

STAT 355 Introduction to Probability and Statistics for Scientists and Engineers

Spring 2021

Instructor: Dr. Seungchul Baek

Office Hours: 3:00-4:00pm TTh via WebEx or by appointment

Email: baek@umbc.edu

Course website: (primary) Blackboard; (secondary) <http://baek.math.umbc.edu/stat355s21.html/>

Teaching Assistant: Udayan Sethuramalingam

Office Hours: 12:00-2:00pm Wednesdays

Email: sudayan1@umbc.edu

Class Time/Place:

- Lecture: 1:00-2:15pm TTh via Blackboard
- Discussion (Section 02): 3:00-3:50pm Tuesdays via Blackboard
- Discussion (Section 03): 3:00-3:50pm Thursdays via Blackboard

Prerequisite: You must have completed MATH 142, MATH 152, MATH 225 or MATH 251 with a grade of 'C' or better and must not have taken or be enrolled in STAT 350, STAT 351, STAT 355H, STAT 453 or CMPE 320.

Textbook:

Jay L. Devore (2015). *Probability and Statistics for Engineering and the Sciences*, 9th Edition. Cengage Learning

Course Overview:

This course is for students who want to learn basic theory and methods of statistics in order to analyze simple real data and experiments. Students will be provided with readily understandable and intuitive descriptions of statistical analyses. We will discuss the following topics: basic probability theory, discrete and continuous random variables and their distributions, joint probability distributions and random samples, statistical inference, simple and multiple linear regression, and the analysis of variance (ANOVA). We are going to cover Chapter 1 to Chapter 10 of the textbook. If time permits, we also learn about linear regression from Chapter 12 and 13.

Learning Outcomes:

By the end of the semester successful students should be able to do the following:

- Perform a basic statistical analysis on a data set.
- Interpret statistical results reported by others.

- Make decisions based on statistical inferences.

Grade Breakdown:

Your course grade will be determined by your performance on **homework (5%)**, **the course engagement (10%)**, **the quizzes (20%)**, **two midterms ($2 \times 20 = 40\%$)** and **the final exam (25%)**.

Final course grades will be assigned according to the following protocol: $A=[90,100)$, $B=[80,90)$, $C=[70,80)$, $D=[60,70)$, and $F=[0,60)$.

Homework:

The list of homework problems is in the below. The problems are tentative and they are subject to change. I recommend you to complete homework as soon as possible after you have covered the corresponding material in class. Each homework will be collected on due date in class via Blackboard. **The completeness of homework will be checked, but not graded. Late homework will not be accepted.**

Homework Assignment (Due will be announced):

- Ch 1: 19, 34, 38, 44
- Ch 2: 4, 8, 9, 12, 16, 18, 30, 32, 38, 50, 60, 62, 76
- Ch 3: 6, 14, 16, 24, 32, 36, 38, 50, 56, 80, 86(a,b)
- Ch 4: 2, 4, 8, 12, 14, 20, 22, 28, 30, 38, 42, 54, 60
- Ch 5: 2, 8, 22, 26, 30, 46, 49, 50, 52, 54, 58
- Ch 6: 3, 3, 9, 16, 19, 20, 22, 23
- Ch 7: 2, 3, 4(a,b,c,e), 6, 28, 33(c), 37(a), 47, 51(a,b), 55
- Ch 8: 6, 9, 30, 33, 34(a), 48(a,b), 52
- Ch 9: 1, 10(a), 12, 36, 43

Course Engagement:

Come prepared to class meetings; be willing to work on problems solo and in groups. Respond to questions and queries during class meetings. If you are in class, please be paying attention.

Quizzes:

Quizzes are scheduled for Thursdays during class time. They contain handwritten problems that you will submit through Blackboard. Your lowest quiz grade will be dropped. All questions in quizzes are based on lecture materials or homework questions or similar contents. **There will be NO make-up quiz.**

Exams:

We will have two midterm and final exams:

- Midterm 1: (tentative) **1:00-2:15pm on Thursday, March 11**
- Midterm 2: (tentative) **1:00-2:15pm on Thursday, April 8**
- Final: **3:30-5:30pm on Thursday, May 20**

Please note that I do not give make-up examinations unless your absence is due to a university function or emergency case, you have given me appropriate documentation, and you have discussed it with me at least one week in advance.

Calculator and Software:

Each student will need a scientific calculator. Sometimes, we may use R, one of the standard statistical software. The R package is available for free at <http://www.r-project.org>. The “An Introduction to R” manual available at this site is an excellent resource, at <http://cran.r-project.org/doc/manuals/-intro.pdf>.

Recommended Study Habits:

- Attend every class and be on time although we are meeting virtually.
- Ask questions if you do not understand something or wish to know more.
- Check email often for announcements.
- Form small study groups to work on homework and to prepare for the exams/quizzes.
- Email me as soon as possible if you have any questions.
- Make it your goal to understand everything we do.

Academic Integrity in the Online Instruction Environment:

Academic integrity is an important value at UMBC. By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC’s scholarly community in which everyone’s academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. These principles and policies apply in both face-to-face and online classes. Resources for students about academic integrity at UMBC are available at <https://academicconduct.umbc.edu/resources-for-students/>.

Accessibility and Disability Accommodations, Guidance and Resources:

Support services for students with disabilities are provided for all students qualified under the

Americans with Disabilities Act (ADA & ADAAA) and Section 504 of the Rehabilitation Act who request and are eligible for accommodations. The Office of Student Disability Services (SDS) is the UMBC department designated to coordinate accommodations that would create equal access for students when barriers to participation exist in University courses, programs, or activities.

If you have a documented disability and need to request academic accommodations in your courses, please refer to the SDS website at <http://sds.umbc.edu> for registration information and office procedures.

SDS email: disAbility@umbc.edu

SDS phone: (410) 455-2459

If you will be using SDS approved accommodations in this class, please contact me (instructor) to discuss implementation of the accommodations. During remote instruction requirements due to COVID, communication and flexibility will be essential for success.

Official UMBC Title IX Guidance: ([link](#))