

**Course Syllabus: CIVL 7012/8012**  
**Probabilistic Methods for Engineers**  
**Spring 2020, M/W 8am-9:25am, EA 102D**

Course Instructor: Dr. Sabya Mishra ([smishra3@memphis.edu](mailto:smishra3@memphis.edu))

Course Teaching Assistant: Diwas Thapa ([dthapa@memphis.edu](mailto:dthapa@memphis.edu))

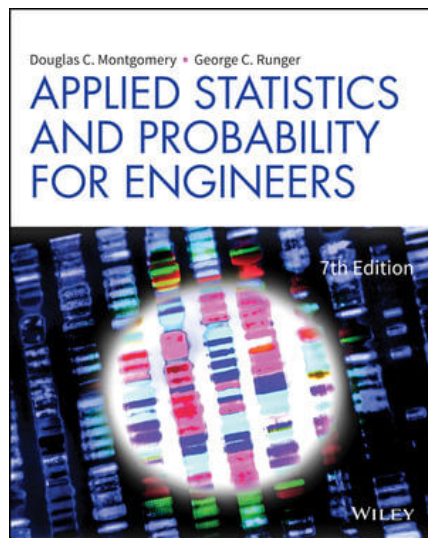
Office Hours: M/W, 9:30am-10:30am at ES 112B

**Course Objectives:**

1. To provide students an understanding of the concepts and methods of probability and statistics that are essential for modeling engineering problems under conditions of uncertainty.
2. To provide students an understanding of the process of and considerations involved in the design of experiments.
3. To provide the opportunity for students to apply course principles to practical problems in their area of concentration.

**Textbook:**

Montgomery and Runger (2018) Applied Statistics and Probability for Engineers, 7th Edition, Wiley.  
ISBN: 978-1-119-40036-3 ISBN: 9781119456261



\*Available at [Wiley.com](http://Wiley.com)

**Class Schedule:**

Dates	Class	Week	Topic
22-Jan-20	1	Week-1	Collection and analysis of data
27-Jan-20	2	Week-2	Discrete probability distributions
29-Jan-20	3	Week-2	Discrete probability distributions
3-Feb-20	4	Week-3	Continuous probability distributions
5-Feb-20	5	Week-3	Continuous probability distributions
10-Feb-20	6	Week-4	Multivariate distribution
12-Feb-20	7	Week-4	Confidence intervals
17-Feb-20	8	Week-5	Confidence intervals

19-Feb-20	9	Week-5	Fitting a distribution and hypothesis testing
24-Feb-20	10	Week-6	Practice problems on hypothesis testing
26-Feb-20	11	Week-6	Practice problems on hypothesis testing
2-Mar-20	12	Week-7	Simple Linear Regression I
4-Mar-20	13	Week-7	First mid term
9-Mar-20	14	9-Mar	Spring break
11-Mar-20	15	11-Mar	Spring break
16-Mar-20	16	Week-9	Simple Linear Regression II
18-Mar-20	17	Week-9	ANOVA
23-Mar-20	18	Week-10	Multiple Linear Regression
25-Mar-20	19	Week-10	Categorical variables in multiple regression
30-Mar-20	20	Week-11	Multicollinearity and validation
1-Apr-20	21	Week-11	Practice problems on SLR and MLR
6-Apr-20	22	Week-12	Time series data
8-Apr-20	23	Week-12	Modeling time series data
13-Apr-20	24	Week-13	Count data models
15-Apr-20	25	Week-13	Modeling count data
20-Apr-20	26	Week-14	Discrete choice modeling
22-Apr-20	27	Week-14	Introduction to Machine Learning
27-Apr-20	28	Week-15	Final research review presentations I
29-Apr-20	29	Week-15	Final research review presentations II
4-May-20	30	Week-16	Final exam
6-May-20			Deadline for submission of research report

Note: The class schedule is subject to change and students will be notified when change occurs.

### **Homework policy:**

Homework will be due in the beginning of the class after one week of being assigned unless instructed otherwise. In case of uncertain circumstances, the student will be given an extension of 48 hours from the deadline after talking to the instructor. No more extensions will be allowed. Homework submitted via email should have the file name CIVL\_Course#\_HW#\_Student\_Name with Course#\_HW# as the email subject.

### **Research review and report:**

Students will undertake a research project of their choice during the course. The research project should incorporate the concepts covered in class. Near the end of the semester students will present their project in class. Class presentations will include:

- Introduction to their project along with the objective of their study and approach used.
- Final results along with a brief discussion of the results.

Research report: The students will submit a report on their class project in accordance with the guidelines provided on the class website.

**Grading:**

Homework=10%

Research Reviews (3 @ 5% each) = 15%

Research Report: 15%

Midterm Exam = 30%

Final Exam = 30%

Students in CIVL 8012 will be given more rigorous questions on homeworks and exams than those in CIVL 7012.

**Grading Scale:**

93-100 A; 80-93 B; 70-79 C; 60-69 D; 59 or lower F

**Special Accommodations:**

Reasonable and appropriate accommodations will be provided to students with disabilities who present a memo from Student Disability Services (SDS).

**Office Hours:**

ES 112B, Monday: 9:30am-10:30am.