# IE 3301-007: Engineering Probability

Fall 2022

## Instructor Information

### Instructor(s)

Erick C. Jones Jr., PhD

### Office Number

420X Woolf Hall

### Office Telephone Number

Phone 817-272-3092, Fax 817-272-3406.

### Email Address

erick.jones@uta.edu

### Faculty Profile

https://www.uta.edu/academics/faculty/profile?username=jonesec

### Office Hours

10am Monday and Wednesday and by appointment.

### GTA

Name TBD; **Email:** email TBD @mavs.uta.edu; **GTA Office Hours:** Time TBD

## Course Information

### Section Information

IE 3301-007

### Time and Place of Class Meetings

Woolf Hall TBD; MWF 11:00 AM – 11:50 AM, In-Person

### Description of Course Content

This course will teach students how to apply probability and statistics to a wide range of problems in engineering, sustainability, and life. Applications and backgrounds for topics in random processes, reliability, inventory systems, and queuing problems, including absolute and conditional prob- abilities, discrete and continuous random variables, parameter estimation, hypothesis testing, and an introduction to linear regression. Students will also be introduced to basic programming skills and applications for statistical analyses using R as well spreadsheet software (e.g., Excel).

### Student Learning Outcomes

At the end of this course students should be able to (1) understand the basic concepts of probability theory and hypothesis testing, (2) apply those concepts to solving numerical problems, especially those relating to probability distributions, (3) collect data and perform descriptive and inferential statistical analyses on engineering and sustainability datasets, (4) use a programming language and/or other software to perform statistical analyses.

### Required Textbooks

Probability and Statistics for Engineers and Scientists, 9th edition by Walpole, Myers, Myers and Ye. A student solution manual is available at the bookstore. Available as an eBook as well.

### Supplemental Materials

I will make extensive of use of the programming language R using R Studio Cloud (a free software) and some use of Excel (if you don’t have Excel, Google Sheets is free) in lectures and workshops. Previous knowledge of R or Excel is not required and a lack of proficiency in R or Excel should not impact your grade. The hope is that exposure to a modern programming language will help give the students skills that will be usable in the future and provide inspiration for the class project.

### Descriptions of major assignments and examinations

***Exam #1*** on Chapters 1–4. Friday, September 30th, 11:00 am – 12:00 pm

***Exam #2*** on Chapters 5, 6, and 8. Friday, October 21st, 11:00 am –12:00 pm

***Exam #3*** on Chapters 9–11. Friday, Friday, December 10th, 11:00 am – 1:30 pm

***Homework*** (last homework due Tuesday, December 6th, 11:59 pm)

***Project*** (final report due Tuesday, December 6th, 11:59 pm)

Dates might be pushed back but not moved forward.

### Technology Requirements

I will be using Canvas and Echo 360. Students will need access to a computer and the internet. Students can access tutorials on these tools by clicking on the “Get Started” Box on their Canvas Homepage. Students might also need a webcam and microphone for times when face-to-face instruction is unavailable.

Since, this course uses in Lecture R and Excel a laptop or capable tablet will be required for some class periods. For students without these devices, accommodations can be made.

### Course Prerequisite

## Math 2425 or concurrent enrollment.

## Grading Information

### Grading

17% - Test #1 on Chapters 1–4. Friday, September 30th, 11:00 am – 12:00 pm

17% - Test #2 on Chapters 5, 6, and 8. Friday, October 21st, 11:00 am –12:00 pm

17% - Test #3 on Chapters 9–11. Friday, December 10th, 11:00 am – 1:30 pm

10% - Homework (last homework due Tuesday, December 6th, 11:59 pm)

40% - Project (last part due Tuesday, December 6th, 11:59 pm)

Letter grades correspond to the following score system:

A = 90–100; B = 80–89; C = 70–79; D = 60–69; F = below 60.

I reserve the right to widen the range of numerical scores for a letter grade but not to shorten it.

Dates might be pushed back but not moved forward.

**Homework**

Homework will be announced during class. Late homework will not be accepted. Upload handwritten homework online either as a picture or a scan. Each homework assignment will be scored as 0, 1, or 2. To receive full credit for your homework, show all of your work. Only the top 10 assignments will be counted. The maximum number of points that will contribute to your final grade is 20.

**Project**

For the project, additional handouts will be given with detailed instructions. Each team must

submit a typewritten report, written in their own words. Any form of copying will be severely penalized.

**Test Policy**

For each exam, you may bring in two letter size sheets of paper written on both

Sides. Calculators with simple functions (ONLY +, −, /, ×, p) may be used during tests (no other calculators permitted). Please bring your UTA ID card to all tests.

A missed test (including Test 3, the final) can be replaced with your ***FINAL***project report grade if desired.

### Attendance and Quizzes

As the instructor of this section, attendance will be taken sporadically throughout the semester. Students who are present will earn an attendance point. Each student’s accumulated attendance points are recorded as a Quiz grade and functionally add to the raw score of Exam #3. Other Quiz grades not related to attendance can also be given. These Quizzes do not hurt your overall grade but serve as extra credit that are weighted so that each Quiz point is equal to a point on Exam #3.

### Missing Exams and Assignments

If the student provides legitimate written documentation proving an illness or emergency depending on the timing or nature of the assignment either a make-up assignment will be given or the assignment will not count and the other grades in that category will be more heavily weighted. If necessary, I may request additional information to verify the validity of your documentation. If you cannot attend an exam, you should make every effort to contact me beforehand.

**Regrading Policy**

If you would like a test or project regraded, you must submit a written statement

which clearly explains the reason you would like a regrade. Please note that the entire test/project will be regraded.

## Course Schedule

## Chapter sections listed below are from Walpole et al. (2012). Approximate number of

## class periods is given in parentheses. Class time will also be used to cover practice test questions, conduct tests, and go over test solutions.

## Chapter 1: Descriptive Statistics (3.5 class periods)

## Chapter 2: Probability (4 class periods)

## Chapter 3: Random Variables (2.5 class periods)

## Chapter 4: Expectation (2 class periods)

## Chapter 5: Discrete Distributions (3.5 class periods)

## Chapter 6: Continuous Distributions (3.5 class periods)

## Chapter 8: Sampling (2.5 class periods)

## Chapter 9: Estimation (4.5 class periods)

## Chapter 10: Hypothesis Testing (4.5 class periods)

## Chapter 11: Simple Linear Regression (3.5 class periods)

## Institutional Information

UTA students are encouraged to review the below institutional policies and informational sections and reach out to the specific office with any questions. To view this institutional information, please visit the [Institutional Information](https://resources.uta.edu/provost/course-related-info/institutional-policies.php) page (https://resources.uta.edu/provost/course-related-info/institutional-policies.php) which includes the following policies among others:

* Drop Policy
* Disability Accommodations
* Title IX Policy
* Academic Integrity
* Student Feedback Survey
* Final Exam Schedule

## Additional Information

### Face Covering Policy

*While the use of face coverings on campus is no longer mandatory, all students and instructional staff are strongly encouraged to wear face coverings while they are on campus. This is particularly true inside buildings and within classrooms and labs where social distancing is not possible due to limited space. If a student needs accommodations to ensure social distancing in the classroom due to being at high risk they are encouraged to work directly with the Student Access and Resource Center to assist in these accommodations.* *If students need masks, they may obtain them at the Central Library, the E.H. Hereford University Center’s front desk or in their department.*

### Attendance and Quizzes

At the University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator of student success. Each faculty member is free to develop his or her own methods of evaluating students’ academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, attendance will be taken sporadically throughout the semester. Students who are present will earn an attendance point.

However, while UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients “begin attendance in a course.” UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student the grade of F, faculty report must the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Canvas. This date is reported to the Department of Education for federal financial aid recipients.

### Emergency Exit Procedures

Should we experience an emergency event that requires evacuation of the building, students should exit the room and move toward the nearest exit, which is located down the hall from the classroom down the stairs. When exiting the building during an emergency, do not take an elevator but use the stairwells instead. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

### Academic Success Center

The Academic Success Center (ASC) includes a variety of resources and services to help you maximize your learning and succeed as a student at the University of Texas at Arlington. ASC services include supplemental instruction, peer-led team learning, tutoring, mentoring and TRIO SSS. Academic Success Center services are provided at no additional cost to UTA students. For additional information visit: [Academic Success Center](https://www.uta.edu/student-success/course-assistance). To request disability accommodations for tutoring, please complete this [form](https://forms.office.com/Pages/ResponsePage.aspx?id=Q1vcXL7XqkyBc3KeOwpi2ccSjcIXpSJAqJFuDEhczLlUMVVHRVRIVlJJWDZJWlVYOUgxNjRPODdLVS4u).

**The** [**IDEAS Center**](https://www.uta.edu/ideas/) (https://www.uta.edu/ideas/) **(**2nd Floor of Central Library) offers **FREE** [tutoring](https://www.uta.edu/ideas/services/tutoring/index.php) and [mentoring](https://www.uta.edu/ideas/services/mentoring/index.php) to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. Students can drop in or check the schedule of available peer tutors at www.uta.edu/IDEAS, or call (817) 272-6593.

### The English Writing Center (411LIBR)

The Writing Center offers **FREE** tutoring in 15-, 30-, 45-, and 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Register and make appointments online at the [Writing Center](https://uta.mywconline.com/) (https://uta.mywconline.com). Classroom visits, workshops, and specialized services for graduate students and faculty are also available. Please see [Writing Center: OWL](http://www.uta.edu/owl) for detailed information on all our programs and services.

The Library’s 2nd floor [Academic Plaza](http://library.uta.edu/academic-plaza) (http://library.uta.edu/academic-plaza) offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various college/school advising hours. Services are available during the [library’s hours](https://library.uta.edu/hours) of operation.

### Librarian to Contact

Each academic unit has access to [Librarians by Academic Subject](http://www.uta.edu/library/help/subject-librarians.php) that can assist students with research projects, tutorials on plagiarism and citation references as well as support with databases and course reserves.

## Emergency Phone Numbers

In case of an on-campus emergency, call the UT Arlington Police Department at **817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also dial 911. Non-emergency number 817-272-3381