NUET 4930 NUCLEAR REACTOR DESIGN AND OPERATION

Instructor: Huseyin Bostanci
Office:   F115L
Office Hours:  Mon 1:00 – 3:00 p.m., Wed 1:00 – 3:00 p.m.
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Course Description

Overview of mass, momentum and energy conservation as it relates to nuclear power plants; includes coupled neutronic/thermal models to study plant operations semi-quantitatively achieving an integrated plant understanding.

Prerequisites: MEET 3940, MEET 4950

Course Objectives

By the end of the course, the students will be able to:

- Understand and predict the dynamic behavior of the primary and secondary plant to transients
- Apply previously acquired skills and concepts from Nuclear Plant Systems
- Model and demonstrate concepts related to nuclear heat generation and removal, reactor safety

Program Outcomes:

- an appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines,
- an ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology,
- ability to identify, analyze and solve technical problems,
- technical expertise in engineering materials, statics, dynamics, strength of materials, fluid power or fluid mechanics, thermodynamics and either electrical power or electronics.

Student Learning Outcomes:

Upon completion of this course, students will be able to do the following, given appropriate parameters:

1. Calculate nuclear reaction rates and reactor criticality. (a, b, f)
2. Solve problems that involve transient response of integrated systems. (a, b, f)
3. Calculate reactor power, turbine power, and plant efficiency. (a, b, f, l)
4. Calculate decay heat removal requirements. (a, b, f, l)
5. Perform calculations related to short and long-term storage requirements of radioactive materials. (a, b, f, l)

Required text


Grading Criteria

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<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework Assignments/Labs</td>
<td>33%</td>
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<tr>
<td>Daily/weekly Quizzes</td>
<td>33%</td>
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<tr>
<td>Midterm Exam #1/2, Final Exam</td>
<td>34%</td>
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Grade Distribution

≥ 90%  = A
80 – 89.99%  = B
70 – 79.99%  = C
60 – 69.99%  = D
< 60%  = F

Disabilities Accommodation:
The University of North Texas complies with Section 504 of the 1973 Rehabilitation Act and with the Americans with Disabilities Act of 1990. The University of North Texas provides academic adjustments and auxiliary aids to individuals with disabilities, as defined under the law. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring accommodation, please see the instructor and/or contact the Office of Disability Accommodation at 940-565-4323 during the first week of class.