The University of Florida, Department of Material Science and Engineering
Nuclear Engineering Program

ENU 4612L: Nuclear Radiation Detection and Instrumentation Laboratory
Addendum to the Lecture Syllabus

Fall Semester 2020

Laboratory Objectives: Provide students with a working knowledge of radiation detectors, detector systems, and their associated electronics. Develop communication skills including technical writing and oral presentations. Prepare students for independent research and/or design projects.

Credit: 1 hours

Instructor: Prof. Kyle C. Hartig kyle.hartig@ufl.edu
352-392-4907
Office hours: Monday, TBD
Wednesday TBD
Note: Office hours may change due to laboratory schedule / upcoming travel schedule

Note: For all course-related questions a preferred mode of interaction is to visit the instructor in person during office hours and refrain from using email.

Teaching Assistant: TBA
Email: TBA
Office hours: TBA

Textbook: G. Knoll, *Radiation Detection and Measurement,* Wiley, Fourth Edition, 2010 (978-0470131480)

Pre-requisites and Co-requisites:
Pre-requisites for ENU 4612:

- EEL 3003 Elements of Electrical Engineering
- ENU4605 Interaction of Radiation with matter

Meeting Times & Schedule:
Lecture: MWF 0935–1025, Aug 31 - Dec 9, 2020
Laboratory: ENU4612L laboratory sections will be assigned/scheduled during the first week of classes.

Note: adjustments to this regular schedule could be made periodically and announced in advance in class and through the class website/email. Occasionally, the lecture may be recorded and the students instructed to watch a video on the course Canvas site instead of meeting for class.

Meeting Location:
Laboratory: MSE Undergraduate Research Laboratory (Rhines Hall Basement)

Web Tools: https://lss.at.ufl.edu/
The course Canvas site will be used to distribute the syllabus, announcements, slides, grades, etc. I will attempt to place course notes ahead of lectures on Canvas. The notes I post may only contain fragments of the entire lecture. Students are required to attend class and fill in the blanks as

necessary, according to written lecture notes dictated in class. Canvas will also be the location to download other posted course materials, such as homework, solution sets, and sample problems.

Contribution of Course to Meeting the Professional Component (ABET only):

a. Graduates will have successful careers in Nuclear Engineering and related disciplines.
b. Graduates will pursue continuing education or advanced degrees.

Relationship of Course to ABET Program Rubric: (L – Low, M – Medium, H – High)
This course supports the following program rubric outcomes:

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

Grading: Your performance in both the lecture and laboratory will be graded separately as they are two different courses. Below is a breakdown for the grading in the laboratory:

Laboratory:
- Short Reports - 50%
- Laboratory Notebook - 10%
- Worksheets - 15%
- Quizzes - 25%

Late assignment deductions 20% (0-1 day) & 100% >1 day

The following grades will be assigned based on the final score: A, A-, B+, B, C, and E.

Lab Reports

You will be required to turn in individual short lab report(s) (a short ~3-5 page tech memo) and (longish ~10 page report(s)). These lab reports will be due 10 days from the date that the lab was actually performed. Guidelines will be handed out describing what is expected to be included in these reports and the formatting style to be used. Lab reports must be prepared by computer and turned into the class site dropbox in PDF format prior to the deadline. Professional document and figure standards will be enforced on all electronic submissions in this course. 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. Excel may not be used to prepare figures (plots). It is suggested that students prepare figures (plots) in Python (GnuPlot), MatLAB, Mathematica, Igor Pro, or Origin Pro. I have exactly zero sympathy for those who select a word processor or computer program without knowing how to format their text or figures using it – complaints that the standards are not the same as a particular piece of software's defaults will fall on deaf ears. Presentations and additional problems may be assigned as part of the laboratory report submission requirements.

Quizzes

A short quiz will be given at the beginning of every lab session (except for Lab 0). They will consist of 1-2 simple questions that will be taken from the lab information handout given before each session.

Worksheets

I will provide the worksheets and lab instruction handouts at the start of each lab session. These worksheets will consist of several questions that each student must answer individually on their own worksheets. At the end of the lab session, I will collect the worksheets for grading. The only exception to this will be weeks

where a short report is required. For labs which are assigned a short report you will hold on to the worksheets in order to use the data for your lab reports or PowerPoint slides.

Laboratory Notebook
Information about maintaining a laboratory notebook for this course will be given out through the course website and during the initial Lab 0 meeting.

I reserve the right to make edits to the description and requirements of the assignments described above for this course.

The final grades will be assigned based on:

- A: ≥92%
- A-: ≥88%
- B+: ≥84%
- B: ≥80%
- B-: ≥76%
- C+ ≥72%
- C: ≥68%
- C-: ≥65%
- D+: ≥62%
- D: ≥59%
- D-: ≥56%
- E: <56%

Please note that following:

1. At the end of the course, students overall course grades may be curved up at my discretion.
2. 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, "Prof. Hartig, why did you take off 2 points here?" is both presumptuous and nonsensical, since you didn't have the points to begin with.
3. 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.
4. The grade cut-offs for A, B, and C are somewhat lower than the "high-school scale" (90, 80, 70, etc.) under which many UF courses and syllabi templates operate. This is not to grant inflated letter grades but rather to account for the challenging nature of the course material and to appropriately award genuinely excellent performances.

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

Attendance and Expectations:
Students are expected to attend ALL laboratory sessions. Students must participate in each laboratory exercise, including lab quizzes, and produce individual laboratory worksheets for every lab, along with two laboratory reports during the semester. Students may make up experiments provided that valid medical reason or previously excused reason. Students must perform ALL laboratory experiments in order to receive a passing grade.

Additional University Policies – COVID-19 Related

We will have face-to-face instructional sessions to accomplish the student learning objectives of this course. In response to COVID-19, the following policies and requirements are in place to maintain your learning environment and to enhance the safety of our in-classroom interactions.

- You are required to wear approved face coverings at all times during class and within buildings. Following and enforcing these policies and requirements are all of our responsibility. Failure to do so will lead to a report to the Office of Student Conduct and Conflict Resolution.
- This course has been assigned a physical classroom with enough capacity to maintain physical distancing (6 feet between individuals) requirements. Please utilize designated seats and maintain appropriate spacing between students. Please do not move desks or stations.
- Sanitizing supplies are available in the classroom if you wish to wipe down your desks prior to sitting down and at the end of the class.
- Follow your instructor's guidance on how to enter and exit the classroom. Practice physical distancing to the extent possible when entering and exiting the classroom.
- If you are experiencing COVID-19 symptoms (Click here for guidance from the CDC on symptoms of coronavirus), please use the UF Health screening system and follow the instructions on whether you are able to attend class. Click here for UF Health guidance on what to do if you have been exposed to or are experiencing Covid-19 symptoms.
    - Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work. Find more information in the university attendance policies.

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 Graduate Program Coordinator
- 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@eng.ufl.edu

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 suppor*t*, 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, 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://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

On-Line Students Complaints*:* http://www.distance.ufl.edu/student-complaint-process.