FLORIDA POLYTECHNIC UNIVERSITY

Course Information

- **Course Number and Title**: STA 3032 Probability and Statistics
- **Credit Hours:** 3
- **Academic Term:** Spring 2026

Instructor Information

- **Instructor: Dr. Ranses Alfonso**
- **Office Location: IST 2021**
- **Office Hours**: MF: 10:00 -11:00 am, W: 12:00 – 1:00 pm, or by appointment.
- **Email address**: ralfonsorodriguez@floridapoly.edu

Course Delivery and Course Description

- **Delivery Mode**: Face-to-face; MWF 11:00 AM – 11:50 AM, BARC-1142
- **Course Website**: Canvas course site
- **Official Catalog Course Description**: This course is a survey of the basic concepts in probability and statistics with applications in electrical, mechanical, and civil engineering. Topics include probability, common discrete and continuous probability distributions, estimation and hypothesis testing, and simple regression.
  The course emphasizes the use of R for statistical computing and data visualization.
  - **Course Pre and/or Co-Requisites**: MAC2312 Analytic Geometry and Calculus 2, with a grade of C or higher.
  - **Communication/Computation Skills Requirement (6A-10.030)**: N
- **Required Texts and Materials:**
  - Thulin – Modern Statistics with R https://www.modernstatisticswithr.com/
  - Pishro-Nik – Introduction to Probability, Statistics, and Random Processes https://www.probabilitycourse.com/
  - Kerns (IPSUR) – Introduction to Probability and Statistics Using R https://www.atmos.albany.edu/facstaff/timm/ATM315spring14/R/IPSUR.pdf

Course Learning Objectives:

- Calculate descriptive statistics.
- Calculate probabilities and expectations from a given distribution.
- Carry out the most common types of statistical inference.
- Construct models for relating variables using linear regression.
- Identify the probability distribution for a given statistical experiment.

Course Policies

Attendance

Students are expected "to attend all of their scheduled University classes and to satisfy all academic objectives as defined by the instructor" (University Policy, FPU-5.0010AP).
Attending class regularly is important for success in this course.
A+ will be used to track attendance daily. Absences will be considered "excused" due to illness or family emergency.
Falsifying attendance for yourself or for another student is an act of academic dishonesty and subject to academic discipline.

Participation

Students are expected to participate in the classroom experience. The use of earbuds/headphones during class is specifically not allowed and students who engage in this behavior may be asked to leave the class for the day (noting exceptions for authorized accommodations). Persistent problems with participation may result in a code of conduct referral.

Late Work/Make-up work

Make-up exams will not be permitted except for sickness, family emergencies, or University related activity. A written note from an appropriate person (doctor, family member, etc.) is required. If possible, notification SHOULD be made BEFORE the missed event.
The Final Exam will replace your lowest midterm grade unless a zero was received due to missing a test without an excuse approved by the instructor or for academic misconduct.

Homework submitted up to 24 hours late will be accepted with a 20% penalty. No submissions will be accepted more than 24 hours late.

Extensions without penalty may be granted on a case-by-case basis. Please communicate with your instructor.

Grading Scale

The following gives the lowest number required to guarantee the corresponding grade:

Grade	A	A-	B+	B	B-	C+	C	D	F
Percentage	90%	87%	84%	80%	77%	74%	70%	60%	0%
GPA	4.0	3.67	3.33	3.0	2.67	2.33	2.0	1.0	0.0

Assignment/Evaluation Methods

Homework	15%
Labs	15%
Quizzes	10%
3 Midterm Exams	13% each
Comprehensive Final Exam	21%
Total	100%

Software

All assignments and labs will use R. Students are encouraged to use RStudio or RStudio Cloud.

Course Schedule (Subject to Change)

- Important Dates: https://floridapoly.edu/academics/academic-calendar/index.php

Week	Topics	Assessments / Activities	Textbook(s) & Chapters
1	Intro to R, Descriptive Statistics	Lab 1	Thulin Ch. 1–3, Kerns Ch. 1–3
2	Exploratory Data Analysis (EDA), Basic Probability	HW 1, Quiz 1	Thulin Ch. 2, Kerns Ch. 2: Plots and Interpretation Pishro-Nik Ch. 1, Kerns Ch. 4, Pishro-Nik Ch.2: Probability
3	Basic Probability, and Counting	HW 2	Pishro-Nik Ch. 1, Kerns Ch. 4: Probability Pishro-Nik Ch.2: Counting,
4	Conditional Probability, Bayes' Rule	HW 3, Lab 2, Quiz 2	Pishro-Nik Ch. 1 (esp. §1.4), Kerns Ch. 4
5	Review + Midterm 1 Intro to Random Variables	HW 4, Midterm 1	**Mon:** Review Session (EDA, Descriptive Stats, Probability, Bayes) **Wed:** **Midterm Exam 1** **Frid:** Introduction to Random Variables (Discrete vs Continuous, notation preview)- Pishro-Nik Ch. 3– Pishro-Nik Ch. 4, Kerns Ch. 5
6	Joint Distributions & Expectation, Covariance	HW 7	Pishro-Nik Ch. 5, Kerns Ch. 7
7	Discrete Random Variables	HW 5, Quiz 3	Pishro-Nik Ch. 3, Kerns Ch. 5 Uniform, Geometric, Binomial, Hypergeometric, and Poisson Distributions
8	Continuous Random Variables	HW 6, Lab 3	Pishro-Nik Ch. 4, Kerns Ch. 6 Uniform, Exponential, Gamma, Normal, Chi^2, and T Distributions
9	Review + Midterm 2 Central Limit Theorem	HW 9, Midterm 2	**Mon:** Review Session (RVs, Expected Value, Variance, Covariance) **Wed:** **Midterm Exam 2** **Frid:** Central Limit Theorem - Kerns Ch. 8
10	No Class		Enjoy your Spring Break 😊
11	Normal Distribution, Sampling Distribution	HW 8, Quiz 4	Pishro-Nik Ch. 4, Kerns Ch. 8
12	CLT, Confidence Intervals	HW 10, Lab 4	Kerns Ch. 8, Thulin Ch. 3, Kerns Ch. 9, Pishro-Nik Ch. 8
13	Hypothesis Testing	HW 11, Quiz 5	Thulin Ch. 3, Kerns Ch. 9, Pishro-Nik Ch. 8
14	Review + Midterm 3 Intro to Regression	Midterm 3	**Mon:** Review Session (Sampling Distributions, CLT, Inference) **Wed:** **Midterm Exam 2** **Frid:** Introduction to Regression: Scatterplots, correlation, model overview - Kerns Ch.11

15	Regression & Diagnostics	HW 12, Lab 5, Quiz 6	Kerns Ch.11, Thulin Ch. 8
16		Lab 6	**Mon: Review** **Wed, Fri:** Reading Days
17	**Final Comprehensive Exam**		

Laboratories Schedule

Lab	**Title**	**Week**	**Description**
Lab 1	Getting Started with R & EDA	Week 1	Students practice importing data, creating basic plots (histograms, boxplots, scatterplots), and computing summary statistics. Helps build R fluency from day one.
Lab 2	Simulating Bayes' Rule	Week 4	Use simulation to explore conditional probability and Bayes' theorem with real-world examples (e.g., medical testing, spam filters). Reinforces conceptual understanding.
Lab 3	Exploring Distributions in R	Week 8	Students simulate and visualize discrete and continuous distributions (Binomial, Geometric, Uniform, Exponential, Normal). Introduces rbinom(), rexp(), rnorm() etc.
Lab 4	Confidence Intervals and Hypothesis Testing	Week 11	Simulation-based exploration of confidence intervals for means and proportions. Emphasizes interpretation and introduces the idea of bootstrapping.
Lab 5	Simple Linear Regression in R	Week 15	Students fit a simple linear model, interpret coefficients, and visualize fit with residuals and diagnostics. Builds foundation for regression inference.
Lab 6	**Tentative-** Regression Diagnostics Mini-Project	Week 16	A more open-ended lab: students apply regression to a new dataset, check assumptions, and write a short report on model quality. Encourages synthesis and communication.

Communication

Students with a concern or issue should feel free to email their instructor at ralfonsorodriguez@floridapoly.edu. Instructors will make every reasonable effort to respond by the end of the next class day. If, after sending the instructor a follow-up email, the issue is not resolved, the student may email the department chair, Dr. Mike Brilleslyper at mbrilleslyper@floridapoly.edu. Students may request an appointment with the department chair for further discussion, if needed.

University Policies

Reasonable Accommodations

The University is committed to ensuring equal access to all educational opportunities. The Office of Disability Services (ODS), facilitates reasonable accommodations for students with disabilities and documented eligibility. It is the student's responsibility to self-identify as a student with disabilities and register with ODS to request accommodations. If you have already registered with ODS, please ensure that you have requested an accommodation letter for this course through the ODS student portal, and communicate with your instructor about your approved accommodations as soon as possible. Arrangements for testing accommodations must be made in advance. Accommodations are not retroactive. If you are not registered with ODS but believe you have a temporary health condition or permanent disability requiring an accommodation, please contact ODS as soon as possible: DisabilityServices@floridapoly.edu; (863) 874-8770; https://floridapoly.edu/studentlife/disability-services/.

Accommodations for Religious Observances, Practices and Beliefs

The University will reasonably accommodate the religious observances, practices, and beliefs of individuals in regard to admissions, class attendance, and the scheduling of examinations and work assignments. (See University Policy.)

Title IX

Florida Polytechnic University is committed to ensuring a safe, productive learning environment on our campus that prohibits sex discrimination and sexual misconduct, including sexual harassment, sexual assault, dating violence, domestic violence and stalking. Resources are available if you or someone you know needs assistance. Any faculty or staff member you speak to is required to report the incident to the Title IX Coordinator. Please know, however, that your information will be kept private to the greatest extent possible. You will not be required to share your experience. If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the Florida Polytechnic University Ombuds Office, BayCare's Student Assistance Program, 1-800-878-5470 and locally within the community at Peace River Center, 863-413-2707 (24-hour hotline) or 863-413-2708 to schedule an appointment. The Title IX Coordinator is available for any questions to discuss resources and options available.

Academic Integrity

Violations of academic integrity regulation include actions such as cheating, plagiarism, use of unauthorized resources (including but not limited to use of Artificial Intelligence tools), illegal use of intellectual property, and inappropriately aiding other students. Such actions undermine the central mission of the university and negatively impact the value of your Florida Poly degree. Suspected violations will be fully investigated, possibly resulting in sanctions up to and including expulsion from the university.

Recording Lectures

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use. Recordings may not be used as a substitute for class participation or class attendance. Recordings may not be published or shared in any way, either intentionally or accidentally, without the written consent of the faculty member. Failure to adhere to these requirements is a violation of state law (subject to civil penalty) and the student code of conduct (subject to disciplinary action). *Recording class activities including, but not limited to, lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), and invited guest speakers is* ***prohibited****.*

Academic Support Resources

- **Library**: Students can access the Florida Polytechnic University Library through the University website and Canvas, on and off campus. Students may direct questions to library@floridapoly.edu.
- **Tutoring and Learning Center**: The Tutoring and Learning Center (The TLC) provides tutoring to all Florida Poly students who may need additional academic support. The TLC is staffed by students who have excelled in the courses they tutor. They offer support by reviewing concepts and materials from class, clarifying points of confusion and providing assistance with learning strategies. While the focus of TLC is to provide support to students in freshman-level courses, upper-level courses are also tutored at the Center. The TLC is located in the IST Commons (second floor).
    - **Knack Tutoring**: Students looking for additional assistance outside of the classroom are advised to consider working with a peer tutor through Knack. Florida Polytechnic University has partnered with Knack to provide students with access to verified peer tutors who have previously aced this course. To view available tutors, visit floridapoly.joinknack.com and sign in with your student account.
- **Academic Success Coaches**: All students at Florida Poly are assigned an Academic Success Coach. Your Academic Success Coach can assist you with academic success strategies. Please visit the Student Success Center on the second floor of the IST building to meet with an Academic Success Coach.
- **Writing Center**: Located on the second floor of the IST (2059/2061), the Writing Center helps students to develop their writing and presentation skills. Consultations are available in person and virtually. For more detail, visit https://floridapolytechnic.libguides.com/writingservices.