



UNIVERSITY of

FLORIDA

STA 3032

Spring 2016

Engineering Statistics

Section 7370 MWF 5th period 11:45-12:35 LIT 109

Section 7393 MWF 7th period 13:55-14:45 LIT 101

Instructor: Demetris Athienitis

Office: Griffin Floyd 116B
E-mail: athienit@ufl.edu
Phone: 352-273-2972

Teaching Assistant: TBA

Office: Griffin Floyd 218
E-mail:

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, replace the live in class lectures.*

Course Communication:

- Piazza Q&A discussion forum.
- 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

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.uci.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 approximately 9 sets of *suggested homework* exercises. With the completion of the corresponding material (see Course Outline) a quiz will be administered. The quizzes will comprise of a **random set of questions (from the suggested homework and potentially altered slightly)** and will administered as a *timed* assignment. Information and dates will be provided on the class website. These assignments may be

- In-class (closed notes).

- Online (Only 1 attempt). It is highly encouraged to use a **reliable device** with a **reliable wired ethernet internet connection**. The time allotted is for uploading your work. Generally, you will **not have enough time to solve the problems at that moment**.

For online quizzes, **please allow yourself enough time to complete the quiz before the deadline. Failure to do so will result in your (unfinished current) attempt to be automatically submitted.** For the best preparation students are encouraged to complete the full suggested homework set and to have it scanned ahead of time.

Exams

With every completion of 2 modules, exams will be administered that will comprise of multiple choice questions and possibly open-ended questions.

Important dates:

Exam #1 February 12, 2016 at 20:20 in NPB1001
 Exam #2 March 18, 2016 at 20:20 in NPB1001
 Exam #3 April 29, 2016 at 15:00 in ???

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>

Make-up policy:

- 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. Instructors are not required to assign incomplete grades.

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.

UF Policies

Accommodating Students with Disabilities: Students requesting accommodation for disabilities must first register with the Dean of Students Office. The Dean of Students will provide documentation to the students who must then provide this documentation to the instructor when requesting information. You must submit this documentation prior to submitting any assignments for which you are requesting accommodation.

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

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	*	