

Fundamentals of Nuclear Engineering
ENU 2002, Class 21630, Section FNE3, Fall 2025
MW 1250-1340 (UF Period 6)
FLI 0105
Final Exam 12/11/2025 1230-1430 in FLI 0105

1 Instructor

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Office Hours: TBD, and by appointment. Beginning and end times of office hours will be enforced strictly. If you would like to meet on Zoom, please send me a message on Teams.

2 Course Description

Two one-hour lectures discussing fundamental concepts in nuclear engineering, including nuclear physics, nuclear reactors, careers in nuclear engineering and related fields, and current issues in nuclear engineering.

3 Course Prerequisites

None

4 Course Objectives

This course serves the following purposes:

- Provides an introduction to nuclear physics and nuclear reactors
- Provides an introduction to career planning, including short-term (scholarships, internships, research) and long-term (graduate school or employment following graduation)
- Introduces students to areas of nuclear engineering and related fields through a series of Town Hall panel discussions with faculty, alumni, and others in the field

5 Relation to Program Outcomes (ABET)

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics (medium coverage)
2. n/a
3. An ability to communicate effectively with a range of audiences (low coverage)
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts (low coverage)

5. n/a
6. n/a
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies (low coverage)

6 Optional Textbook

Atoms, Radiation and Radiation Protection

James E. Turner

2007, 3rd edition

ISBN 978-3-527-40606-7

Free PDF available at <https://onlinelibrary.wiley.com/doi/book/10.1002/9783527616978>

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Must be on UF network or UF VPN.

7 References

Chart of the Nuclides app on iOS/iPadOS or Android

<https://apps.apple.com/us/app/chart-of-the-nuclides/id1529624218>

https://play.google.com/store/apps/details?id=io.cordova.echart&hl=en_US

Live Chart of the Nuclides

<https://www-nds.iaea.org/relnsd/vcharthtml/VChartHTML.html>

8 Required Computer

Recommended Computer Specifications: <https://it.ufl.edu/get-help/student-computer-recommendations/>

HWCOE Computer Requirements: <https://www.eng.ufl.edu/students/advising/fall-semester-checklist/computer-requirements/>

9 Lecture Schedule

Date	Due	(Lecture #) Topic	Reading
Aug 25		Introduction to Course	
Aug 27		Fundamental Skills for NE Students	
Sep 1		Labor Day (No Class)	
Sep 3	HW 1	College (Undergraduate) Planning	
Sep 8		Graduate School Planning	
Sep 10		Nuclear Terminology & Structure	
Sep 15		Chart of Nuclides Activity	
Sep 17	HW 2	Modern Physics	
Sep 22		Modern Physics	
Sep 24	HW 3	Radioactivity & Decay Law	
Sep 29		Nuclear Reactions (Q-Values)	
Oct 1		Exam 1 Review	
Oct 6		Exam 1	
Oct 8		Photon Interactions	
Oct 13 4		Neutron Interactions	
Oct 15		Chain Reactions and Criticality	
Oct 20	HW 4	Types of Reactors (LWRs)	
Oct 22		Types of Reactors (Gas-Cooled, Metal-Cooled, Molten Salt)	
Oct 27		Fusion	
Oct 29	HW 5	Exam 2 Review	
Nov 3		Exam 2	
Nov 5		From Fundamentals to Applications	
Nov 10		Town Hall 1	
Nov 12	HW 6	Town Hall 2	
Nov 17		Applied NE Math & Problem Solving	
Nov 24 & 26		Thanksgiving (No Class)	
Dec 1		Current Issues in NE	
Dec 3		Final Exam Review	
Dec 11		Final Exam (12:30 to 2:30 pm)	

10 Grading

Assessments in this course are worth a total of 1000 points broken down as follows:

- (10) Homework Assignments – 900 points (100 points each; lowest HW grade dropped automatically)
- (1) Town Hall Attendance – 50 points
- (1) Town Hall Participation – 50 points

Grades will be assigned based on the following scale:

- A: 920+ points
- A-: 900 - 919 points
- B+: 880 - 899 points
- B: 800 - 879 points
- C: 700 - 799 points
- E: < 700 points

11 Course Policies

11.1 Attendance

Skip at your own risk. Attendance is not required and is not directly considered in the grade.

Pursuant to HWCOE policy, the following statement is required: Excused absences are consistent with university policies in the undergraduate catalog. <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx> and require appropriate documentation.

11.2 Assignments

The following restrictions apply for submission format:

- All assignments must be submitted as a single PDF via Canvas.
- Use pencil or black/dark-blue ink and either white paper (lined or not) or engineering paper. You may typeset your homework using Microsoft Word, L^AT_EX, or other appropriate typesetting software.
- Use a one-column layout. Each problem should appear beneath the previous or on a new sheet of paper, not next to other problems.
- Submissions, or any part thereof, that are unreadable will earn zero credit.
- Submissions that are only readable with unusual effort, difficulty, or unpleasantness (e.g., text too small to read comfortably, writing too light to see, poor penmanship, etc.) and those that violate the first, second, and/or third bullet point in this list will be subject to a 10% deduction for the first instance, followed by a 30% deduction for the second, and zero credit for the third and further instances. These progressive penalties apply to these issues as a set. For example, a 10% penalty for multiple PDFs will be followed by a 30% penalty for a multi-column layout.

The following restrictions apply for submission deadlines and excused absences:

- Assignments are due by 2359 on the specified date.
- A grace period until 0800 the following day is set for each assignment. Students may submit assignments within this grace period without penalty.
- After 0800 the following day, the assignment closes on Canvas and no submissions are allowed, unless there is an approved excused absence.
- For excused absences, you must contact me via email as soon as conditions permit and provide a reason for your excused absence. I reserve the right to require documentation (except for religious holidays), consistent with university policy. Upon approval of an excused absence, I will modify the “open until” date in Canvas to allow you to make up the assignment.

11.3 Electronic Communication and Course Website

Canvas is used extensively for the course including, but not limited to:

- Distributing and storing the course syllabus, along with any syllabus updates
- Maintaining student grades
- Regular communication with students through announcements
- Providing access to course materials

Microsoft Teams is used for this course including, but not limited to:

- Communication between students and instructor through the “Chat” feature.

11.4 Changes to Syllabus

Changes to this syllabus will be provided via the Canvas platform. Such changes may include those required by policy changes, changes in the speed of course coverage, university closure, or errors in previous syllabus versions.

12 Standardized Syllabus Content

The following statements were required to be inserted into all syllabi by the HWCOE and/or UF. While you may ask me questions about the statements, I may have to refer you to the appropriate UF unit responsible for the statement.

12.1 Academic Policies & Resources

To support consistent and accessible communication of university-wide student resources, instructors must include this link to academic policies and campus resources: <https://go.ufl.edu/syllabuspolicies>. Instructor-specific guidelines for courses must accommodate these policies.

12.2 Commitment to a Positive Learning Environment

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University’s core values.

If you feel like your performance in class is being impacted, please contact your instructor or any of the following:

- Your academic advisor or Undergraduate/Graduate Program Coordinator
- HWCOE Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
- Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, pld@ufl.edu

13 Changelog

[1.0] - 2025-08-01

- Original version