PRECALCULUS

MATH 1650.623

FALL 2019

Instructor: Dr. J. Iaia — Time: MF 10:00-10:50, TR 9:30-10:50
Office: GAB 420 — Place: GAB 317(M) or CURY 210(TR) or GAB 310(F)
Office Hours: TR 11-1, or by appt. — email: iaia@unt.edu
Homework assignments are online in "canvas" - go to learn.unt.edu

Text: J. Stewart, L. Redlin, S. Watson, *Precalculus: Mathematics for Calculus, 6th ed.*

GRADING POLICY

Exam 1	$16\frac{2}{3}\%$	*Tuesday Sept.* 17, 9:30-10:50
Exam 2	$16\frac{2}{3}\%$	*Thursday Oct.* 10, 9:30-10:50
Exam 3	$16\frac{2}{3}\%$	*Tuesday Nov.* 5, 9:30-10:50
Project	$16\frac{2}{3}\%$	*Tuesday Nov.* 26
Homework	$16\frac{2}{3}\%$	2 *times per week*
Final Exam	$16\frac{2}{3}\%$	*Saturday Dec* 7, 8-10 am

Exams: Exams **must** be taken on the dates listed above. Exceptions will be considered *only* if one has **written documentation** certifying one's absence.

Homework: Homework will be assigned each class and collected 2 times a week. Five problems will be chosen at random and graded. Homework is extremely important and students are highly encouraged to spend a lot of time working on the homework problems.

Attendance: Students are required to attend class.

Code of Conduct: Students are expected to be *respectful of others* at all times. This includes keeping talk and other noise to a minimum while a lecture is in progress or an exam is being taken. Any student being disruptive may be dismissed from the class meeting. **Cheating** will **not** be tolerated and anyone found guilty of cheating may receive an F for the semester.

Student Perceptions of Teaching (SPOT) is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in feedback from students, as I work to continually improve my teaching. I consider the SPOT to be an important part of your participation in this class.

Students with disabilities: It is the responsibility of students with disabilities to provide the instructor with appropriate documentation from the Dean of Students Office.

Semester grades are determined by averaging the grades on the 3 exams, the final exam, and the homework. Letter grades will be based on this average and will follow this scheme:

A 90- ;B 80-89; C 70-79; D 60-69; F -59

Course Description

This course is to prepare students for calculus. First we will discuss the principal of mathematical induction and use it to prove some well-known formulas. Next we will discuss polynomials, rational functions, and their graphs. We will also discuss exponential and logarithmic functions and their graphs. We will discuss trigonometry of the right triangle and the trig functions. Students will also learn the value of the trig functions at common angles. We will become familiar with the graphs of the trig functions and the inverse trig functions. We will solve equations involving trig functions. We will also learn about the law of sines and the law of cosines and see how we can use these to solve triangles. We will learn the addition and subtraction formulas as well as the double angle and half angle formulas. We will learn how to solve trigonometric equations. Next we will discuss polar coordinates and the graphs of polar equations. We will also discuss the polar form of complex numbers. We will next discuss arithmetic and geometric sequences. Near the end of the semester we will talk about vectors in two and three dimensions as well as the dot product and cross product of vectors and their geometric significance.

Course Objectives

At the end of the semester the student should be able to prove basic formulas by mathematical induction. The student should know how to sketch the graphs of polynomials and rational functions. The student should also know how to find the zeros of polynomials. The student should be familiar with the graphs of exponential and logarithmic functions and how to solve equations containing them. The student should know the definition of the six trig functions and the sketch of the graph of each of these. The student should be able to prove various trig identities as well as be familiar with how to apply and use the double angle and half angle formulas. The student should also know how to solve various trig equations. The student should be familiar with polar coordinates and how to graph a function written in polar form. The student should also know if a sequence is arithmetic or geometric. Finally, the student should be familiar with vectors in two and three dimensions and how to find their lengths and the angle between them.

Course Outline

Meeting 1 - mathematical induction

Meeting 2 - induction

Meeting 3 - induction

Meeting 4 - induction problems with inequalities

Meeting 5 - polynomials

Meeting 6 - zeros of polynomials

Meeting 7 - synthetic division and long division of polynomials

Meeting 8 - graphs of polynomials

Meeting 9 - rational functions

Meeting 10 - graphs of rational functions and their asymptotes

Meeting 11 - exponential functions

Meeting 12 - logarithmic functions

Meeting 13 - review for exam 1

Meeting 14 - Exam 1

Meeting 15 - graphs of exponentials and logarithms

Meeting 16 - solving exponential and logarithmic equations

Meeting 17 - definition of trigonometric functions

Meeting 18 - extension of trig functions to all angles

Meeting 19 - table of well-known values of trig functions

Meeting 20 - graphs of trig functions

Meeting 21 - more on graphs of trig functions

Meeting 22 - more on graphs of trig functions

Meeting 23 - more on graphs of trig functions

Meeting 24 - inverse trig functions

Meeting 25 - more on inverse trig functions

Meeting 26 - review for exam 2

Meeting 27 - Exam 2

Meeting 28 - law of sines

Meeting 29 - law of cosines

Meeting 30 - solving triangles

Meeting 31 - trig identities

Meeting 32 - more on trig identities

Meeting 33 - more on trig identities

Meeting 34 - addition and subtraction formulas

Meeting 35 - double angle and half angle formulas

Meeting 36 - trigonometric equations

Meeting 37 - more on trigonometric equations

Meeting 38 - polar coordinates

Meeting 39 - graphs of polar equations

Meeting 40 - polar form of complex numbers

Meeting 41 - review for exam 3

Meeting 42 - Exam 3

Meeting 43 - arithmetic sequences

Meeting 44 - geometric sequences

Meeting 45 - more on geometric sequences

Meeting 46 - mathematics of finance

Meeting 47 - binomial theorem

Meeting 48 - vectors

Meeting 49 - dot product of vectors

Meeting 50 - length of vectors

Meeting 51 - angles between vectors

Meeting 52 - cross product of vectors

Meeting 53 - equations lines in three dimensions

Meeting 54 - equations of planes

Meeting 55 - review for final exam