



STA 4210 (Class number 17786)

Fall 2021

Regression Analysis

MWF 09:35-10:25 in FLO 100

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**Course Website:** [e-Learning](#)

**Course Material:** Material will be provided in course website.

- Notes (that at times deviate from textbook).
- Slides (based off of class notes).

**Course Communication:**

- Discussion forum (link to Windows Teams available in course website).
- Live office hours via Zoom (available in course website).
- One in person (instructor only) office hour per week at a fixed time (available in course website). Students are required to notify the instructor no later than 24 hours prior. Masks are STRONGLY encouraged.
- E-mail for questions regarding course policies. (Ensure that STA **4210** is in the subject line. Failure to do so may result in a non-response.)

**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 3024 or STA 3032 or (STA 4321 and STA 2023) or (MAS 3114 and STA 2023) or (MAS 4105 and STA 2023)
- STA 3100 will be an added prerequisite to this course, so it is highly recommended you have some programming experience

**Credit Hours:** 3

**Software:** You will need a computer for the homework assignments and practise. The main software used in class will be [R](#).

### 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

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

## Demeanor

All members of the class are expected to follow rules of common courtesy in all classroom discussions, email messages, threaded discussion and chats. Please refer to [expected class netiquette](#).

## Assignments

- All **deadlines (excluding exams) are at 23:59** of the due/end date. These are **hard deadlines** meaning that any open or ongoing assignments will automatically be submitted at the deadline. No late assignments will be accepted under any circumstances.
- Students are expected to work independently, unless otherwise specified in writing. **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 UF Student Honor and Conduct Code**. Discussion amongst students is encouraged, but when in doubt, direct your questions to the instructor.
- Students are expected to **show and explain their work**.
- All electronically **submitted work must be as one merged file**. In Canvas, all uploaded files automatically get a grade of 0, until the teaching assistant grades them.
- Feedback will be provided within two business days from the assignment deadline.

## Projects/Quizzes

Under each module in e-Learning,

- **Homework** that are based on (primarily) textbook exercises.
- **Quizzes** that are *closed notes and timed* and range from conceptual to applied.

All deadlines are posted on e-learning. **Assignments are automatically submitted at deadline even if in progress.**

## Exams

There will be three (3) exams that may comprise of multiple choice questions ( $\approx 20\%$ ) and some open-ended questions ( $\approx 80\%$ ). Exams will emphasise more on conceptual questions while HW/Quizzes will be more computational (not always).

Allowed material:

- Provided with exam formula sheet(s). Can be viewed ahead of time on class website.
- Scientific/Graphing Calculator. No cell phones allowed.

## Important dates:

Exam #1	.....	September 29th, at 09:35
Exam #2	.....	November 3rd, at 09:35
Exam #3	.....	December 16th, at 15:00

## Grading

### Grade distribution:

Exams 1, 2 and 3	70% (15% lowest, 25% second best, 30% best)
Homework	15%
Quizzes	15% (lowest 1 dropped, conditional on 11 total quizzes)
Extra Credit	0-1% (discussion forum and classroom participation)

Final grade and can be calculated using:

$$\begin{aligned} \text{Final} &= 0.15(\text{worst exam}) + 0.25(\text{second best exam}) + 0.30(\text{best exam}) \\ &+ 0.15 \left( \frac{\sum \text{homeworks}}{100} \times 100 \right) \\ &+ 0.15 \left( \frac{\sum \text{quizzes} - \text{lowest}}{100} \times 100 \right) \\ &(+0 \text{ to } 0.01 \text{ class and discussion forum participation}) \end{aligned}$$

### Letter grade assignment:

There will be *no rounding up* of scores.

B+	84 to < 88	A	91 to 100	A-	88 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

To view the result of the letter grades to your GPA please visit the [UF Grade and Grading Policies](#). **Final grades shown on Canvas are not accurate because they do not account for the conditional weighing of exams and quizzes.**

## Make-up

Requirements for class attendance and make-up exams, assignments, and other work in this course as well as policies regarding absences, religious holidays, illness and student athletes are consistent with [UF Attendance Policies](#).

### 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.
- Make-ups need to be scheduled within a week from the assignment deadline. Student is responsible for scheduling.
- 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 most recent [Academic Calendar](#).

## Addressing Issues

### Technical difficulties

Please contact the UF Help desk via e-Learning “Help” tab or [UF IT Service Portal](#). Any requests for make-ups due to technical issues must be accompanied with appropriate documentation/proof including screenshots and communication with the help desk. You **MUST** contact your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

### Grievances/Commendations

Should you have any grievances or commendations with your experience in this course you can always address them

- to the instructor at [athienit@ufl.edu](mailto:athienit@ufl.edu), or

- the [Department of Statistics](#).

For issues that are not satisfactorily resolved at the department level or which seem to be broader than one department, students are referred to the [Office of the Ombuds](#).

## UF and CLAS Policies

### Dropping, Withdrawing and Incomplete

#### Dropping and Withdraw

For late course drops and course withdrawals check the [catalog](#).

#### 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 [CLAS incomplete grade policy and contract](#).

#### Accommodating Students with Disabilities

Students requesting accommodation for disabilities must first register with the [Disability Resource Center \(DRC\)](#). The DRC 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.

#### U Matter, We Care

[U Matter, We Care](#) offers care related resources and programs focused on health, safety, and holistic well-being.

## Academic Misconduct

Students are held accountable to the [UF Student Honor and Conduct Code](#).

## Evaluations

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>

## Tentative Course Outline

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

Chapter	Content	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	10.2-10.5
11	Remedial Measures	11.1-11.5
12	Autocorrelation in Time Series	12.1-12.5
Exam 3		