

MECH3420 Engineering Materials II

Course Code: MECH 3420	Course Title: Engineering Materials II	
Required Course Or Elective Course: Elective	Terms Offered (Credits): Fall (3 credits)	
Faculty In Charge: Sherry CHEN	Pre/Co-Requisites: MECH 2410	
Course Structure: lecture: 2 day per week, 3 hours; tutorial: 1 day per week, 1 hour		
Textbook/Required Material: Materials Science and Engineering: An Introduction, W.D. Callister, Jr, Ninth Edition, Wiley		
Course Description: The course covers the fundamental knowledge of engineering ceramics, polymeric materials, composite materials and construction materials, as well as corrosion/degradation of these materials and the electrical properties. The materials microstructure, processing, mechanical behaviour and applications are emphasized.		
Course Topics: 1. Structure, properties and applications of ceramics and polymers 2. Introduction to composites 3. Corrosion and wear 4. Electrical properties 5. Construction materials		
Course Objectives:	<ol style="list-style-type: none"> 1. To equip students with fundamental understanding of the atomic/microscopic structures, characteristics, properties, processing and applications of various materials, including ceramics, polymers and composites 2. To introduce specific properties of materials, including corrosion, wear, environmental degradation of properties, electrical properties of metals, semiconductors and insulators 3. To introduce structures, properties and processing of construction materials, including wood and concrete 	
Course Outcomes:	<p>On successful completion of this course, students are expected to be able to:</p> <ol style="list-style-type: none"> A. Explain the characteristics, properties, manufacturing processes and applications of different classes of materials. B. Describe the key criteria for selecting appropriate materials for a wide range of engineering designs and applications. C. Assess a variety of approaches to developing or discovering new materials with enhanced performance to replace existing materials. D. Undertake further independent research in the field of materials. 	
Assessment Tools:	Homework problems Homework	30%
	Mid-term and Final exams	70%