COURSES

ENR 100   ENGINEERING INTRO SEMINAR
1 Lecture Hour   0 Lab Hours   1 Credit Hour
Designed for students in the Engineering Science (ENR) curriculum, this course will focus on personal development and effective strategies for successful completion of the AS degree. Personal educational goals and curriculum management, transfer and employment opportunities, technical reading and writing, math and computer skills, communication skills and using college resources will be among the topics examined in the seminar.

ENR 101   INTRODUCTION TO ENGINEERING
2 Lecture Hours   2 Lab Hours   3 Credit Hours
An introduction to the field of engineering. Topics include exploring the various engineering disciplines, engineering analysis and design methods, engineering economics and statistics, engineering ethics, the impact of engineering on society, life long learning, and using engineering tools in practice. These concepts are emphasized and applied in hands on problem solving situations that require teamwork, research and documentation. Students will create a design for manufacturing prototype and deliver their design solution results through the engineering reporting process. Co- or Prerequisite: MAT 184

ENR 102   COMPUTER PROGRMMNG FOR ENGNRS
3 Lecture Hours   1 Lab Hour   3 Credit Hours
A course in computer programming using a high level programming language as a tool to solve engineering problems. Topics include programming structure, decisions, repetition, arrays, functions, data files, addresses and pointers and object oriented design. Prerequisite: MAT185 or MAT221 or MAT222 or MAT223 or MAT224.

ENR 201   INTRO ELEC CIRCUITS & NETWORKS
3 Lecture Hours   2 Lab Hours   4 Credit Hours
This course provides the student with the basic tools needed to analyze the circuits and systems he/she will encounter in electrical engineering. Topics include basic circuit concepts, Kirchhoff's Laws, basic network topology, mesh analysis, nodal analysis, superposition, Thevenin's Theorem, Norton's Theorem, maximum power transfer, initial conditions, the classical solutions of first and second order differential equations, sinusoidal steady state analysis, Phasor concepts, impedance and admittance, effective values, phasor diagrams, AC power relationships, power factor, apparent and complex power, pf correction, and 3-phase circuits. Laboratory assignments will require students to analyze data using computer programming skills, use of the software package Multisim for circuit analysis, and practice writing both formal and informal reports. Prerequisite: Proficiency with computer software including word processing and spreadsheets. Corequisite: MAT 223 and PHY152.

ENR 204   MECHANICS OF MATERIALS
4 Lecture Hours   0 Lab Hours   4 Credit Hours
A first engineering-level course in the mechanics of materials. The major emphasis is on how materials react in the elastic range of stress before permanent deformation takes place. Computer analysis is included where appropriate. Topics include the basic concepts of stress and strain, properties of various materials, working stress, factors of safety; torsional and flexural stresses; analysis of beams and columns, combined stresses, and welded, bolted and riveted connections. Both English and SI units are used. Prerequisite: ENR 208

ENR 207   ENGINEERING MATERIALS SCIENCE
3 Lecture Hours   3 Lab Hours   4 Credit Hours
This course is a study of the fundamental characteristics of solid materials and their applications in engineering. Included are crystalline and noncrystalline materials; metals, ceramics, polymers and composites. The course analyzes the mechanical, thermal, optical, electrical, magnetic and surface properties of various materials. A design project is required. Note: Students must register for both a lecture and a lab. Prerequisites: CHE 121 and PHY 152 or permission of the department

ENR 208   ENGINEERING STATICS
3 Lecture Hours   0 Lab Hours   3 Credit Hours
A study of static force systems. Vectorial and conventional techniques are used in problem solving. Topics included are: properties of force systems, free-body analysis, particles, rigid bodies, trusses, frames and machines, internal forces in structural members, properties of area and mass, and friction. Prerequisites: PHY 151 and MAT 222.

ENR 209   ENGINEERING DYNAMICS
3 Lecture Hours   0 Lab Hours   3 Credit Hours
A study of dynamic force systems. Vectorial and conventional techniques are used in problem solving. Topics included are: properties of force systems, free-body analysis, particles, rigid bodies, properties of area and mass, kinematics, kinetics, energy methods and momentum methods. Prerequisite: ENR 208 or permission of the department

ENR 215   SURVEYING I
2 Lecture Hours   3 Lab Hours   3 Credit Hours
This course is an introduction to the field of surveying. Students will learn what surveying encompasses and what further course of study is required to become licensed as a Professional Land Surveyor. Students will learn how to use modern land surveying equipment such as automatic levels, total station theodolites, and GPS (Global Positioning Systems). Students will learn how the use of field equipment information is integrated into the production of topographic maps. During this entire process, students will be introduced to the standards of map making and the fundamentals of land surveying. There is no prerequisite, but students should have basic knowledge of algebra, geometry and trigonometry functions. This course is cross-listed and may be taken as either ENR 215 or SUR 215.

ENR 216   SURVEYING II
2 Lecture Hours   3 Lab Hours   3 Credit Hours
This course is a continuation of Surveying I. The student will gain additional experience in the use of modern surveying equipment and how the data collected is processed into maps. The student will also be introduced to the fundamentals of land surveying as applied to the process of preparing a construction survey used for design purposes. The student will learn and be required to work within national mapping standards at all times. This course is cross-listed and may be taken as either ENR 216 or SUR 216. Prerequisite: Successful completion of SUR/ENR 215 and co- or prerequisite of ARC 104

ENR 220   DIGITAL CIRCUIT DESIGN
2 Lecture Hours   2 Lab Hours   3 Credit Hours
This course focuses on the design of digital electronic circuits used in both computing and control applications. Topics include Boolean algebra and reduction, Karnaugh mapping, design using FPGA CPLDs, arithmetic circuits including the ALU, state machine design, multiplexing, memory and addressing, and the processor clock cycle. Prerequisites: ELT 115 with a grade of C or better, or permission of the department

ENR 271   SPECIAL STUDY PROJECT I
1 Lecture Hour   0 Lab Hours   1 Credit Hour
A special learning experience designed by one or more students with the cooperation and approval of a faculty member. Proposed study plans require departmental approval. Projects may be based on reading, research, community service, work experience, or other activities that advance the student's knowledge and competence in the field of engineering or related areas. The student's time commitment to the project will be approximately 35-50 hours.

ENR 272   SPECIAL STUDY PROJECT II
2 Lecture Hours   0 Lab Hours   2 Credit Hours
Similar to ENR 271, except that the student's time commitment to the project will be approximately 70-90 hours.

ENR 273   SPECIAL STUDY PROJECT III
3 Lecture Hours   0 Lab Hours   3 Credit Hours
Similar to ENR 271, except that the student's time commitment to the project will be approximately 105-135 hours.