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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<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

Policies and Procedures

1. **Academic Integrity Standards and Sanction for Violations**: According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University. Any violation of academic honesty in an exam or assignment will result in a grade of zero and a report to https://facultysuccess.unt.edu/academic-integrity.

2. **ADA Statement**: UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one’s specific course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the ODA website at disability.unt.edu.

3. **Emergency Notification & Procedures**: UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Blackboard for contingency plans for covering course materials.