

This syllabus serves the following course sections:

1. **ENU 4134**
Reactor Thermal Hydraulics, ENU 4134, Section 221E
2. **ENU 6135**
Nuclear Thermal Hydraulics, ENU 6135, Section 1C40

The times and dates are the same for both:

MF 1500-1550 (UF “Period” 8) in Turlington Hall 2354 and W 1500-1655 (UF “Periods” 8-9) in Rinker Hall 0106

Final Exam: 1230-1430, Friday, December 13, Location TBD

The undergraduate (ENU 4134) and graduate (ENU 6135) courses share common lectures and a fraction of common coursework. Some course procedures may vary based on your registration. *You are subject to the procedures of the course for which you are registered – you may not mix and match!*

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.

1 Instructor

DuWayne Schubring, Ph.D., Instructional Professor
317A 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 “Inbox” feature *is not* real e-mail. Messages sent via that system will not be acknowledged.)

2 Office Hours

M 1210-1250; TWRF 1310-1430 (subject to change)

Office hours are held in a hybrid format, with online availability via the following Zoom link: <https://ufl.zoom.us/j/9057355922>. For Zoom attendees: if you are in a private space (e.g.; your own house or apartment, a dorm room, etc.), please turn your camera off. If you are in a public space (e.g.; unused classroom, outdoors at UF), your camera status is at your discretion.

At the beginning of an office hour block, all those in line in person at the start of the office hour block will be addressed first, followed by those on Zoom who have been there since the start of the office hour block. If there is a line, Monday office hour visits are limited to 5 minutes per student or group. On other days with a line, visits are limited to 10 minutes. If you have further questions, you may go to the back of line and potentially return. Once both lines are cleared, I will continue on a first-come, first-served basis with no preference for in-person vs. Zoom.

End times of office hours will be enforced strictly, even if students are still waiting, as I have other engagements (including teaching class) immediately after each office hour block.

There are no office hours on days when no UF classes are held, including reading days and finals week.

3 Description

4134: Nuclear applications of fluid mechanics, heat transfer and thermodynamics. Two-phase flow and boiling heat transfer. Heat transfer mechanisms in reactor core and sub-channel thermal hydraulics. Steam generator, power cycles, balance of plant. Introduction to thermal design for reactors.

6135: Treatment of nuclear thermal sciences: thermodynamics, fluid mechanics, heat transfer, two-phase flow, boiling; sub-channel thermal hydraulics, steam generator design, balance of plant analysis.

3.1 Prerequisites

EML 4140 + (EGN 3353C or ENU 4133)

4 Course Objectives

This course serves the following purposes: (1) provides an introduction to two-phase flow and heat transfer, (2) covers nuclear applications of thermodynamics, fluid mechanics, and heat transfer, (3) provides an introduction to thermal design of reactors, and (4) reinforces teamwork, communication, and programming skills learned in junior courses.

5 Program Outcomes (ABET) – 4134 only

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics (high coverage)
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 (medium coverage)
3. an ability to communicate effectively with a range of audiences (medium 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. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions (low coverage)
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies (low coverage)

6 Text (Optional)

Nuclear Systems I: Thermal Hydraulic Fundamentals, N.E. Todreas and M.S. Kazimi, 2011 (2nd edition). (ISBN: 9781439808870).

This text (“T&K”) may be useful as a reference for this course, ENU 4191/4192, and your future career and may be worth purchasing. However, you can complete this course without it. I do not recommend renting the book or buying it with intent to sell it back at the end of the term.

Notes are available on Canvas, as both a large number of small files and a single .pdf, suitable for printing.

To complete some of the homework and projects in this course, access to a programming or scripting language such as MATLAB, Python, FORTRAN, C, C++ (etc.) and a spreadsheet application, will be required.

The department also has a license for Engineering Equation Solver (EES). This program can iteratively solve large systems of non-linear equations, enable efficient parametric studies and optimizations, and produce high-quality plots. It also includes thermodynamic and transport property look-ups. These capabilities will make some homework problems easier to solve or offer additional options on which problems constitute some HW. For ENU 4134/6135, you are not required to learn or use this software. (Depending on which areas of senior design – ENU 4192 – you focus, you may be required to learn EES for that course.)

6.1 References

1. *Nuclear Heat Transport*, M. M. El-Wakil, 1978 (1st edition). (ISBN: 0894480146). A second book on nuclear-specific thermal issues.
2. Any undergraduate textbooks (typically aimed at mechanical engineering students) on thermodynamics, fluid dynamics, and heat transfer.

Required Computer

UF student computing requirement: <https://news.it.ufl.edu/education/student-computing-requirements-for-uf/>

7 Course Outline and Schedule

The course is organized into 18 modules, Notes, examples, etc. for each module are in separate folders on the course website. (Any materials for Module 15 will be uploaded later in the term.)

1. Nuclear Applications of Fluid Mechanics and Heat Transfer [T&K, Sections 9.6, 10.5.1.1.3]
2. Averaging in Two-Phase Flow [T&K, Sections 5.1 through 5.4]
3. Transport in Two-Phase Flow [T&K, Sections 5.5 through 5.7]
4. Homogeneous Equilibrium Model [T&K, Sections 11.1 through 11.4, 11.5.2]
5. Separated Flow Model and Void Fraction Correlations [T&K, Section 11.5]
6. Pressure Loss in Two-Phase Flow [T&K, Section 11.6]
7. Flow Regimes in Two-Phase Flow [T&K, Section 11.2]
8. Boiling Heat Transfer – Fundamentals [T&K, Sections 12.1 through 12.5, 13.1, 13.2]
9. Boiling Heat Transfer – Correlations [T&K, Section 13.3]
10. Boiling Heat Transfer – Critical Heat Flux [T&K, Section 13.4]
11. Nuclear Heat Transport [T&K, Sections 3.1 through 3.6.1, 3.9, 8.1 through 8.3, 8.5, 8.7]
12. Single Channel Analysis (SCA) Methods [T&K, Chapter 14]
13. Critical Flow [T&K, Section 11.7]

14. Nuclear Power Cycles [T&K, Sections 6.1, 6.3 through 6.7]
15. Thermal Design Principles
16. Steam Generators
17. Natural Circulation
18. Condensation Heat Transfer [T&K, Section 12.7]

Each module is supported by online lecture notes. The notes for Modules 1-14 and 16-18 are complete on Canvas as of the first day of class; Module 15 will be finalized at a later date. Since T&K is primarily a graduate-level textbook and is not written in the same order as this course is taught, these notes are intended to distill the key points of the modules for use in this course

Deadlines will not be earlier than listed in the schedule below, but may be later. Exams will only be delayed in exceptional circumstances (*e.g.*; university closure on the date of the exam or multiple cancelled class days prior to the exam).

The day-by-day outline of lecture coverage is to be taken as a draft.

Week	Day	Date	Due	Material
1	F	23 Aug		Introduction to Course
2	M	26 Aug		M1 – Nuclear App. of Fluid Mechanics and Heat Transfer
2	W	28 Aug		M1 – Nuclear App. of Fluid Mechanics and Heat Transfer
2	F	30 Aug		M2 – Averaging in Two Phase Flow
3	M	2 Sep		NO CLASS (UF HOLIDAY)
3	W	4 Sep	HW 1	M2 – Averaging in Two Phase Flow & M3 – Transport in Two-Phase Flow
3	F	6 Sep		M3 – Transport in Two-Phase Flow
4	M	9 Sep		M4 – Homogeneous Equilibrium Model
4	W	11 Sep	HW 2	M4 – Homogeneous Equilibrium Model & M5 – Separated Flow Model and Void Fraction Corr.
4	F	13 Sep	HW 3	M5 – Separated Flow Model and Void Fraction Corr.
5	M	16 Sep		M6 – Pressure Loss in Two-Phase Flow
5	W	18 Sep	HW 4	M6 – Pressure Loss in Two-Phase Flow M7 – Flow Regimes in Two-Phase Flow
5	F	20 Sep		M7 – Flow Regimes in Two-Phase Flow
6	M	23 Sep		M7 – Flow Regimes in Two-Phase Flow
6	W	25 Sep	Exam 1	Exam 1
6	F	27 Sep	HW 5	M7 – Flow Regimes in Two-Phase Flow
7	M	30 Sep		M8 – Boiling Heat Transfer – Fundamentals
7	W	2 Oct		M8 – Boiling Heat Transfer – Fundamentals
7	F	4 Oct	HW 6	M9 – Boiling Heat Transfer – Correlations
8	M	7 Oct		M9 – Boiling Heat Transfer – Correlations
8	W	9 Oct	HW 7	M10 – Boiling – Critical Heat Flux
8	F	11 Oct		M11 – Nuclear Heat Transport

Week	Day	Date	Due	Material
9	M	14 Oct		M11 – Nuclear Heat Transport
9	W	16 Oct	Exam 2	Exam 2
9	R	17 Oct	HW 8	NO CLASS (Deadline Only)
9	F	18 Oct		NO CLASS (UF HOLIDAY)
10	M	21 Oct		M12 – Single Channel Analysis
10	W	23 Oct	HW 9	M12 – Single Channel Analysis & M13 – Critical Flow
10	F	25 Oct		M13 – Critical Flow
11	M	28 Oct		M14 – Nuclear Power Cycles
11	W	30 Oct		M15 – Thermal Design Principles
11	F	1 Nov	HW 10	M14 – Nuclear Power Cycles
12	M	4 Nov		M14 – Nuclear Power Cycles
12	W	6 Nov	Exam 3	Exam 3
12	F	8 Nov	HW 11	Project Work Day
13	M	11 Nov		NO CLASS (UF HOLIDAY)
13	W	13 Nov	Project Part A	M16 – Steam Generators
13	F	15 Nov		Project Work Day
14	M	18 Nov		Project Work Day (ANS Meeting)
14	W	20 Nov		Project Work Day (ANS Meeting)
14	F	22 Nov	Project Part B	M17 – Natural Circulation
15	-	-		NO CLASS (Thanksgiving Week)
16	M	2 Dec		M18 – Condensation
16	W	4 Dec	HW 12	Review for Exam 4
17	F	13 Dec	Exam 4	Exam 4 (1230-1430)

8 Grading

There are 1000 total points in the course. These points are equally valuable.

- Exams (500 points total, 125 points each) [50%]
 1. Modules 1 through 5
 2. Modules 6 through 9
 3. Modules 10 through 13
 4. Comprehensive, focus on Modules 14 and after
- Project: Single Channel Analysis (SCA) Code Development and Use for Thermal Design (200 points total) [20%]
 - Part A – Code: 50 points
 - Part B – Report: 150 points
- Homework (300 points total, 25 points each except where indicated) [30%]

1. Nuclear Applications of Fluid Mechanics and Heat Transfer
2. Averaging in Two-Phase Flow and Transport in Two-Phase Flow
3. Homogeneous Equilibrium Model
4. Separated Flow Model and Void Fraction Correlations
5. Pressure Loss in Two-Phase Flow
6. Boiling Heat Transfer – Fundamentals
7. Boiling Heat Transfer – Correlations
8. Boiling Heat Transfer – Critical Heat Flux (26 points)
9. Nuclear Heat Transport
10. Critical Flow
11. Nuclear Power Cycles
12. Steam Generators, Natural Circulation, and/or Condensation (24 points)

8.1 Grading Scale

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

8.2 Grading Notes

1. I reserve the right to grant higher grades at the end of the course at my sole discretion, including the use of B- and C+. Under no circumstances will grades of C- or any flavor of D be used.
2. Each exam is individually curved. The details of this curve are included as part of the Exam Previews.
3. No single item exceeds 15% of your course grade. This emphasizes consistent performance in this course and limits the deleterious effect on your grade of a single poor exam.
4. Except on the Project (Part A – Code & the document professionalism on Part B – Report), grading in this course is plus-based. That is, I award you points based on correct steps, rather than deducting points for errors. As a result, a question such as, “Dr. Schubring, why did you take off 2 points here?” is both presumptuous and nonsensical, since you never had the points.
5. There is no general protection against double jeopardy. Points are often allocated, particularly on exams, to each specific step and to obtaining the final, correct answer in each problem – a single error will prevent you from earning points at that step and for the final answer.
6. Per UF policy, grades are entered into Canvas to enable you to look up grades quickly. These grades are manually copied from other documents. I reserve the right to correct data-entry errors, as well as other errors, until finalization of grades with the registrar.

(Pertains to ENU 4134 only): More information on UF grading policy may be found at:
<https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

(Pertains to ENU 6135 only): More information of UF Grading policy may be found at:

<https://gradcatalog.ufl.edu/graduate/regulations/>

8.3 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.

It is inevitable that scoring of essay answers is somewhat subjective; a margin of error of one point per line-item is applied for this reason. That is: if you receive a grade of 7/10 on an essay-like question, only those appeals that propose a grade of 9/10 or better will be considered.

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 (a) “ENU 4134” or “ENU 6135” – use your class number and (b) “Grade Appeal” in the subject line.

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

If I believe you are not acting in a good faith belief that more points are deserved, I will deem the appeal frivolous. Requests to change an essay-like line-item by only one point will also be considered 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.

9 Course-Specific Policies

9.1 Canvas and Electronic Communication

The Canvas platform will be used for file storage and for posting assignments and grades. I take no responsibility for downtime of this service, nor for actions of University of Florida staff that affect the website (including Canvas upgrades).

For those who wish to work more problems (not for credit, but for practice), the Fall 2021, 2022, and 2023 exams and solutions are available on Canvas as are the Fall 2023 homework sets and solutions.

As discussed in Section 1, *do not* use the Canvas Inbox feature to contact me. I only access Canvas when needed and therefore cannot guarantee rapid replies. Therefore, to avoid inconsistent responsiveness, I do not use Canvas’s pseudo-e-mail at all. Instead, use real e-mail (address in that same section), which I check frequently. The primary means of communication to 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.

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 you in the following formats: .ppt, .pptx, .doc, .docx; make a PDF and send that if needed.)

9.2 Attendance and Make-Up Work Policies

9.2.1 Pertains to ENU 4134 only

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.

9.2.2 Pertains to ENU 6135 only

Excused absences must be consistent with university policies in the Graduate Catalog: <https://catalog.ufl.edu/graduate/regulations> and require appropriate documentation. Additional information can be found here: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

9.2.3 Pertains to ENU 4134 and ENU 6135

Skip at your peril. Attendance is not directly considered in the grade. I reserve the right to take attendance to prioritize e-mail assistance.

Late-work excuses (extensions) and excused absences from exams 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 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.

All requests for extensions, including excused absences from exams, must be submitted in writing, preferably via e-mail.

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.

One UF-allowed personal reason for absence or extension is “serious accidents or emergencies affecting the student, their roommates, or their family”. The word “roommates” is ambiguous between those with whom a student shares a residence (“housemate” or “flatmate”) and only those with whom a student shares a bedroom. For the purposes of this course, “roommates” shall be taken to mean those with whom a student shares a residence. Further, no definition of “family” is provided. Therefore, the following people shall be taken as included as “family” for the purposes of this course:

- Spouse, domestic partner, great-grandparent, grandparent, parent, brother, sister, child, grandchild, or the grandparent, parent, brother, sister, child, grandchild, or great-grandchild of the student’s spouse or domestic partner, or the spouse or domestic partner of any of them. This also includes individuals for whom the student is the current legal guardian. These are based on the UF definition of “immediate family”, which can be accessed at:
http://benefits.hr.ufl.edu/wp-content/uploads/sites/3/2018/05/immediate_family_defs.pdf
 Note that the term “domestic partner” does not apply automatically to any partner with whom you cohabit (formal registration with UF is required). That is, if you have not registered with UF, an accident involving your partner would count, but not one involving your partner’s parent, child, etc.
- Your own aunt/uncle, great-aunt/uncle, nibling (niece or nephew), or great-nibling.

More distant relatives (a cousin, your spouse’s nibling, etc.), partners (excluding spouses or those with whom you cohabit), friends (other than roommates), 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 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 16 and 22, inclusive, that are connected to the 2024 ANS “Winter” Meeting will be taken as related to those professional activities and potentially grounds for extensions.

Further, be advised that any approved reasons for extensions do not reduce the amount of work you are required 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.

Excused absences must be consistent with university policies in the Graduate Catalog (<https://catalog.ufl.edu/graduate/regulations>) and require appropriate documentation. Additional information can be found here: <https://gradcatalog.ufl.edu/graduate/regulations/>

Undergraduate Catalog Attendance Policies: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

9.3 Examinations

For each exam, you will receive an Exam Preview, intended to prepare you for taking the exam (both technically and procedurally). Detailed policies (including grading/curving) are included on this document. The preview will also include the specific topics addressed by the problem (for most problems), the way points are distributed among problems, and a brief list of topics within the scope of the exam.

Exams will serve as the primary means of differentiation between ENU 4134 and ENU 6135 coursework.

Examinations are due at the end of the examination period. No collaboration is permitted during examinations, although you may prepare for these however you choose.

The criteria for make-up exams are the same as for extensions to other assignments. All make-up exams will be held after the regular exam, as organized with me. Conflicts in my proposed make-up times with your personal business will not, in general, be accommodated.

In the event that UF requires that any scheduled exam day(s) are done online, all reasonable efforts will be made to ensure that privacy-violating proctoring software is not required. These efforts include, but are not limited to, switching to have more exams of lower point value each (percent of course grade each) to stay below a mandatory-proctoring threshold.

UF policy restricts make-up finals to Friday, December 13, 1500-1700, barring a conflict at that time with another make-up in a course of higher number. This rule applies regardless of your personal business, such as travel times. I strongly discourage you from making hard-to-change travel plans such as flight reservations before Friday evening.

In the unlikely event you (1) are unable to complete the exam at the time originally scheduled for allowed reasons, (2) are unable to make the UF-appointed make-up exam time for allowed reasons, (3) do not make-up the exam at some other time prior to the finalization of grades on December 16, and (4) are on pace to pass the course, you will receive a grade of I (Incomplete). In the (also unlikely) case that the first three of these conditions apply but you were on pace to fail the course, UF policy requires that I assign a failing grade with the notation that you stopped participating before the end of the term. This may have implications on financial aid beyond a simple “E” grade.

9.4 Homework and Project

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

HW 8 and the Project (both Part A and Part B) must be submitted electronically (via Canvas). All other HW may be submitted electronically (via Canvas) or in hard copy. The Canvas deadline will usually be at 2359, with the hard copy deadline at an earlier time that day (usually beginning of class).

The following restrictions apply for electronic submissions:

- 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 a hard copy and electronic submission are provided on a homework, the hard copy will take precedence. (Only it will be read, reviewed, and graded.) You may not submit parts of the assignment electronically and parts in hard copy.
- If multiple students in a Project group independently submit Part B electronically, the submission by the student whose name is listed earlier 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.)

- Additional requirements will be provided for Project Part A on the relevant assignment document.

Many assignments require the use of fluid properties. Use only those properties from EES, including from the tabular listing provided on the course website. *No points will be awarded on problems solved with any other set of properties, including those in the back of T&K.*

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 and 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. For electronic submissions, make sure the scan quality is sufficient to ensure readability.

The onus is on you to submit the solutions in the documents or files presented. No credit will be granted if the wrong document is handed in or the wrong file uploaded. In the case of EES files, I will only use Solve, Min/Max, and Evaluate Parametric Table functions. Do not submit a single file to solve multiple problems with (parts of) all but one problem commented out plus a list of instructions to complete a scavenger hunt for the remaining problems.

The project must be written using word processing or typesetting software. Professional document and figure standards will be enforced 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.* 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 not lead to a revision of requirements or grading.

9.5 Collaboration

The project will be done in groups. I will assign the groups. A peer review system is in place with a goal of equal workload among students in each group. In the event the workload is significantly unequal, 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 of you retains the individual right to privacy and to maintain good mental and physical health. To this end, no one 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 with a goal of 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 groups on the project.

9.6 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 resume (or CV).
- A copy of the following form with all four circles checked (requests with three or fewer circles checked will be denied):
<http://www.registrar.ufl.edu/pdf/ferparelease.pdf>.

Letters are typically filed once per week. For those of you 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 for each of you during the term. (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 to provide a letter for anyone and am not obligated to provide a reason for such refusal.

9.6.1 Ph.D. Applications

The first duty of every Ph.D. holder is to the truth, whether it is scientific truth or historical truth or personal truth! It is the guiding principle on which inquiry is based, and if you can't find it within yourself to stand up and tell the truth about what happened, you don't deserve to have that degree! – adapted from Captain Picard.

If I have *ever* caught you in a lie, no matter how small, do not presume that I will write you a letter of recommendation for Ph.D. programs until we have discussed your transgression.

10 Syllabus Boilerplate

The following statements were written by people other than your instructor. Questions on these items will usually be referred to the responsible level/office within the university, which will take longer than for the sections written by your instructor

10.1 Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting

<https://disability.ufl.edu/students/get-started/>

It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

10.2 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/>

10.3 In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

10.4 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/sccr/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.

10.5 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]
- 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
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@ufl.edu

10.6 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.

10.7 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>

10.8 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/>

10.9 Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. <https://elearning.ufl.edu/>.

Career Connections Center, Reitz Union, 392-1601. Career assistance and counseling; <https://career.ufl.edu>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

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: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>; <https://care.dso.ufl.edu>.

On-Line Students Complaints: <https://distance.ufl.edu/getting-help/>; <https://distance.ufl.edu/state-authorization-status/#student-complaint>.