

# APPM 4570/5570 COURSE SCHEDULE (TENTATIVE)

**Instructor:** Brian Zaharatos

**Office:** ECOT 338

**Office Hours:** Tues: 1:30pm to 3:00pm; Wed: 3:00pm to 4:30pm; or by appointment

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- *Probability and Statistics with R, 2nd Edition* by M.D. Ugarte, A.F. Militino, A.T. Arnhold, CRC Press, 2016, ISBN-13 978-1466504394
- **Optional Text:** *Probability and Statistics for Engineering and the Sciences*, 8th ed., Jay Devore

Week	Date	Unit	Topic	Reading Due	Assignment Due
1	Wed, Jan 17, 2018	Intro/Exploratory Data Analysis	Intro to R/Jupyter	Review Ch. 1	
	Fri, Jan 19, 2018	Intro/Exploratory Data Analysis	Intro to R/Jupyter	Review Ch 1; 2.1, 2.2, 2.5	
	Mon, Jan 22, 2018	Intro/Exploratory Data Analysis	Intro to R/Jupyter	Review Ch 1; 2.1, 2.2, 2.5	
2	Wed, Jan 24, 2018	Exploratory Data Analysis	Summary Statistics/Data Visualization	2.6.1, 2.6.3, 2.6.4	
	Fri, Jan 26, 2018	Exploratory Data Analysis	Summary Statistics/Data Visualization	2.4.3	<b>Homework #1 Due</b>
3	Mon, Jan 29, 2018	Intro to Probability Theory	Axioms and Theorems of Probability Theory	3.3.1,3.3.2	
	Wed, Jan 31, 2018	Intro to Probability Theory	Axioms and Theorems of Probability Theory	3.3.3, 3.3.4	
	Fri, Feb 2, 2018	Intro to Probability Theory	Axioms and Theorems of Probability Theory	3.3.4	<b>Homework #2 Due</b>
4	Mon, Feb 5, 2018	Intro to Probability Theory	Bayes' Theorem/ Independence	3.3.5, 3.3.6	
	Wed, Feb 7, 2018	Probability Distribution Functions (pdfs)	Intro to pdfs	3.4 (omit sections on Expected Value, moments, and Variance)	
	Fri, Feb 9, 2018	Probability Mass Functions (pdfs)	Discrete Random Variables	4.1, 4.2.2, 4.2.3	<b>Homework #3 Due</b>
5	Mon, Feb 12, 2018	Probability Mass Functions (pdfs)	Discrete Random Variables	4.2.3, 4.2.4	
	Wed, Feb 14, 2018	Probability Mass Functions (pdfs)	Discrete/Continuous Random Variables	4.2.4	
	Fri, Feb 16, 2018	Probability Density Functions (pdfs)	Continuous Random Variables	4.3.2	<b>Homework #4 Due</b>
	Mon, Feb 19, 2018	Probability Density Functions (pdfs)	Continuous Random Variables	4.3.3, 4.3.6	

Week	Date	Unit	Topic	Reading Due	Assignment Due
6	Wed, Feb 21, 2018	Exam (through discrete RVs)	Exam (through discrete RVs)	NA	Exam #1 (in class)
	Fri, Feb 23, 2018	Expectation, Variance, Covariance	Discrete Expectation and Variance	3.4.1.1, 3.4.1.2	
	Mon, Feb 26, 2018	Expectation, Variance, Covariance	Discrete/Continuous Expectation and Variance	3.4.2.2, 3.4.2.3	
7	Wed, Feb 28, 2018	Expectation, Variance, Covariance	Covariance		
	Fri, Mar 2, 2018	Expectation, Variance, Covariance	Covariance		Homework #5 Due
	Mon, Mar 5, 2018	Central Limit Theorem	CLT	6.1.1, 6.4, 6.5.1	
8	Wed, Mar 7, 2018	CLT	CLT	6.4, 6.5.1, 6.5.3	
	Fri, Mar 9, 2018	CLT	CLT	6.5.3	Homework #6 Due
	Mon, Mar 12, 2018	Confidence Intervals	Intro to Confidence Intervals/CI for Population Mean	8.1	
9	Wed, Mar 14, 2018	Confidence Intervals	Confidence Intervals for the Population Mean	8.1, 8.2.1	
	Fri, Mar 16, 2018	Confidence Intervals	Confidence Intervals for the Population Mean	8.2.1, 8.2.2	
	Mon, Mar 19, 2018	Confidence Intervals	Confidence Intervals for the Population Proportion	8.4.1	
10	Wed, Mar 21, 2018	Confidence Intervals	CLs for Variance, Two Sample Confidence Intervals	8.3.1, 8.2.3-8.2.4	
	Fri, Mar 23, 2018	Confidence Intervals	Two Sample Confidence Intervals	8.2.5-8.2.6, 8.4.2	Homework #7 Due
	Mon, Mar 26, 2018	Spring Break	No Class		
11	Wed, Mar 28, 2018	Spring Break	No Class		
	Fri, Mar 30, 2018	Spring Break	No Class		

Week	Date	Unit	Topic	Reading Due	Assignment Due
12	Mon, Apr 2, 2018	Confidence Intervals	Two Sample Confidence Intervals	8.2.5-8.2.6, 8.4.2	
	Wed, Apr 4, 2018	Hypothesis Testing	Intro to Testing, Test Statistics, Rejection Regions	9.1, 9.2, 9.5	<b>Exam #2 (evening)</b>
	Fri, Apr 6, 2018	Hypothesis Testing	Rejection Regions, Error Types	9.1, 9.2, 9.5	
13	Mon, Apr 9, 2018	Hypothesis Testing	Tests for Population Mean	9.7.1, 9.7.2	
	Wed, Apr 11, 2018	Hypothesis Testing	Tests for Population Mean/Proportion, p-values	9.7.2, 9.9.2	
	Fri, Apr 13, 2018	Hypothesis Testing	Tests for Population Proportion/Two Sample Tests	9.7.3-9.7.5	<b>Homework #8 Due</b>
14	Mon, Apr 16, 2018	Hypothesis Testing/Simple Linear Regression	Two Sample Tests/Intro, Ordinary Least Squares, Properties	9.9.4, 12.1, 12.2	
	Wed, Apr 18, 2018	Simple Linear Regression	Properties of Regression Line, Applications	12.4, 12.5, 12.6, 12.8, 12.9	
	Fri, Apr 20, 2018	Simple/Multiple Linear Regression	Properties of Regression Line, Applications	12.4, 12.5, 12.6, 12.8, 12.9	<b>Homework #9 Due</b>
15	Mon, Apr 23, 2018	Multiple Linear Regression	Intro, Ordinary Least Squares, Properties	12.3	
	Wed, Apr 25, 2018	Multiple Linear Regression	Intro, Ordinary Least Squares, Properties	12.4, 12.5, 12.6, 12.8, 12.9	
	Fri, Apr 27, 2018	Multiple Linear Regression	Properties of Regression Surface, Applications	12.4, 12.5, 12.6, 12.8, 12.9	
16	Mon, Apr 30, 2018	Multiple Linear Regression	Properties of Regression Surface, Applications	12.4, 12.5, 12.6, 12.8, 12.9	
	Wed, May 2, 2018	Multiple Linear Regression	Properties of Regression Surface, Applications	12.4, 12.5, 12.6, 12.8, 12.9	<b>Project Due</b>
	Fri, May 4, 2018	No Class	No Class	No Class	
	Wed, May 9, 2018				<b>Final Exam (not cumulative): 1:30pm - 4pm, room TBA</b>

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Week	Date	Unit	Topic	Reading Due	Assignment Due
1	Mon, Aug 28, 2017	Intro/Exploratory Data Analysis	Intro to R	Review Ch. 1	
	Wed, Aug 30, 2017	Intro/Exploratory Data Analysis	Intro to R	Review Ch 1; 2.1, 2.2, 2.5	
	Fri, Sep 1, 2017	Exploratory Data Analysis	Summary Statistics/Data Visualization	2.6.1, 2.6.3, 2.6.4	
2	Mon, Sep 4, 2017	NO CLASS	NO CLASS	NO CLASS	
	Wed, Sep 6, 2017	Exploratory Data Analysis	Summary Statistics/Data Visualization	2.4.3	
	Fri, Sep 8, 2017	Intro to Probability Theory	Axioms and Theorems of Probability Theory	3.3.1, 3.3.2	<b>Homework #1 Due</b>
3	Mon, Sep 11, 2017	Intro to Probability Theory	Axioms and Theorems of Probability Theory	3.3.3, 3.3.4	
	Wed, Sep 13, 2017	Intro to Probability Theory	Axioms and Theorems of Probability Theory	3.3.4	
	Fri, Sep 15, 2017	Intro to Probability Theory	Axioms and Theorems of Probability Theory	3.3.4	<b>Homework #2 Due</b>
4	Mon, Sep 18, 2017	Intro to Probability Theory	Bayes' Theorem	3.3.5	
	Wed, Sep 20, 2017	Intro to Probability Theory	Bayes' Theorem/Independence	3.3.6	
	Fri, Sep 22, 2017	Probability Distribution Functions (pdfs)	Intro to PDFs	3.4 (omit sections on Expected Value, moments, and Variance)	<b>Homework #3 Due</b>
5	Mon, Sep 25, 2017	Probability Mass Functions (pdfs)	Discrete Random Variables	4.1, 4.2.2, 4.2.3	
	Wed, Sep 27, 2017	Probability Mass Functions (pdfs)	Discrete Random Variables	4.2.3, 4.2.4	

Week	Date	Unit	Topic	Reading Due	Assignment Due
6	Fri, Sep 29, 2017	Probability Mass Functions (pdfs)	Discrete Random Variables	4.2.4	
	Mon, Oct 2, 2017	Probability Density Functions (pdfs)	Discrete/Continuous Random Variables	4.3.1, 4.3.2	
	Wed, Oct 4, 2017	Probability Density Functions (pdfs)	Continuous Random Variables	<b>4.3.2</b>	
	Fri, Oct 6, 2017	Probability Density Functions (pdfs)	Continuous Random Variables	4.3.3, 4.3.6	<b>Homework #4 Due</b>
7	Mon, Oct 9, 2017	Probability Density Functions (pdfs)	Continuous Random Variables		
	Wed, Oct 11, 2017	Expectation, Variance, Covariance	Discrete Expectation and Variance	3.4.1.1, 3.4.1.2	
	Fri, Oct 13, 2017	Expectation, Variance, Covariance	Discrete/Continuous Expectation and Variance	3.4.2.2, 3.4.2.3	<b>Homework #5 Due</b>
8	Mon, Oct 16, 2017	Expectation, Variance, Covariance	Discrete/Continuous Expectation and Variance		
	Wed, Oct 18, 2017	Intro to Statistical Inference	Statistical Inference	6.1, 6.2	
	Fri, Oct 20, 2017	Exam	Exam		<b>Exam #1</b>