

## Course Information

- **Course Number and Title:** STA 2023 Statistics 1
- **Credit Hours:** 3
- **Academic Term:** Spring 2024

## Instructor Information

### Section 02

- **Instructor:** Dr. Bernadette Mullins
- **Office Location:** IST 2009
- **Office Hours:** Mon 12:00-1:00, Tue 1:00-2:00, Wed 11:00-12:00, Fri 1:00-1:50, and by appointment
- **Email address:** [bmullins@floridapoly.edu](mailto:bmullins@floridapoly.edu)

### Section 03

- **Instructor:** Dr. Jared Bunn
- **Office Location:** IST 2011
- **Office Hours:** MWF: 4:00pm-5:00pm and by appointment
- **Email address:** [jbunn@floridapoly.edu](mailto:jbunn@floridapoly.edu)

## Course Delivery and Course Description

- **Delivery Mode:** Face-to-face
  - Section 02:** MWF 10:00 – 10:50, IST-1062
  - Section 03:** MWF 12:00 – 12:50, IST-1045
- **Course Website:** See the Canvas course site.
- **Official Catalog Course Description:** This course covers probability, random variables, hypothesis testing, confidence interval estimation, small sample methods, correlation, simple linear regression, and nonparametric statistics.
  - **Course Pre and/or Co-Requisites:** None
  - **Communication/Computation Skills Requirement (6A-10.030):** No
- **Required Texts and Materials:**
  - *OpenIntro Statistics* (4th Edition) by David Diez, Mine Cetinkaya-Rundel, and Christopher Barr, ISBN 9781943450077. A free PDF version is available for this book at <https://www.openintro.org/book/os/>.
  - Online homework will be required through Edfinity. See Canvas for details.
  - GeoGebra.org, Desmos.com, and Microsoft Excel will be used for descriptive and inferential statistics. Office 365 with Excel is available through the MyApps Florida Poly portal at <https://apps.floridapoly.edu/>.
  - A scientific or graphing calculator is required.

# Course Objectives and Outcomes

- **Course Objectives:**
  - This introductory course assumes no prior knowledge and presents basic statistical concepts and real-world applications, with an emphasis on data collection and analysis. This course not only provides a conceptual foundation required for more advanced classes but also helps the student become an educated data user and consumer. The course covers survey design and experiments to collect data from samples that are representative of a population, graphical and numerical representation of data using descriptive measures, and inferential statistics where random samples are used to draw conclusions about populations of interest. The primary goal of this course is to help students understand the process of framing a research question, collecting and analyzing relevant data, and interpreting the results to find solutions to the posed research questions. Students will work either individually or as part of a team on a project where the statistical and data analytics tools learnt will be put into practice.
  
- **Course Learning Outcomes:**
  1. Identify and evaluate alternative sampling techniques that best fit the objectives of the data being considered.
  2. Apply the correct descriptive statistics to best address the data being analyzed.
  3. Evaluate the appropriate data visualization that helps the audience to interpret the data.
  4. Apply the principles of probability to quantify the likelihood of alternative outcomes.
  5. Evaluate the appropriate inferential statistics (both confidence intervals and test statistics) to address the hypothesis under consideration.
  6. Solve a real-world data analysis problem using statistical tools on a final course project.
  
- **Alignment with Applied Mathematics Program Outcomes**

| Applied Mathematics Program Student Outcomes  | Course Learning Outcome and Learning Level* |          |           |          |            |            |
|---|---|----------|-----------|----------|------------|------------|
|   | 1   | 2        | 3         | 4        | 5          | 6          |
| (1) Analyze a complex data set and apply principles of statistics and other relevant disciplines to identify solutions.                                   |   |          |           |          |            | Applying   |
| (2) Design, implement, and evaluate a statistics-based solution to meet a given set of data requirements in the context of the statistician’s discipline. | Applying                                    | Applying | Applying  |          | Evaluating |            |
| (3) Communicate effectively in a variety of professional contexts.  |   |          |           |          | Evaluating | Evaluating |
| (4) Recognize professional responsibilities and make informed judgments in statistical practice based on legal and ethical principles.                    |   |          |           |          |            |            |
| (5) Function effectively as a member or leader of a team engaged in activities appropriate to the program’s discipline.                                   |   |          | Analyzing |          |            | Creating   |
| (6) Apply theory, techniques, and tools throughout the data analysis lifecycle and employ the resulting knowledge to satisfy needs of stakeholder.        |   |          |           | Applying | Evaluating | Creating   |

\*Learning level as described in Bloom’s taxonomy and Anderson and Krathwohl’s taxonomy

## 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).

### 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.

### Grading Scale

| Grade      | A   | B+   | B   | B-   | C+   | C   | D   | F     |
|------------|-----|------|-----|------|------|-----|-----|-------|
| Percentage | 90% | 87%  | 83% | 80%  | 77%  | 70% | 60% | < 60% |
| GPA        | 4.0 | 3.33 | 3.0 | 2.67 | 2.33 | 2.0 | 1.0 | 0.0   |

### Assignment/Evaluation Methods

|                             |                             |
|-----------------------------|-----------------------------|
| Edfinity online homework    | 7.5%                        |
| Written homework            | 7.5%                        |
| Data analysis final project | 15%                         |
| Midterm exams               | 50% (4 exams at 12.5% each) |
| Comprehensive final exam    | 20%                         |
| Total                       | 100%                        |

- **Edfinity online homework:** Online homework will be required through Edfinity. See Canvas for details.
- **Written homework:** Written homework will be required weekly to be submitted through Canvas. See the Guidelines for Written Homework Submission on Canvas for details.
- **Data analysis final project:** A final project will be required that involves applying statistical concepts to a data set. Specific guidelines will be posted to Canvas.
- **Midterm exams:** There will be four in-class midterm exams.
- **Comprehensive final exam:** There will be a comprehensive final exam given at the time scheduled by the University. Your comprehensive final exam score may be used to replace your one lowest midterm exam score, up to a maximum score of 80 out of 100, if that helps your grade, but the final exam score still counts for the final exam percentage of the course grade listed above regardless.

### Late Work/Make-up work

- Due dates for assignments are posted on Canvas. Students are responsible for checking Canvas regularly to be aware of assignment deadlines and other class information.
- Edfinity online homework will not be accepted late. Your three lowest Edfinity online homework scores will be dropped to allow for occasional extenuating circumstances (student illness, family emergencies, technical difficulties, etc.)
- Written homework submitted up to 24 hours late will be accepted with a 20% penalty. Homework will not be accepted more than 24 hours late. Your one lowest written homework score will be dropped to allow for occasional extenuating circumstances (student illness, family emergencies, technical difficulties, etc.)
- A final project submitted up to 24 hours late will be accepted with a 20% penalty. Final projects will not be accepted more than 24 hours late.
- Make-up exams will be given only when requested *in advance* for an appropriate reason (e.g. participation in college-sponsored activity, illness requiring medical attention, family emergency, etc.) or in case of extreme circumstances with a documented excuse.
- Extensions without penalty may be granted on a case-by-case basis. Please communicate with your instructor.

## Course Schedule (Subject to Change)

| Week | Date |     |    | Section | Topic (See Canvas for due dates for Edfinity Online HW and Written HW)              |
|------|------|-----|----|---------|---|
| 1    | M    | Jan | 8  | 1.2     | Data basics   |
|      | W    | Jan | 10 | 2.1     | Examining numerical data  |
|      | F    | Jan | 12 | 2.1     | Examining numerical data  |
| 2    | M    | Jan | 15 |         | <b>Martin Luther King Day—no classes</b>  |
|      | W    | Jan | 17 | 2.1     | Examining numerical data  |
|      | F    | Jan | 19 | 2.2     | Considering categorical data  |
| 3    | M    | Jan | 22 | 3.1     | Defining probability  |
|      | W    | Jan | 24 | 3.2     | Conditional probability   |
|      | F    | Jan | 26 | 3.4     | Random variables  |
| 4    | M    | Jan | 29 |         | Review  |
|      | W    | Jan | 31 | 3.5     | Continuous distributions  |
|      | F    | Feb | 2  |         | <b>Exam 1</b>   |
| 5    | M    | Feb | 5  | 4.1     | Normal distribution   |
|      | W    | Feb | 7  | 4.1     | Normal distribution   |
|      | F    | Feb | 9  | 4.3     | Binomial distribution   |
| 6    | M    | Feb | 12 | 4.3     | Binomial distribution   |
|      | W    | Feb | 14 | 5.1     | Point estimates and sampling variability (Central Limit Theorem)                    |
|      | F    | Feb | 16 | 5.1     | Point estimates and sampling variability (Central Limit Theorem)                    |
| 7    | M    | Feb | 19 |         | Review  |
|      | W    | Feb | 21 |         | Resampling for confidence intervals   |
|      | F    | Feb | 23 |         | <b>Exam 2</b>   |
| 8    | M    | Feb | 26 | 5.2     | Confidence intervals for a proportion   |
|      | W    | Feb | 28 | 5.2     | Confidence intervals for a proportion   |
|      | F    | Mar | 1  |         | Resampling for hypothesis tests   |
| 9    | M    | Mar | 4  |         | <b>Spring Break—no classes</b>  |
|      | W    | Mar | 6  |         | <b>Spring Break—no classes</b>  |
|      | F    | Mar | 8  |         | <b>Spring Break—no classes</b>  |
| 10   | M    | Mar | 11 | 5.3     | Hypothesis testing for a proportion   |
|      | W    | Mar | 13 | 5.3     | Hypothesis testing for a proportion   |
|      | F    | Mar | 15 | 6.1/6.2 | Inference for a single proportion / Difference of two proportions                   |
| 11   | M    | Mar | 18 | 7.1     | One-sample means with the $t$ -distribution   |
|      | W    | Mar | 20 | 7.2     | Paired data   |
|      | F    | Mar | 22 | 7.3     | Difference of two means   |
| 12   | M    | Mar | 25 |         | Review  |
|      | W    | Mar | 27 | 7.5     | Comparing many means with ANOVA   |
|      | F    | Mar | 29 |         | <b>Exam 3</b>   |
| 13   | M    | Apr | 1  | 8.1     | Fitting a line, residuals, and correlation  |
|      | W    | Apr | 3  | 8.2/8.3 | Least squares regression / Types of outliers in linear regression                   |
|      | F    | Apr | 5  |         | <b>Peer project review</b>  |
| 14   | M    | Apr | 8  | 8.4     | Inference for linear regression   |
|      | W    | Apr | 10 | 6.3     | Testing for goodness of fit using chi-square  |
|      | F    | Apr | 12 | 6.4     | Testing for independence in two-way tables; <b>Final project due</b>                |
| 15   | M    | Apr | 15 |         | Review  |
|      | W    | Apr | 17 | 1.3     | Sampling principles and strategies (simple random, cluster, stratified, multistage) |
|      | F    | Apr | 19 |         | <b>Exam 4</b>   |
| 16   | M    | Apr | 22 | 1.4     | Experiments   |
|      | W    | Apr | 24 |         | Review  |

## 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](mailto:library@floridapoly.edu).
- **Peer Learning Strategists (PLS):** Are specially trained student leaders who help their peers strategize approaches to course content and work through solution methods. PLS work in collaboration with the courses they support so the content and methods are aligned with your instructors' expectations. Students can meet with a PLS in The Learning Center, which is located on the first floor of the Innovation, Science and Technology (IST) building in room 1019.
- **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://floridapoly.edu/writingcenter>.

## Civility and Collegiality

Faculty and students come to the university for the same reason, which is to participate in a highly professional educational environment. To that end, both students and faculty are expected to treat each other with mutual regard and civility. In more general terms, collegiality means respecting the right of both faculty and students to participate fully and fairly in the educational enterprise.

## University Policies

### Reasonable Accommodations

The University is committed to ensuring equal access to all educational opportunities. The University, through 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.

The Office of Disability Services (ODS):  
DisabilityServices@floridapoly.edu  
(863) 874-8770  
The Access Point  
[ODS website: www.floridapoly.edu/disability](http://www.floridapoly.edu/disability)

### 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. You may speak to your professor, but your professors have an obligation 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 discussion [resources and options](#) available.

## Academic Integrity

The faculty and administration take academic integrity very seriously. 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 an academic integrity hearing and sanctions against the accused student if found in violation. Sanctions range from receiving a zero on the exam or assignment, to expulsion from the university. Repeat offenders are subject to more severe sanctions and penalties.

## 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 other than class lectures, 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**.*