

**Course Syllabus**  
**ESI 6325 Applied Probability Methods in Engineering (APME)**  
**Fall 2020**

**Meeting Time:** MWF 3:00 pm – 3:50 pm  
**Zoom meeting link:** [Monday, Wednesday, Friday](#)  
**Course Website:** <https://ufl.instructure.com/courses/407937>

**Instructor:** Xiaochen Xian  
**Office Hour:** 3:50pm to 4:50pm MW  
**Phone:** (352) 294-7713  
**Email:** [xxian@ufl.edu](mailto:xxian@ufl.edu)

**Grader:** TBD  
**Email:** TBD

**Course Catalog Description:**

*Prerequisite: Calculus, differential equations, undergraduate probability and statistics.*

Applied probability theory and statistics, probability distribution, statistical sampling and estimation, hypothesis testing, regression, forecasting, reliability engineering, Markov processes, and queuing theory.

**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.

**Recommended course materials**

- Hayter, 2007, *Probability and Statistics for Engineers and Scientists*, 3rd Edition, Duxbury (Thomson Brooks/Cole), ISBN #0-495-10757-3 (note: the 4th edition is available and is certainly acceptable).
- This course packet consists of Chapters 13, 17, and 20 of the book “Operations Research, 4th ed.” by W.L.Winston, 2004 Duxbury (Thomson Brooks/Cole), ISBN #0-534-38058-1, or Chapters 2, 5, and 8 of the book “Introduction to Probability Models, 4th ed.,” by W.L. Winston, 2004 Thomson Brooks/Cole, ISBN #0-534-40572-X.

**Course Topics**

- Review of probability (HAYTER CHAPTERS 1-6)
- Statistical sampling and hypothesis testing (HAYTER CHAPTERS 7-10)
- Regression analysis (HAYTER CHAPTERS 12-13)
- Reliability (Subject to Change) (HAYTER CHAPTER 17)
- Markov chains (WINSTON CHAPTER 5)
- Queuing theory (WINSTON CHAPTER 8)

**Course Assessment**

Homework (~6)		25 % of final grade
Exam 1	F2F, TBA	25 % of final grade
Project		25% of final grade
Exam 2	Online, 12/10	25 % of final grade

Exam/Homework grade disputes/inquiries must be made to the instructor within one week after grades are posted along with an appeal in writing. Any grade dispute/inquiry after the specified period will not be considered.

Grade	Range	Grade points	Grade	Range	Grade points
A	[90 – 100]	4.00	C	[70 – 73)	2.00
A-	[87 – 90)	3.67	C-	[67 – 70)	1.67
B+	[83 – 87)	3.33	D+	[63 – 67)	1.33
B	[80 – 83)	3.00	D	[60 – 63)	1.00
B-	[77 – 80)	2.67	D-	[57 – 60)	0.67
C+	[73 – 77)	2.33			

There may or may not be a curve at the end of the semester. This depends on the overall performance of the class throughout the semester.

### Make-up policy

Excused absences require appropriate documentation. If you missed an exam due to a health problem, you will need to provide documentation that indicates the date of the visit.

### Course schedule

	<i>Topic</i>	<i>Exam and HWs</i>
<i>Week 1</i>	General course information and review of prerequisites	
<i>Week 2</i>	Random variables	<i>HW1</i>
<i>Week 3</i>	Random variables	
<i>Week 4</i>	Discrete probability distributions	
<i>Week 5</i>	Continuous probability distributions	<i>HW2</i>
<i>Week 6</i>	Normal distribution	
<i>Week 7</i>	Descriptive statistics	<i>HW3</i>
<i>Week 8</i>	Statistics estimation and sampling distributions	
<i>Week 9</i>	Statistics estimation and sampling distributions	<i>Exam 1, project announcement</i>
<i>Week 10</i>	Statistical inferences	<i>HW4</i>
<i>Week 11</i>	Reliability, regression analysis	
<i>Week 12</i>	Markov chains	<i>HW5</i>
<i>Week 13</i>	Markov chains	
<i>Week 14</i>	Queuing theory	<i>HW6</i>
<i>Week 15</i>	Project and presentation	<i>Exam 2, project due</i>

### Face-to-face instructional sessions

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](#).

### **Online learning**

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live.

- Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image.
- Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.
- If you encounter technical issues, visit the [helpdesk website](#) or call 352-392-4357.

### **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/>.

### **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://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-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.

### **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.

### **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>

### **Accommodations 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. 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, psychological and psychiatric services.
- Career Resource Center, Reitz Union, 392-1601, career and job search services.