

## **1. Description**

Four one period-hour lectures discussing continuous and discrete variable solution methods for the statistical, algebraic, differential and integral equations important in nuclear engineering. Problems involving neutron, photon, fluid and temperature distributions in configuration, time and velocity are mathematically modeled, solved and interpreted.

## **2. Pre-requisites**

MAP 2302. Co-req: CGS 2421

## **3. Course Objectives**

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**

*4 credits engineering*

1. Provide students with the ability to apply knowledge of mathematics, science and engineering for problem solving in engineering.
2. Provide students with the ability to identify, formulate and solve engineering problems.
3. Provide students with the ability to apply advanced mathematics, science, atomic and nuclear physics and engineering to nuclear and radiological systems and processes.

## **5. Program Outcomes Supported by Course**

Outcome a: an ability to apply knowledge of mathematics, science and engineering for problem solving in engineering.

Outcome e: an ability to identify, formulate and solve engineering problems.

Outcome l: an ability to apply advanced mathematics, science, atomic and nuclear physics and engineering to nuclear and radiological systems and processes.

## **6. Instructor**

**Dr. Sedat Goluoglu, 168 Rhines, 352-294-1690,**  
**[goluoglu@mse.ufl.edu](mailto:goluoglu@mse.ufl.edu)**

Office hours: MW 10:15-11:00, via e-mail, or appointment.

Course website: on E-Learning platform.

## **7. Teaching Assistant**

Madison Martin, NSE-241D, 954-328-0615, memartin@ufl.edu

## **8/9/10. Course Meetings**

### **11. Material and Supply Fees**

None

### **12. Text (Required)**

*Advanced Engineering Mathematics*, 10<sup>th</sup> Edition, E. Kreyszig, John Wiley & Sons, Inc. 2011,  
ISBN: 978-0-470-45836-5

### **13. References**

*Nuclear Reactor Analysis*, Duderstadt and Hamilton, John Wiley & Sons, 1976

*Nuclear Reactor Theory*, Bell and Glasstone, VanNostrand Reinhold Company, New York,  
1970.

*Introduction to Nuclear Engineering*, 2<sup>nd</sup> Ed, J.R. Lamarsh, Addison-Wesley Publishing  
Company, Inc., 1983

### **14. Course Outline**

1. First Order Ordinary Differential Equations (ODEs)
2. Second Order ODEs Series
3. Solutions of ODEs Vector
4. Differential Calculus
5. Partial Differential Equations (PDEs)
6. Selected Topics Important to Nuclear Engineering as Time Permits

### **15. Attendance and Expectations**

You are expected to attend all class meetings, barring meritorious professional or University-sanctioned personal reasons. Particularly meritorious reasons are expected for any absence from exams. Whether or not your justification for your absence is acceptable (other than those that are sanctioned by the University) is at sole discretion of the Instructor. Notify the Instructor and check to see if it is acceptable as soon as you know you will be absent. As a hint, “I partied too much and have a hangover” will not pass the muster.

Class distractions such as **cell phones and pagers are unacceptable**. Students will ensure that any such devices that are brought into the classroom will be turned off. There is no tolerance for mobile phones or other electronic disruptions. Such disruptions (including texting) will lead to the student being told to leave the room for the duration of the class period, including during examination periods. Note that if a pop quiz is given after the student is asked to leave, he/she will receive zero as a grade for that pop quiz. Laptops, tablets, iPads, etc. are not allowed during the lecture period. If a student arrives late or leaves early, he/she is

expected to do so with minimum level of disruption to the class in progress. If a pop quiz is given before or after the student is in the classroom, he/she will receive zero for that pop quiz (no make-up). You will notice that there is a strong correlation between number of students absent in a class period and the probability of having a pop quiz!

**All exams are cumulative**, i.e., every topic that is covered prior to the exam day (including the latest class period) may be on the test. This means you should study in advance – those who wait until the last day typically do not do well in this class! Instructor will assume you already know the topics covered in the prerequisite course MAP 2302.

## 16/17. Grading and Grading Scale

Homework: 10%, Pop quizzes: 20%, two Midterm Exams: 20% each, Final Exam: 30%

100:A+; 95.0-99.9%: A; 90.0-94.9%: A-; 87.0-89.9%: B+; 83.0-86.9%: B; 80.0-82.9%: B-; 77.0-79.9%: C+; 73.0-76.9%: C; 70.0-72.0%: C-; 67.0-69.9%: D+; 63.0-66.9%: D; 60.0-62.9%: D-; 59.9% and lower: F

*"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:*

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

**Homework:** This course will use UF's e-learning tools. New homework assignments will be posted online. Homework turned in between the due date and the release of solutions will be worth 50% of their score had they been on time. Homework will not be accepted after solutions are released. Solutions are typically released within a week after the class period following the due date. There may be homework assignments for which no ``late homework, half-credit" period will exist.

## 18. Make-up Exam Policy

Make-up exams will only be offered to those who miss the exam due to emergencies at the instructor's discretion. Health-related emergencies will require proof and may not be considered sufficient (e.g., "I drank too much last night and was taken to the hospital for alcohol poisoning" is not an acceptable medical excuse).

## 19. 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 (<http://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.

Note that failure to comply with this commitment will result in disciplinary action compliant with the UF Student Honor Code Procedures.

See <http://www.dso.ufl.edu/sccr/procedures/honorcode.php>

## **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, <http://www.counseling.ufl.edu/cwc/Default.aspx>, counseling services and mental health services.
- Career Resource Center, Reitz Union, 392-1601, career and job search services.

University Police Department 392-1111

## **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. Students are expected 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>. “