

Applied Probability Methods in Engineering

ESI6325

Academic Term: Fall 2025

Class Periods: T Period 7 (1:55 PM - 2:45 PM) & TR Period 7-8 (1:55 PM - 3:50 PM)

Location: TUR 2318

Lecture zoom link: [Zoom Link](#)

Instructor:

Tobias Lodemann, Ph.D. Email: Leibniz93@ufl.edu, Office Location: Weil 368

Office Hours: Mondays 6-7pm (via [zoom](#)) & Tuesdays 3-4pm (Weil 368, other class has priority) & by appointment

TA:

Name: Jindong Tong

Email: jindongtong@ufl.edu

Office Hours: Wednesdays 6-7pm & Fridays 9-10am

Location: Zoom - see Canvas course page for link

Course Description

Applied probability theory and statistics, reliability engineering, quality control, robust design, forecasting, Markov processes, and queuing theory. (3 credits).

Course Pre-Requisites / Co-Requisites

Calculus, differential equations, undergraduate probability, and statistics.

Course Objectives

By the end of this course, you should have a solid understanding of the fundamental methods of probability and statistics, as well as the use of these methods in foundational applications areas used in Industrial and Systems Engineering, including reliability, Markov chains, and Queuing theory.

Materials and Supply Fees

None

Required Computer

- Recommended Computer Specifications: <https://it.ufl.edu/get-help/student-computer-recommendations/>
- HWCOE Computer Requirements: <https://www.eng.ufl.edu/students/advising/fall-semester-checklist/computer-requirements/>

Recommended Materials

- Sheldon M. Ross, *Introduction to Probability Models* (12th edition), 2019. ISBN 978- 0128143469
- Anthony J. Hayter, *Probability and Statistics for Engineers and Scientists* (3rd or 4th edition), 2012. ISBN 978-1111827045
- Wayne L. Winston, *Operations Research: Applications and Algorithms* (4th edition), 2004. ISBN 978-0534380588.

Tentative Course Schedule

Week	Dates	Topics (Tentative)	Assignments (Tentative)
1	Aug 21	Introduction and Syllabus Review	
2	Aug 26/28	Module 1: Random Variables	
3	Sep 2/4	Module 2: Probability Distributions	
4	Sep 9/11	Module 3: Markov Chains	Homework 1
5	Sep 16/18	Module 3: Markov Chains	
6	Sep 23/25	Module 3: Markov Chains	Homework 2
7	Sep 30 & Oct 2	Sep 30: No class – career fair Module 4: Decision Analysis	Homework 3 Project announcement
8	Oct 7/9	Module 5: Statistics estimation and sampling	
9	Oct 14/16	Oct 14th Exam 1, 6:30-8:30pm Module 6: Statistical inferences	Midterm 1 Homework 4
10	Oct 21/23	Module 6: Statistical inferences	
11	Oct 28/30	Module 7: Reliability	
12	Nov 4/6	Module 8: Queueing Theory	Homework 5
13	Nov 11/13	Nov 11: No class – national holiday Module 8: Queueing Theory	
14	Nov 18/20	Module 8: Queueing Theory	Homework 6
15	Nov 23-29	Thanksgiving break, no classes	
16	Dec 2	Dec 1 Exam 2, 6:30-8:30pm Dec 2: Project Presentations	Midterm 2 Project presentations
17	Finals Week		

Evaluation of Grades

Assignment	Percentage of Final Grade
Exam 1	25%
Exam 2	25%
Homework	25%
Project	25%
Total	100%

Your grade will be based on exams, homework, and miscellaneous assignments such as quizzes, discussion posts, in-class activities, and reflections. All assignments must be submitted via Canvas unless specified otherwise. Late homework assignments will be accepted for 24 hours after the due date with a 20% deduction. If you do not submit within 24 hours of the deadline or submit the wrong file, you will receive a zero. All other assignments have to be submitted and do not have any late submission options, unless specified otherwise. Potentially, not all of the homework assignments will be graded. Instead, one or more problems may be randomly selected and graded. All work is assumed to be individual work unless the specific assignment denotes a group activity.

Grading Policy

Percent	Grade	Grade Points
93 - 100	A	4.00
90 - 93	A-	3.67
87-90	B+	3.33
83-87	B	3.00
80-83	B-	2.67
77-80	C+	2.33
73-77	C	2.00
70-73	C-	1.67
67-70	D+	1.33

63-67	D	1.00
60-63	D-	0.67
0 - 60	E	0.00

A C is required to pass this course. A C- is NOT a passing grade. The grades may or may not be curved, depending on the overall performance of the class. More information on UF grading policy may be found at: [here](#) and [here](#).

For UF ISE PhD students only: This course is a Qualifying Exam course and thus may be subject to stricter rules. More information on the Qualifying Exam policy can be found [here](#).

Homework Assignments

- All assignments should be submitted online through Canvas (paper submissions will not be accepted).
- Late homework assignments will be accepted for 24 hours after the due date with a 20% deduction.
- Homework assignments that are not submitted within 24 hours after the due date will receive an automatic zero.

Collaboration and Online Resources Policy

You are encouraged to discuss assignment problems with other students in the class, but you cannot share complete answers, code, or simulation results before everyone involved in the discussion has submitted their work and the assignment deadline has passed. You may refer to online resources, tools, and artificial intelligence (AI) software, such as ChatGPT to help you understand the class material. However, you are not allowed to ask for complete solutions assignments. Assignments have to be completely your own work unless otherwise specified. Thus, you are expected to always be able to explain your submitted work if requested to do so.

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](#) 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.

Exam Make-up Policy

- In general, there will be no makeup exams given. However, a student is permitted to make up a missed exam without penalty if they have a conflict between an exam and a scheduled University-approved activity (please do not ask for a make-up exam to attend a job interview). A student needing a make-up exam due to schedule conflicts must notify the instructor as early as possible and at least one week before the day the exam is scheduled for.
- A student is permitted to make up a missed exams only if they have a conflict between an exam and a scheduled university-approved activity with appropriate documentation. Employment interviews, employer events, weddings, vacations, etc. are generally not excused absences. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>
- Medical emergencies are of course excluded if accompanied by a doctor's note. A note indicating that you were seen at the health center the day of the exam is not sufficient documentation of a medically excused absence from an exam. The note must say that you were medically unable to take the exam. If you fail to take the exam on the assigned day and do not have a valid excuse, there will be no make-up exam and you will be given a zero (0) on the exam.

- It is the student's responsibility to make sure a make-up exam date is scheduled within a week of the original date or as soon as possible in the case of medical circumstances.

Grade Disputes

Grade disputes must be made to the instructor within one week after grades are posted / graded work is returned to the class, even if you were not present that day. Any grade dispute after the specified period will not be considered. Before you contact the instructor, compare your solution to the solution posted on Canvas. If you still believe there is an issue with your grade, the request for regrading must be done in writing together with a detailed description of the reasons why you believe there was a mistake in your grade. Do not contact the TA for regrade requests. Throughout the semester, you have to ensure that your grades are entered correctly.

Attendance & Makeup Exams:

Student attendance is encouraged, and active participation is expected. Students will be responsible for all material covered and announcements made in class. If you anticipate not being able to attend any class due to travel restrictions or personal health concerns, contact me at the beginning of the semester or as soon as your situation changes. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Read the university attendance policies: [Link](#).

Class Expectation

To ensure a classroom environment conducive to success for everyone, please consider the following expectations

- Turn your cell phones off (or on mute) before class starts and put it in your bag/pocket.
- Avoid using your computer during the lecture for matters that are unrelated to the class content to prevent distracting yourself and others.
- Please arrive at class on time. If you must enter the classroom late or leave early, be considerate and be as quiet as possible.
- Behave in a manner that is respectful to the instructor and to fellow students. Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at a minimum, if at all.
- Restrict eating to outside of the classroom.
- Students who are being disruptive (e.g., using electronic devices when not appropriate for class activities, talking over the instructor/other students, or otherwise disrupting the learning environment for other students) will be asked to leave class. Persistent disruptive behavior will not be tolerated and might result in grade deductions (half a letter grade).

Course Communication

- Important communication from the course instructor will be posted on the CANVAS "Announcements" page.
- In emails, provide the course code in the email subject. Please give the instructor 48 hours to respond to questions. You are highly encouraged to "bump" the messages to the instructor's attention if you have not received a response within 48 hours.
- If you have any suggestions to improve the course and/or if there is anything that can help you on your learning journey, please feel free to communicate with me early and often.

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.

Course Evaluation

Students are expected 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/>.

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.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University’s core values, including the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information, and veteran status.

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 Coordinator
- HWC OE 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@eng.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: <https://counseling.ufl.edu>, 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://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>.