INEG 53103 Engineering Applications of Probability Theory
University of Arkansas, Fall Semester 2025, First Eight Weeks

Course Syllabus

I may announce changes or publish updates to this document.
I may provide additional details about some items in this document later in the semester.

Catalog Description

Introduction to probability, discrete random variables, continuous random variables, multiple random variables. Applications of these topics from inventory, reliability, quality control.

General Course Information

Instructor C. Richard Cassady, PhD, University Professor of Industrial Engineering
cassady@uark.edu

Course materials are provided on the course Blackboard page.

- The materials on Blackboard are organized chronologically. You are responsible for staying current with course content.
- If you encounter a personal situation that makes it difficult or impossible to keep up with the course content, then you should notify me as soon as it is reasonable to do so. I attempt to provide reasonable accommodations to students in need.
- There is no required textbook. Text materials are provided on Blackboard.

I do not have regularly scheduled office hours. However, I strive to keep my Microsoft Outlook calendar up to date to facilitate your ability to schedule ad hoc meetings. If you need to schedule a meeting with me:

- Use Microsoft Outlook to request/schedule an in-person meeting.
- Use Microsoft Teams to request/schedule a remote meeting.
- Use Scheduling Assistant to confirm I am available at the requested time. To use Scheduling Assistant, you must have a meeting duration of at least 30 minutes. If you do not need that much of my time, you can change the meeting duration after you have found a good time window.
- Meeting lengths of 5-30 minutes are acceptable.
- Meeting requests for a time outside of normal working hours may be declined.
- Meeting requests with little notice may be declined.

Note that this process does not include any type of direct messaging with me.

All ad hoc messaging regarding this course must be conducted using the "Dr. Cassady's Office Fall 2025" Slack (slack.com) workspace. You are required to use a Slack account using your uark email address; your uark email addresses will be used to invite you to join the workspace and access the private ineg-53103-fall-2025 channel on the workspace. Note that the use of Slack implies that email will not be used for ad hoc messaging in this course.

I will (rarely) use the general channel in the workspace for any announcements from that are relevant to students in all of my courses. The ineg-53103-fall-2025 channel will be used for communication among me and the students in this course. You are encouraged to use the ineg-53103-fall-2025 channel for questions that are relevant to all or a large number of students in this course. You are encouraged to use direct messaging as needed.

Course Chapters

1. Probability Modeling using Events
2. Static Reliability Models
3. Discrete Random Variables
4. Continuous Random Variables
5. Time-Dependent Reliability Models
6. Multiple Random Variables
7. Random Sampling

Self-Monitoring of Student Progress

Self-monitoring of student progress is based on homework assignments. The homework assignments are essential to the course because they provide you with the opportunity to evaluate and develop your understanding of the course material. The homework assignments are sometimes time-consuming and sometimes require you to solve some problems that go beyond what is presented in the text and lectures. Homework assignments are not graded, but I will provide and review the solutions to the assignments.

Assessment of Student Performance

Assessment of student performance is based on four tests. On tests, you are authorized to use only your own notes (including materials provided by me on Blackboard), a calculator, Microsoft Excel, Mathematica, and your own Microsoft Excel workbooks and Mathematica notebooks that were created in advance of or during the test.

Most test problems will require you to demonstrate your use of the course vocabulary (orange text in text materials and lecture slides), your understanding of the underlying assumptions of the probability models included in the course, your understanding of the relationships among the probability models included in the course, and your ability to solve

problems similar to those included in examples and homework assignments. Some test problems may require you to apply your knowledge to problems unlike those included in examples and homework assignments.

The schedule for tests is as follows:

Chapter 1	must be completed NLT 11:59 pm CDT on August 26
Chapters 2-3	must be completed NLT 11:59 pm CDT on September 9
Chapters 4-5	must be completed NLT 11:59 pm CDT on September 19
Chapters 6-7	must be completed NLT 11:59 pm CDT on October 7

Each test gives you the opportunity to earn 100 points. Final grades are assigned based on the average of your test scores. An 85-70-60-50 scale is used to translate the average into a letter grade.

Continuous Improvement of Course Materials

You are encouraged to assist with the improvement of the materials used to deliver this course. Students who discover a mistake in course materials should direct message me on Slack about the mistake.