

MTH 2480 – Probability and Statistics

Spring Semester 2025 (S2 2024-2025)

Instructor:

Dr. Dylan Heuer (pronounced “Hoy-er”) – feel free to call me Dylan, Dr. H, or Dr. Heuer.
Pronouns: he/him. Email: heuerd@msoe.edu Office: L324B

Course Meetings:

Section 001: Monday 8:00-8:50am in L104 and Wednesday/Friday 8:00-8:50am in L305.

Section 003: Monday/Wednesday/Friday from 10:00-10:50am in L104.

Section 009: Monday/Wednesday/Friday from 11:00-11:50am in L104.

Drop-in Hours:

My scheduled drop-in hours are as follows:

Monday: 9:00-9:50am

Tuesday: 11:00-11:50am

Wednesday: 12:00-12:50pm

Friday: 9:00-9:50am

Drop-in hours take place in my office (L324B) unless otherwise stated. There is no need to make an appointment for drop-in hours – this is time I have specifically set aside to assist students in whatever way I can. Feel free to come by and chat, ask questions, work on problems, etc. If you can’t make it to my scheduled drop-in hours but have something you’d like to ask or discuss, please let me know on Teams and send me your availability so that we can set up a time to meet.

Course Materials:

E-Textbook and Online Homework: *Probability and Statistics for Engineering and the Sciences*, 9th Edition, Devore, 2016 (Cengage). This course uses Inclusive Access to provide immediate access to your course materials, including the e-text and WebAssign. You may opt-out of inclusive access by January 29, 2025, but doing so will make it impossible to complete some graded course requirements.

You will also need a computer (your university-assigned laptop will work great) and a calculator.

Electronic Communication:

For electronic communication, I prefer Teams (although I will also usually respond to emails). Sometimes I will reply via Teams, even if you contact me in another way. I will always try to respond within 24 hours, although usually it will be much quicker. There is no wrong time to send me a message, just know that messages sent in the evening, at night, or on the weekends might take longer to get a response.

Canvas:

I will be using Canvas to make announcements, post class materials, update grades, and more. It is your responsibility to check Canvas regularly, and I recommend that you have notifications turned on to make sure you don't miss anything.

Course Description:

This course provides an introduction to the laws of probability and statistical analyses. Both descriptive and inferential statistics are considered. Laws of probability, Bayes' Theorem, probability distributions, the central limit theorem, confidence intervals, hypothesis testing, and linear regression are considered. Statistical software is used.

Prereq: MTH 1110 (quarter system prereq: MA 137)

Note: Students may receive credit for only one of MTH 2430, MTH 2450, and MTH 2480.

This course is not available to students with credit for MTH 2410 or IND 2030.

This course meets the following Raider Core CLO requirement: Think Critically.

Course Learning Outcomes:

Upon successful completion of this course, the student will be able to:

- Summarize data numerically and graphically
- Use software for statistical analysis
- Identify the difference between a population parameter and a sample statistic
- Apply the multiplication rule, permutations, and combinations to calculate the number of
- outcomes
- Apply rules of probability to calculate the probabilities of events
- Apply the law of total probability and Bayes' theorem to calculate the probabilities of events
- Calculate expectation and variance of probability distributions
- Apply the binomial, Poisson, normal, and exponential distributions to calculate the probabilities of events
- Apply the Central Limit Theorem to calculate sampling probabilities
- Construct appropriate confidence intervals for population mean and proportion
- Perform hypothesis tests concerning the means and proportions of one or two populations
- Construct a linear regression model and perform an inference for the regression

Attendance Policy/Classroom Expectations:

- You are expected to attend class regularly. Planned absences should be discussed prior to the class missed. If you are sick, you should prioritize your health and notify me as soon as possible. Attendance will typically be recorded daily. Every five (5) unexcused absences will result in a 1% deduction from your final course grade.
- Make every effort to arrive in the classroom before class starts, have your materials for our class ready to go, and put any unrelated items away.

- During class you are expected to be attentive, take notes, participate in discussions or activities, and be respectful of your classmates' learning.
- Phones, computers, earbuds, and other such electronics are a distraction to you, me, and your classmates. **Keep them put away (not out on the desk) unless you are actively using them to take notes or instructed otherwise.** If you do not follow this rule, you may be asked to leave.
- Do not work on WebAssign during class, unless instructed otherwise. Failure to follow this rule may result in a WebAssign grade penalty.
- Be respectful to your instructor and you classmates. Racism, sexism, homophobia, or any other hate speech or bias incident will not be tolerated. Any such instance will be reported to the university.

Getting Help Outside of Class:

Asking Questions in MS Teams: I prefer to use MS Teams chat for all electronic communication with students. I recommend installing the MS Teams app on your smartphone if you are able. Feel free to message me on Teams at any time, even late at night! I may not see it and respond immediately, but will do so when I can. Whenever possible, provide as much context as you can – for example, if you have a question on a particular problem, include a screenshot or photo of the problem itself as well as the work you've done so far.

Drop-in Hours: If you would like to ask me in-person questions outside of class, you may always come to my drop-in hours (see above for details).

Raider Center for Academic Success:

- Raider Success Coaches are professional staff who assist students one-on-one with emotional, personal, and academic support to develop a plan, establish goals, and identify the habits to help achieve success. To schedule a meeting, contact RCAS (rcas@msoe.edu) or email the Coach listed on your class schedule.
- Raider Success Allies are upperclassmen peers who assist students in their pursuit of success in and out of the classroom. An Ally serves in a variety of capacities - mentorship, accountability, study. Students looking to enhance their academic skills can stop by the RCAS HYPE Desk in the library M-F | 830AM-430PM.
- Tutoring offers free peer and professional academic support through one-on-one, group, and online sessions. Tutoring is located on the 2nd floor of the Library and online via Teams. To schedule a one-on-one, group, or online session please go to <https://tutoring.msoe.edu> or [Writing Assistance Request Form | MSOE](#)

Grading and Evaluation:

Grades will be assigned with the following weights:

- Online Homework in WebAssign: 8%
- In-class Quizzes: 12%
- Activities (Computer/Written): 20%
- Two Midterm Exams: 36% (18% each)
- Comprehensive Final: 24%

Your letter grade is determined using the following grading scale:

Score	A	AB	B	BC	C	CD	D	F
%	100-93	92-89	88-85	84-81	80-77	76-74	73-70	< 70

WebAssign:

- WebAssign is an online homework platform that allows you to complete the exercises from your textbook and assess your understanding. Links to current WebAssign homework will be embedded into Canvas modules. WebAssign is your opportunity to practice what you've learned. You will often need more practice beyond these assignments to master the material. Each question generally allows up to 5 attempts with the last attempt being the one that counts.
- I highly recommend you treat WebAssign like written homework – keep a notebook just for WebAssign problems, carefully and neatly write down your solution and all of work as if you were turning it all in for a grade. Then, once you finish the problem, type your answer into WebAssign and check. If it's not correct, you have a neatly organized solution to go back through and try to identify mistakes. If you get stuck on a problem, first consult your notes and the book itself. If you still need help, you can send me a message on Teams with screenshot of the problem you are stuck on, as well as the work you have done to get to where you are.
- If you are unable to complete an assignment on time, you may request an extension no later than the day after the assignment was originally due. The new due date for an extended assignment will be 3 days after the original due date. Your first two extension requests will be granted with no penalty, while subsequent extensions will result in a 30% deduction.

In-class Quizzes:

There will be in-class quizzes given throughout the semester, generally once a chapter of material is completed. Quizzes will always be announced ahead of time by at least one class period. Quizzes will generally be 20 minutes long and take place at the end of the class period.

Activities: There will be several graded “activities” throughout the semester. Many of these will require the use of the statistical software R. Generally speaking, class time will be given to get started on an activity, but time outside of class will be required to finish. Late work will not be accepted. More information about activities will be given as we get to them.

Exams:

We will have two 50-minute midterm exams and a comprehensive 120-minute final exam. A formula/reference sheet will be provided for each exam. More detailed information will be given as each exam approaches.

Organization, communication, and notation will be part of your grade on written problems, including activities, quizzes, and exams.

Any questions on a graded assessment must be addressed within one week after the assessment has been returned.

Make-up Policy:

Make-ups for quizzes and exams will be handled on a case-by-case basis, with the following general guidelines:

- If there is an *approved* reason causing you to miss a quiz or exam, you must communicate this with me *in advance* (preferably at least 24 hours before the scheduled time, but the earlier the better) to make arrangements. Acceptable reasons include things like serious illness, religious observance, military service, and MSOE activities (such as athletics). Unacceptable reasons include things like family vacation, leaving early or returning late for a break or weekend, hunting trips, and other similar activities.
- If you are allowed to make up a missed exam, you must take it at a mutually arranged time and place. No further opportunities will be extended. **Failure to contact me about a missed quiz or exam in a timely manner will result in a grade of zero on that assessment.**

Student Integrity:

Unless otherwise indicated, **all work submitted for grades must be your own**. While you may discuss general strategies and concepts with tutors or peers, what you submit must reflect your own comprehension of the course content. See MSOE’s [Policy on Student Integrity](#) for more information. Generally, you should not be using technology to do your work for you. This includes using websites with verbatim solutions to the problem or large language models like ChatGPT. Exceptions to this will be explicitly stated for an individual assessment.

Recording or Dissemination of Course Content:

Course content created by your instructor may not be redistributed outside the MSOE community without instructor approval. Video or audio recording of the classroom is allowed only by approval of the instructor or with an appropriate accommodation plan from Student Accessibility Services.

Student Accessibility Services (SAS):

For students with documented disabilities, chronic medical conditions, or mental health concerns; MSOE provides services to make reasonable accommodations available. If you are a student who requires or anticipates the need for accommodations, please contact Student Accessibility Services Office at 414-277-7281, by email at moureau@msoe.edu, or in person at CC341 to discuss appropriate accommodations and eligibility requirements.

Nondiscrimination Statement:

Milwaukee School of Engineering admits students of any race, gender, color, national and ethnic origin to all the rights, privileges, programs and activities generally accorded, or made available, to students at the university. It does not discriminate on the basis of race, ethnicity, color, creed, religion, sex, (including pregnancy and pregnancy-related disabilities), age, national origin/ancestry, arrest record, conviction record, physical or mental disability, military and veteran status, sexual orientation, gender identity, genetic characteristics, marital status, hairstyle, or any other characteristic protected by local, state or federal law in administration of its educational policies, admission policies, scholarship and loan programs, and athletic and other institutionally administered programs. MSOE also maintains its long-standing policy as an Equal Opportunity Employer for its faculty and administrative staff.

Raider Center for Academic Success:

- Raider Success Coaches provide emotional, personal, and academic support through one-on-one meetings to assist students in developing a plan, establishing goals, identifying the habits to help achieve success. To schedule a meeting, contact RCAS (rcas@msoe.edu) or email the Coach listed on your class schedule.
- Raider Success Allies are upperclassmen peers who assist students in their pursuit of success in and out of the classroom; mentorship, accountability, study partner – an ally can serve in a variety of capacities. Students looking to enhance their academic skills should stop by the RCAS Information Desk M-F | 830AM-430PM.
- Tutoring offers free peer and professional academic support through one-on-one, group, and online sessions. Tutoring is located on the 2nd floor of the Library and online via Teams. To schedule a one-on-one, group, or online session please go to <https://tutoring.msoe.edu>. Writing assistance is located <https://www.msoe.edu/tutoring-services>.

Student Accessibility Services (SAS):

For students with documented disabilities, chronic medication conditions and mental health concerns, MSOE provides services to make reasonable accommodations available. If you are a student who requires or anticipates the need for accommodations, please contact the Student Accessibility Services (SAS) Office at 414-277-7281, by email at moureau@msoe.edu or in person at K 250 to discuss appropriate accommodations and eligibility requirements.

Sexual Misconduct Policy:

<https://www.msoe.edu/campus-experience/student-support-services/sexual-assault-resources/title-ix>

MSOE Land Acknowledgement:

<https://www.msoe.edu/about-msoe/diversity-inclusion/land-acknowledgement/>

Tentative Exam Schedule:

Exam 1 – Friday of Week 6 (February 28)

Exam 2 – Friday of Week 12 (April 18)

Final Exam – see official schedule released by registrar later in the term

Changes to the Course Syllabus:

The information contained in this syllabus, other than the required course materials, may be subject to change. Any changes will be announced in class and posted in Canvas.