Elements of Nuclear and Radiological Engineering Design, ENU 4191, Section 6299

**Online Synchronous** (this means you cannot complete the course without being available at the dates/times below)

- M 1605-1800 (UF “Periods” 9-10) and F 1605-1655 (UF “Period” 9),
- No final exam.

**Changes to Syllabus**

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

**Instructor**

DuWayne Schubring, Ph.D., Associate Engineer
317 Materials Engineering Building (MAE, not MAE-A, MAE-B, or MAE-C)
352-294-7870
dlschubring@ufl.edu (This is the best way to reach me. The Canvas “conversations” feature is not e-mail and does not send a message to me until I happen to log into Canvas. Therefore, messages sent via that system will not be acknowledged.)

**Office Hours (tentative)**

- M 1350-1450, T 1315-1445, W 1220-1450, F 1350-1450, and by appointment.

End times of M/T/W office hours will be enforced strictly, as I have other engagements (including teaching class) immediately afterwards. There are no office hours on days when no UF classes are held.

Zoom meetings will be provided for each of these. I will log on at the beginning of each period, but may not stay logged-on the entire time. (When I’m holding office hours and no student is around, I try to get some other work done. Some of this work is bandwidth-intensive.) However, if you notice I am not logged-on to an office hour Zoom meeting, please send me an e-mail. I will keep my e-mail auto-checking – I will log on to the Zoom meeting within 10 minutes (usually closer to 5).

**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.

**Prerequisites**

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

This Senior Capstone course sequence will train students in a large team-based project, including multiple technical areas within the NE undergraduate program. Written and oral communication will be emphasized.

For most students, ENU 4192 will involve design of a nuclear fission reactor system, to be completed in groups. An alternate project or projects may be offered, pending participation of other faculty; this will be determined by the first day of class. 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. Development of familiarity with nuclear engineering codes, with a focus on code selection (training in operation of the codes is generally not part of ENU 4191, though tutorials on MCNP criticality may be offered to the class) and, if needed, acquisition of legal copies of the codes
3. Reinforcement and backfilling of selected technical content (standards and codes, engineering economy) that does not fit comfortably within other required courses
4. For reactor design groups: exploration of the full range of reactor technology options, including non-LWR choices

Professional Component (ABET)

1 credit Engineering Topics

Program Outcomes (ABET)

1. n/a
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors (high coverage)
3. an ability to communicate effectively with a range of audiences (high 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. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives (medium coverage)
6. n/a
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies (high coverage)

Text (None Required)

None

References

Useful references for ENU 419x include, but are not limited to:
12. Nuclear Power Plant’s FSARs
15. FE & PE Review Manual
+ any other textbooks you’ve accumulated along the way.

Course Outline and Schedule

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

1. A total of 8 assignments, equally-weighted, will be required. These will include both individual and group work and will include in-class activities.
   (a) Engineering Design Constraints, Standards and Codes, Regulations
   (b) In-class Activity Related to Engineering Design
   (c) In-class Activity Related to Engineering Design
   (d) Survey to Assign Project Groups
   (e) Group Division of Labor Form
   (f) In-class Activity Related to Design Project
   (g) In-class Activity Related to Design Project
   (h) Self-evaluation of Design Project

2. A group report (a) selecting a general reactor design for detailed work in ENU 4192 or (b) performing a comparable scope of work for an alternate project, including a presentation and a written report.
The schedule below notes which classes are synchronous and which are recorded. Synchronous classes also have an maximum expected duration noted. However, be advised that any disruption to the schedule may cause significant shifts – you should not make conflicting plans between 1600 and 1800 on any Monday afternoon this term. Friday sessions will be held only if unavoidable.

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Due</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>31 Aug</td>
<td>Intro and Technical Communication (1.5 hour synch. class)</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>7 Sep</td>
<td>NO CLASS (UF HOLIDAY)</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>14 Sep</td>
<td>Computer Codes, Standards and Codes, &amp; Engineering Design Process (1/3) (Recorded Lecture)</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>21 Sep</td>
<td>HW 1</td>
<td>Engineering Design Process (2/3) (2 hour synch. class)</td>
</tr>
<tr>
<td>M</td>
<td>28 Sep</td>
<td>HW 2</td>
<td>Alternate Project “Pitch”, if needed (&lt;1 hour synch. class)</td>
</tr>
<tr>
<td>M</td>
<td>5 Oct</td>
<td>HW 3</td>
<td>Engineering Design Process (3/3) (2 hour synch. class)</td>
</tr>
<tr>
<td>M</td>
<td>12 Oct</td>
<td>HW 4</td>
<td>Project Groups Announced (&lt;1 hour synch. class) &amp; Non-LWR Options (1/2 – Recorded Lecture)</td>
</tr>
<tr>
<td>M</td>
<td>19 Oct</td>
<td>Non-LWR Options (2/2 – Recorded Lecture)</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>26 Oct</td>
<td>HW 5 &amp; 6</td>
<td>First Project Discussions (2 hour synch. class)</td>
</tr>
<tr>
<td>M</td>
<td>2 Nov</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>9 Nov</td>
<td>HW 7</td>
<td>Second Project Discussions (2 hour synch. class)</td>
</tr>
<tr>
<td>M</td>
<td>16 Nov</td>
<td>NO CLASS (ANS Meeting) – work on your projects</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>23 Nov</td>
<td>Project</td>
<td>Project Presentations (2 hour synch. class)</td>
</tr>
<tr>
<td>M</td>
<td>30 Nov</td>
<td>Engineering Economy (1/2 – recorded lecture)</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>7 Dec</td>
<td>HW 8</td>
<td>Engineering Economy (2/2 – recorded lecture)</td>
</tr>
</tbody>
</table>

Grading

If you 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). Final grades will be assigned based on:

- A: 87%+
- A-: 85-86.99%
- B+: 83-84.99%
- B: 75-82.99%
- C: 66-74.99%
- E: < 66%

I reserve the right to grant higher grades at the end of the course at my 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.

The gradebook on Canvas is used to enable you to look up grades quickly. Note that this gradebook is not official. I reserve the right to correct errors, including transcription errors, from
the official (spreadsheet) gradebook, to which I alone have access, until finalization of grades with the registrar.

More information on UF grading policy may be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

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 near the end of the term. I will announce this via e-mail as needed.) 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.

Grade appeals must be provided in the following format:

- Provide, in PDF format only, a written summary of which problem(s) or part(s) you believe were graded inaccurately. Be as specific as possible.
- Send your appeal in the form of an e-mail with “ENU 4934” and “Grade Appeal” in the subject line.

You will be informed of the result of your appeal via e-mail reply.

On very rare occasions, if I believe you are not acting in a good faith belief that more points are deserved, I will deem the appeal frivolous. 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.

Course-Specific Policies

Attendance

Skip at your peril. Attendance 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.

However, several homeworks will be done during class time – you will receive a zero for a homework completed during an unexcused absence. Accommodations, which may take the form of simply dropping that HW for you, will be made for excused absences. Further, some materials in the course will not be covered in the textbook or in the notes provided online – only in class. Some example problems and complex figures (hard to digitize, easy to make on chalkboard) fall into this category. Students are responsible for these materials.

I reserve the right to take attendance to prioritize e-mail assistance.

Required COVID Statement

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are
unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

*The statement above is required by UF policy. However, our class sessions will not be recorded for dissemination to the class – again, this is a **synchronous** online class.*

**Decorum for Zoom Meetings/Synchronous Classes (Excluding Synchronous Exams)**

The guiding principle is: *do not distract your instructor or classmates.*

- This will likely be a small class, so I will usually verbally confirm with all participants that two-way communication is working. Those of you who opt out of turning your microphone on may respond via the chat. Please don’t turn Zoom on and then walk away for those sessions that do not include in-class HW – this will just confuse.
- You are not required to turn on your video. If you are (1) using a busy internet connection, (2) are further than 300-350 miles from Gainesville (that is, beyond Miami or Atlanta or Pensacola), (3) multitasking in a way that may distract, or (4) likely to be interrupted, please leave it off.
- You should mute yourself unless actively speaking/conversing.

**Make-Up Work Policies**

Late-work excuses (extensions) can be grouped into the categories of *professional, medical, and personal.*

*Professional:* Reasonable extensions for job/internship interviews, technical conferences, or other professional/career development reasons should be requested. Most requests are granted, excluding those that provide a student or group of students an unfair advantage, cause significant disruption to the course or grading schedule, or violate some UF policy.

*Medical:* 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 issues that are frequent or suspiciously-timed *(e.g.; you are repeatedly, suddenly ill at deadlines)*, I 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. Extensions for these personal issues are generally limited to those mandated by the letter of UF policies. The list of UF-approved personal reasons changes from time to time. If you have a question regarding your personal issue and if it qualifies under one of the excused absence/late-work policies, contact me in advance.

I reserve the right to grant extensions for other personal reasons as *rare exceptions to the rule* at my sole discretion – advance notice gives you the best chance at a favorable decision. The approval of an extension does not establish precedent for that student (notably, there are some scenarios that I may accommodate only once) or for other students with similar circumstances.
The 12-day rule will be enforced strictly. Note that the count of days is based on a per-student, not per-approved-activity basis.

For the purposes of this course, in the above-referenced list of approved absence (extension) reasons, the word “family” shall be taken to mean your parents, grandparents, great-grandparents (etc.); children, grandchildren (etc.); siblings; aunts/uncles; nieces/nephews; your spouse and the spouse of any of the above; and half- or step- “versions” of the above categories. More distant relatives (a cousin, your spouse’s sibling’s spouse, etc.), partners (excluding spouses), and pets are not included. Minor illnesses (guideline: anything meriting home care only or care at a walk-in clinic, as opposed to an ER) of family members, including minor children, do not count as serious family emergencies, nor do events such as birthdays, anniversaries, weddings, etc.

Political activities, including protests, demonstrations, and the like are considered personal matters and not generally permitted as reasons for extensions. This includes activities related to nuclear engineering or nuclear power. Exceptions: (1) if you are pursuing nuclear-related (whether pro- or anti-) politics as a career path, you may be granted extensions, at my discretion, on condition of providing evidence of bona fide efforts to secure a full-time position or to secure admission to a relevant, non-STEM degree-granting graduate program and (2) activities between November 13 and November 20, inclusive, that are connected to the 2020 ANS “Winter” Meeting will be taken as related to that professional activity and potentially grounds for extensions.

Further, be advised that any approved reasons for extensions do not reduce the amount of work you are expected to complete, but merely rearranges the timing. For those issues that are predictable (interview, holidays, etc.), you should work ahead to avoid disruption. In the case where your extension (or other accommodation) adversely affects a group project, I may modify the assignment and/or groups for those concerned to minimize the disruption of one student’s issues on other group members.

Homework and Projects

Excluding the make-up work policies, above, no late homework or projects will be accepted.

Homework and projects must be submitted electronically (via Canvas). Submissions may include multiple files, but only files with the following extensions will be accepted: pdf, xls, xlsx, ods, numbers, ees, txt, and (for the Project only) zip. This zip archive may not contain any ppt, pptx, doc, or docx files. Such files will be ignored for the purposes of grading. If multiple students in a Project group independently submit electronically, the submission by the student whose name is listed first on the assignment that I post to Canvas will take precedence. (One student must submit the entire project – different students submitting the project narrative and supporting zip archive is not allowed.)

For handwritten homework, use pencil or black/dark-blue ink and either white paper (lined or not) or engineering paper. If you choose the combination of pencil and (yellow) engineering paper, write largely/clearly enough to be easily readable. Homework on other paper or with other writing instruments will be accepted, but you will earn no credit for homework that is not readable. Make sure the scan quality is sufficient to ensure readability.

All projects must be written using word processing or typesetting software. Professional document and figure standards will be enforced on projects. 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. I have 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.

**Collaboration**

Projects are to be done in groups. I will assign the groups. A peer review system is in place to assure equitable workload. In the event the workload is not equitable, I reserve the right to adjust individual grades to accurately reflect contributions to the work.

The ground rules for collaboration should be decided by each group through compromise and consensus. However, regardless of the preferences of the group as a whole, each student retains the individual right to privacy and to maintain good mental and physical health. To this end, no student shall be compelled:

- To join a real-name social networking site or modify their existing use of such a site, or
- To accept a 24/7 or other onerous on-call policy.

That is: each member holds a unilateral veto on using Facebook (or some such) for your group’s work or for being contacted at all hours of the day and night.

Inter-personal issues within your group stemming from deciding group rules must be brought to me promptly for arbitration. This arbitration will focus on the guidelines above and in forming an equitable compromise (essentially, equal marginal/new inconvenience) among group members and not on determining whose activities outside this course (including personal pursuits, situations, and choices) are more meritorious.

No collaboration is permitted between teams on projects

**Electronic Communication**

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

You will receive an update e-mail on a weekly basis, usually on Friday. This will serve as a reminder of all synchronous sessions, recorded lectures to watch, and due dates for the next week. Relevant opportunities or items-of-interest may also be included.

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.

When sending questions via e-mail, please make sure you provide all the information needed for me to produce an answer or solution. This includes any files, particularly EES files, on which you are working. (Note: I will not open files from students in the following formats: .ppt, .pptx, .doc, .docx; make a PDF and send that if needed.)
Course Website (Canvas)

The primary use of the Canvas website is for file storage, as all assignments, lecture notes, etc. will be provided there. I take no responsibility for downtime of this service, nor for actions of University of Florida staff that affect the website (including Canvas upgrades).

Deadline Flexibility

I am well-aware that senior students have extremely busy fall semesters. Reasonable accommodations on homework and projects will be made for professional commitments (conference attendance, taking the GRE, grad school visits, etc.) and, potentially, to minimize conflicts among senior year courses. However, I do not have an efficient means to make myself aware of all student conflicts and commitments. Therefore, it is up to you to make me aware of issues, for which some accommodations/extensions/flexibility may be offered.

Letters of Recommendation/Evaluation Policy

To request a letter of recommendation/evaluation (for graduate school or otherwise), you must provide (all in a single e-mail):

- A copy of your UF transcript.
- A copy of a résumé (or CV).
- A copy of the following form with all four circles checked (requests with three or fewer circles checked will be denied):

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.

I reserve the right to refuse provide a letter for any student and am not obligated to provide a reason for such refusal.

Syllabus Boilerplate

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://www.dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to me when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.
Course Evaluations

The University of Florida expects students to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at: https://gatorevals.aa.ufl.edu/students/

Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/

Summaries of course evaluation results are available to students at: https://gatorevals.aa.ufl.edu/public-results/

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code: https://www.dso.ufl.edu/sscr/process/student-conduct-honor-code/

specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

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

• Your academic advisor or Undergraduate/Graduate Program Coordinator [for NE/NES students, these are both also your instructor]
• Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
• Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
• Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@ufl.edu

Software Use

All faculty, staff, and students 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.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see:

https://registrar.ufl.edu/ferpa.html

Campus Resources

Health and Wellness

U Matter, We Care
Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center:
http://www.counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence
If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the Office of Title IX Compliance, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.
University Police Department at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu
https://lss.at.ufl.edu/help.shtml
Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling.
https://www.crc.ufl.edu/
Library Support, Various ways to receive assistance with respect to using the libraries or finding resources.
http://cms.uflib.ufl.edu/ask
Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
https://teachingcenter.ufl.edu/
Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
https://writing.ufl.edu/writing-studio/
Student Complaints Campus:
On-Line Students Complaints:
http://www.distance.ufl.edu/student-complaint-process