

Changes to this syllabus will be provided via the ELearning/Sakai platform. Such changes may include those required by policy changes, instructor travel, changes in the speed of course coverage, university closure, errors in previous syllabus versions, and other reasons.

1. Description:

The first of a two-course capstone design sequence. A one-hour lecture that provides preparatory work for ENU 4192. Identification of initial design project(s) and areas of work, selection/assignment of groups to areas of work/tasks, accumulation of reference materials and computer codes and development of initial timelines/milestones.

2. Prerequisite:

ENU 4144. Co-reqs: ENU 4134, ENU 4612, and ENU 4630.

3. Program Educational Objectives Supported by Course

1. Graduates will have successful careers in Nuclear Engineering or related disciplines.
2. Graduates will pursue advanced degrees or continuing education.

4. Professional Components Supported by Course

1. Provide students with the ability to apply advanced mathematics, computational skills, science and engineering science, including atomic and nuclear physics, to identify, formulate, analyze, and solve nuclear and radiological engineering problems.

4. Provide students with the skills needed to communicate effectively, work collaboratively, and understand their professional and ethical responsibilities and the impact of engineering solutions in a societal and economic context so they can pursue successful, productive careers in nuclear and radiological engineering.

5. Program Outcomes Supported by Course

While ENU 4191 indirectly supports many outcomes (all except for b and m), no outcome data are generated in this course.

6. Instructor

DuWayne Schubring, Assistant Professor
205 Nuclear Sciences Building
352-392-0852
dlschubring@ufl.edu
Web: Sakai
Office hours: WR 1215-1345, by e-mail, and appointment.

7. Teaching Assistant:

none

8/9/10. Course Meetings:

M 1605-1800 (“Periods” 9 and 10); F, 1605-1655 (“Period” 9), NSB 225. Final Exam: December 16, 730-930 (the final project is a “take-home final”, due at 930).

11. Material and Supply Fees:

None

12. Text (Required):

There is no printed textbook. Download the FE Reference Handbook from NCEES:
<http://ncees.org/exams/study-materials/download-fe-supplied-reference-handbook/>

13. References

Useful references for ENU 419x include, but are not limited to:

1. Handbook of Nuclear Reactors Calculations, Vol. I, Ed. Y. Ronen, CRC Press, 1986.
2. A Guide to Nuclear Power Technology, F.J. Rahn, et al., J. Wiley & Sons, 1984.
3. Structural Materials in Nuclear Power Systems, J.T.A. Roberts, Plenum Press, 1981.
4. Principles of Design Improvement for Light Water Reactors, L.S. Tong, Hemisphere Publishing, 1988.
5. Thermal Design of Nuclear Reactors, R.H.S. Winterton, Pergamon Press, 1981.
6. Nuclear Power Plant Design Analysis, Alexander Sesonske, NTIS TID 26241, 1973.
7. Nuclear Reactor Analysis, J.J. Duderstadt & L.J. Hamilton, J. Wiley & Sons, 1976.
8. Nuclear Systems I & II, N.E. Todreas & M.S. Kazimi, HPC, 1990.
9. Heat Transfer and Fluid Flow in Nuclear Systems, Henri Fenech, Pergamon Press Inc, 1981, ISBN 0-08-027 181-2.
10. Nuclear Power Plant Engineering, James H. Rust, Haralson Publishing Company, 1979, ISBN 0-934534-00-4.
11. Nuclear Heat Transport, M.M. El-Wakil, Intl Textbook Co (and ANS), 1971, ISBN 0-7002-2309-6.
12. Nuclear Power Plant’s FSARs
13. Nuclear Fuel Cycle: Analysis and Management, Robert Cochran and N. Tsoulfanadis, 1993.
14. Nuclear Power Reactor Instrumentation Systems Handbook, Vol. I & II, J. M. Harrer and G.Beckerely, USAEC, 1973.
15. PE Review Manual
16. Nuclear Reactor Kinetics, 2nd Edition, M.S. Ash, 1979.
17. Radiation Detection and Measurement, 2nd Edition, G. F. Knoll, 1979.
18. Radiation Shielding, J. K. Shultis and R. E. Faw, 2000.
19. Nuclear Reactor Theory, Bell and Glasstone, VanNostrand Reinhold Company, New York, 1970.

+ any other textbooks you’ve accumulated along the way.

14. Course Outline

ENU 4192 will involve design of a nuclear fission reactor system, to be completed in groups. The purpose of ENU 4191 is to prepare you for ENU 4192. This includes the following broad foci for ENU 4191:

1. Development of engineering design skills, including work in teams
2. Exploration of the full range of reactor technology options, including non-LWR choices
3. Development of familiarity with nuclear engineering codes, with a focus on code selection (training in operation of the codes *is not* part of ENU 4191) and acquisition of legal copies of the codes
4. Reinforcement and backfilling of selected technical content (standards and codes, engineering economy) that does not fit comfortably within other required courses

The course will cover the following material, with approximate number of lecture periods noted:

1. Introduction to Course (1)
2. Technical Communication (1)
3. Standards and Codes for Reactor Design (1.5)
4. Available Computer Codes; Code Selection (1.5)
5. Engineering Design Process (6)
6. Project Description/Assignment (1)
7. Introduction to non-LWR Technology Options (5)
8. Engineering Economy (3)
9. Teamwork in Engineering [guest lecture, tentative] (1)
10. Project Presentation (2)

The course work will consist of two major, equally weighted components:

1. A total of 5-10 assignments, equally-weighted, will be required. These may include individual and group work and may include in-class activities. In addition to assignments tied to the topics above, you will also be required to attempt to obtain relevant codes from RSICC. *Failure to fill out the appropriate paperwork is grounds for failure in the course, regardless of performance on other course items.*
2. A group report selecting a general reactor design for detailed work in ENU 4192, including a presentation (last day of class) and a written report (due at the final exam time)

A very early draft follows. Topics may change, but those dates labeled “NO CLASS” will remain cancelled.

Week	Day	Date	Material
1	M	24 Aug	Introduction to Course
1	F	28 Aug	Technical Communication
2	M	31 Aug	NO CLASS (NURETH)
2	F	4 Sep	NO CLASS (NURETH)
3	M	7 Sep	NO CLASS (UF HOLIDAY)
3	F	11 Sep	NO CLASS
4	M	14 Sep	Standards and Codes for Reactor Design
4	F	18 Sep	TBD – likely to be cancelled
5	M	21 Sep	Available Computer Codes; Code Selection
5	F	25 Sep	NO CLASS
6	M	28 Sep	Engineering Design Process
6	F	2 Oct	NO CLASS
7	M	5 Oct	Engineering Design Process
7	F	9 Oct	Engineering Design Process
8	M	12 Oct	Engineering Design Process
8	F	16 Oct	Engineering Design Process (if needed)
9	M	19 Oct	Project Description/Assignment
9	F	23 Oct	Introduction to non-LWR Technology Options
10	M	26 Oct	Introduction to non-LWR Technology Options
10	F	30 Oct	NO CLASS
11	M	2 Nov	Introduction to non-LWR Technology Options
11	F	6 Nov	NO CLASS (UF HOLIDAY)
12	M	9 Nov	NO CLASS (ANS)
12	F	13 Nov	Introduction to non-LWR Technology Options (if needed)
13	M	16 Nov	Engineering Economy
13	F	20 Nov	NO CLASS
14	M	23 Nov	Engineering Economy
14	F	27 Nov	NO CLASS (UF HOLIDAY)
15	M	30 Nov	Teamwork in Engineering (tentative)
15	F	4 Dec	TBD – likely to be cancelled
16	M	7 Dec	Project Presentations

15. Attendance and Expectations

Attendance, Class Conduct, Late Work

Attendance is required and will be taken, starting September 14. The effect on grading is covered in Item 16/17.

There is no tolerance for mobile phones or other electronic disruptions. Such disruptions will lead to the student being told to leave the room for the duration of the class period, *and penalized for being absent*. During office hours or appointments: if you stop by my office and your phone rings, you will be told to leave the room for the duration of that day’s office hours (or your appointment considered over).

Absences and late-work excuses can be grouped into the categories of *professional*, *medical*, and *personal*.

Professional: Reasonable excuses/extensions for job/internship interviews, technical conferences, or other professional/career development reasons should be requested. Requests are typically granted, at instructor’s discretion, unless they would grant a student or group of students an unfair advantage over their peers, cause significant disruption to the course or grading schedule, or violate some UF policy.

Medical: Excuses/extensions will also be granted for (your own) medical reasons – please do not come to class if you are ill. Per UF policy, in the case of medical absences that are frequent or suspiciously-timed (*e.g.*; you are repeatedly, suddenly ill at deadlines), the instructor may request a signed note from a physician or similar professional practitioner.

Personal: In addition, UF policies require accommodation for several non-academic, non-medical reasons. *Excuses/extensions for these personal issues are strictly limited to those mandated by the letter of UF policies.* UF-authorized excuses/extensions include UAA competitions, religious observances, and serious illness or death of specified relatives. There is no single document listing all UF-approved personal reasons for excuses/extensions; further, the list of reasons changes from time to time. If you have a question regarding your personal issue and if it qualifies under one of the excuses/extensions policies, contact the instructor in advance.

Homework

Homework will be collected at the beginning of the class period at which it is due. All homework assignments will require submission of hard copy. No type of paper or writing utensil is preferred over others (within reason). You must include your full first and last name on all homework (as well as projects and exams).

Direct electronic submission of files used on homework (spreadsheets, etc.) may be required for some assignments, as indicated on the assignment sheet. The allowable level of collaboration on homework assignments may vary throughout the course and is indicated clearly on each assignment.

Homework handed in between the due date and the next scheduled class period is worth 50% credit. Submissions after that are not accepted (0 credit). If your homework is late, the onus is on you to provide it to me; *the clock does not stop until I have homework in hand*.

Projects

Electronic submission of project narratives is not accepted. You will need to collaborate with and divide labor among the members of your team, but no collaboration among teams is permitted.

The instructor will assign the groups. A peer review system is in place to assure equitable workload. In the event the workload is not equitable, the instructor reserves the right to adjust individual grades to accurately reflect contributions to the work.

No late projects are accepted. (In other words, missing the project deadline will cause your whole group to fail the class.)

Certain professional document and figure standards will be enforced on the project; *the onus is on you to figure out how to meet these standards in whatever programs you use to write the document and make figures.* Your instructor has exactly zero sympathy for those who select a word processor without knowing how to format their text using it – complaints that the standards are not the same as a particular piece of software’s defaults will fall on deaf ears.

Grade Appeal

All appeals of grades, including those from clerical/grade-calculation errors, must be made within 1 week of return. (This may be modified for specific assignments. I will announce this via e-mail if needed.)

Grade appeals must be provided in the following format:

- Include your entire assignment *unmodified*.
- Attach (paper clip preferred) a written summary of which problem(s) or part(s) you believe were graded inaccurately. Be as specific as possible.
- Turn in your appeal to me at class time or during office hours.
- I will review your grade appeal, contact you via your ufl.edu e-mail address, and return the assignment in class. Fairly simple appeals provided to me during office hours may be decided upon while you wait, at my discretion.

Appeals will be considered for clerical errors, addition errors, and inconsistent scoring. Grade appeals will not be entertained if you simply do not like that (for example) Part 1 was worth only 2 points with Part 2 worth 5.

On very rare occasions, some denied appeals may be deemed “frivolous”, if the instructor believes the student is not acting in a good faith belief that more points are deserved. Following two frivolous appeals, your grade appeal privilege through this method will be *revoked*. Further appeals must be done through the petitions process, which requires formal paperwork and department/program level involvement.

File Formats

The electronic components of homework submissions *must* be in the formats requested. If you do not know how to convert your files to these formats, contact the instructor in advance of the deadline. Not knowing your software is not an excuse for late homework. Acceptable formats may include plain text, .pdf, .csv, and EES files, as well as other file formats at the instructor’s discretion.

In particular, the instructor will not open files from students in the following formats: .ppt, .pptx, .doc, .docx. Presentation and word processing documents are best converted to .pdf.

The instructor will open spreadsheets in .csv, .xls, or .xlsx format. Please be aware that .xlsx format has remaining compatibility issues with free office software; .xls is usually a wiser choice.

E-mail

The primary means of communication with the class outside of class time will be e-mail listserv. These listserv will send to your @ufl.edu address only. Any inquiries regarding grading will be directed towards your @ufl.edu address only, per FERPA .

Technical and procedural questions will be answered as a reply to whatever e-mail address you used to send them. If the entire class will benefit from the answer, I may send to the class list (either in lieu of or in addition to a direct reply to you, at my discretion). If you do not wish to have a specific e-mail to me regarding technical content or course procedures replied to through the class list, you must explicitly state this in that e-mail. In such a case, I will reply directly to you and send a general-purpose announcement to the class list, not indicating who caused me to send it.

Letters of Recommendation/Evaluation Policy

To request a letter of recommendation/evaluation (for graduate school or otherwise), you must provide:

- A hard copy of your UF transcript.
- A hard copy of a résumé (or CV).
- A hard copy of the following form: <http://www.registrar.ufl.edu/pdf/ferparelease.pdf>. You *must* check all four circles.

Letters are typically filed once per week. For students whom I know only through coursework, my letter typically focuses on an estimate of their rank-in-class and on their performance on projects and challenging problems.

I will only file *one batch* of letters per student during the term, for any student currently enrolled in a class with me. (This policy is designed to keep me from looking up slight changes in your rank/performance multiple times for multiple batches of letters.) I recommend that this batch occur as late as possible in the term to allow me sufficient information (sample size) on your performance to write a useful letter.

16/17. Grading

If:

- You fail to fill out the paperwork to request codes from RSICC, or
- Receive a grade of strictly lower than 65% on your final project (presentation component and written component combined)

... you will receive a grade of E in the class (since you are not prepared for ENU 4192, which is the whole point of ENU 4191.)

Else, your grade is computed as the average of your homework average (as a percentage) and your final project score (as a percentage), less the unexcused absence deduction. This deduction will be 0% for 0 or 1 unexcused absences, 1% for 2, 2% for 3, 4% for 4, 8% for 5, 16% for 6, 32% for 7, and 64% for 8 or more. (The last of these mathematically clinches a failing grade for you in the course.)

Final grades will be assigned based on:

- A: > 84%
- B: 76-83.99%
- C: 67-75.99%
- E: < 67%

For example, for a student with a homework average of 84% and a final project of 74%, with 3 unexcused absences:

$$\%Grade = \frac{82\% + 72\%}{2} - 2\% = 75\% \quad (1)$$

This student would earn a C in the course.

The instructor reserves the right to grant higher grades at the end of the course at his sole discretion, including the use of A-, B+, B-, and C+.

Under no circumstances will grades of C- or any flavor of D be used. Regardless, the following statement is required by COE polic: “A C- will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit:

<http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>”

18. Make-up Exam Policy

No exams means no make-up exams.

19. Honesty Policy

All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

Addendum to 19: Violations of UF Academic Honesty policies in this course will be reported through appropriate channels. If you choose to commit academic misconduct in this course, expect to receive a failing grade for the course.

20. Accommodation for Students with Disabilities

Students requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

21. UF Counseling Services

Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.

- Career Resource Center, Reitz Union, 392-1601, career and job search services.

22. Software Use:

All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

23. Course Evaluations

The University of Florida expects students to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at

<https://evaluations.ufl.edu>

Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at

<https://evaluations.ufl.edu/results>