EGR. ENGINEERING

EGR-140. SCIENTIFIC PROGRAMMING
Credits: 3
An introduction to computer techniques for engineering design and analysis of components. Mechanisms, systems, and processes. Utilization of computer software packages in problem solving, performance evaluations, demonstration, trouble shooting, and determination of the interrelationships among system components as well as processes. Two hours of lecture and one two-hour lab per week.
Click here for course fees.

Pre-Requisites
MTH-100 OR Corequisite MTH-111

EGR-200. INTRODUCTION TO MATERIALS SCIENCE
Credits: 3
Application of materials properties to engineering design. Introduction to atomic arrangements, crystal structures, imperfection, phase diagrams, and structure-property relations. Fundamentals of iron, steel, and non-ferrous materials. The behavior of materials in environmental conditions.

Pre-Requisites
CHM-118

EGR-201. PROFESSIONALISM AND ETHICS
Credits: 1
Responsibility of an engineer as a professional; ethics in science and engineering; role of professional societies; recent trends in technological innovations; career planning. Review of professional exam. Requirement: Junior standing in engineering.

EGR-214. MODELING OF PHYSICAL SYSTEMS
Credits: 3
Modeling of physical systems. Engineering applications of Laplace transforms, Fourier series, matrices, statistics and probability, and related topics to solve problems in electromagnetics, heat and mass transfer, control systems, fluid mechanics, robotics, engineering management, and communication systems. Emphasis on the use of simulation packages. Two hours of lecture and one two-hour lab per week.
Click here for course fee.

Pre-Requisites
EE-211, MTH-112.

EGR-219. INTRODUCTION TO WEAPONS SYSTEMS
Credits: 3
Introduction to military weapons and warfare, with a focus on how the modern period has resulted in greater complexity and the development of weapons systems. Basic principles of explosives, internal and external ballistics, calculation of probabilities of hit given randomness, fire control, guidance algorithms, radar and other sensors, detection and tracking, nuclear weapons and their effects.

Co-Requisites
PHY-202

EGR-222. MECHATRONICS
Credits: 3
Introduction to mechatronics system design with emphasis on using sensors to convert engineering system information into an electrical domain, signal conditioning and hardware integration, programming, and using actuators to effect system changes. Two one-hour lecture and one three-hour lab per week.
Click here for course fees.

Pre-Requisites
EE-211, EE-283, EGR-140 and PHY-202

EGR-327. THIN FILM PROCESSING
Credits: 3
Nucleation and growth theory; crystalline, amorphous, epitaxial growth morphology. Deposition techniques like DC, RF, magnetron sputtering, ion beam sputtering, evaporation, chemical vapor deposition, physical vapor deposition. Structure, properties, and applications for specific thin film processing techniques. Two hours of lecture and two hours of lab per week.
Click here for course fees.

Pre-Requisites
EGR-200, PHY-203.

EGR-391. SENIOR PROJECTS I
Credits: 1
Design and development of selected projects in the field of engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. A professional paper and detailed progress report are required.
Click here for course fees.

Pre-Requisites
Senior standing in engineering

EGR-392. SENIOR PROJECTS II
Credits: 2
Design and development of selected projects in the field of engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. This is a continuation of EGR-391. A professional paper to be presented and discussed in an open forum is required.
Click here for course fees.

Pre-Requisites
EGR-391

EGR-399. COOPERATIVE EDUCATION
Credits: 1-6
Professional cooperative education placement in a private or public organization related to the student’s academic objectives and career goals. In addition to their work experiences, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student’s discipline. See the Cooperative Education section of this bulletin for placement procedures.
Requirements: Junior standing; minimum 2.0 cumulative GPA; consent of the academic advisor; and approval of placement by the department chairperson.
Engineering

EGR-498. LABORATORY TOPICS
Credits: Varies with topic
A study of topics of special interest not extensively treated in regularly offered laboratory courses.
Click here for course fee.

Pre-Requisites
Will vary according to the specific topics course.