Syllabus
ENME 430 FUNDAMENTALS OF NUCLEAR REACTOR ENGINEERING
All Sections
Fall 2015

Course Information

Location and Time
Classroom: JMP 2121
Time: TuTh 2:00pm – 3:15pm

Instructor Information
Instructor: Dr. Robert C. Sanders
Office: 1181 Engineering Lab
Email: rsanders@umd.edu
Phone: 443-804-6485
Office Hours: TuTh 12:00pm – 1:30pm

ELMS Site
ENME430 All Sections – Fall 2015: Fundamentals of Nuclear Reactor Engineering.

Required Textbook

Required Technology
All students are required to have a calculator.

Communications
Communications outside the classroom will be via email and/or the ELMS site.

Emergency Protocol
In the event of an emergency that closes the university for an extended period of time, lectures, homework assignments and exams will be posted on the ELMS site. Students will provide the instructor with completed homework assignments and exams via email.
Course Description, Goals and Expectations

Course Description

ENME 430 presents the principles of nuclear reactor engineering as applied to nuclear reactor cores. This includes topics in basic nuclear physics (including fundamental nuclear particles), interactions of nuclear radiation with matter, interactions of neutrons with matter, nuclear fission, neutron diffusion, neutron moderation and neutron continuity. The main emphasis is to understand the conditions that must be met to achieve a sustained nuclear chain reaction (criticality) under both steady state and time dependent conditions.

Course Goals

The major objective of ENME 430 is to have the student understand the fundamental concepts of nuclear reactor engineering as applied to steady state and time dependent nuclear reactor systems. A student who successfully completes ENME 430 is able to demonstrate the ability to:

1. Understand the basics of the structure of an atom and nucleus, radioactivity, nuclear reactions, neutron cross sections, nuclear fission.
2. Understand how neutrons interact with matter.
3. Understand the fundamentals of neutron diffusion and moderation, including neutron flux, continuity, the diffusion equation and its solutions, thermal neutron diffusion, and multigroup diffusion.
4. Understand the fundamentals of nuclear reactor theory (steady state and time dependent), including the one-group reactor equation and its solutions, bare and reflected reactors, homogeneous and heterogeneous reactors.

Course Schedule

During each class meeting the instructor will present information that supplements and clarifies the information presented in the course textbook. Students are expected to ask questions if additional clarification is needed.

Due Dates

Homework assignments are due at the beginning of class on the specified due dates. To be fair to all students, late homework will not be accepted under any circumstances.

Midterm Exams: Two midterm exams will be given during the semester. The tentative dates for the midterm exams are:
Exam 1: October 6, 2015
Exam 2: November 10, 2015
Final Exam: TBD

Expectations for Students

Students are expected to attend class on a regular basis. Students are also expected to complete all homework assignments, both midterm exams and the final exam.

Grading Procedure

Homework: In order for the student to better understand the material presented in class, homework will be assigned. Problem sets (collected at the beginning of the class on the due date) will be worth 10 points each. Most homework assignments will not be graded in detail. All students that make an honest effort to complete a homework assignment will receive 10 points for the assignment. Solutions to all homework assignments will be posted on the ELMS site. Students can work together; however, copying homework is a violation of the Student Code of Academic Integrity – any occurrences will be referred to and dealt with by the Student Honor Council.

Midterm Exams: There will be two one-hour midterm exams. Each hour exam will concentrate on the subject matter covered since the previous exam. However, keep in mind that engineering material builds on itself as a course progresses. Students are expected to have mastery of all previous material. Each midterm exam is worth 100 points.

Quizzes: Unannounced quizzes may be given at random times during the semester. If given, each quiz will be worth 10 points.

Final Exam: The final exam will be cumulative and cover all course material. The final exam is worth 200 points.

The student’s final grade will be determined based on all course work. The final grade is determined only after all course work is completed (i.e. after the final exam).

The final grade will be determined using the following points:

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<thead>
<tr>
<th>Points</th>
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<tbody>
<tr>
<td>Homework: 100</td>
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<tr>
<td>Midterm Exam 1: 100</td>
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<tr>
<td>Midterm Exam 2: 100</td>
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<tr>
<td>Quizzes: 10 per quiz</td>
</tr>
<tr>
<td>Final Exam: 200</td>
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<td>TOTAL: 500 plus 10 per quiz</td>
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Course Procedures and Policies

Course Attendance Policy

Class attendance will not be recorded on a regular basis; however, students are strongly encouraged to attend all classes since some of the material covered during the exams is presented in the classroom and not included in the course textbook. Also, unannounced quizzes may be given at random times during the semester.

Written Absence Policy

All students are expected to attend class on the scheduled days for the midterm and final exams. Absences will be granted only in extreme situations such as illness or personal emergency. In such situations, the student must provide the instructor with a written document signed by a physician, or other authorized official, explaining why the student was not able to take the exam at the scheduled time. A makeup time for the missed exam will be mutually agreed to by the student and the instructor.

If a student anticipates in advance that he or she cannot attend class for a scheduled exam, it is the student’s responsibility to notify the instructor in advance so that a makeup exam can be scheduled. Failure to do so will result in a score of zero for the missed exam.

Academic Integrity Expectations

The University has a nationally recognized Honor Code, administered by the Student Honor Council. The Student Honor Council proposed and the University Senate approved an Honor Pledge. The University of Maryland Honor Pledge reads:

*I pledge on my honor that I have not given or received any unauthorized assistance on this assignment/examination.*

Unless you are specifically advised to the contrary, the Pledge statement should be handwritten and signed on the front cover of all papers, projects, or other academic assignments submitted for evaluation in this course. Students who fail to write and sign the Pledge will be asked to confer with the instructor.

Arrangements for Students with Disabilities

Academic accommodations for students with disabilities will be provided as directed by a signed statement from the university Disability Support Service.

Copyright Notice

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