STAT 355 Introduction to Probability and Statistics for Scientists and Engineers

Spring 2020

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Class Time/Place:

- Lecture: 1:00-2:15pm TuTh in Information Technology 102
- Discussion (Section 02): 3:00-3:50pm Tuesdays in Janet & Walter Sondheim 103
- Discussion (Section 03): 3:00-3:50pm Thursdays in Janet & Walter Sondheim 103

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
I will also provide lecture notes and handouts in the course website.

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 (10 percent), the pop-quizzes and attendance (10 percent), the quizzes (15 percent), two midterms ($2\times20=40$ percent) and the final exam (25 percent).
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. The completeness of homework will be checked, but not graded. Last homework will not be accepted.** You will find brief solution at the Blackboard after homework due. Working these problems should serve as good preparation for the exams and quizzes you will take in this course.

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, 88
- Ch 3: 6, 14, 16, 24, 32, 36, 38, 50, 56, 80, 86
- Ch 4: 2, 4, 8, 12, 14, 20, 22, 28, 30, 38, 42, 54, 60, 66, 67
- Ch 5: 2, 6, 8, 22, 26, 30, 46, 49, 50, 52, 54, 58
- Ch 6: 3, 9, 16, 19, 20, 22, 23
- Ch 7: 2, 3, 6, 16, 20, 22, 28, 33, 37
- Ch 8: 6, 9, 10, 16, 18, 24, 48, 50, 52
- Ch 9: 1, 10(a), 12, 23, 24, 36, 46
- Ch 10: TBD
- Ch 12: TBD

Quizzes:
There will be **announced** quizzes that will start randomly during discussion sessions. All questions in quizzes are based on lecture materials or homework questions or similar contents. Your

lowest quiz grade will be dropped. **There will be NO make-up quiz.**

Pop Quizzes:
There will be **unannounced** pop-quiz during lectures. Attendances for both lecture and discussion sessions are very important in this course and in this sense pop-quiz can be a part of the proof for attendance. Up to two missed pop-quiz will not affect your grade negatively. **There will be NO make-up pop-quiz.**

Exams:
We will have two midterm and final exams:

- Midterm 1: (tentative) **1:00-2:15pm on Tuesday, March 10**
- Midterm 2: (tentative) **1:00-2:15pm on Tuesday, April 7**
- Final: **3:30-5:30pm on Thursday, May 14**.

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. Cell phone or any other wireless device calculators are **NOT** permitted for use on exams.
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/r-release/R-intro.pdf.

Expectations for Classroom Behavior:
All cell phones are to be turned off or silenced during class (not on vibrate). All cell phones are to be put away out of view during class; there is no text messaging, web browsing, etc, during class. Please be respectful of each other, the instructor, and any guest while in class.

Recommended Study Habits:

- Attend every class and be on time.
- 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 and/or drop by my office as soon as possible if you have any questions.
- Make it your goal to understand everything we do.

Academic Integrity:
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 disciplinary action that may include, but is not limited to, suspension or dismissal. See the Faculty Handbook, or the UMBC Policies section of the UMBC directory.