

## **ME 3101: Materials Science and Engineering**

### **3 Credit Hours**

*Prerequisite: CHEM 1211 and PHYS 2211*

A study of metals, ceramics, polymers, and composites as related to material selection for design and manufacturing. Areas include atomic structure and bonding, crystal structure and defects, mechanical properties and failure, diffusion, dislocation and strengthening, alloying, phase diagrams and transformations/heat treatment, polymers, ceramics and glasses, and composites.

## **ME 3133: Composite Mechanics**

### **3 Credit Hours**

*Prerequisite: ENGR 3131*

To provide a broad introduction to the technology and mechanics of advanced composites (polymer, metal and ceramic matrix), with a particular emphasis on mechanical design using fiber reinforced composites. Micromechanics of composites, as well as effective properties such as lamination theory will be introduced. Design considerations, applications and composite fabrication will also be introduced.

## **ME 3201: Product Realization**

### **2 Credit Hours**

*Prerequisite: ENGR 2214 and EDG 1211 and Engineering Standing*

This course will introduce students to a rigorous design process. From needs assessment to implementation, an emphasis will be placed on the need for a formal process. Case studies will be used extensively, as well as a real-world ME design project.

## **ME 3343: Fluid Dynamics**

### **3 Credit Hours**

*Prerequisite: ENGR 2214 and Engineering Standing*

This course introduces the fundamentals of fluid flows. Topics include fluid statics and kinematics, control volume and differential flow analyses, similitude, inviscid, viscous and turbulent flows, pipe flow, boundary layers, and external flows. By the end of this course, students will develop an understanding of the basic principles of fluid mechanics, apply basic fluid mechanics principles to analyze fluid flows, and gain some knowledge of fluid flow phenomena in mechanical engineering systems.