IE3302 Engineering Statistics Spring 2021

Lectures: 1:30-2:50pm T Th (Online)
Credit hours: (3)

INSTRUCTOR

Dr. Gerry Knapp, P.E., 3250-B Patrick F Taylor Hall
Cell 225-953-6789 (business hours only): E-mail: gknapp@lsu.edu
Class website: http://moodle.lsu.edu/
Office hours: 10:30-11:30 M W (zoom)
TA: Vamsi Pusapati, contact by Moodle email (office hours tba)
See Moodle course home page for Zoom links

DESCRIPTION

Prereq: Grade of C or better in Math 1552 and (PHYS 2112 or CSC 2259). Probability, discrete and continuous distributions, functions of random variables, estimation theory, tests of hypotheses including goodness-of-fit and independence.

TEXT & REQUIRED SOFTWARE

- Textbook: Probability & Statistics for Engineers & Scientists, 9th Ed, Pearson, by R.E. Walpole, R. H. Myers, S. L. Myers, and K. Ye.
  - *Do not get international editions of this textbook*. They have different questions and chapter coverage.
- Microsoft Excel 2016 or higher

COURSE OBJECTIVES

A student successfully completing this course should be able to:

1. Explain basic characteristics of probabilities and solve problems using probability theorems, definitions, and rules. (Chapter 1, 2)
2. Explain properties and compute probabilities of random variables. (Chapter 3)
3. Compute expectations of random variables. (Chapter 4)
4. Use several discrete distributions and show their application in engineering problems. These distributions will include uniform, binomial, geometric, negative binomial, and Poisson. (Chapter 5)
5. Use continuous distributions (uniform, normal, and exponential) and show their application in engineering problems. Students will also be able to explain the general use of the chi-square, "t", and "F" distributions. (Chapter 6, 8)
6. Apply the concept of confidence intervals and conduct hypothesis tests using various random variables. (Chapter 10)

EVALUATION

1.	Mid semester exam #1	25%
2.	Mid semester exam #2	25%
3.	Final exam	35%
4.	Assignments, in-class work, & quizzes	15%
		100%

GRADING

A+ ≤ 97 < A ≤ 93 < A- ≤ 90 < B- ≤ 87 < B ≤ 83 < B- ≤ 80 < C+ ≤ 77 < C ≤ 73 < C- ≤ 70 < D+ ≤ 67 < D ≤ 63 < D- ≤ 60 < F
This is the grade scale used in Moodle.

COURSE OPERATION & ATTENDANCE

This course will be conducted 100% online:

- **Prerecorded lecture materials** (based on slide sets) will be posted to Moodle prior to the start of each chapter and can be reviewed anytime.
- **The scheduled lecture times (1:30-2:50pm T Th) will be a live zoom-based recitation style lectures**, covering additional examples and answering any questions from those attending. These will be recorded and posted to Moodle as well. Exam reviews will also be done during these times. *Attendance is strongly encouraged but not required (except for the midterm exam lectures noted below).* These live lectures generally will be 30-60 minutes in length unless there are many questions raised.
- **Quizzes** will be conducted regularly online through Moodle. You may complete a quiz anytime from when it is opened until its posted deadline (usually about one week later). You may attempt the quiz up to two times before the deadline, with the best grade being recorded. Quiz attempts are time limited, and questions are randomly selected from a question bank; questions will change between attempts and across students. Note there may be multiple quizzes open at any time. Quizzes not attempted by the deadline will receive a grade of 0.
- **Assignments** will be posted on Moodle and must be submitted through Moodle by the posted deadline. Your solutions must be typed (Word or PDF), or neatly written and scanned to PDF. If scanned, it is your responsibility to ensure your solutions are legible in the scanned copy. Problems must be in order given in the assignment. Late assignments will receive a penalty of 20% of points for each day overdue and, for problem-based assignments, will not be accepted after solutions are posted (usually within 1-2 days after the due date).

I strongly encourage everyone to attend the first scheduled lecture time (**1:30pm Tuesday January 12th**) zoom meeting, where I will be going over and answering any questions about the course operation. The zoom link will be distributed by email and posted on the Moodle course home page.

Reminders of where you should be in terms of course material coverage, and of upcoming deadlines, will be posted regularly on the Moodle course home page.

EXAMS

Two midterm exams will be administered during lecture periods. Tentative midterm dates are:

- ***Midterm exam 1***: Thursday, February 25th, 2021, 1:30-2:50pm
- ***Midterm exam 2***: Tuesday, March 30th, 2021, 1:30-2:50pm

A comprehensive ***final exam*** will be given at end of term on Monday April 26th, 2021, 3:00-5:00pm.

Exams will be administered during at the times indicated above through an online mechanism. During the exam, you will be required to be logged in on Zoom with video enabled for proctoring purposes. For each exam, a review guide will be posted which also summarizes the rules of the exam (what you are allowed and not allowed to use during the exam).

MISSED WORK

I do not provide make-ups for missed exams, quizzes, or assignments. Students missing graded work for documented university recognized reasons will have remaining grades re-weighted at my discretion. For assignments & quizzes, your excused absence must cover most of the period these were open for this consideration. Every effort should be made to inform me of an absence *prior to its occurrence* (email is sufficient). Any work missed, including exams, without a legitimate documented excused absence will be assigned a grade of 0.

LSU STUDENT CODE OF CONDUCT & ACADEMIC INTEGRITY

The LSU student code of conduct explains student rights, excused absences, and what is expected of student behavior. Students are expected to understand this code as described here: Student Code of Conduct. Any violations of the LSU student code will be reported to the LSU Dean of Students.

For homework, you may meet with fellow students to discuss general aspects of a problem (for instance, to clarify what is being asked for). However, each problem is ultimately to be worked individually – no sharing of solutions.

Under no circumstances are assignment problems to be worked by tutors or on a "hire" basis; this is cheating. If you decide to take advantage of tutoring, you will need to have the tutor work different but similar types of problems with you.

ACCOMODATIONS

Louisiana State University is committed to providing reasonable accommodations for all persons with disabilities.

Students with disabilities: If you are seeking classroom accommodations under the Americans with Disabilities Act, you are required to register with Disability Services in 115 Johnston Hall. Their phone number is 225-578-5919 and website is www.lsu.edu/disability. To be considered for academic accommodations for this class, you will need to obtain and provide to me the appropriate Disability Services forms to me at the beginning of the semester.

I do not use Disability Services' facilities for exams. If you request extended time on exams, you will be given extended time for the online exam *for a time overlapping with the scheduled exam*.

Tentative Schedule (subject to change)

Week	Date	Topic	Reading (textbook)
1	Jan 11-15	Intro to statistics, probability	Ch. 1 (skip 1.7), 2
2	Jan 18-22	Probability	Ch. 2
3	Jan 25-29	Probability	Ch. 2
4	Feb 1-5	Probability, Random variables	Ch. 2, 3
5	Feb 8-12	Random variables, Expectations of random variables	Ch. 3, 4
6	Feb. 15-19	**No class Tuesday 2/16 – Mardi Gras** Exam review, Discrete probability distributions	Ch. 5
7	Feb 22-26	Discrete probability distributions	**Test Thu Feb 25: Ch. 1-4** Ch. 5
8	Mar 1-5	Discrete probability distributions Continuous probability distributions	Ch. 5 Ch. 6 (skip gamma distribution: parts of 6.6-6.7, skip 6.8-6.10)
9	Mar 8-12	Continuous probability distributions	Ch. 6
10	Mar 15-19	Continuous probability distributions Sampling distributions	Ch. 6 Ch. 8
11	Mar 22-26*	**No class Thursday 3/25 – March Break** Exam Review, Sampling distributions	Ch. 8
12	Mar 29-Apr 2	Sampling distributions	Ch. 8 **Test Tue Mar 30: Ch. 5-6**
13	Apr 5-9	Confidence intervals and hypothesis testing	Ch. 10
14	Apr 12-16	Confidence intervals and hypothesis testing	Ch. 10
15	Apr 19-23	Confidence intervals and hypothesis testing Catch-up and exam review	Ch. 10
FINAL EXAM: MONDAY, APRIL 26, 3-5PM (COMPREHENSIVE)			

* Final date for resigning from University and/or dropping courses, or to request rescheduling final exam (if 3 or more in 24 hours): **Mar 26, 4:30pm**