



STA 3032

Fall 2016

Engineering Statistics

of

Section 7661 MWF 5th period 11:45-12:35 WEIM 1064

Instructor/TA:

	Demetris Athienitis Samrat Roy	Chuji Luo
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E-mail:	athienit@ufl.edu	samratroy@ufl.edu
Grading:	Exams	Quizzes (odd modules) Quizzes (even modules)

Course Website: e-Learning

Course Notes: http://www.stat.ufl.edu/~athienit/IntroStat/class_notes.pdf

Lecture videos will be provided but are only meant, as a review and *are not meant to replace the live in class lectures.*

Course Communication:

- Piazza Q&A discussion forum. (Link available “Pages” under Canvas.)
- Office hours (posted on Canvas under “Pages”). There will be no office hours during holidays.
- E-mail for questions regarding course policies. (Ensure that 3032 is in the subject line. Failure to do so may result in a non-response.)

All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussion and chats. Please refer to expected class netiquette.

The instructor reserves the right to update any parts of this syllabus as necessary. Students will promptly be notified of any changes.

Required Text(s): *Statistics for Engineers and Scientists*, 4th Edition (Companion site)

Author(s): William Navidi; **ISBN-13:** 978-0073401331

Course Description: A survey of the basic concepts in probability and statistics with engineering applications. Topics include probability, discrete and continuous random variables, confidence interval estimation, hypothesis testing, correlation, regression, and analysis of variance.

Prerequisite(s): MAC 2311. The use of integrals will be used greatly throughout the class.

Credit Hours: 3

Software You will need a computer for the homework assignments and practise. Some introductory lessons will be provided but students are expected to familiarize themselves with the software they wish use. The main software used in class will be R (<http://www.r-project.org/>) although you can use any other allowable software: Minitab, SPSS, SAS, JMP, Matlab. For more help visit <http://www.stat.ufi.edu/~athienit/software.html>

Purpose of Course: To comprehend basic concepts of probability and statistics, and to make meaningful inferences on relevant datasets.

Course Goals and Objectives:

At the completion of this course, students will be able to:

1. Access, manipulate and analyse data using statistical software.
2. Produce appropriate graphs and descriptive statistics for one and two variables, for both categorical and continuous data.
3. Interpret graphs and descriptive statistics for one and two variables.
4. Know and apply the basic probability rules, the concepts of expected value and variance for discrete and continuous variables.
5. Know and apply the Central Limit Theorem, which is crucial for inference.
6. Understand confidence intervals and hypothesis tests.
7. Carry out and interpret one-sample and two-sample analyses for means and proportions.
8. Carry out and interpret statistical modeling using multiple regression and analysis of variance.
9. Know and apply basic quality control procedures.

Course Policies

Assignments

- Students are expected to work independently, unless otherwise specified. **Offering and accepting** solutions from others is an act. of **plagiarism**, which is a serious offense and **all involved parties will be penalized according to the Academic Honesty Policy**. Discussion amongst students is encouraged, but when in doubt, direct your questions to the instructor or teaching assistant.
- **No late assignments will be accepted under any circumstances.**
- Students are expected to show and explain how the answers were obtained.
- All electronically **submitted work must be in pdf format**. In Canvas, all uploaded files automatically get a grade of 0, until the teaching assistant grades them.

Homework/Quizzes

There will be homework assigned on a regular basis as *suggested homework* (not to be turned in) containing data, analysis problems and/or book exercises. Suggested homework will be posted under “Assignments”. A *timed* quiz assignment, (based on the suggested homework) will be administered either as

- In-class (closed notes).

- Online (Only 1 attempt. It is highly encouraged to use a **reliable device** with a **reliable wired ethernet internet connection**. As soon as work is submitted a grade of 0 will show up as a placeholder until the assignment is graded.)

but which format will be used, will not be announced prior. For the best preparation students are encouraged to complete the full suggested homework set by the deadline posted on the suggested homework, indicating when you should be ready to take the quiz.

Solutions to suggested HW will not be posted.

Exams

With every completion of 2 modules, exams will be administered that will comprise of multiple choice questions and possibly open-ended questions. Exams will emphasize more on conceptual questions while HW/Quizzes will be more computational (not always).

Important dates:

Exam #1	September 30, 2016
Exam #2	October 26, 2016
Exam <i>φB</i>	December 14, 2016

Allowed material:

- Instructor provided formula sheet. (Provided ahead of time.)
- Scientific/Graphing Calculator.

Grading

Change of grade: Grades will be changed only when an error has been made by the instructor.

Grade distribution:

Exams 1, 2 and 3	75% (15% lowest, 30% highest two)
Homework/Quizzes	25% (lowest score will be dropped)

Letter grade distribution:

B+	84 to < 87	A	91 to 100	A-	87 to < 91
C+	74 to < 77	B	80 to < 84	B-	77 to < 80
D+	64 to < 67	C	70 to < 74	C-	67 to < 70
E	< 55	D	60 to < 64	D-	55 to < 60

There will be *no rounding up* of scores. Students who actively participate in the discussion forum will be awarded **extra credit** (to the discretion of the instructor). To view the result of the letter grades to your GPA please visit

<http://www.registrar.ufl.edu/catalog101/policies/regulationgrades.html>

Attendance/Make-up

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

(Additional) Make-up policy requirements:

- Every effort should be made to complete the assignment/exam during the open period. Only extreme situations will warrant a makeup. Contact the instructor prior to the exam - as soon as you realize you will be unable to take the assignment/exam at the scheduled time. Each case will be reviewed individually. Valid and detailed documentation is a prerequisite for scheduling a makeup under such extenuating circumstances.
- If you have an emergency on the day of the assignment/exam, the instructor must be contacted by midnight of the day of the assignment/exam.
- Additional Note: Being on vacation or booking a trip prior to the completion of the semester is not a valid reason to request a makeup. Please reference the Academic Calendar

Incomplete: An incomplete grade may be assigned at the discretion of the instructor as an interim grade for a course in which the student has completed a major portion of the course with a passing grade, been unable to complete course requirements before the end of the term because of extenuating circumstances, and obtained agreement from the instructor and arranged for resolution of the incomplete grade in the next term. Instructors are not required to assign incomplete grades. For complete details please visit the registrar's course policies.

Getting help

For issues with technical difficulties for e-learning in Canvas, please contact the UF Help desk at:

- <https://lss.at.ufl.edu/help.shtml> OR <http://helpdesk.ufl.edu/>
- 352-392-4357 - select option 2
- e-mail at helpdesk@ufl.edu.

Any requests for make-ups due to technical issues MUST be accompanied by the **ticket number** received from LSS when the problem is reported to them. The ticket number will document the time and date of the problem. You MUST contact your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

Complaints/Praises: Should you have any complaints/praises with your experience in this course you can always address them to the instructor at athienit@ufl.edu, or you may contact Ms. Tina Greenly t.greenly@ufl.edu of the Department of Statistics to submit a complaint. You may submit anonymous e-mail using:

- <http://anonymouse.org/anonemail.html> (No reply option, there is a time delay)
- <https://anonymousemail.me/> (Has optional reply option. Requires entry in the **From** field so put a fake address, e.g. fake@fake.com)

Both of these sites have been tested and no personal information or IP addresses are available. Feel free to test them.

For complaints that are not satisfactorily resolved at the department level or which seem to be broader than one department, students are encouraged to review the UF Complaints Policy.

Other general UF Policies

Accommodating Students with Disabilities: Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Academic Misconduct: Students are held accountable to the UF Honor Code.

Evaluations: Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

Tentative Course Outline

* Additional topics included

Modules	Content	Class notes	Video	Textbook	Suggested HW
1	Summary Statistics	5-7	1	1.1-1.2	1
	Graphical Summaries	8-13	2	1.3	
2	Sample Space, Events and Probability	14-17	3	2.1	2.1
	Counting Methods	18-20	4	2.2	
	Conditional Probabilities and Independence	21-25	5	2.3	
	Random Variables: Properties (I)	26-29	6	2.4	
	Random Variables: Properties (II)	30-32	7	2.4	
	Random Variables: Properties (III)	33-36	8	2.4, 2.6	
	Random Variables: Properties (IV)	37-40	9	2.5, 2.6	2.2
	Random Variables: Common discrete distributions	41-44	10	4.1-4.4	
	Random Variables: Common continuous distributions	45-48	11	4.5, 4.8	
	Central Limit Theorem	49-50	12	4.11	
	Normal Probability/Quantile Plot	51-52	13	4.10*	
Exam 1					
3	Inference for Population Mean (I)	54-58	14	5.1, 5.3	3.1
	Inference for Population Mean (II)	59-64	15	6.1-6.2, 6.4	
	Inference for Population Proportion	65-66	16	5.2, 6.3	
	Inference for Population Variance	67-69	17	5.8, 6.11	3.2
	Distribution Free Inference (I)	70-74	18	6.9*	
4	Inference for Population Means: Confidence Intervals	75-79	19	5.4-5.7	4
	Inference for Population Means: Hypothesis Tests	80-82	20	6.4-6.8	
	Inference for Population Variances	83-85	21	6.11*	
	Distribution Free Inference (II)	86-90	22	6.9*	
	Contingency Tables: Tests of Independence	91-93	23	6.10	
Exam 2					
5	Simple Linear Regression (I)	95-99	24	7.1-7.2	5.1
	Simple Linear Regression (II)	100-103	25	7.3	
	Checking Assumptions and Transforming Data	104-110	26	7.4*	
	Multiple Regression (I)	111-115	27	8.1-8.2	5.2
	Multiple Regression (II)	116-119	28	8.3	
	Qualitative Predictors	120-124	29	*	
6	Completely Randomized Design (I)	125-128	30	9.1	6
	Completely Randomized Design (II)	129-131	31	9.2	
	Randomized Block Design	134-138	33	9.4	
Exam 3					
Supplemental	Completely Randomized Design: Nonparametric	132-133	32	*	
	Randomized Block Design: Nonparametric	139-140	34	*	