

# Course Outline

## STA 4322: Introduction to Mathematical Statistics II

### Spring 2020

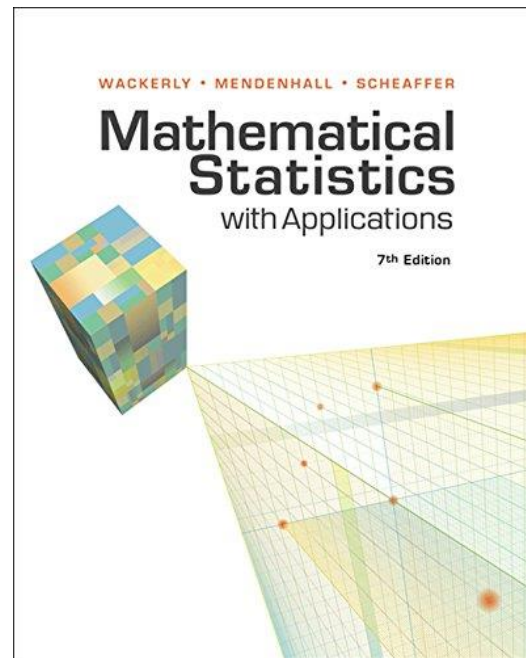
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**Class Time and Place:** Monday and Wednesday, 2:00 PM to 3:15 PM @ TBA.

**Office Hours:** Monday and Wednesday, 3:30 PM to 4:30 PM or by appointment.

**Prerequisite:** STA 4321: Introduction to Mathematical Statistics I or equivalent course.

**Text:** Mathematical Statistics with Applications, **7th Edition** by Dennis D. Wackerly, William Mendenhall III and Richard L. Scheaffer  
Cengage Learning, USA  
ISBN-13: 978-0-495-11081-1  
ISBN-10: 0-495-11081-7



**Course Description:** This is the second course in a two-semester sequence. The detailed course outlines are presented below:

**7. Sampling Distribution:** Distribution of statistics; sample mean and sample variance. The chi-squared, F and t distributions. Sampling distribution of order statistics. Joint distribution of order statistics.

**8. Estimation and Confidence Intervals:** Some properties of point estimators, some common unbiased point estimators, evaluating the goodness of a point estimator, confidence intervals, large sample confidence interval, selecting the sample size, small-sample confidence interval.

**9. Properties of Point Estimators and Method of Estimation:** Unbiasedness, relative efficiency, consistency, minimal sufficiency and minimum variance unbiased estimation (MVUE), the method of moments, the method of maximum likelihood.

**10. Hypothesis Testing:** Elements of a statistical test, common large-sample tests, calculation of type-I error, sample size for the Z-test, different ways of reporting the result of a test, attained significance levels or p-values, some comments on the theory of hypothesis testing, two-sample tests based on t-distributions, testing hypothesis concerning variances, power of tests, the Neyman-Pearson lemma, likelihood ratio tests. Analysis of contingency table, the Chi-Square goodness of fit test.

**15. Nonparametric Tests:** Sign test, Signed-Rank test, Rank-Sum tests, Tests based on Runs, Rank correlation.

**11. Linear Models and Estimation by Least Squares (optional):** Linear regression and estimation by least squares method, method of least squares and its connection with maximum likelihood method under normality assumption, confidence intervals for parameters, prediction interval, Multiple Linear regression.

**13. Analysis of Variance (optional):** Experimental Design, one-way and two-way analysis of variance.

**Note: A scientific calculator is required for this course.**

**Course Evaluation:** Tentatively the grading scheme is as follows:

Assignments	20%
Midterm Exam I	20%
Midterm Exam II	20%
Final Exam	40%

**Assignments:** There will be several assignments (independently done) for this course. Only some of the selected problems from each of the assignments will be graded.

The *tentative midterm dates* are as follows:

**The first Midterm Exam** will be held on February 10 (Monday), 2020 and exam covers the materials until February 5 (Wednesday), 2020.

**The second Midterm Exam** will be held on March 23 (Monday), 2020 and exam covers the materials until March 18 (Wednesday), 2020.

**The Final Exam** is cumulative. The exact time and date will be provided as soon as it is available.

**PS: You should not register in this class if your final exam conflicts with other course.**

**Note:** Any complain about the grading of the midterm exams/assignments have to be done within two weeks after the corresponding exams/assignments.

**No make-up exam will be given**, however, if an extenuating circumstance exists, please contact the instructor prior to the exam and receive permission to be absent and must arrange for taking a substitute test as soon as possible. All students are required to attend in the final exam. Failure to attend it will result in a grade of "F" for the course.

**Unfortunately, no extra work will be given to improve the grade.**

**Grading Scale:** The weighted average of the scores in the three exams will be converted to a percentage. The following scale will then be used to assign letter grades for the course.

Letter	Range (%)	Letter	Range (%)	Letter	Range (%)
A	90 - 100	B	80 - 83	C	67 - 73
A-	87 - 89	B-	77 - 79	D	60 - 66
B+	84 - 86	C+	74 - 76	F	0 - 60

**Some Important Dates:**

- 1. January 6, 2020, Monday:** Classes begin.
- 2. January 13, 2020, Monday:** Last day to add or drop courses or withdraw from the University without incurring financial liability for tuition and fees
- 3. January 20, 2020, Monday:** Martin Luther King Holiday (University Closed).
- 4. February 24-29, 2020, Monday - Saturday:** Spring Break.
- 5. March 16, 2020:** Last day to drop a course with a DR grade. Last day to withdraw from the University with a WI grade. (**PS:** Please check with the university for the exact date, Instructor is not responsible for this date, add or drop the course etc).
- 6. Class end:** April 17, 2020
- 7. Grades available for students:** Thursday, April 30, 2020

**Note:** The instructor is not responsible about the above date or time. Students must review FIU Academic Calendar 2019-2020 for the above dates. **The instructor is not responsible to add or drop a course. It is student's own responsibility.**

**Incomplete:** The incomplete (I) grade will be given ONLY to a student who has completed the bulk of the course works (**at least half of the course**) and is unable to complete the course due to a serious interruption not caused by the student's own negligence. **It is not a choice to have incomplete grade.**

**Attendance:** Students are expected to attend the classes regularly. If a student misses (or fails to attend) a class, it is his/her sole responsibility to obtain the missing information (for examples change of exam date, change of exam location, add/ omit some sections, class notes, new home works etc) from the Instructor or other students. Students are encouraged to seek the instructors help during office hours.

**Note:** The course outline provides a general plan/guide for the course only, however, deviation or some changes may be necessary. The instructor will assume the sole authority in all matters related to course content, students grading, and classroom procedures. No active beeper or cellular phones are allowed in classes.

**You should not register in this class if your final exam conflicts with other course.**

**Academic Misconduct:** *Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas, and community service. All students should respect the right of others to have an equitable opportunity to learn and honestly to demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook.*