

ME 5390: Nuclear Materials & Mechanics

Class Reference Number: 18867
Class/Lab Meeting: 1:00 pm - 3:20 pm, MW
Class Room: CRBL 304
Instructor: Ramana V. Chintalapalle, Ph.D.
Associated Professor
Department of Mechanical Engineering
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Office Hours: M: 11.00 am - 11.50 am & W: 9.30 am – 10.30 am
Teaching Assistant(s): Gustavo Martinez

Course Objectives

- * **The goal of this course is to prepare the next generation engineering professionals whose broad knowledge and skill set in the topical area of nuclear engineering materials and mechanics will be beneficial to the nuclear and other related energy industries.**

The objectives of the course are:

- Provide a deeper understanding of nuclear engineering materials and structural mechanics of reactors.
- Introduce advanced structural and nuclear materials, mechanics of nuclear materials at extreme environments, and designing.
- Discuss and develop strategies to damage recovery and self-healing materials and improved stability.
- Develop problem solving skills to design efficient nuclear power plants.

Topics/Chapters Covered

1. Fundamentals of Nuclear Reactors
2. Materials – Selection Criteria and Engineering
3. Mechanics
4. Radiation Damage – Models and Advanced Theories
5. Fuel/Cladding Materials
6. Radiation Effects

Grading

Your grade for this course will be assessed based on your performance in the quizzes, home work and/or assignments, mid-term exams, group project and final exam towards the end of course. Quizzes will be given in the class, every week and throughout the semester. There will be three or four mid-term exams during the course and one final exam at the end of the semester. The following is the breakup of the grades:

Quizzes (20%)
Homework & Assignments (40%)
Project Work and Presentations (40%)

****Instructor reserves the right to change these proportions any time during the course. However, the changes will be notified to the students.**

Policy on Cheating

Students are expected to be above reproach in all scholastic activities. Students who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and dismissal from the university. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, and helping or preparing presentation/term-paper for another person. Scholastic dishonesty harms the individual, all students, and the integrity of the university, policies on scholastic dishonesty will be strictly enforced.

Text Books

1. **Introduction to Nuclear Engineering, John R. Lamarsh and Anthony L. Baratta, Person Education**
2. Power Plant Technology, M. M. El-Wakil, McGraw Hill.
3. *Structural Materials in Nuclear Power Plants, J. d. Adrian Roberts, Springer Series*

Disabilities

If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at www.sa.utep.edu/cass.

Mechanical Engineering - Safety Statement

The Department of Mechanical Engineering at the University of Texas at El Paso is committed to a model of excellence in education that includes providing a safe and healthy environment for its students, staff, faculty, and the general public.

Our goal is to maximize education and research training that can only occur if you, the individual, minimize hazards and risks. This can be done by:

- » providing adequate control of the health and safety risks arising from any and all activities;
- » consulting with employees on matters affecting their health and safety;
- » providing and maintaining safe laboratories and equipment;
- » ensuring safe handling and use of substances;
- » ensuring all employees are competent to do their tasks and have adequate training; and
- » maintaining clean, safe and healthy working conditions;

The principal investigator or individual in charge of each laboratory is ultimately responsible for safety in that respective lab. This includes training and ultimate release of the laboratory. Within the Department, we hold every employee (staff, faculty, student) responsible for implementing our safety practices and our departmental safety policy. We hold every employee (staff, faculty, student) responsible for providing leadership within our department to establish effective environmental, safety and occupational health standards.

Prepared by:

Ramana V. Chintalapalle, Associate Professor, Mechanical Engineering