MECH 4395

Special Topic: Functional Polymer and Ceramic Materials

Course Syllabus

Instructors: Dr. Yirong Lin
Locations: Online
Time: TRs 12:00 – 01:20 pm
Offices: Engineering A 111
Email: ylin3@utep.edu

Textbook: N/A. Notes and Power Point slides available in class and/or on blackboard.

Course Objective:

This course focuses on several functional materials including ceramics and polymers that can be used in advanced materials systems for energy storage, energy harvesting, and sensing for nuclear energy related applications. It provides diverse and rich content to the students about how research in the area of nano-material, manufacturing, and energy conversion in advancing the science and engineering domains.

Course Contents:

- Course Introduction and Overview
- Overview of Functional Materials
- Polymer and its application
- Ceramic and its application
- Energy harvesting Materials and Devices
- Self-Healing polymer and its application

Objective:

This class is to expose undergraduate students with state-of-the-art advancement of functional materials and devices such as ceramic sensors, super capacitors, energy harvesters, thermoelectrics, and self-healing polymers. In the classroom lecture, fundamentals on energy harvesting and storage devices fabrication, current state-of-the-art, and future development trend will be introduced; while in the term paper session, students will be divided into groups to perform investigation of green energy harvesting and storage devices fabrication such as dye-synthetized solar cell, super capacitors, lithium-ion batteries.

Project:

Projects related to functional materials such as piezoelectric and polymer will be covered.

Grading:

- **Quiz:** 2 quizzes (20%), end of Sept, Oct.
- **Exam**: 2 Exams (50%), end of Sept, Oct.
- **Project reports**: 1 reports (30%), end of semester.