

## SYLLABUS




### COURSE INFORMATION

- **Course Name:** STA 5207 - Applied Regression Methods
- **Course Hours:** 12:00PM-12:50PM MWF
- **Course Meeting Location:** OSB 204
- **Credit Hours:** 3 hours
- **Prerequisites:** One of STA 2122, 2171, 3032, 4322, 5126, 5354, or QMB 3200




### COURSE INSTRUCTOR



 Joshua Loyal

 Assistant Professor

 [jloyal@fsu.edu](mailto:jloyal@fsu.edu) (<mailto:email@fsu.edu>)

 Office: OSB 313

**In-Person Office Hours:** Wednesday 2:30-4:30PM

Zoom appointments for other times may be requested by e-mail.

**Zoom:** <https://fsu.zoom.us/j/2719558167>,

<https://fsu.zoom.us/j/2719558167>) Meeting ID: 271 955 8167



### TEACHING ASSISTANT

 Yuanxin Yao

 [yyao3@fsu.edu](mailto:yyao3@fsu.edu) (<mailto:email@fsu.edu>)

**Zoom Office Hours:** Tuesday 4:00 - 5:00PM and Thursday 4:00 - 5:00PM

**Zoom:** Meeting ID: 938 2800 1966, Passcode: STA5207





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## COURSE OBJECTIVES

This course provides an introduction to the basic principles of regression. Upon successful completion, a student will be able to confidently carry out a regression study using R.



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## TENTATIVE TOPICS

Introduction to R, simple linear regression, multiple linear regression, hypothesis testing, regression diagnostics, collinearity, generalized least squares, weighted least squares, robust regression, transformations, model and variable selection, shrinkage methods.

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## TENTATIVE SCHEDULE

All dates are **tentative** and subject to change.

**Week 1:** Introduction, R Basics, Simple Linear Regression (Estimation)

**Week 2:** Simple Linear Regression (Inference)

**Week 3:** Multiple Linear Regression

**Week 4:** Variable Selection

**Week 5:** Regression Diagnostics

**Week 6:** Exam 1 (Wednesday, September 28)

**Week 7:** Multicollinearity

**Week 8:** Generalized Least Squares

**Week 9:** Robust Regression

**Week 10:** Exam 2 (Wednesday, October 26)

**Week 11:** Principal Components

**Week 12:** Ridge Regression and Lasso

**Week 13:** Transformations

**Week 14:** Thanksgiving

**Week 15:** Project Week (Project due Friday, December 2nd)

**Week 16:** Exam Week



## COURSE MATERIALS

### TEXTBOOKS (OPTIONAL):

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- *Linear Models with R*, 2<sup>nd</sup> ed, by Julian Faraway
- *A Modern Approach to Regression with R*, 1<sup>st</sup> ed, by Simon Sheather
- *Applied Linear Statistical Models*, 5<sup>th</sup> ed, by Kutner, Nachtsheim, Neter, and Li.

### CLASS NOTES

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All lecture notes and R code will be posted on Canvas under Modules.

### SOFTWARE

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**R** software will be used in the course. Example **R** code and instructions will also be given. **R** is a freely available language and environment for statistical computing and graphics. Previous **R** experience is not necessary.

**Data science students and students not participating in the SAS certification must have access to a computer with R to be able to complete this course.** Installing **R** and RStudio on your own computer is the best option. RStudio is not strictly required, but several **R** concepts will be introduced with RStudio in mind, thus it is highly recommended. You should try installing **R** (<http://cran.r-project.org/> [\(http://cran.r-project.org/\)](http://cran.r-project.org/)) and RStudio (<http://www.rstudio.com/>) [\(http://www.rstudio.com/\)](http://www.rstudio.com/) before beginning the course. Do not worry if you run into problems, just email me or come see me during office hours.



## ELEMENTS OF THIS COURSE

## HOMWORK ASSIGNMENTS

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Roughly ten weekly homework assignments will be given as we cover the corresponding material. Assignments will be posted on Canvas along with the due date.

### Policies

- I encourage you to work together on these assignments and ask questions on canvas discussions, but you must formulate and write your own solutions. You may not share files with other students.
- Assignments must be submitted through Canvas. You may submit a typed Word or PDF document, or a picture or scan of handwritten work.
- Assignments may be done in either **R** or **SAS**, however, **Data Science students and students not participating in the SAS certification program must use R**. Submitting assignments using another programming language, such as Python, will not receive credit.
- The lowest assignment score will be dropped.
- If you are unable to meet a particular deadline, it is your responsibility to make prior arrangements with the instructor for that given week. Otherwise, work submitted later than the deadline will be penalized by 75%, and work submitted later than one day will not be considered for grading.

## EXAMS

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This course will have two in-class exams. Tentatively, one in Week 6 covering topics in Weeks 1-4, and one in Week 10 covering topics from Weeks 5-9. The content will be similar to the homework problems.

### Policies

- During an exam, everything except a calculator and writing utensil must be stowed under the desk or chair.
- Only scientific calculators are allowed. Calculators may not be shared. Phones may not be used as calculators.
- Students who must miss a scheduled exam due to an excused absence (as defined in the University Attendance Policy) should contact the instructor as soon as possible on or before the day of the exam. All excuses must be verifiable. A conflict exam, which will be cumulative, will be given near the very end of the semester as a replacement for a missed exam that was due to a verifiable excuse. The date will be announced later.
- Grade disputes must be made within 24 hours of the class period in which graded exams are first returned.
- You will be allowed to bring one 8.5 by 11 inch sheet (front and back) of notes for each exam. These notes must be handwritten without the assistance of anyone else.

## FINAL PROJECT

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This course will have a final project due at the end of the course. This project must be completed individually. The project will use methods from the course to perform data analysis and generate a written report. A detailed description of the final project will be posted on Canvas.



## GRADING DISTRIBUTION

- 40% Homework Assignments (The lowest score is dropped)
- 15% In-Class Exam 1 (Date TBD)
- 15% In-Class Exam 2 (Date TBD)
- 30% Final Project (Due Friday, December 2nd @ Midnight)

The weighted average is rounded up to the nearest integer.



## GRADING SCHEME

The following grading standards will be used in this class:

Grading Scheme Breakdown

Grade	Range
A	100% to 93%
A-	< 93% to 90%
B+	< 90% to 87%
B	< 87% to 83%
B-	< 83% to 80%
C+	< 80% to 77%
C	< 77% to 73%
C-	< 73% to 70%
D+	< 70% to 67%
D	< 67% to 63%
D-	< 63% to 60%
F	< 60% to 0%



## HOW TO GET HELP

### CANVAS DISCUSSION BOARD

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Canvas discussions are available for this course. I will create a general Q&A discussion each week where you can ask general questions about the course. I will also create discussions for specific assignments (homework, exams, and projects). If you have a question specific to an assignment post them in the discussion created for them. Any personal questions (grade disputes, late assignments, etc.) should not appear on the discussion board. Instead email me directly.

#### Policies

- I encourage you to answer other student's questions if you know the answer. This is a forum for you to more easily help each other.
- I will monitor the discussion board once per day, but I do not guarantee that I will answer every question. If you need to get in contact with me, send me an email.
- When posting in discussions, we understand that it is helpful to post code to describe your question. Please attempt to post a minimal example that does not completely solve a question. The instructor reserves the right to edit out any code that reveals too much of the solution.

### EMAIL

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I will try to respond to student emails within 24 to 48 hours. Adhere to the following guidelines to ensure that I see your email:

- Email from your FSU accounts. The emails from non-FSU accounts may not reach me due to filters.
- Write your full name at the end of each email message you send.
- Write STA 5207 at the beginning of the subject line, e.g., *STA 5207: Question about Homework #1*.



## CANVAS SUPPORT

Need help with Canvas? Contact FSU Canvas Support:

✉ Email: [canvas@fsu.edu](mailto:canvas@fsu.edu) (<mailto:canvas@fsu.edu>)

📞 Phone: (850) 644-8004

🌐 Website: [support.canvas.fsu.edu](http://support.canvas.fsu.edu) (<http://support.canvas.fsu.edu>)

🕒 Hours: 8am to 5pm, Monday - Friday



## ATTENDANCE POLICY

Attendance will be taken on the first day of class via a ungraded online quiz that requires a password to access. The password is **LinearModels!**. I will provide this password during the first lecture. If you are absent, the Registrar's Office will drop you from the course. I expect you to keep up-to-date with the lessons, activities and announcements by getting in touch with a classmate or with me, **and** by reading the course site on Canvas. Drop and withdrawal deadlines are given in the [University's academic calendar](https://registrar.fsu.edu/registration_guide/fall/academic_calendar/) ([https://registrar.fsu.edu/registration\\_guide/fall/academic\\_calendar/](https://registrar.fsu.edu/registration_guide/fall/academic_calendar/)).



## UNIVERSITY POLICIES

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### UNIVERSITY ATTENDANCE POLICY

Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

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### ACADEMIC HONOR POLICY

The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to "...be honest and truthful and... [to] strive for personal and institutional integrity at Florida State University." (For more details see the [FSU Academic Honor Policy and procedures for](#)

**addressing alleged violations** [\\_\(http://fda.fsu.edu/academic-resources/academic-integrity-and-grievances/academic-honor-policy\)\\_](http://fda.fsu.edu/academic-resources/academic-integrity-and-grievances/academic-honor-policy).)

## ACADEMIC SUCCESS

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Your academic success is a top priority for Florida State University. University resources to help you succeed include tutoring centers, computer labs, counseling and health services, and services for designated groups, such as veterans and students with disabilities. The following information is not exhaustive, so please check with your advisor or the Dean of Students office to learn more.

## PROCESS FOR RESOLVING ACADEMIC PROBLEMS OR GRIEVANCES

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Please use the *Resolving Academic Problems: A Step-by-Step Guide for Students* in the *Academic Honor Policy and Grievances* section of the **Office of Faculty Development and Advancement's website** [\\_\(https://fda.fsu.edu/academic-resources\)\\_](https://fda.fsu.edu/academic-resources) to begin the process of communicating with your instructor to resolve any confusion or difficulty you may be having in the course. Detailed information on FSU's grievance procedure, including special instructions for students enrolled in an FSU branch campus, is maintained on the General Bulletin's **Academic Integrity & Grievances** [\\_\(https://registrar.fsu.edu/bulletin/undergraduate/information/integrity/index.cfm\)\\_](https://registrar.fsu.edu/bulletin/undergraduate/information/integrity/index.cfm) webpage. Out-of-state distance learning students should review the Office of Distance Learning **Complaint Resolution** [\\_\(https://distance.fsu.edu/about-us/complaint-resolution\)\\_](https://distance.fsu.edu/about-us/complaint-resolution) page for additional procedures.

## AMERICANS WITH DISABILITIES ACT

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Florida State University (FSU) values diversity and inclusion; we are committed to a climate of mutual respect and full participation. Our goal is to create learning environments that are usable, equitable, inclusive, and welcoming. FSU is committed to providing reasonable accommodations for all persons with disabilities in a manner that is consistent with academic standards of the course while empowering the student to meet integral requirements of the course.

To receive academic accommodations, a student:

- (1) must register with and provide documentation to the Office of Accessibility Services (OAS);
- (2) must provide a letter from OAS to the instructor indicating the need for accommodation and what type; and,
- (3) should communicate with the instructor, as needed, to discuss recommended accommodations. A request for a meeting may be initiated by the student or the instructor.



Please note that instructors are not allowed to provide classroom accommodations to a student until appropriate verification from the Office of Accessibility Services has been provided.

This syllabus and other class materials are available in alternative format upon request.

For more information about services available to FSU students with disabilities, contact the

**Office of Accessibility Services (Tallahassee Campus)** [\(https://dsst.fsu.edu/oas\)](https://dsst.fsu.edu/oas)

874 Traditions Way

108 Student Services Building

Florida State University

Tallahassee, FL 32306-4167

(850) 644-9566 (voice)

(850) 644-8504 (TDD)

[oas@fsu.edu \(mailto:oas@fsu.edu\)](mailto:oas@fsu.edu)

<https://dsst.fsu.edu/oas>

**Student Accessibility Services (Panama City Campus)**

[\(https://pc.fsu.edu/students/student-affairs/sas\)](https://pc.fsu.edu/students/student-affairs/sas)

Office of Student Affairs

4750 Collegiate Drive

2nd Floor Barron Building (Room 215)

Florida State University Panama City

Panama City, FL 32405

(850) 770-2172 (office)

(866) 693-7872 (toll free)

Email: [sds@pc.fsu.edu \(mailto:sds@pc.fsu.edu\)](mailto:sds@pc.fsu.edu)

<https://pc.fsu.edu/students/student-affairs/sas>

## FREE TUTORING FROM FSU

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On-campus tutoring and writing assistance are available for many courses at Florida State University. High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to encourage the highest level of individual academic success while upholding personal academic integrity.

### *Tallahassee Campus*

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For more information, visit the Academic Center for Excellence (ACE) Tutoring Services' comprehensive list of on-campus tutoring options - see the [Academic Center for Excellence](#)

**(ACE) Tutoring Services' website** [\\_\(http://ace.fsu.edu/tutoring\)](http://ace.fsu.edu/tutoring) or contact [tutor@fsu.edu](mailto:tutor@fsu.edu) [\\_\(mailto:tutor@fsu.edu\)](mailto:tutor@fsu.edu).

### *Panama City Campus*

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**The PC campus provides both in-person and remote tutoring. In-person tutoring is available at the Robbins Center for Academic Excellence and Innovation in the Holley Building (which also houses the Digital Design Studio). Remote tutoring will be available through Zoom. To inquire about tutoring options for the PC campus, please visit the **Peer Tutoring website** [\\_\(https://pc.fsu.edu/students/academic-advising-student-success-center/peer\\_tutoring\)](https://pc.fsu.edu/students/academic-advising-student-success-center/peer_tutoring) [\\_\(https://pc.fsu.edu/students/academic-advising-student-success-center/peer\\_tutoring\)](https://pc.fsu.edu/students/academic-advising-student-success-center/peer_tutoring) or contact an academic advisor in the Advising Center in the Holley Building to discover your options.**

## CONFIDENTIAL CAMPUS RESOURCES

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Various centers and programs are available to assist students with navigating stressors that might impact academic success. These include the following:

**Victim Advocate Program** [\\_\(https://dsst.fsu.edu/vap\)](https://dsst.fsu.edu/vap)

University Center A,  
Room 4100, (850) 644-7161,  
Available 24/7/365,  
Office Hours: Monday-Friday 8am-5pm  
<https://dsst.fsu.edu/vap>

**Counseling & Psychological Services (Tallahassee Campus)** [\\_\(https://counseling.fsu.edu/\)](https://counseling.fsu.edu/)

Askew Student Life Center, 2nd Floor  
942 Learning Way  
(850) 644-8255 / (850) 644-TALK  
<https://counseling.fsu.edu/>

**FSU PC Counseling Center (Panama City Campus)** [\\_\(https://pc.fsu.edu/students/student-affairs/counseling-Center\)](https://pc.fsu.edu/students/student-affairs/counseling-Center)

Rebecca Whitfield, LSCW  
Assistant Director for Treatment Coordination  
Counseling & Psychological Services  
Florida State University  
Phone: (850) 644-TALK (8255)  
[rjwhitfield@fsu.edu](mailto:rjwhitfield@fsu.edu)  
<https://pc.fsu.edu/students/student-affairs/counseling-Center>

**University Health Services** [\\_\(https://uhs.fsu.edu/\)\\_](https://uhs.fsu.edu/)

Health and Wellness Center,

(850) 644-6230

<https://uhs.fsu.edu/>

## FSU FOOD PANTRIES

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FSU has established Food Pantries where students in need can pick up non-perishable food items freely and anonymously. The Food Pantry is available during the pandemic, and it is free and open to all students to take what they need. Donations for collection of non-perishable food items are encouraged.

For more information about the Tallahassee Food Pantry, visit the **Tallahassee Food for Thought Pantry website** [\\_\(https://dos.fsu.edu/resources/food-for-thought-pantry\)](https://dos.fsu.edu/resources/food-for-thought-pantry)

[\\_\(https://dos.fsu.edu/resources/food-for-thought-pantry\)](https://dos.fsu.edu/resources/food-for-thought-pantry). The pantry is located at University Center A, Suite 4148. If you have questions or concerns, contact the Department of Student Support and Transitions at [dsst@fsu.edu](mailto:dsst@fsu.edu) or (850) 644-2428.

For more information about the Panama City Food Pantry, visit the **PC Food Pantry website** [\\_\(https://pc.fsu.edu/students/student-services/food-pantry\)](https://pc.fsu.edu/students/student-services/food-pantry) [\\_\(https://pc.fsu.edu/students/student-services/food-pantry\)](https://pc.fsu.edu/students/student-services/food-pantry). The pantry is located at Holley West Hall. If you have questions or concerns, contact Kathleen Duval LCSW at [krduval@fsu.edu](mailto:krduval@fsu.edu) or (850) 770-2174.

## SYLLABUS CHANGE POLICY

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"Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice."