

# EGR. ENGINEERING

## EGR-200. 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]] or [[CHM-115]].

## 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-202. ENGINEERING PROFESSIONAL DEVELOPMENT I

**Credits:** 1

The subjects the student will learn and develop in this course are important in securing an internship, a spot in graduate school, or a professional position. This professional development course will allow the student to experience a variety of communicative activities that prepare a student to be an experienced, informed, and professional engineer. The student will be introduced to networking with professionals as well as provided with the ability to communicate skills to employers at job fairs or on-campus mentoring events. Emphasis will be placed on professional interactions as well as attendance at events and mastering the fundamentals of written resumes, cover letters, and creating professional profiles.

### Pre-Requisites

Permission of the instructor.

## EGR-203. ENGINEERING PROFESSIONAL DEVELOPMENT II

**Credits:** 1

The subjects the student will learn and develop in this course are important in securing an internship, a spot in graduate school, or a professional position. This professional development course will allow the student to experience a variety of communicative activities that prepare a student to be an experienced, informed, and professional engineer. The student will be introduced to networking with professionals as well as provided with the ability to communicate skills to employers at job fairs or on-campus mentoring events. Emphasis will be placed on professional interactions as well as attendance at events and mastering the fundamentals of written resumes, cover letters, and creating professional profiles.

### Pre-Requisites

Permission of the instructor.

## 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 exterior 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]] concurrent or before

## 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.

[Click here for course fees.](#)

### Pre-Requisites

[[EE-211]], [[EE-283]], [[ME-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.

[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]]

## Engineering

### **EGR-399. COOPERATIVE EDUCATION**

**Credits:** 0-6

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.