



STA 4210

Fall 2016 (section 9631 )

Regression Analysis

MWF 2nd period 08:30-09:20, FLO 100

**Instructor/TA:**

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Grading:	Exams	Quizzes (odd)	Quizzes (even)

**Course Website:** e-Learning

**Course Notes:** [http://www.stat.ufl.edu/~athienit/STA4210/reg\\_notes.pdf](http://www.stat.ufl.edu/~athienit/STA4210/reg_notes.pdf)

These are a rough draft and work in progress.

**Course Communication:**

- Piazza Q&A discussion forum. (Link available “Pages” under Canvas.)
- Office hours (posted on e-learning under “Pages”).
- E-mail for questions regarding course policies. (Ensure that **4210** 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):** *Applied Linear Statistical Models*, 5<sup>th</sup> Edition

**Author(s):** M. Kutner, C. Nachtsheim, J. Neter and W. Li, **ISBN-13:** 9780073108742

**Course Description:** Investigate the purposes, methods and applications of regression. Inference about, model parameters and predictions, diagnostic and remedial measures about, the model, independent, variable selection, multicollinearity and autocorrelation. This course includes a chapter devoted to regression on time series data, and forecasting based on the fitted model. The goal is to make students functional in the use of the important, scientific tool of regression.

### Prerequisite(s) :

- STA 2023 or STA 3032 or STA 4322 (It is suggested if possible that a linear algebra and programming class be taken prior.)
- Read review material, Chapter 0

### Credit Hours: 3

**Software:** You will need a computer for the homework assignments and practise. There will not be any lessons on how to use software, but questions are welcomed especially during office hours. The main software used in class will be R <http://www.r-project.org/> although you can use any other software you wish that yield similar results. For more help information including R tutorials, visit <http://www.stat.ufl.edu/~athienit/software.html>

**Purpose of Course:** Investigate the purposes, methods and applications of regression. Emphasis is on what to apply and why it works.

### Course Goals and Objectives:

1. Access, manipulate and analyse data, using statistical software.
2. Acquaint, students with Least. Square methods and concept, of linear regression, correlation, and its applications.
3. To approach the material with matrices algebra..
4. Develop the ability to build regression models.
5. Acquaint, students with transformations, qualitative variable in the model which broaden the use of linear regression theory.
6. Develop a deeper understanding of the linear regression model and its limitations.
7. Know how to diagnose and apply corrections to some problems in regression.

## 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** or a standard file format such as doc, jpeg, etc.

### 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 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, but solutions to the quizzes will be.

### Exams

There will be three (3) in-class exams that will comprise of multiple choice questions (approximately 60%) and some open-ended questions (40%). 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 28, 2016  
 Exam  $\phi B$  ..... December 16, 2016

## 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% best two)  
 Homework/Quizzes 25% (lowest 2 scores are 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. To view the result of the letter grades to your GPA please visit UF registrar

### 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 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](mailto: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](mailto:athienit@ufl.edu), or you may contact Ms. Tina Greenly [t.greenly@ufl.edu](mailto: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](mailto: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.

## 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

The course will cover chapters 1-12 in the text (and time permitting selected topics from chapters 13-14).

Chapter	Content	Class notes	Textbook
0	Introduction/Review		Appendix A, B, 1.1-1.2
1	Least Square for SLR		1.3-1.8
2	Inference in SLR		2.1-2.11
3	Diagnostics		3.1-3.10
Exam 1			
4	Simultaneous Inference		4.1-4.7
5	Matrix Approach		5.1-5.13
6 & 8	Multiple Regression (I)		6.1-6.8, 8.1-8.7
Exam 2			
7	Multiple Regression (II)		7.1-7.6
9	Model Selection		9.1-9.4
10	Diagnostics		10.1-10.5
11	Remedial Measures		11.1-11.5
12	Autocorrelation in Time Series		12.1-12.5
Exam 3			