

Operations Research 2

ESI 4313

Class Periods: TR, Period 5-6, 11:45-1:40

Location: WEIM 1094

Academic Term: Spring 2020

Instructor:

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(352) 294-6896

Office Hours: Tuesdays and Thursdays, 2:15-3:30, Weil 401C (or by appointment)

Teaching Assistants:

Please contact through the Canvas website

- HongYi Lee (hungyilee@ufl.edu) office location (TBD), office hours (TBD)
- Juan Beltran (juanjo97@ufl.edu), Office Location (TBD), office hours (TBD)
- Jose J Perez Escolano (perezescolanoj@ufl.edu), Office Location (TBD), office hours (TBD)

Course Description

Catalog Description: Introduces stochastic models and methodologies for analyzing and providing solutions to decision-making problems with uncertainties.

Course Pre-Requisites / Co-Requisites

ESI 4327C and STA 4321 with minimum grades of C

Course Objectives

This course teaches the basic concepts of stochastic modeling in operations research. Students will develop and enhance their ability to address various problems that involve randomness/uncertainty, including Stochastic Modeling, Markov Chains, Queuing Analysis, and Stochastic Decision Making.

These objectives will be accomplished through: In-class lectures, in-class problem solving activities, homework assignments.

Professional Component (ABET):

This course introduces the basic concepts of stochastic modeling in operations research. Students will develop and enhance their ability to address various problems that involve randomness/uncertainty.

Relation to Program Outcomes (ABET):

Outcome	Coverage*
a. an ability to apply knowledge of mathematics, science, and engineering	High
b. an ability to design and conduct experiments, as well as to analyze and interpret data	
c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
d. an ability to function on multidisciplinary teams	
e. an ability to identify, formulate, and solve engineering problems	Medium

f. an understanding of professional and ethical responsibility	
g. an ability to communicate effectively	
h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
i. a recognition of the need for, and an ability to engage in life-long learning	Medium
j. a knowledge of contemporary issues	
k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	Medium

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not part of the course.

Materials and Supply Fees

N/A

Required Textbooks and Software

- Title: **Introduction to Probability Models**
- Author: Sheldon Ross
- Academic Press; 11th edition, 2014
- ISBN: 978-0124079489

Recommended Materials

- Title: **Introduction to Probability**
- Authors: Dimitri Bertsekas and John Tsitsiklis
- Athena Scientific; 2nd edition, 2008
- ISBN: 978-1886529236

Course Schedule

The course Schedule is offered as a guide. This means that it is subject to change, depending on the pace of the class. The instructor might choose to cover parts of the curriculum more extensively, or give extensions to deadlines. The dates of the exams might be subject to change depending on the progress of the class.

Week	Chapter/Book	Book Chapter	Exam
1	Review of Probability Theory and Set Theory	Chapter 1	
2	Random variables	Chapter 2	
3	Random variables /Conditional Probability/Expectation	Chapter 2 and 3	
4	Conditional Probability/Expectation, Bernoulli process	Chapter 3 and 5	
5	Bernoulli process/Poisson process	Chapter 5	
6	Poisson process	Chapter 5	
7	Review Session and Exam 1		Exam 1 (TBD)
8	Markov Chains	Chapter 4	
9	Spring Break		
10	Markov Chains Continued	Chapter 4	

11	Continuous-time Markov Chains	Chapter 6	
12	Continuous-time Markov Chains	Chapter 6	
13	Queueing Theory	Chapter 8	
14	Queueing Theory	Chapter 8	
15	Review session and Exam 2		Exam 2 (TBD)
16	Reliability Theory	Chapter 9	

Attendance Policy, Class Expectations, and Make-Up Policy

Attendance Policy

Attendance is very strongly encouraged - you are responsible for the announcements made in class. Students are expected to know the material covered in the prerequisite courses. When necessary, they are expected to relearn material from these courses on their own.

This is not a course where you can do well on exams solely by blindly applying formulas. In order to get the most out of the course, try to stay ahead. By the weekend, make sure you have at the least reviewed the material covered in the lectures and readings of the preceding week. In addition to reading, working out extra exercises on your own will help in improving your understanding of the material. With diligent practice, you can prepare yourself to the point where, on exams, instinct takes over and the problems seem straightforward.

HW Policy

Homework assignments are to be submitted at the beginning of the class on the due date. There will be 6 to 8 assignments. *The lowest score will be removed automatically.*

Quiz Policy

There will be five unscheduled unannounced quizzes during the class. There will be no make up quiz. *The lowest score of your quizzes will be removed automatically.*

Exam Policy

You are expected to be present without exception and to plan any travel around these dates accordingly. 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. Employment interviews, employer events, weddings, vacations, etc. are not excused absences.

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Homework Sets (6-8)	100 each	20%
Quizzes and Participation (5)	100 each	20%
Exam 1	100	30%
Exam 2	100	30%
		100%

Grading Policy

The following is given as an example only.

Percent	Grade	Grade Points
90.0 - 100.0	A	4.00
87.0 - 89.9	A-	3.67
84.0 - 86.9	B+	3.33

81.0 – 83.9	B	3.00
78.0 - 80.9	B-	2.67
75.0 - 79.9	C+	2.33
72.0 – 74.9	C	2.00
69.0 - 71.9	C-	1.67
66.0 - 68.9	D+	1.33
63.0 - 65.9	D	1.00
60.0 - 62.9	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:

<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades>

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

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 feedback on the quality of instruction in this course by completing online evaluations at <https://gatorevals.aa.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://gatorevals.aa.ufl.edu/>.

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.

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: <http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

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 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, <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>.