FLORIDA POLYTECHNIC
UNIVERSITY

General Education Syllabi -- Fall 2022

Courses

MAC 2311 - Calculus 1
STA 2023 - Statistics

Instructions

To navigate this document open the arrow on the left-hand side and select the icon for bookmarks.

To search, click CTRL-F for find. A dialogue box will open in the top right-hand corner of the screen.

Syllabus: MAC 2311 Analytic Geometry & Calculus 1

Fall semester 2022

POSTED July 5, 2022
SUBJECT TO CHANGE

Course Information

Course Number and Title: MAC 2311 Analytic Geometry & Calculus 1
Credit Hours: 4
Current Academic Term: Fall 2022

Course Offerings and Instructors

MTWF 8:00 – 8:50AM – Dr. Manoj Lamichhane
MTWF 9:00 – 9:50AM – Dr. Manoj Lamichhane
MTWF 10:00 – 10:50AM – Dr. Jaeyoun Oh
MTWF 11:00 – 11:50AM – Dr. Jaeyoun Oh
MTWF 2:00 – 2:50PM – STAFF
MTWF 3:00 – 3:50PM – STAFF

Official Catalog Course Description: This course is an introduction to analytic geometry; limits; continuity; differentiation of algebraic, trigonometric, exponential and logarithmic functions; applications of the derivative; inverse trigonometric functions; differentials; introduction to integration; and the fundamental theorem of calculus.

Gordon Rule (6A-10.030): No

Prerequisites: Any of the following:

a grade of C in a MAC course numbered 1147 or higher

IB credit for a MAC course numbered 1147 or higher.

Required Text: Openstax Calculus 1 by Gilbert Strang et al.
ISBN-13: 978-1-394-01415-6

Equipment and Material: N/A

Course Objectives:
To help the students build up a solid foundation in mathematical reasoning by acquiring important building blocks and skills. Also, giving the students the tools to apply the learned knowledge to solve routine and non-routine problems with emphasis placed on solving applications by mathematical modeling. At the end of this course, you should be able to:

Course Learning Outcomes: The following topic will be used to measure the student learning outcome to demonstrate fluency in mathematics concepts," which corresponds to the Mathematics Reasoning Competency:

1. Illustrate fundamental understanding and modeling uses for critical classes of STEM functions: linear, power, exponential, logarithmic, sinusoidal, and sigmoidal.
2. Interpret, use, and calculate derivatives of basic STEM functions and simple combinations of STEM functions.
3. Interpret, use, and calculate anti-derivatives of basic STEM functions and simple combinations of STEM functions.
4. Appreciate and demonstrate a computational and conceptual understanding of average and instantaneous rates of change.
5. Develop, analyze, and interpret mathematical models in an interdisciplinary setting.

   Additionally:

6. Demonstrate a computational and conceptual understanding of accumulation of a function.
7. Use computers as appropriate to assist in analyzing and solving mathematical problems. Recognize data as fundamental to mathematical work.
8. Clearly communicate solutions to multi-step mathematics problems through careful, organized, and well-annotated work.

Grading Scale

A	B	C	D	F
90%	80%	70%	60%	< 60%

Plus and minus grades will be assigned at the discretion of the instructor.

 (See also [University Grading Policy](#)).

Assignment/Evaluation Methods

Homework	10%
Projects	10%
Quizzes	10%
Exams	45%
Final Exam	25%
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Total	100%

Schedule of Topics by week

Week	Topics	Chapter/Sections
1	Function and Trig Review	1.1 – 1.5
2	Limits	2.2, 2.3, 2.4
3	Dimensional Analysis, tangent lines, derivatives	3.1, 3.2
4	Derivative rules, rates of change	3.3, 3.4
5	Derivatives of trig functions, chain rule, **Midterm #1**	3.5, 3.6
6	Chain rule, implicit differentiation	3.6, 3.7
7	Exponential & log functions, related rates	3.9, 4.1
8	Linear approximation, maxima and minima	4.2, 4.3
9	Derivatives and shape of graphs, asymptotes,	4.5, 4.6
10	Optimization, **Midterm #2**	4.7

11	L'hopital's rule, Newton's method	4.8, 4.9
12	Approximating area	5.1
13	Definite Integrals; **Midterm #3**	5.2
14	Fundamental Theorem of Calculus; **Thanksgiving Break**	5.3
15	Calculus and Data	
16	Student presentations; review for final	

FLORIDA POLYTECHNIC
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Syllabus: STA 2023 Statistics 1
Fall semester 2022

Course Information

Course Number and Title: STA 2023 Statistics 1
Credit Hours: 3
Current Academic Term: Fall 2022

Course Offerings and Instructors
MWF   4:00 – 4:50PM – Dr. Jikhan Jeong
MW   4:00 – 5:15PM – Mr. Kevin Calkins

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.

Gordon Rule (6A-10.030): No

Prerequisites: None

Required Text: *OpenIntro Statistics (4th Edition)* by David Diez, Mine Cetinkaya-Rundel & Christopher Barr ISBN: 9781943450077. A free PDF version is available for this book. See https://www.openintro.org/book/os/

Equipment and Material: Office 365 with Excel, R and RStudio (freeware), and Minitab are available through the MyApps Florida Poly portal (https://apps.floridapoly.edu/). No knowledge of these programs is assumed. Data- and computationally-based curricular materials available at the StatPREP site will also be explored (http://www.statprep.org/LittleAppSite/Activities.html)

Course Objectives:
This introductory course assumes no prior knowledge and presents the basic statistical concepts and real-world application emphasizing data collection and analysis. This course not only provides a conceptual foundation required for advanced upper-level classes but also helps the students become an educated data user and consumer. The first half of the course covers survey design and experiments to collect data from samples that are representative of a population and graphical and numerical representation of data using descriptive measures and relation between variables. The second half of the course focuses on inferential statistics where random samples are used to draw conclusions about the population of interest. The primary goal of this course is to help students understand the process of framing a research question, collect and analyze relevant data and interpret 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 statistical and data analytics tools and concepts 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 to address the hypothesis under consideration.
6. Solve a real-world data analysis problem using statistical tools by working either individually or in teams of two on a final course project.

Course Policies

Attendance

- Students are expected to attend all class meetings unless sick or some other documented emergency prevents attendance.
- Class participation and presentation will represent a significant portion of the class grade.

Late Work/Make-up work

Make-up exams will be given only in extreme circumstances with a documented excuse. If you will miss an exam because you are participating in a College-sponsored activity, inform your instructor before the exam and provide them with documentation.

Grading Scale

The following grading scale will be used for this class.

A	93% – 100%	B	83% – <86%	C	73% – <76%	D	63% – <66%
A–	90% – <93%	B–	80% – <83%	C–	70% – <73%	D–	60% – <63%
B+	86% – <90%	C+	76% – <80%	D+	66% – <70%	F	0% – <60%

(See also University Grading Policy).

Assignment/Evaluation Methods

- Exams: There will be two midterm exams.
- Homework: There will be some homework assignments that may involve the use of the statistical programming tool or Excel.
- Final Project: This is a data analysis assignment that involves application of concepts covered in the course on a data set.
- Final Exam: There will be a cumulative final exam.

Assignment	Percentage
Participation & In-class Quizzes	10%
Homework	20%
Data Analysis Project	10%
2 Midterms	35% (17.5% each)
Comprehensive Final Exam	25%
Total	100%

Participation in all course activities is a very important element of this course and is a basic expectation. Course participation consists of active and respectful involvement in class discussions, peer feedback, postings, replies, projects, and other interactions. The participation grade considers quality, quantity, and timeliness of student participation.

Reasonable Accommodations
Florida Polytechnic University is committed to assisting students with disabilities and offering reasonable accommodations to those with documented eligibility. The Office of Disability Services (ODS) coordinates accommodations for students with disabilities in accordance with the ADA Amendments Act of 2008 (ADAAA), the Americans with Disabilities Act of 1990 (ADA), and Section 504 of the Rehabilitation Act of 1973. Reasonable accommodations are determined on an individual basis through an interactive process between you, ODS, and your instructor(s). If you have already registered with ODS, please ensure that you have requested an accommodation letter for this course and communicate with your instructor about your approved accommodations at your earliest convenience. 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
ASC East building
ODS website: www.floridapoly.edu > Student Affairs > Health Wellness > 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. It is important for you to know that there are resources 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. It is an educational goal that you feel able to share information related to your life experiences in classroom discussions and in one-on-one meetings. However, it is requirement for university employees to share information with the Title IX Coordinator regarding disclosure. However, please know 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.

Academic Integrity
All students must commit to the highest ethical standards in completion of all academic pursuits and endeavors, whether in classroom or online environments: Academic Integrity.

Student Record of 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**.*

Schedule of Topics by week

Week	Topic	Reading
1	Introduction to the course	
	Introduction to data: statistics, measurement levels, population vs sample	Ch. 1
2	Summarizing data: data collection, qualitative vs quantitative data, measures of central tendency	Ch. 2
3	Summarizing data: describing distributions, measures of variability	Ch. 2
	Introduction to probability	Ch. 3
4	Independent events, law of large numbers, sampling with and without replacement	Ch. 3
	Conditional probability, tree diagrams	Ch. 3
5	Random variables and expectation	Ch. 3
	Probability distributions: Bernoulli, binomial and geometric	Ch. 4
6	Probability distributions (cont.)	Ch. 4
	Exam 1	
7	Distributions of random variables: transformations, Z-scores, Normal distribution	Ch. 4
	Foundations for inference: sampling distribution	Ch. 5
8	Foundations for inference: Central Limit Theorem, Confidence intervals	Ch. 5
9	Foundations for inference: Hypothesis testing	Ch. 5
10	**Exam 2**	
	Project Assignment and statistical software demonstration	
11	Inference for categorical data: inferences for proportions, Chi-Square	Ch. 6
12	Inference for numerical data: t-distribution, paired distribution	Ch. 7
13	Inference for numerical data: non-paired distribution, power calculations	Ch. 7
14	Comparing many means with ANOVA	Ch. 7
	Introduction to linear regression. *Thanksgiving Break*	Ch. 8
15	Introduction to linear regression (cont.)	Ch. 8
16	Introduction to linear regression (cont.)	Ch. 8
	Final Project and Final Exam Review	

This is a tentative schedule, and it may be modified as required based on the progression of the class.