ENGR 2033D - Statics - Drill Session
This drill session accompanies ENGR 2033 and provides directed problem solving in statics. Prerequisite(s): Concurrent enrollment in ENGR 2033D is required.

ENGR 2043 - Dynamics
This course provides an introduction to the dynamics of particles and rigid bodies with applications of Newton’s second law, the principle of work and energy, and the principle of impulse and momentum. Prerequisite(s): ENGR 2033 and MATH 2343 or concurrent enrollment in MATH 2343. Concurrent enrollment in ENGR 2043D is required.

ENGR 2043D - Dynamics - Drill Session
This drill session accompanies ENGR 2043 and provides directed problem solving in dynamics. Prerequisite(s): Concurrent enrollment in ENGR 2043 is required.

ENGR 2143 - Strength Of Materials
This course provides an introduction to solid mechanics, including concepts of stress and strain, mechanical behavior of engineering materials, and analysis of loaded-bearing members. Prerequisite(s): ENGR 2033. Concurrent enrollment in ENGR 2143D is required.

ENGR 2143D - Strength Of Materials - Drill
This drill session accompanies ENGR 2143 and provides directed problem solving in strength of materials. Prerequisite(s): Concurrent enrollment in ENGR 2143 is required.

ENGR 2151 - Strength Of Materials Lab
This laboratory provides experience in measuring, validating and reporting the mechanical characteristic of elastic and brittle materials. This laboratory also provides experience in finite element analysis that evaluates the stress and deformation of mechanical components. Prerequisite(s): ENGR 2143 or concurrent enrollment in ENGR 2143.

ENGR 2303 - Electrical Science
This course teaches analysis techniques for electrical circuits which consist of resistors, capacitors, and inductors. The circuits analyzed are driven by constant and sinusoidal voltage and current sources. Prerequisite(s): PHY 2114 and ENGR 2311 or concurrent enrollment in ENGR 2311. Concurrent enrollment in ENGR 2303D is required.

ENGR 2303D - Electrical Science - Drill Session
This drill session accompanies ENGR 2303 and provides directed problem solving in electrical science. Prerequisite(s): Concurrent enrollment in ENGR 2303 is required.

ENGR 2311 - Electrical Science Lab
This laboratory provides experience in the simulation, design, and construction of electrical circuits and exposure to electrical laboratory equipment. Prerequisite(s): ENGR 2303 or concurrent enrollment.

ENGR 3203 - Thermodynamics
This course provides an introduction to the laws of thermodynamics. Thermodynamic properties are defined that describe the behavior and state of systems. The laws of thermodynamics are applied to control masses and control volumes. Thermodynamic analysis is applied to a variety of standard thermodynamic devices and cycles. Prerequisite(s): ENGR 2033, CHEM 1103, and MATH 3103 or concurrent enrollment in MATH 3103 with a minimum grade of “C". Junior or senior standing. Concurrent enrollment in ENGR 3203D is required.
ENGR 3203D - Thermodynamics - Drill Session
This drill session accompanies ENGR 3203 and provides directed problem solving in thermodynamics. Prerequisite(s): Concurrent enrollment in ENGR 3203 is required.

ENGR 3222 - Digital Logic Design & Lab
This course will discuss Boolean algebra, number systems and representations, and analysis and design of combinational and sequential logic circuits. Prerequisite(s): ENGR 2303 and 2311. Concurrent enrollment in ENGR 3222L is required.

ENGR 3222L - Digital Logic Design Lab
This course comprises the laboratory component of ENGR 3222. Labs and computer simulations are designed to facilitate and reinforce the understanding of the concepts covered in the lecture course and equip students with the basic skills associated with the design, simulation, and analysis of digital logic and circuitry. Prerequisite(s): Concurrent enrollment in ENGR 3222 is required.

ENGR 3263 - Introduction To Engineering Optics
This course provides an introduction to geometrical and physical optics. Topical coverage includes reflection, refraction, mirrors, lenses, interference, diffraction, polarization, coherence, and the design of optical instruments. Prerequisite(s): PHY 2114.

ENGR 3302 - Engineering Statistics & Experiment
This course provides an introduction to general characteristics measurement systems, statistical analysis of experimental data, experimental uncertainty analysis, data acquisition and control software, and computer software for statistical analysis of experimental data. Prerequisite(s): ENGR 2303 and 2311.

ENGR 3323 - Signals and Systems & Lab
This course focuses on techniques to represent signals mathematically, and design systems that process these signals. Topics covered in this course are the analysis techniques in both continuous and discrete-time linear systems, and signal representation including Fourier, Laplace and z transforms. Prerequisite(s): ENGR 2303, 2311 and MATH 3103. Concurrent enrollment in ENGR 3323L is required.

ENGR 3323L - Signals and Systems Lab
This course comprises the laboratory component of ENGR 3323. Experiments and computer simulations are designed to reinforce the concepts covered in the lecture course, and equip students with the basic skills associated with the analysis of signals and systems in the time and frequency domain. Prerequisite(s): Concurrent enrollment in ENGR 3323 is required.

ENGR 3363 - Mechanical Engineering Design
This course enables students to apply engineering fundamentals to machine components design and to evaluate material properties in the selection of materials for various applications. Prerequisite(s): ENGR 2043, ENGR 2143, and MATH 3103 or concurrent enrollment in MATH 3103.

ENGR 3404 - Analog Electronist & Lab
This course provides an introduction to analog electronics, including theory and application of passive devices, bipolar junction transistors, field effect transistors, and operational amplifiers. Laboratory experience is a principal component of this course. Prerequisite(s): ENGR 2303 and ENGR 2311. Concurrent enrollment in ENGR 3404L is required.

ENGR 3404L - Analog Electronics Laboratory
This course comprises the laboratory component of ENGR 3404. Laboratory experiments emphasize design and analysis of basic analog circuitry. Prerequisite(s): PHY 2114 or 1214 (previously PHY 1213 and 1201). Concurrent enrollment in ENGR 3404 is required.

ENGR 3413 - Materials Science
This course provides an introduction to engineering materials and their uses in engineering applications. Properties and structures of metals, ceramics, polymers, and composites are discussed. Prerequisite(s): PHY 2114 and CHEM 1103 and (MATH 3103 or concurrent enrollment).

ENGR 3443 - Fluid Mechanics
This course includes the study of fluid properties, fluid statics, conservation equations, inviscid flow, dimensional analysis and similitude, boundary layer theory, viscous internal and external flow, and fluid measurement techniques. Prerequisite(s): ENGR 3203 and MATH 3103.

ENGR 3451 - Fluid Mechanics Lab
This laboratory provides experience in fluid mechanics experiments involving Bernoulli’s theorem, orifices, energy losses in pipes, and cavitations. Prerequisite(s): ENGR 3443 or concurrent enrollment.

ENGR 3613 - Microprocessors and Lab
This course includes: architecture, operation, and application of microprocessors; microprocessor programming; address decoding; system timing; parallel, serial, and analog I/O; interrupts and direct memory access. Prerequisite(s): ENGR 2303, 2311 and 3222. Concurrent enrollment in ENGR 3613L is required.

ENGR 3613L - Microprocessors Lab
This course comprises the laboratory component of ENGR 3613. Labs are designed to facilitate and reinforce the understanding of the concepts covered in the lecture course and equip students with the basic skills associated with the programming and applications of microprocessors. A design project is an integral component of the labs. Prerequisite(s): Concurrent enrollment in ENGR 3613 is required.

ENGR 3703 - Computational Methods In Engineering
This course introduces general-purpose numerical methods and linear algebra concepts for solving problems in science and engineering. Students should develop an understanding of the strengths and limitations of standard numerical techniques applied to problems in engineering, such roots of nonlinear equations and systems of linear equations. The course will also cover numerical differentiation and integration, initial-value and boundary-value problems. The course will also discuss concepts and methods of scientific and engineering computing, mathematical modeling, and engineering design. Prerequisite(s): ENGR 1213, PHY 2014, and MATH 3103 or concurrent enrollment.

ENGR 3803 - Electrical Power Systems
This course will introduce design, operation and key theoretical principles of modern electric power systems. Topics include basic power engineering concepts, power system design and operation, socio-economic aspects and new technologies. Prerequisite(s): ENGR 2303, ENGR 2311, and MATH 2343.

ENGR 3990 - Advanced Topics In Engineering
Credit will vary from 1 to 4 hours. Subject matter will vary within the department’s field of study.

ENGR 4103 - Finite Element Analysis
This course provides an introduction to the finite element method and its application to engineering analysis. The course introduces approximate solution methods, the RITZ method, interpolation, isoparametric finite elements, displacement-based bending elements, and applications for elasticity problems. The course includes the development of stand-alone finite element computer codes and the application of commercial finite element software packages to analyze solid and structural mechanics problems. Prerequisite(s): ENGR 2143, ENGR 3703, and PHY 3883.
ENGR 4113 - Principles Of Biomedical Engineering
This course provides an introduction to applications of physics and engineering principles to biomedical systems. Biological functions of the human body will be studied using mechanics, electricity and magnetism, optics, and thermodynamics. Responses of human biological functions to different bioengineering applications will also be studied. Prerequisite(s): BIO 2604, CHEM 1103, CHEM 1112, MATH 3103, and ENGR 3302.

ENGR 4123 - Heat Transfer
This course introduces basic thermal-energy transport processes, conduction, convection, radiation, and the mathematical analysis of systems involving these processes in both steady and time-dependent cases. Prerequisite(s): ENGR 3443, MATH 3103, and ENGR 3703 or concurrent enrollment in ENGR 3703.

ENGR 4132 - Biomedical Engineering Lab
This course provides the students with a practical experience in applying different methods to measure physiological signals and interpret the results. Students will design and build digital and analog circuits that might be used in biomedical instrumentation and prosthetic devices. Prerequisite(s): ENGR 3323 and ENGR 4233 or concurrent enrollment.

ENGR 4141 - Heat Transfer Lab
This laboratory provides experience in heat transfer experiments involving conduction, convection, thermal radiation, and heat exchange. Prerequisite(s): ENGR 4123 or concurrent enrollment.

ENGR 4183 - Electromagnetic Fields II
This course presents the application of Maxwell’s equations to time-varying electromagnetic fields, electromagnetic waves, radiation, diffraction, the electromagnetic theory of light, and antenna design. Prerequisite(s): ENGR 3183 or PHY 3183.

ENGR 4223 - Biomedical Imaging
The first part of this course is an overview of biomedical imaging systems and analysis including how images are formed and what types of information they provide by examining various imaging systems such as X-ray, ultrasound, and MRI. The second part of the course introduces students to the image processing of medical images, such as reconstruction, enhancement, segmentation, registration and representation and analysis. Prerequisite(s): ENGR 3323.

ENGR 4233 - Biomedical Instrumentation
This course introduces students to the principles, applications, and design of the medical instruments most commonly used in hospitals. Introduction to theory of measurement and analysis of biological systems. Instruction will be provided in the use of transducers, design integrated circuits to process biological signals, signal display and analysis, data acquisition and controls, and electrical safety. Prerequisite(s): ENGR 3203.

ENGR 4303 - Control Systems
This course focuses on linear, non-linear, and discrete automatic control systems; feedback control; system robustness and stability; and classical and modern control theories. Prerequisite(s): ENGR 3323.

ENGR 4313 - Fluid Dynamics
The fundamental equations and solution methods of fluid dynamics are presented with particular attention to solving the Navier-Stokes equation. Topics covered will include mass conservation, momentum and energy equations, potential flow, incompressible and compressible flows, viscous flow, similarity and dimensional analysis, boundary layer theory, vorticity, and turbulent flow. Prerequisite(s): ENGR 3443, MATH 3103, and Junior standing or above.

ENGR 4323 - Digital & Analog Communication
This course addresses selected theoretical and practical aspects of digital and analog communications systems such as amplitude modulation, frequency modulation, pulse code modulation, and multiplexing. It develops the engineering mathematics and techniques to describe the physical transmission of information over point-to-point links, taking account of channel characteristics and the presence of noise and distortion. Prerequisite(s): ENGR 3323.

ENGR 4333 - Digital Signal Processing & Lab
This course provides an introduction of the theory and application of fundamental digital signal processing techniques. The topics include: discrete signals and systems, z-transform, discrete Fourier transform and related discrete-time orthogonal transform and related fast algorithms; and IIR and FIR filter design techniques and realizations. Prerequisite(s): ENGR 3323. Concurrent enrollment in ENGR 4333L is required.

ENGR 4333L - Digital Signal Processing Lab
This course comprises the laboratory component of ENGR 4333. Students implement digital signal processing algorithms on a general purpose digital signal processor. Labs include the use of a simulator to develop and high level programming languages to develop and test IIR and FIR filters. Prerequisite(s): Concurrent enrollment in ENGR 4333 is required.

ENGR 4343 - Biomechanics
This course provides the application of mechanics to describe the cardiovascular and musculoskeletal systems. Topics include the interrelationship between biomechanics and physiology in medicine, surgery, and the design of prosthetic devices. Prerequisite(s): ENGR 3203.

ENGR 4533 - Thermal Systems Design
This course develops the concepts and methodology of system design, energy analysis, and optimization applied to thermal-fluid systems. Topics include simulation of systems in which the system components are known and system parameters such as flow, temperature, and pressure are to be determined and design of systems involving the selection of right type, size and combinations of equipment to optimize system performance. A discussion of engineering ethics and economics relevant to design topics covered is included in this course. Prerequisite(s): ENGR 3443 and MATH 3103.

ENGR 4613 - Photonics
In this course the ray, wave, and photon formulations of optics are used to understand and design laser systems. Prerequisite(s): PHY 3103 and PHY 3263.

ENGR 4633 - Introduction To Solid State Devices
This course presents the physical principles of operation of the p-n junction, metal semiconductor contact, bipolar junction transistor, MOS capacitor, MOS and junction field-effect transistors, and related electro-optical devices. First-order device models reflecting the underlying physical principles are developed. Prerequisite(s): PHY 3103, (PHY 3183 or ENGR 3183), and ENGR 3404.

ENGR 4803 - Electromechanical Systems & Mechatronics &Lab
This course will introduce: design, optimization, and control of electromechanical and mechatronic systems; dynamic analysis, modeling, and simulation of electric machines; power electronics and sensors; application of advanced software and hardware in mechatronic systems design. Prerequisite(s): ENGR 3233 and ENGR 2043. Concurrent enrollment in ENGR 4803 is required.

ENGR 4803L - Electromechanical Systems & Mechatronics Lab
This course comprises the laboratory component of ENGR 4803. Experiments and computer simulations are designed to reinforce the concepts covered in the lecture course and to equip students with the basic skills associated with the designs, simulations and analyses of electromechanical systems and mechatronics devices. Prerequisite(s): Concurrent enrollment in ENGR 4803 is required.
ENGR 4882 - Senior Engineering Design I
Through discussions with the course instructor and other faculty members, students will determine a design-related engineering problem they wish to study. A detailed written project proposal will be submitted and approved by the chosen faculty project director. Working as individuals or in teams, students will apply the design process by developing projects from the proposal stage to the test, evaluation, and implementation stages. Students are expected to follow this course with ENGR 4892 Senior Engineering Design II. Prerequisite(s): ENGR 4882, written permission required and senior standing.

ENGR 4892 - Senior Engineering Design II
This course is a continuation of ENGR 4882 Senior Engineering Design I. Prerequisite(s): ENGR 4882 and senior standing.

ENGR 4900 - Practicum In Engineering
Credit will vary from 1 to 4 hours. Subject matter will vary within the department’s field of study.

ENGR 4910 - Seminar In Engineering
Credit will vary from 1 to 4 hours. Subject matter will vary within the department’s field of study.

ENGR 4920 - Workshop
Credit will vary from 1 to 9 hours. Subject matter will vary within the department’s field of study. Normally involves lecture, films, guest speaker, etc. A grade of “P” or “F” is given. No more than 6 hours of workshop may be counted toward a bachelor’s degree.

ENGR 4930 - Individual Study
Credit will vary from 1 to 4 hours. Subject matter will vary within the department’s field of study.

ENGR 4950 - Internship In Engineering
Credit will vary from 1 to 8 hours. Subject matter will vary within the department’s field of study.

ENGR 4960 - Institute In Engineering
Credit will vary from 1 to 8 hours. Subject matter will vary within the department’s field of study.

ENGR 4970 - Study Tour In Engineering
Credit will vary. Subject matter will vary within the department’s field of study.

FAMILY AND CONSUMER SCIENCE EDUCATION
(FACS)
Department of Adult Education and Safety Sciences

FACS 2000 - Topics
Credit will vary from 1 to 4 hours. Subject matter will vary within the department’s field of study.

FACS 3000 - Workshop
Credit will vary from 1 to 6 hours. Subject matter will vary within the department’s field of study. Normally involves lecture, films, guest speaker, etc. A grade of “P” or “F” is given. No more than 6 hours of workshop may be counted toward a bachelor’s degree.

FACS 3633 - Problems Of Today’s Consumer
This course presents the economic aspects of purchasing for the consumer, including consumer credit, protective agencies, principles of consumer choice, consumer services, and the family as a center for consumer education.

FACS 3990 - Advanced Topics
Credit will vary from 1 to 4 hours. Subject matter will vary within the department’s field of study.

FACS 4223 - Fundmntls Hospitality & Tourism
This course is designed to offer a foundation of knowledge about the hospitality and tourism industry and its importance to global economic and social vitality. It will also inform students about employment opportunities in the hospitality and tourism industry such as in hotels, restaurants, resorts, casinos, convention centers, healthcare and corporate dining facilities, educational institutions and other commercial and noncommercial settings. Prerequisite(s): Junior or senior standing.

FACS 4323 - Parenting Skills Education
This course is designed to provide theories, principles, and skills essential for parents and professionals in guiding children within the family system. Stages of parenthood are identified and problem prevention techniques are stressed, as well as practical skills for working with children. Prerequisite(s): Junior standing or above.

FACS 4453 - Consumer Management
This course is designed to provide a framework for examining the key areas of personal and family financial decision-making, and the relationship of course content to home economics education.

FACS 4513 - Family Resource Management
This course is the study of effective management concerning values and goals as reflected in decision-making about personal and family resources. Prerequisite(s): Junior standing or above.

FACS 4573 - Career Education
This course is designed to provide the student with skills to balance career and personal life when making career decisions, to become skilled in the use of career information resources, to acquire job seeking skills and to understand the nature of the changing labor market.

FACS 4753 - Program Development
This class is designed to provide family and consumer science education majors with knowledge and skills needed for developing a vocational family and consumer science program.

FACS 4853 - Methods Of Teaching
This course will focus on understanding diverse learners, developing relevant instructional plans and presentation skills using a variety of techniques, media, and technology.

FACS 4900 - Practicum
Credit will vary from 1 to 4 hours. Subject matter will vary within the department’s field of study.

FACS 4910 - Seminar
Credit will vary from 1 to 4 hours. Subject matter will vary within the department’s field of study.

FACS 4920 - Workshop
Credit will vary from 1 to 9 hours. Subject matter will vary within the department’s field of study. Normally involves lecture, films, guest speaker, etc. A grade of “P” or “F” is given. No more than 6 hours of workshop may be counted toward a bachelor’s degree.

FACS 4930 - Individual Study
Credit will vary from 1 to 4 hours. Subject matter will vary within the department’s field of study.

FACS 4950 - Internship
Credit will vary from 1 to 8 hours.

FACS 4960 - Institute
Credit will vary from 1 to 8 hours.

FACS 4970 - Study Tour
Credit will vary. Subject matter will vary within the department’s field of study.