages 0-8. Methods for encouraging emergent reading skills are investigated. Criteria for book selection, creative links for enhancing literature, techniques in storytelling, and literacy data are included. *Prereq: Admission to Teacher Education and TCED 302 or permission of instructor.*

**485 (685) Creativity and Play** (4) A four-hour methods course addressing creativity and play in Pre-kindergarten through Grade Three (birth to age eight years). *Prereq: Admission to Teacher Education and TCED 302 or permission of instructor.*

**490 Learning Theory and Affective Environment** (3) An analysis of the psychological foundations of learning and the application of learning theory to classroom practice, including cognitive, affective, and behavioral approaches to classroom discipline and self-discipline. *Prereq: Admission to Teacher Education.*

## Economics (ECON)

**100 American Enterprise System** (3) An introductory elective course designed to acquaint students with the various aspects of the U.S. economy, including the free enterprise system, economic issues of public concern, government functions and policies in a market economy, and the importance of the evolving global economy.

**201 Principles of Macroeconomics** (3) An introduction to the economic problem, the basics of supply and demand, national income accounting, fiscal and monetary policy, and other topics. *Coreq: A college level math course.*

**202 Principles of Microeconomics** (3) An in-depth analysis of supply and demand, the economics of production and cost, and analysis of firm behavior in various market models, resource markets and the international economy, and other topics. *Coreq: A college level math course.*

**311 Intermediate Microeconomic Theory** (3) An in-depth analysis of supply and demand and their elasticities, the allocation of resources and price determination in various market models, an analysis of consumption and marginal utility and other topics. *Prereq: ECON 201-202.*

**312 Macroeconomic Theory** (3) A thorough analysis of aggregate demand, output, the level of employment, the price level, national income accounting and economic growth. Comparison of classical, Keynesian, and other approaches to the employment problem. *Prereq: ECON 201-202.*

**321 International Economics** (3) An introduction to basic theories of international trade. World trade and economic growth, world trade and income distribution, basic rationale for free trade and trade protection, national policies affecting international trade, trade agreements, international cartels, international trade accounts, and foreign exchange. *Prereq: ECON 201-202.*

**322 Economic Development** (3) The basic theories of economic development. Overview of world economic development in a historical perspective. Macroeconomic trade and government policies that have influenced international economic growth. International financial assistance to the developing world and its results. *Prereq: ECON 201-202.*

**331 Money and Banking** (3) Nature and functions of money, role of commercial banks in the monetary and economic system, structure and function of the Federal Reserve System, monetary operations of the treasury, relationship between money and economic activity. *Prereq: ECON 201-202.*

**333 International Business** (3) The domestic and international dimensions of the relationships among private enterprises, governments, and individuals in a changing world. Exploration of the role of governments in maintaining environments conducive to private enterprise including multina-

tional businesses as well as the danger of business concentration both domestic and international.

*Prereq: ECON 201-202.*

**335 Public Finance** (3) Public expenditures, federal and state revenue systems, budgeting and public debt management. *Prereq: ECON 201-202.*

**351 Business Forecasting** (3) Study of the factors contributing to business fluctuations. A survey of the possible techniques used to analyze current conditions and to forecast future levels of activity as well as applications of selected forecasting models. *Prereq: ECON 201-202.*

**411 Managerial Economics** (3) Application of economic theory to business decision making; emphasis on profit objectives, measurement and forecasting demands and costs. *Prereq: ECON 201 and 202.*

**416 Development of Economic Thought** (3) An analysis of the origin and development of economic thought beginning with the traditional and premarket economies and continuing through mercantilism, capitalism, socialism, and the mixed economies of the twentieth century. *Prereq: ECON 201-202.*

**417 Market Structures** (3) An analysis of monopoly and competition in market economies and the interrelationships of market structure, business behavior, and economic performance. *Prereq: ECON 201-202 and 311.*

**471-479 Topics in Economics** (3) Selected topics in economics offered on an occasional basis for qualified students. Admission by permission of instructor only.

**480 Internships in Economics** (1-9) Supervised work experience in business establishments, institutions, or other organizations matched to the student's curriculum. May be repeated for up to a total of 9 hours internship credit. A maximum of 6 hours may be used to fulfill degree requirements. Pass/Fail. *Prereq: Departmental approval required; at least junior standing.*

**491-492 Independent Study in Economics** (3, 3) Special research projects undertaken individually under the supervision of the faculty. Maximum credit available for independent study courses is six hours. *Prereq: Senior standing.*

**710 Managerial Economics** (3-4) Applications of economic theory, management problems from an economic point of view using decision-making tools in managing enterprises.

**711 Economics for Secondary Teachers** (1-3) Presentation and analytical application of economic concepts with emphasis on methods of relating the concepts to students in grades 9-12. May be repeated for a maximum of three semester hours. May not be counted toward MBA or MAC degree requirements.

**712 Economics for Elementary Teachers** (1-3) Presentation and analytical application of economic concepts with emphasis on methods of relating the concepts to students in grades K-8. May be repeated for credit for a maximum of three semester hours. May not be counted toward MBA or MAC degree requirements.

**713 Selected Topics in Economics** (1-6) The study of specific topics in economics. Topics and prerequisites to be announced. May be repeated for a maximum of 6 semester hours. May not be counted toward MBA or MAC degree requirements.

**720 International Business and Economics** (3) The function, purpose and role of business in an international economics context. Included are multi-national firms, international monetary system, balance of payments, government regulations affecting international trade, foreign exchange markets.

## Educational Administration and Supervision (EDAS)

**710 Introduction to Supervising and Leading Educational Change** (3) Processes, organization, and functional context of educational administration. Emphasis on the responsibilities of the principal, supervisor, and superintendent.

**720 Leadership Theories in the Educational Setting** (3) An explanation of postindustrial leadership models as they relate to administration of educational organization. Definitions of leadership, power, authority, commitment, ethics, empowerment style, substance, leaders, managers and other dimensions of leader/follower relationships.

**730 Public Relations and Resource Allocation in the School Setting** (3) The course explores and develops models for developing appropriate positive public/community involvement in the allocation of resources. Topics of study include: planning and budgeting, public relations, bond issues, management of school affairs, personnel issues and management, and all support service components (transportation, food services, record keeping, payroll, purchasing, auditing, and school/community partnerships).

**740 Educational Finance** (3) Fiscal setting of the public schools; State-Federal participation; special emphasis on financial aspects of public education in Tennessee.

**750 Facility Management for a Safe, Efficient, and Effective Learning Environment** (3) A study of the relationship between educational facilities and educational programs. A safe and nurturing environment is essential for maximum learning outcomes. This course explores and develops facility management models to maximize effective utilization.

**760 Law and Policy in the Educational Setting** (3) A study of law, policies and governance issues as related to public education; further, a study of the dynamics of policy development and advocacy under our democratic system which includes the principles of representation governance that undergird the system of American Public Schools.

**765 Essential Skills for School Leaders** (3) Explores the development and improvement of skills essential to successful educational leadership. Topics include leadership influence, interpersonal influence, written communication, decision-making, planning, assessment and school safety. Students cannot receive credit for both EDAS 765 (1-3) and EDAS 765 (3).

**770 Internship in School Leadership** (3) The student completes approved administrative assignments under the mentorship of a practicing organizational leader in a selected school system.

**771 Field Studies in EDAS: Secondary Principal** (3) The student completes approved administrative assignments with selected school systems.

**772 Field Studies in EDAS: Elementary Supervisor** (3) The student completes approved administrative assignments with selected school systems.

**773 Field Studies in EDAS: Secondary Supervisor** (3) The student completes approved administrative assignments with selected school systems.

**774 Field Studies in EDAS: Superintendent** (3) The student completes approved administrative assignments with selected school systems.

**775 Field Studies in EDAS: Selected Educational Setting** (3) The student completes approved administrative assignments with selected school systems.

**780 The Principalship** (3) The role of the principal, problems in administering a school program.

**781 The Supervisor** (3) The role of the supervisor as a curriculum worker. Models of supervisory technique.

**782 School Transportation** (3) Administration of transportation in the public school system.

**783 School Personnel** (3) Emphasis upon such problems as recruitment, selection, promotion, morale, salary, and staff relation.

## **Educational Evaluation (EDEV)**

**461 (661) Educational Tests and Measurement** (3) Construction, use, and interpretation of teacher made and standardized instruments for measuring pupil development. Emphasis on the determination of different estimates of reliability and validity and an introduction to questionnaire and test construction. Prereq: Admission to Teacher Education.

**710 Educational Statistics** (3) An elementary course in methods applied to educational problems; resolution of assigned or chosen problems in educational statistics.

## **Educational Foundations (EDFN)**

**700 Educational Studies: Historical and Philosophical Dimensions** (3) An integrated analysis

and synthesis of how historical and philosophical ideas, policies and practices impinge on the nature of educational discourse and decision making, with particular attention to relating historical-philosophical dialogue to current educational topics and controversies.

**710 Research in Education (3)** Introduction to graduate study. Consideration of the various techniques appropriate to the production and consumption of educational research. *Prereq: EDEV 710; for counseling majors: PSYC 318, EDEV 710 or a similar course.*

**720 Educational Studies: Multicultural Issues in Education and Counseling (3)** Emphasis is on multicultural education and cultural foundations in education and counseling; developing knowledge, self-awareness, and skill competencies for effectiveness in teaching and counseling services in Pre K-12 schools.

**730 Seminar in Post-Secondary Education (3)** Models of instruction applicable to the college level; major problems and issues in higher education.

**731 Internship in College Teaching (3)** Assignment as an intern in a selected area of college teaching. *Prereq: EDFN 730 and consent of instructor.*

## Educational Psychology and Guidance (EDPG)

**712 Learning and Instruction (3)** Overview of research related to the major theories of learning with emphasis on classical and operant conditioning, social learning theory, and cognitive theories applied to school environments. Required for students in school counseling or advanced education degrees who are not licensed teachers.

**715 Advanced Educational Psychology (3)** An in-depth research based survey of recent developments in educational psychology, with particular emphasis upon problems associated with learning.

**716 Growth and Development Across the Life Span (birth to adult) (3)** Emphasis on theory and research on social, emotional, and cognitive development over the life with emphasis on educational settings.

**720 Introduction to Counseling (3)** An orientation to counseling, guidance skills and principles including sociological, historical and philosophical foundations of pupil personnel services; informing students and parents of the purposes of the guidance program, confidentiality, ethics in the counseling relationship and the profession, gender and multicultural issues in counseling, and contemporary trends or issues in counseling.

**722 Professional, Ethical and Legal Issues in Counseling (3)** An introduction and orientation to the practice of counseling in schools, community agencies, and higher education settings. Topics addressed will include the history and philosophy of counseling; ethical decision-making; professional credentials and affiliations; and, standards of practice, research, and educational preparation in counseling.

**725 Theories and Techniques of Counseling (3)** This course provides a detailed review of the theoretical foundations of major counseling theories and techniques applicable to children/ adolescents/ adults. Reviewed theories will include Psychoanalytic, Neo-Freudian, Person-Centered, Gestalt Therapy, Existentialist, Behaviorist, Rational Emotive Therapy, and Reality Therapy.

**730 Career Development and Counseling (3)** Theories of vocational development, career education, career development, and the significance of the world of work in the lifestyle of individuals. The strategies related to career exploration, career-related assessment, application of career development materials, technical and college career tracks of curriculum development, exploration of gender and cultural/ethnicity issue that may affect the career development of individuals in our society are emphasized.

**740 Group Dynamics (3)** A study of group processes, techniques, and ethical issues involved in using groups for counseling and personal and interpersonal growth opportunities. A participatory format will be utilized in exploring the versatility of groups. Topic of course investigation includes the study of leadership, communication skills, stress management, and career development.

**745 Current Issues in Counseling (Topic) (3)**

A study of selected problems and issues affecting counselors. May be repeated under different topics. Only 6 credits may be applied to the MEd degree in Counseling. *Prereq: Instructor's permission.*

**750 Mental Health and Psychopathology (3)**

This course reviews concepts of personality development and factors influencing it as well as psychopathology as described in the Diagnostic and Statistical Manual of Psychiatric Disorders.

**760 Individual Appraisal (3)** A study of representative psychological and educational test/inventories including the rationale which underlies testing or assessment of individuals for educational or guidance purposes. Practice in the use and appraisal of instruments and techniques for understanding the individual, including both testing and non-testing interview or developmental history procedures.

**775 Counseling Children/Adolescents with Psychological Dysfunctions (3)** Identification of children and adolescents with extensive emotional, social, or psychological/mental disorders. Emphasizes a broad spectrum of therapeutic approaches to treatment that can be utilized in educational and mental health settings and in counseling/consultative activities; IEP's; parent education and training; teacher education and training; social skills education and training; and self esteem education and training.

**777 Psychopathology: Diagnosis and Treatment (3)** This course reviews interviewing and diagnosing skills and intervention models and techniques applicable to psychological disorders: cognitive, affective and behavioral.

**780 Community Resources (3)** A study of the development and function of community agencies and resources. Employment services, rehabilitation services, mental health centers, public health services, and social welfare agencies are included.

**781 Introduction to Marital and Family Counseling (3)** An exploration of the basic philosophy, goals, and techniques associated with the major theories of marital and family counseling.

**782 Alcohol and Substance Abuse Counseling (3)** The process of counseling alcohol and drug or substance dependent persons. The modalities of

treatment including the pharmacological approach and referral are covered.

**783 Community Counseling (3)** A survey of the organization, management, and delivery of community counseling services. Overview of relationships between counselors and other professionals in a variety of practice settings; techniques of community needs assessment and program evaluation; overview of methods used in community settings; characteristics of community service programs.

**785 Counseling Laboratory (3)** Supervised, clinical on-campus experience in beginning counseling skills. Relationship building skills, listening skills, fact finding skills, reflective skills, summarizing skills, role playing, simulation, and actual experiences with clients in counseling are investigated. Professional liability insurance is required. Enrollment is by application and permission of the instructor.

**786 Organization and Administration of School Counseling Services/Programs (3)** Emphasis on the counselors' need to have a knowledge base on the functions, organization, administrative principles, and evaluation of counseling services in Pre K-12 schools, college and junior colleges, community agencies, and counseling or mental health centers. The student will prepare a proposal/project for the organization and administration of a counseling program that is specific to his/her career goals. Students will be involved in designing a counseling program for a specific school setting that is congruent with their career objectives. Project also includes preparation of sample lesson plans to be incorporated into classroom counseling units.

**788 Internship in Community Counseling I (3)** This internship provides opportunity to develop skills in counseling on site. Case experiences are discussed under the supervision of faculty in class meetings. Students complete a minimum of 300 hours on site that includes 120 client contact hours (group and individual), and 15 hours of supervision. Favorable final evaluations by the site supervisor and faculty are required for credit. *Prereq: EDPG 785. Application needed--limited enrollment.*

**789 Internship in Secondary School Counseling (3)** Includes 300 hours of supervised experience in 7-12 school settings. Students will plan

and manage all facets of the counseling program including counseling with students, coordinating the program, and consulting with student support personnel, parents, and community resources.

*Prereq: EDPG 712, 720, 725, 740, 750, 760, 775, 785, 786, and consent of course instructor and on-site supervisor.*

**790 Internship in Elementary School Counseling** (3) Includes 300 hours of supervised experience in Pre K-6 school settings. Students will plan and manage all facets of the counseling program including counseling with students, coordinating the program, and consulting with student support personnel, parents, and community resources.

*Prereq: EDPG 712, 720, 725, 740, 750, 760, 775, 785, 786, and consent of course instructor and on-site supervisor.*

**791 Supervised Practicum in Secondary Counseling** (3) For students seeking secondary school counselor certification. *Prereq: EDPG 710, 715, 720, 727, and consent of faculty adviser.*

**792 Internship in Community Counseling II** (3) This internship provides the opportunity to develop skills in counseling on site. Case experiences are discussed under the supervision of faculty in class meetings. Students complete a minimum of 300 hours on site that includes 120 client contact hours (group and individual), and 15 hours of supervision. Favorable final evaluations by the site supervisor and faculty are required for credit.

*Prereq: EDPG 788 and permission of instructor. Application needed— limited enrollment.*

## Educational Studies (EDST)

**290 Workshop in Education [Title of Workshop]** (1-3) Workshop on selected topics. No more than nine hours of workshop credit may be applied to an undergraduate degree in education. Can not be repeated for credit under the same workshop title.

**440 (640) Selected Problems in Education: [Title]** (3) A study of selected problems and issues affecting education. *Prereq: Admission to Teacher Education or Instructor's approval.*

**450 (650) The School, the Teacher, and the Law** (3) A study of the federal, state, and local laws that affect the operation of the school with special emphasis on legal rights and responsibilities of both students and school personnel.

**460 (660) Education in a Pluralistic Society** (3) The study of issues that exist in teaching culturally different students in a multicultural school setting.

**710 Models of Instruction, Curriculum Development, and Advanced Teaching Strategies** (3) Advanced principles of curriculum and instruction as applied to education; study of a variety of curriculum designs used regularly or experimentally; development and organization of the curriculum; analysis of current practices, problems and trends in education; an exploration of significant alternative approaches to teaching in education.

**740 Project in Education** (3) The student will select a specific project and develop this project through research and implementation in a specified educational setting. *Prereq: 18 graduate hours and permission of instructor. May not be repeated for credit without permission of the Department of Educational Studies.*

**750 Advanced Computer Applications and Technologies in Education** (3) Intended to give background in microcomputer technology necessary to enable the teacher to be computer functional in the classroom use of software, word processing, use of data bases and spreadsheets, low and high resolution graphics, as well as administrative software applications. In addition, there will be a review of up-to-date technologies used in education. A research paper regarding computer applications in the student's field of study will be required. *Prereq: HLRN311, the equivalent, or demonstrated proficiency.*

## Elementary Education (ELED)

**413 (613) Mental Health in Schools** (3) Influences within the school which affect the self-concepts, motivation, and social adjustment of students and teachers. Emphasis on means for promoting

mental health in the classroom. Opportunity for self-exploration provided.

**422 (622) The Microcomputer and Its Use in the Classroom** (3) Provision of the understanding and skills necessary to make the computer an effective tool in the classroom. Focus on the use of the computer in the various subject (grade level) areas. Attention to computer ethics. (Same as SEDU 422/622)

**423 (623) Logo for the Public School Teacher** (3) Focus on the educational, philosophical, and psychological development of the Logo environment in a public school setting. Emphasis on the project approach. *Prereq: Admission to Teacher Education (Same as SEDU 423/623)*

**430 (630) Problems in Teaching Language Arts and Social Studies in the Elementary School** (3) Individual or group work on assigned or chosen problems in English and social studies. *Prereq: Admission to Teacher Education.*

**433 (633) Contemporary Approaches to Teaching Arithmetic and Science in the Elementary School** (3) Special investigation concerning effective teaching of arithmetic and science in the elementary school. Use of the current curricula materials. Individual or group work on assigned or chosen problems in elementary arithmetic and science.

**455 (655) Child Psychology** (3) An overview of the principles of learning and behavior applicable to young children's physical, social, and intellectual development. Emphasis on the current research findings related to young children and the process of education. *Prereq: Admission to Teacher Education.*

**490 (690) Workshop in Education: [Title of Workshop]** (1-3) Workshop on selected topics. Same as SEDU 420 (620) if same Title of Workshop. No more than six hours of workshop credit may be applied to an undergraduate or graduate degree in education. *Prereq: Instructor's approval.*

**760 Supervision of Student Teaching and Field Experiences** (3) A study of objectives and general techniques of supervising student teachers and students participating in field experiences in public schools.

**790 Seminar: [Selected Topics]** (3) Can be taken in multiples of 3 semester hours. Twelve semester hours can be counted toward a degree. *Prereq: Permission of instructor. Certain workshops may be offered on a pass/fail basis.*

**792 Master Research Project, K-8** (2) The culminating professional research project for the Master of Science in Education with a major in Teaching Program. Seminar topics to include but not limited to educational reform, curriculum design, student achievement, parent involvement, cultural diversity, education technology, assessments, and educators as collaborative leaders and mentors (in a K-8 setting). *Prereq: ELED 791. May repeat enrollment. P/N only.*

**793 Student Teaching Grades K-4** (5) Supervised student teaching in grades K-4 for a minimum of 7.5 weeks. Must be taken with ELED 794.

**794 Student Teaching Grades 5-8** (5) Supervised student teaching in grades 5-8 for a minimum of 7.5 weeks. Must be taken with ELED 793.

**795 Student Teaching Grades K-6** (5) Supervised student teaching in grades K-6 for a minimum of 7.5 weeks. To be taken by candidates seeking licensure in K-12 programs.

## Engineering (ENGR)

**100 Society and Technology** (3) Historical review of the interaction between society, technology, and engineering.

**101 Engineering Graphics** (3) Introduction to technical drawing and introduction to the computer for use in computer assisted drawings. Two lecture hours and one two-hour lab. *Coreq: MATH 251 or instructor's approval.*

**111 Engineering Methods I** (2) Problem solving and engineering design. Introduction to technical drawing. Use of the computer for word processing, e-mail, Internet, engineering calculations, graphical presentations and data analysis. Professional ethics. Two two-hour labs. *Coreq: MATH 185 or above.*

**112 Engineering Methods II** (2) Continuation of problem solving and engineering design. Introduction to the computer for use in computer assisted drawings. Two two-hour labs. *Prereq: ENGR 111. Coreq: MATH 251.*

**121 Statics** (3) Application of vector algebra to represent forces and moments in two and three dimensions and the relationship of these forces systems to the equilibrium of rigid bodies. Centroids and moments of inertia. Three lecture hours. *Prereq: MATH 251.*

**201 Engineering Methods** (2) Problem solving in a computer environment. Standard software tools emphasizing matrix methods are used to solve engineering problems. One lecture hour, one three-hour lab. *Prereq: MATH 185 or 251.*

**210 Engineering Design** (2) Teams conduct a design project that includes development of requirements and objectives, project planning, information research, concept development and assessment, detailed design, preparation of assembly and part drawings, technical report writing, and a technical presentation. Ethics, safety, and team building are included. Project requires use of 3D CAD technology. One lecture hour and one three-hour lab. *Prereq: ENGR 112 and MATH 251 or instructor's approval.*

**220 Strength of Materials** (3) Concepts of stress and strain; stress-strain relations; transformations of stress and strain; applications including axially loaded members, torsion of circular shafts, bending of beams, buckling of columns, stress in spherical and cylindrical thin-walled pressure vessels. Shear and moment diagrams, combined stress. Three lecture hours. *Prereq: MATH 252 and ENGR 121.*

**231 Digital Logic** (3) Number systems and codes. Boolean Algebra. Gate-level digital electronics with hardware reduction strategies. Combinational and sequential logic. Students cannot receive credit for both ENGR 330 and ENGR 231. Three lecture hours. *Prereq: Sophomore standing.*

**232 Linear Circuits I** (3) Basic principles of resistors, operational amplifiers, capacitors, inductors, and transformers. DC and AC circuit analysis techniques (Ohm's law, Kirchhoff's laws, mesh analysis, nodal analysis, and circuit theorems). Steadystate AC phasor analysis, including power and power factor. Students cannot receive credit for both ENGR 230 and ENGR 232. Three lecture hours. *Prereq: MATH 252. Coreq: PHYS 221.*

**233 Electrical Laboratory I** (1) Laboratory methods, experiments, and design approaches that illustrate and apply digital logic and linear circuit topics covered in ENGR 231 and ENGR 232. One three-hour lab. *Prereq: ENGR 231. Coreq: ENGR 232.*

**241 Dynamics** (3) The relationship between the motion of particles and rigid bodies and the forces which act upon them. Newton's laws of motion. Three lecture hours. *Prereq: MATH 252, PHYS 220, and ENGR 121.*

**301 Computer Aided Engineering/Design Tools** (1) Discipline specific software tools are used to model engineering problems. Students apply software targeted to their engineering concentration. One three-hour lab. *Prereq: Junior standing and instructor's approval.*

**310 Engineering Materials** (3) Correlation of atomic structure, crystal structure and microstructure of solids with mechanical, physical, and chemical properties of engineering significance. Two lecture hours and one three-hour lab. *Prereq: CHEM 121 and ENGR 220.*

**311 Engineering Applications of Probability and Statistics** (3) Basic knowledge of probability theory and statistical inference for use in engineering. Theory and practical applications of random variables and probability distributions; estimation of statistical parameters; hypothesis testing; and regression analysis. Three lecture hours. *Coreq: MATH 320.*

**313 Industrial Internship** (1) Work experience during one summer or semester for a business, industry or government agency, on-site, in an engineering intern (apprenticeship) position which is approved by the department chair. A final report is required. Students who complete the co-op program will be allowed to substitute their last co-op semester for this course. Students enrolled in this course will be considered full-time by the College of Engineering and Natural Sciences. *Prereq: At least junior standing and approval of the Department Chair.*

**315 Engineering Analysis** (3) Formulation and solution of differential equations typical to engineering. Emphasis will be placed on classical solution techniques of ordinary differential equations and Laplace transforms. Three lecture hours. *Prereq: MATH 252.*

**316 Signals and Systems** (3) Classification of signals and systems, convolution representation of systems, response of linear systems to periodic and finite-energy signals, system modeling by differential equations, Fourier series and transforms, frequency domain analysis of systems. Three lecture hours. *Prereq: ENGR 232 and 315 or MATH 330.*

**317 Instrumentation and Experimental Methods** (3) Introduction to experimental methods, design of experiments, and analysis and interpretation of experimental data. Topics include accuracy and precision, Fourier series and FFT, expected time response of zeroth-order, first-order, and second-order measurement systems, applied statistics and uncertainty analysis, analog and digital signals and AD/DA conversion, and introduction to basic transducers and instruments for measuring voltage, current, temperature, pressure, flow, and strain. Two lecture hours and one three-hour lab. *Prereq: ENGR 232 and 311. Coreq: ENGR 315.*

**331 Semiconductor Electronics** (3) Basic electronic device concepts including diodes, field transistors, bipolar junction transistors; design and analysis of diode switching and rectifier circuits; single and multistage transistor amplifiers biasing; frequency response, output stage and power amplifiers; operational amplifier applications; electronic simulation using software. Three lecture hours. *Prereq: ENGR 231, 232, 233.*

**332 Linear Circuits II** (3) Transient analysis, two-port networks, AC power analysis, three-phase circuits, magnetically coupled circuits, frequency response and active filters, Laplace and Fourier transform analysis of circuits. Three lecture hours. *Prereq: ENGR 232, 233. Coreq: ENGR 316.*

**333 Electrical Laboratory II** (1) Laboratory methods, experiments, and design approaches that illustrate and apply semiconductor electronics and linear circuit topics covered in ENGR 331 and ENGR 332. One three-hour lab. *Prereq: ENGR 331. Coreq: ENGR 332.*

**340 Thermodynamics** (3) Fundamentals of engineering thermodynamics. The phases of a pure substance and their thermodynamic properties. The concept of work and heat, conservation of mass, conservation of energy, entropy and the second law

of thermodynamics using closed system and control volume analyses. Three lecture hours. *Prereq: PHYS 220. Coreq: MATH 320.*

**341 Fluid Mechanics** (3) Fluid properties and behavior; fluid statics and dynamics of ideal and real fluids. Continuity, momentum, energy equations for control volume analyses. Laminar and turbulent incompressible flows. Pipe flows, open channel flow, lift and drag calculations. Three lecture hours. *Prereq: ENGR 241 and 340.*

**350 Elementary Surveying** (3) Engineering surveying measurements, methods and computations. Mensuration, leveling, traversing, topographic mapping. Construction surveys. Two lecture hours and one three-hour lab. *Coreq: MATH 251.*

**351 Basic Structural Analysis** (4) Analysis of statically determinate and indeterminate structural systems for loads and deformations. Analysis of continuous beams, trusses, floor systems, and frames. Gravity, live, wind and earthquake loads. Deformations by the elastic curve and by energy methods. Indeterminate analysis using force, displacement, and approximate methods. Introduction to computer analysis. Four lecture hours. *Prereq: ENGR 220.*

**352 Transportation Engineering** (3) Analysis of the characteristics of transportation systems, including vehicle dynamics, volumes, speeds, capacities, roadway conditions, and accidents. Highway design including intersections, horizontal and vertical alignment, earthwork, and pavement design. Three lecture hours. *Prereq: MATH 252. Coreq: ENGR 311.*

**353 Hydraulics and Hydrology** (3) Fundamentals of open channel hydraulics and engineering hydrology. Hydrologic cycle, qualitative and quantitative hydrology, and related practical engineering computations involving precipitation, runoff, and discharge. Engineering analysis of practical open channel flows; energy, depth, slope, and transient considerations. *Coreq: ENGR 341.*

**361 Digital Signal Processing** (4) Properties of continuous and discrete signals. Z-transform and Fast-Fourier Transform. Sampling theorem, and IIR and FIR Digital filtering techniques. Finite word length effects on digital signal processing elements. Three lecture hours and one three-hour lab. *Prereq: ENGR 316.*

**370 Vibrations** (4) Free and forced vibration of translational and rotational single- and multi-degree-of-freedom mechanical and structural systems. System modeling and analytical and computer simulated response to periodic and general input excitations. Selection of system parameters to achieve desired response. Resonance and rotating unbalance. Fourier transform analysis. Modal analysis of multi-degree-of-freedom systems. Experimental verification of analytical results, with report writing. Three lecture hours and one three-hour lab. *Prereq: ENGR 241 and 315.*

**371 Advanced Strength of Materials** (3) Development and application of the equations of equilibrium, strain-displacement equations, stress-strain relationships, and ductile and brittle failure theories to plane stress, plane strain and axisymmetric problems. Solution of problems involving thick walled cylinders, interference fits, rotation disks, torsion of non-circular cross sections, contact, and stress concentrations. Three lecture hours. *Prereq: ENGR 220*

**380 Engineering Economy** (3) Economic decision making for engineering projects and capital expenditures proposals. Concepts of time value of money, cash flow, and capital rationing. Basic comparative models for evaluating alternatives. Depreciation and tax consequences. Students cannot receive credit for both INEG 380 and ENGR 380. Three lecture hours. *Prereq: Sophomore standing.*

**381 Human Factors in Engineering** (3) A study of the limitations of humans in production and other man-made systems. Analysis of stress, and environmental factors such as noise, lighting and atmospheric conditions on performance of tasks. Three lecture hours. *Prereq: Instructor's approval.*

**409 Project Management** (2) An introduction to the methods and tools used to manage projects. Topics include the role and responsibilities of a project manager, planning, estimating, scheduling, tracking and monitoring, resolving conflicts, and documentation of project status and deliverables. *Prereq: ENGR 210, ENGR 313, and senior standing.*

**410 Senior Design I** (1) Working as individuals or in teams, students conduct an engineering design project while working under the direction of a

faculty adviser. Students are required to organize and develop a plan for accomplishing project activities; establish goals, objectives, and design requirements; gather information; develop concepts; perform trade studies, analyses and engineering assessments; and develop engineering design packages that may include system diagrams, schematics, CAD models, and assembly and part drawings. A summary presentation to faculty, students, and industry representatives is required. *Prereq: Senior standing, and approval of the student's adviser.*

**411 Senior Design II** (3) A continuation of ENGR 410. Working as individuals or in teams, students complete the design project defined in ENGR 410. This capstone design project requires that students apply knowledge gained in previous coursework to solve practical, open-ended engineering problems encountered on a realistic project having deadlines and performance requirements. Some projects may require hardware fabrication and product realization. A final report, poster, and presentation to faculty, students, and industry representatives are required. *Prereq: ENGR 410.*

**413 Engineering Management** (3) Human, quality, organizational, legal, and ethical aspects of the engineering profession. Three lecture hours. *Prereq: instructor's approval.*

**430 Transformers and Rotating Machines** (3) Introduction to magnetic circuits. Ideal and practical transformers. Efficiency and regulation. Three-phase transformers. DC motors and generators. Single and polyphase motors, generators, and alternators. Applications of large and small motors and generators. Two lecture hours and one three-hour lab. *Prereq: ENGR 232.*

**440 Energy Systems** (3) A continuation of ENGR 340. Applications involving entropy as a property and The Second Law of Thermodynamics. Thermodynamic analyses of vapor power cycles, gas power cycles, refrigeration cycles, nozzles, and psychrometric applications. Analyses of reactive gas mixtures, hydrocarbon fuels and combustion. Three lecture hours. *Prereq: CHEM 121, ENGR 340.*

**450 Reinforced Concrete Design** (4) Reinforced concrete as a modern construction material. Aggregate and Portland cement properties and mix

design. Structural analysis and design of beams, deep beams, columns, and shear walls using ACI code. Quality assurance, quality control. Standard lab tests and design project with test verification. Three lecture hours and one three-hour lab. *Prereq: ENGR 351.*

**451 Geotechnical Engineering** (4) Introduction to soil mechanics, shallow foundations and retaining structures. Soil identification and classification, compaction, effective stress, consolidation, shear strength, vertical and lateral stress, and slope stability. Standard laboratory tests. Response of soil to foundation and retaining structure loads, including settlements and stability. Design of shallow foundations and retaining structures. Three lecture hours and one three-hour lab. *Prereq: ENGR 220. Coreq: GEOL 121 and ENGR 351.*

**452 Steel Design** (3) Structural analysis and design of beams, columns, axial members, frames, and connections. Use of load and resistance factor design (LRFD) code. Design of typical steel structure including connections. Use of computer analysis. Three lecture hours. *Prereq: ENGR 351.*

**453 Pavement Design and Analysis** (4) Design principles of highway pavements. Pavement stresses and strains. Flexible and rigid pavement materials testing and mix design. Thickness design of asphalt and concrete pavements. Pavement distresses and evaluation. Three lecture hours and one three-hour lab. *Prereq: ENGR 220.*

**460 Microprocessors and Computer Organization** (4) Computer organization, assembly language programming, memory hierarchy, digital interfacing, use of microprocessors in common consumer applications, study of contemporary general and special purpose architectures. Three lecture hours and one three-hour lab. *Prereq: ENGR 231, and CSCI 221or 231.*

**461 Communication Systems** (3) Analog and digital communication systems, information coding, modulation, signal processing techniques, software and hardware implementations, contemporary wireless, audio and video applications. Three lecture hours. *Prereq: ENGR 231, 311, and 316.*

**462 Linear Control Systems Design** (3) An interdisciplinary approach to feedback control system

analysis and design. Block diagrams, transfer functions, stability, steady state error, time response, root locus and Bode techniques, lead/lag compensators, and design of PID controllers. Three lecture hours. *Prereq: ENGR 232, 241, and 315.*

**463 Electrical Power Systems** (3) Transmission line parameters and models, power flow studies, fault analysis. Electrical power control methods including voltage regulation, generator allocation, and protection schemes. Three lecture hours. *Prereq: ENGR 315 and 332.*

**464 Engineering Electromagnetics** (3) Application of physical laws of electricity and magnetism to the design of electrical components, including resistors, capacitors, inductors, antennas and transmission lines. Transient and steady-state behavior of electromagnetic waves. Three lecture hours. *Prereq: ENGR 332, PHYS 221, and MATH 320.*

**471 Heat Transfer** (3) An introduction to the theory of conduction, convection and radiation and their use in engineering applications. Steady and transient heat transfer solutions with analytical and numerical solutions. An introduction to heat exchanger analysis and multi-phase heat transfer. Three lecture hours. *Prereq: ENGR 341.*

**472 Kinematics/Dynamics of Machines** (4) Analysis and synthesis of mechanisms and machine systems subjected to dynamic forces and motion constraints. Topics covered include classical analysis and synthesis of mechanisms, computer modeling and simulation of machine dynamics, rotating unbalance, and analysis and synthesis of cams and geared systems. Three lecture hours and a three-hour lab. *Prereq: ENGR 241, 315 and MATH 320.*

**473 Machine Design** (3) Fundamental principles, including stress analysis and design considerations for static and fatigue strength. Design and selection criteria for mechanical components including fasteners, weldments, springs, bearings, gears, clutches, brakes and miscellaneous elements used in mechanical systems. Three lecture hours. *Prereq: ENGR 371 and 472.*

**474 Manufacturing Processes** (3) An introduction to the processes used in manufacturing to convert raw materials into finished products. Processes covered include casting, molding, forming

and shaping, material removal, and joining. The mechanical and metallurgical fundamentals of material deformation processes will also be covered. Two lecture hours and one three-hour lab. *Prereq: ENGR 220 and 310.*

**475 Automated Production Systems (3)** A study of production automation and related systems including CAD/CAM, numerical control, industrial robotics, flexible manufacturing systems, and programmable logic controllers. Two lecture hours and one three-hour lab. *Prereq: Junior standing.*

**476 Applied Finite Element Analysis Lab (1)** Introduction to the application of the finite element method to the solution of stress, vibration, and heat transfer problems using commercial finite element software. One three-hour lab. *Prereq: ENGR 371 and 472. Coreq: ENGR 473.*

**490 Special Topics (Title of topic) (1-3)** Selected topics relating the state-of-the-art in engineering science and engineering design. Engineering subjects which are of current interest and importance but are not covered in depth in any other course. May be repeated for credit. *Prereq: Approval of advisory committee and dean.*

## Engineering, Industrial (INEG)

**310 Operations Management (3)** Management of business transformation processes. A survey of the basic concepts, principles, and practices involved in the design, implementation, operation, and control of business processes (operations) in contemporary business organizations. Emphasis is placed on the integration of the operation function with other disciplines to foster achievement of strategic and tactical goals in both manufacturing and service organizations. Topical coverage includes operations strategy, product/service design, process design, contemporary quality management, forecasting, capacity planning, facility location and layout, work design and scheduling, production planning and control with a broad emphasis on goal-driven process and productivity management, and quality management. *Prereq: MATH 210 and MGT 301, or ENGR 210. (Same as MGT 310)*

**312 Introduction to Management Science (3)** Introduction to quantitative methods used in business decision making. Topical coverage includes mathematical programming, dynamic and network programming, multi-objective decision modeling, decision theory, simulation, inventory models, and waiting lines. Computer software will be used to analyze application problems in business and economics. *Prereq: CSCI 201 and MGT 310, or INEG 310. (Same as MGT 312)*

**330 Process Control and Improvement (3)** A methodology for selecting, defining, measuring, stabilizing, evaluating and improving both production and service processes is presented. A variety of analytical methods are utilized in the sequence of instruction including the 7 simple tools of quality, metrology, SPC, process capability analysis and experimental design. *Prereq: Junior standing. (Same as MGT 330)*

**402 Industrial Safety (3)** Accident prevention, control and record keeping, safety standards, codes, and laws. Fundamentals of industrial hygiene, occupational safety and health. Organization and development of safety programs. *Prereq: Junior standing or instructor's approval.*

**412 Applied Operations Management (3)** Design, operation, control and continuous improvement of lean operations processes through methods analysis utilizing TOC, JIT and TQM principles. Emphasis is on the design, implementation and operation of integrated lean processes covering such functions as aggregate planning, master scheduling, inventory planning and control, material requirements planning, production scheduling and control, capacity requirements planning, and production and process layout, and work design and flow. A project is required. *Prereq: MGT 310 or INEG 310. (Same as MGT 412)*

## English (ENGL)

**100 English Studies: Critical Thinking and Writing (4)** Provides intensive practice in the college-level treatment of texts. Predominantly a skills course that requires students to think critically, to respond in writing to a variety of readings, and to generate, revise, and edit texts of their own. Three

classroom hours and one hour of lab. ENGL 100 must precede and may not be substituted for ENGL 110. In order to advance to ENGL 110, students must complete ENGL 100 with a grade of C or higher.

**110 English Composition: Critical Thinking and Writing** (4) Continued work with the fundamentals of written discourse. Study of rhetoric, grammar, and style as a means to effective prose. Readings and concomitant writing assignments. Predominantly a skills course. Three classroom hours and one hour of lab. *Prereq: successful completion of ENGL 100. In order to proceed to ENGL 112, students must complete ENGL 110 with a grade of C or higher.*

**111 English Composition** (3) (TBR: ENGL 1010) Introduction to the fundamentals of written discourse. Study of rhetoric, grammar, and style as means to effective prose. Readings and concomitant writing assignments. Predominantly a skills course. Students must complete ENGL 111 and 112 in sequence. In order to proceed to ENGL 112, students must complete ENGL 111 with a grade of C or higher.

**112 English Composition** (3) (TBR: ENGL 1020) Further study of written English and practice in composition. Readings and research writing with documentation. Predominantly a skills course. Students must complete ENGL 111 and 112 in sequence. For successful completion of ENGL 112, students must earn a grade of C or higher.

**111H-112H Honors English Composition** (3, 3) An introduction to written discourse for students with Enhanced ACT scores in English of 28 or above.

**200 Introduction to Literary Style** (1) Principles of and practice in literary analysis. *Prereq: ENGL 111-112.*

**250 British Literary Tradition** (3) (TBR: ENGL 2210) English literature from Beowulf through the Neoclassic period. *Prereq: ENGL 111-112.*

**250H Honors British Literary Tradition** (3) The literature of Britain from its beginnings through the eighteenth century. Limited class size allowing in-depth discussions, projects, and presentations. Open to students who have demonstrated superior academic quality. *Prereq: ENGL 111-112 and department approval.*

**251 British Literary Tradition** (3) (TBR: ENGL 2220) English literature from the Romantic period to the present. ENGL 251 may be taken before ENGL 250. *Prereq: ENGL 111-112.*

**251H Honors British Literary Tradition** (3) The literature of Britain from the romantic period to the present. ENGL 251H may be taken before ENGL 250H. Limited class size allowing in-depth discussions, projects, and presentations. Open to students who have demonstrated superior academic quality. *Prereq: ENGL 111-112 and department approval.*

**260 American Literary Tradition** (3) (TBR: ENGL 2110) American literature from the pre-Colonial period through the Romantic period. *Prereq: ENGL 111-112.*

**260H Honors American Literary Tradition** (3) American literature from the pre-Colonial period through the Romantic period. Limited class size allowing in-depth discussions, projects, and presentations. Open to students who have demonstrated superior academic quality. *Prereq: ENGL 111-112 and department approval.*

**261 American Literary Tradition** (3) (TBR: ENGL 2120) American literature from the Realistic period to the present. ENGL 261 may be taken before ENGL 260. *Prereq: ENGL 111-112.*

**261H Honors American Literary Tradition** (3) American literature from the Realistic period to the present. ENGL 261H may be taken before ENGL 260H. Limited class size allowing in-depth discussions, projects, and presentations. Open to students who have demonstrated superior academic quality. *Prereq: ENGL 111-112 and department approval.*

**270 World Literature** (3) (TBR: ENGL 2310) A survey of world masterpieces (excluding American and British writers) from the beginnings through the Renaissance. *Prereq: ENGL 111-112.*

**271 World Literature** (3) (TBR: ENGL 2320) A survey of world masterpieces (excluding American and British writers) from the eighteenth century to the present. ENGL 271 may be taken before ENGL 270. *Prereq: ENGL 111-112.*

**305 (505) Advanced Composition** (3) Principles of and practice in the various modes of expository writing. *Prereq: ENGL 111-112.*

**310 (510) Fiction Workshop (3)** Principles of and practice in writing fiction. *Prereq: ENGL 111-112.*

**315 (515) Poetry Workshop (3)** Principles of and practice in writing poetry. *Prereq: ENGL 111-112.*

**320 (520) Introduction to English Linguistics (3)** A linguistic study of the sound system, word structure, and syntax of English. Some attention to etymology and social and regional dialects.

**325 (525) Technical Communications (3)** Introduction to written, oral, and electronic media in professional fields such as criminal justice, engineering, agriculture, and business. Topics include memoranda, letters, proposals, feasibility reports, oral presentations, and on-line communications. *Prereq: ENGL 111-112 and one course within the student's major field of study.*

**330 (530) Topics in World Literature (3)** A study of selected authors, genres, or periods from world literature (Eastern and Western) in translation. Specific topics may include Greek and Roman Drama, Medieval European literature, the Modern European novel, Russian literature, and Japanese literature. Students may repeat course with variation in topic.

**341 (541) Topics in American Literature before 1900 (3)** A study of selected authors, movements, and periods in American literature before 1900. Specific offerings may include Colonial American literature, American Renaissance, American Realism and Naturalism, nineteenth-century American Poetry, or nineteenth-century Women Writers. Students may repeat course with variation in topic.

**343 (543) Literatures of Contemporary America (3)** A study of literature representative of the many cultural groups in America, with emphasis on aspects of race, ethnicity, religious background, and gender since 1945.

**345 (545) Black Writers in America (3)** Prose, poetry, and drama by black authors.

**350 (550) Women Writers: Gender, Race, and Class (3)** A historical survey of women writers, including contemporary writers, which focuses on women writers' concern with and presentation of issues such as race, ethnicity, religion, and class. (Same as WMST 351)

**355 (555) Folklore (3)** A survey of folk literature and its significance as an aid to understanding racial and cultural heritage.

**360 (560) Sixteenth-Century British Literature (3)** A study of British literature written between 1485 and 1603 excluding Shakespeare.

**365 (565) Restoration and Eighteenth-Century English Literature (3)** A study of English literature from 1660 to 1798.

**370 (570) Romantic Prose and Poetry (3)** A study of English literature from 1798 to 1832.

**375 (575) Development of English Drama (3)** A survey of English drama from the Medieval beginnings to Shaw and Wilde.

**380 (580) Modern Drama (3)** Major British, American, and Continental playwrights since Ibsen.

**385 (585) Modern Poetry (3)** Major twentieth-century poets and movements in England and America and their nineteenth-century predecessors.

**390 (590) Playwriting (3)** Writing exercises, scenes, and one-act plays which may be performed in the laboratory theater. *Prereq: ENGL 111-112 and THEA 110 and 220 or by permission of the instructor. (Same as THEA 390/590.)*

**395 (595) Literature and Film (3)** A study of the interrelationships among literary genres, scenarios, and the film form. Assignments include reading the literature as well as viewing films.

**401 (601) Studies in British and Commonwealth Writers Since 1660 (3)** An intensive study of one to four authors from England, Scotland, Ireland, or the Commonwealth (Canada, New Zealand, Australia, India, and South Africa) writing after 1660.

**420 (620) History of the English Language (3)** The development of English from its Indo-European backgrounds to the present day. Elementary readings in Old and Middle English illustrating various stages of the language.

**425 (625) Advanced Grammar (3)** Study of system and pattern implicit in the English language. Basic sentence patterns, inflections, determiners, parts of speech, expansions, complementation, and usage.

**440 (640) Southern Literature (3)** A study of humorists, local colorists, and realists in relation to the Southern tradition in literature from William Byrd to the present.

**445 (645) The American Novel to Faulkner (3)** Representative novels from the beginnings to Faulkner, with attention to the historical development of the genre.

**450 (650) Introduction to Literary Criticism (3)** The concepts, terminology, and procedures of formal literary study with readings in representative critics.

**460 (660) Early English Literature (3)** A survey of Old and Middle English literature in translation (excluding Chaucer) from the beginnings to 1485.

**465 (665) Victorian Prose and Poetry (3)** A study of English literature from 1832 to 1901.

**470 (670) The British Novel to Joyce (3)** Representative novels to Joyce, with attention to the historical development of the genre in Great Britain.

**475 (675) Modern Novel (3)** Major twentieth-century novelists and movements, primarily in Great Britain and America.

**480 (680) Chaucer (3)** A study of representative works read in Middle English, with attention to the cultural context.

**485 (685) Shakespeare (3)** A study of representative poems and plays, with attention to the cultural background and to the theater of Shakespeare's age.

**490 (690) Seventeenth-Century British Literature (3)** A study of the British literature written between 1603 and 1660 including Milton's entire career.

**494 Internship in English (3)** To gain experience in the use of written and oral communications in the world of work. Service positions are not monetarily compensated. Course performance based on an agreement between student and English department chair, who stipulates specific academic and work assignments. In all cases, grades will be based upon academic evaluation and work evaluation by on-the-job supervisors. May be repeated once with permission of the English department chair.

**495 (695) Topics [title TBA] in Gender and Cultural Studies (3)** Special topics in gender and cultural studies issues in literature. May be repeated with variation in topic. (Same as WMST 496 when topic offered is on women's literature and issues.)

**496 (696) Seminar [title TBA] in Language or Literature (3)** Special topics in literature or linguistics. May be repeated with variation in topic.

**499 Critical Approaches to Literature: A Senior Capstone Course (3)** A capstone experience for English and Secondary English majors to read, write, review, evaluate, put the major's academic career in perspective, and have a better grasp of the nature of the discipline. A writing and speaking intensive course.

**700-701 Graduate Studies in Language or Literature (3, 3)** Advanced study in literature or linguistics. Open to graduate students in Education. May be repeated for credit.

## Family and Consumer Sciences (FCS)

**100 Family and Consumer Sciences Perspectives (1)** Family and consumer sciences as an academic discipline. Survey of the curriculum, its interdisciplinary nature, overview of professional opportunities and formulation of individual plans for education and career. Concepts and principles of decision making and resource management applied to family and consumer sciences. Required of all family and consumer sciences majors. Offered in Fall Semester only.

**400 Senior Seminar (3)** Assessment of personal and academic potentials for professional careers by the Family and Consumer Sciences graduate. Examination of crucial past, present, and future issues that affect individuals, families, communities, and job environments using systems theory. Analysis of these issues through teambuilding activities and assignments with focus on interrelationships of issues and capacity building. This is a speaking and writing intensive course. *Prereq: Senior standing.*

**411 Fundamentals of Cooperative Extension (3)** History, philosophy and organizational structure

of the Cooperative Extension Service, major areas of program emphasis, teaching methods used, and relationships with other educational agencies. (Same as AGRI 411)

#### **460 Orientation to Field Experience (2)**

Intensive course emphasizing preparation for individualized field experience in area of career choice. Scheduled concurrently with Family and Consumer Sciences 48- and Family and Consumer Sciences 49- Supervised Field Experience (1-5, 1-5) *Prereq: Senior standing and minimum of 2.50 cumulative grade point average or permission of instructor.*

**47- (67-) Topics: [Selected Area]** (1-6) Topics in selected areas of Family and Consumer Sciences for students showing special ability and interest. The subject matter area is indicated by the third digit: 0 for Family and Consumer Sciences, 1 for Child and Family Studies, 2 for Food Science and Nutrition, 3 for Consumer Resource Management, 4 for Interior Design, 5 for Textiles and Clothing, 6 for Family and Consumer Sciences Education, and 7 for Dietetics. Must be requested in advance of registration. May repeat enrollment up to six credit hours. *Prereq: Departmental and instructor's approval.*

**48-, 49- Supervised Field Experience (1-5, 1-5)** Supervised work experience in off-campus placement matched to the student's curriculum and career goals. May be repeated with variable credit up to a maximum of five hours in 48- and five hours in 49- depending on available resources and student's course load at time of registration. Scheduling arrangements must be made through the adviser and the department chair at least one semester prior to registration. The third digit will follow the pattern described in FCS 47- (67-). *Prereq: Senior standing and minimum of 2.50 cumulative grade point average.*

#### **700 Non-Thesis Graduation Completion (2)**

Required for the non-thesis student not otherwise registered during any semester when such a student uses University facilities and/or faculty time before degree completion. May repeat enrollment. P/N only.

**701-702 Master's Thesis (3, 3)** Thesis proposal and research; thesis writing and presentation. May repeat enrollment. P/N only.

**760 Perspectives in Family and Consumer Sciences (3)** Philosophical and historical examination of disciplines constituting family and consumer sciences. Integrating theories and practices which define individuals and families in their near environments.

**77- Trends in Family and Consumer Sciences [Selected Area]** (1-6) Recent advances in selected areas of family and consumer sciences, their impacts, and implications for new programs and curricular considerations. The selected area is indicated by the third digit as described for FCS 47- above. Must be requested in advance of registration. *Prereq: Consent of chair and instructor. May repeat enrollment up to six (6) credit hours.*

**791 Research Methods in Family and Consumer Sciences (3)** Topics and methods in family and consumer sciences research. Development of research proposals.

**792 Research Seminar in Family and Consumer Sciences (3)** Interpretation of research literature; focus on selected areas for written and oral presentations.

## **Family and Consumer Sciences Education (FCSE)**

*The Department of Family and Consumer Sciences cooperates with the College of Education and Behavioral Sciences in preparing students for teacher certification. Enrollment in the following courses requires prior assessment for admission to teacher education. Students must meet the admission criteria as described.*

**330 Introduction to Vocational Family & Consumer Sciences Education (2)** Program planning in Consumer and Homemaking and Occupational Family & Consumer Sciences. Implications of TIM and other models of teaching for curriculum planning. Leadership and supervision for Family, Career, and Community Leaders of America programs and activities. Measurement and assessment. *Prereq: Admission to Teacher Education.*

**340 Methods of Teaching Family & Consumer Sciences** (3) Learning and teaching styles. Examination of various instructional strategies, equipment and resources. Computer aided instruction. Student, parent, and teacher relationship, and counseling. *Prereq: Admission to Teacher Education.*

**404 Student Teaching in Family & Consumer Sciences** (6) Supervised teaching experience in off-campus centers for the entire semester. *Coreq: TCED 401, FCSE 405. Prereq: Admission to Teacher Education.*

**405 Student Teaching in Family & Consumer Sciences** (6) Supervised teaching experience in off-campus centers for the entire semester. *Coreq: TCED 401, FCSE 404. Prereq: Admission to Teacher Education.*

**713 Human Relationships in the Classroom** (3) Basic needs of individuals, social values, and techniques of interpersonal relations in developing effective secondary home economics programs.

**722 Evaluation in Family & Consumer Sciences Education** (3) Purposes, fundamental principles, and techniques.

## Finance (FIN)

**160 Financial Planning** (3) An introductory course designed to enable students to develop an individual financial plan. Topics include the responsible use of credit (including credit cards), savings and investments, taxes, real estate, employee benefits, and retirement planning.

**301 Managerial Finance** (3) The domestic and multinational corporation, its operating, legal, and tax environment. Financial analysis, long-term investment decisions, capital structure, management of working capital, sources of long-term financing, and failure. *Prereq: ACCT 201 or ACCT 300; and ECON 201 or 202.*

**302 Intermediate Managerial Finance** (3) An advanced course in financial management designed to cover theory and practice of the management of the finance function in corporations. Topics covered include capital budgeting, the theory and practice of capital structure, leasing, capital asset pricing model, long-term financing, expansion and synthetic securities. *Prereq: FIN 301.*

**311 Investment Analysis** (3) An introductory course on the basics of investing in bonds and common stocks. Topics covered include the operations of stock and bond markets, fundamental and technical analysis of stocks, bond portfolio management, options and futures. *Prereq: FIN 301.*

**313 Analysis of Financial Statements** (3) An in-depth study of current financial reporting practices; analysis and interpretation of corporate financial statements. The course includes an extensive review of financial accounting concepts. *Prereq: FIN 301.*

**332 International Finance** (3) Financing the multinational corporation, hedging arbitrage, foreign exchange, Eurodollar and Euro-bond markets, and banker's acceptances. Short-term money flows and their impact upon interest rates. Devaluation and its impact upon the balance sheet and other topics. *Prereq: FIN 301.*

**341 Financial Markets and Institutions** (3) A study of the wide range of markets and instruments used to finance projects and control risk in today's global economy. Students are introduced to the operational, regulatory, and transitory characteristics of capital markets and financial institutions. Topics in this application-oriented course include the monetary system, stock, bond, mortgage, futures, and options markets, pension funds, investment firms, commercial banks, credit unions, mutual funds, and insurance companies. *Prereq: ACCT 201-202 or 300, and ECON 201-202.*

**351 Commercial Banking** (3) A comprehensive study of commercial banks and their role in the economy. The course emphasizes the practical application of business and economic principles as they relate to bank management and regulatory policy. Topics covered include banking history and regulation, consumer and commercial credit analysis, asset and liability management, risk management, loan policy, and money management services. Trends such as consolidation, on-line banking, internationalization, and project-line expansion are also addressed. *Prereq: FIN 301.*

**370 Principles of Real Estate** (3) A survey course in the economic and financial aspects of investing in real estate. Urban economic growth and development, property valuation, mortgage