Math 110.105.88: Precalculus Course Syllabus

Instructor

Alexa Gaines (she/her/hers)

Email: againes8@jhu.edu

Office Hours: Online, by appointment

Course Description

This course provides students with the background necessary for the study of calculus. It begins with a review of the coordinate plane, linear equations, and inequalities, and moves purposefully into the study of functions. Students will explore the nature of graphs and deepen their understanding of polynomial, rational, trigonometric, exponential, and logarithmic functions, and will be introduced to complex numbers, parametric equations, and the difference quotient.

Course Structure:

The course materials are divided into weekly modules which can be accessed in Canvas. A module will have several sections, including the overview, required reading, lectures, practice problems, online homework, online quiz, and supplemental material. During the week of an exam, the exam will be found online in the module. You should check the calendar in Canvas regularly for due dates and the announcements page for updates and reminders.

Learning Outcomes:

At the conclusion of this course, you are expected to have gained the ability to:

- Express problems and solutions using the language of mathematics and/or logic.
- Recall and apply basic algebra skills without the use of review.
- Solve problems that require rigorous logical demonstrations with multiple steps.
- Define the basic characteristics of a function: domain, range, intercepts, symmetry, etc.
- Recall the definition of a function, and recognize various functions including polynomial, rational, radical, exponential, and logarithmic along with their graphs.
- Analyze and graph distinct functions as models in "real-world" examples.
- Define trigonometric functions and know how to solve problems that include the right triangle.
- Know and apply identities involving trigonometric functions.
- Recognize parametric equations, use them to plot points and draw graphs.
- Use a graphing calculator as a tool, not as a substitute for understanding.

Textbook

PreCalculus, by Faires, J. Douglas, DeFranza, James, 5th Ed.,

ISBN-13: 978-0840068620

Online Lectures:

Prerecorded lectures will be posted for the week in each module. There will be live synchronous sessions throughout the semester through zoom, with dates posted in the course. During these live synchronous components, homework problems and exam review will take place. Links to the recordings of each live online session will be posted in Canvas. For more information regarding Zoom, please see the [Zoom Student Quick Start Guide](#).

Discussion Forums

There will be five required discussion forums in the class. To receive full credit for each discussion forum, you must post an original discussion and at least one response to another discussion or to a response within your original post.

Homework

Homework will be assigned for each week and will be due by Sunday of that same week. Late homework will be accepted only with an exceptionally good excuse. You will have two attempts at each homework assignment and only the highest grade of those attempts is counted. The lowest homework grade will be dropped.

Quizzes

There will be a short 30-minute online quiz each week. This quiz will cover the topics assigned that week for homework. You will have two attempts at each quiz assignment and only the highest grade of those attempts is counted. Your lowest quiz grade will be dropped.

Written Assignments

There are five written assignments throughout the course which contain questions that need to be answered individually and uploaded to the course directly. They are designed to show the students' ability to communicate mathematically. Solutions are to be uploaded to the course as a .pdf for grading and you may only use a graphing calculator when indicated. They will be hand-graded based on correctness, proper argument, and overall presentation.

Exams

There will be two online Midterm Exams during the course and a cumulative 3-hour online Final Exam during the end-of-semester exam period. These exams are "closed book" and therefore students may not use any reference materials including, the textbook, notes, a calculator, any additional files, or documents that may reside on the computer hard drive, the Internet or any other external website or device.

Late Work

Work will be due on the date given on the Canvas course webpage, on the assignment itself, and in the course calendar. A late penalty of 10% will be applied each day after the original due date has passed for assignments turned in late. After 7 calendar days of the original due date, late work will not be accepted. Additional points may be deducted for errors. Any exceptions to this will be solely at the instructor's discretion.

Collaboration

Collaboration on homework is allowed and encouraged. However, each student must write up his/her solutions to the problems individually and in his/her own words - copying from another student's paper is prohibited. Homework is an essential part of learning the course material. Failing to give it proper attention will significantly harm your performance on the exams and your overall grade for the class. Collaboration is not permitted on exams.

Grading

Your final grade for the class will be given as a weighted average with the weights given as follows:

- Discussion Forums: 10%
- Quizzes: 15% (lowest grade dropped)
- Homework: 15% (lowest grade dropped)
- Written Assignment: 10%
- Midterm Exam 1: 15%
- Midterm Exam 2: 15%
- Final Exam: 20%

The letter grades are as follows based on your final weighted average:

A: 90-100
B: 80 - 89
C: 70 - 79
D: 55 - 69
F: < 55

Course Topics

- Chapter 1: Functions
  - 1.1 Introduction
  - 1.2 The Real Line
  - 1.3 The Coordinate Plane
  - 1.4 Equations and Graphs
  - 1.5 Using Technology to Graph Equations
  - 1.6 Functions
  - 1.7 Quadratic Functions
- Chapter 2: New Functions from Old