University of Pittsburgh | College of General Studies

MATH 0200 – Preparation for Scientific Calculus

Department of Mathematics, Spring, 2023

Instructor
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Thackeray Hall, 518

Office Hours
Virtual office hours are available via Zoom

Course Description

The goal of the course is to build a proficiency of Algebra and Trigonometry necessary for scientific calculus, Math 0220 or other related science courses. A variety of topics are studied: functions, rational functions, graphs, asymptotes, inverse functions, logarithmic and exponential functions, conic sections, translation and rotation of axes, trigonometric identities and equations, vectors, polar coordinates, complex numbers.

Course Prerequisites

C or better in Math 0031, C or better in Math 0020, OR math placement score at least 61.

Course Objectives

Students who successfully complete this course will be able to:

- sketch the graphs of polynomial, rational, exponential and logarithmic functions and use them to solve word problems;

- determine the domain, range, x- and y-intercepts, and asymptotes of basic functions; perform basic operations on functions, i.e. addition, subtraction, multiplication, division and composition, find inverse functions, describe symmetries of graphs and apply elementary transformations to functions;

- show how trigonometry 'appears' in right triangles and can be used to solve word problems;

- identify the definitions of trigonometric functions using the unit circle and measures of angles in radians as well as degrees;

- sketch and analyze graphs of trigonometric functions (including finding period and amplitude);

- distinguish between and apply the laws of sines and cosines;

- apply identities involving trigonometric and inverse trigonometric functions.

Required Course Texts and Materials

- The textbook for this course is Precalculus, A Prelude to Calculus, third edition, by Sheldon Axler. However, the second edition can be sufficiently used.
- Online Homework
All your graded homework will be done online using WebWork. You will work individually on problem solving skills, using computer generated problems. The URL for your homework is https://webwork.math.pitt.edu. Select your section. At the login prompt, enter your usual Pitt username and for the password prompt type in your Pitt password. You must enter your username in lower case. You will be automatically linked to the course in which you are enrolled. Once logged in, go to the Homework Sets on the left side menu. WebWork should work well with any modern web browser. Google Chrome is recommended.

Communication, Course Structure, and Participation

This course will take place in the Canvas learning management system. Please use email to get in touch with me. Note the course title, number, and section in the subject line of messages or emails. I will reply to inquiries within 24 hours.

Course content, which includes lectures, readings, videos, activities, and assessments, is organized in modules by week. In order to be successful in this course, I recommend planning to log into the Canvas course shell no less than five times each week and checking your University of Pittsburgh email on a biweekly basis. Course work should take you approximately [number of hours] per week. For information about navigating and using Canvas, refer to the tutorials posted in the course shell and the Canvas Student Guide.

Assignments Submission and Grading

The modules, and discussion board (if applicable for the week) will open up weekly on Monday, as well as the module containing the required readings and videos for the week. Aside from the first part of the discussion board post (due Thursday at 11:59PM), all other assignments are due every Sunday at 11:59PM Eastern Standard Time (EST) on the dates listed on the course schedule. All assignments should be submitted electronically through Canvas.

All exams and assignment dates are given on the course schedule. Please mark your calendar accordingly. Make-up exams will be given on a case-by-case basis only in exceptional cases and at the instructor's discretion. Please be aware that proper documentation must be provided in these instances. Please be aware that make-up exams may differ in both content and format.

If you experience technology difficulties, you are responsible for contacting the University Help Desk to resolve problems. Technology difficulties or illness without an official medical excuse does not excuse late work.

Assignments

Detailed assignment descriptions and grading tools are posted in the Canvas course shell. Your course grade will be calculated as follows:

WebWork Homework Assignments	10%
May include small various assignments, such as the introductory syllabus quiz	
Quizzes	10%
3-8 questions in each quiz	
Participation	15%
Includes discussion board posts, and Video Knowledge Checks; extra credit can be earned in this category	
Two Midterm Exams	40% (20% each)
Must schedule appointment and be taken at Testing Center	
Final Exam	25%
Must schedule appointment and be taken at Testing Center	

Total: _____100%_____

Grade Scale

A = 93-100, A- = 90-92, B+ = 87-89, B = 83-86, B-= 80-82, C+=77-79, C = 73-76, C-= 70-72, D+ = 67-69, D = 63-66, D-= 60-62, F < 60

Course Policies

Academic Integrity Policy

Students in this course will be expected to comply with the University of Pittsburgh's Policy on Academic Integrity. Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy. Furthermore, no student may bring any unauthorized materials to an exam, including calculators. **Students suspected of violating the University of Pittsburgh Policy on Academic Integrity will incur a minimum sanction of a zero for the quiz, exam, or paper in question.** Additional sanctions may be imposed, depending on the severity of the infraction.

To learn more about Academic Integrity, visit the [Academic Integrity Guide](#) for an overview of the topic. For hands-on practice, complete the [Understanding and Avoiding Plagiarism tutorial](#).

Disability Services Policy

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and [Disability Resources and Services](#) (DRS), 140 William Pitt Union, (412) 648-7890, drsrecep@pitt.edu, (412) 228-5347 for P3 ASL users, as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course.

Statement on Classroom Recording

To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.

Copyright Notice

Course materials may be protected by copyright. United States copyright law, 17 USC section 101, et seq., in addition to University policy and procedures, prohibit unauthorized duplication or retransmission of course materials. See [Library of Congress Copyright Office](#) and the [University Copyright Policy](#).

Accessibility

Canvas is ADA Compliant and has fully implemented the final accessibility standards for electronic and information technology covered by Section 508 of the Rehabilitation Act Amendments of 1998. Please note that, due to the flexibility provided in this product, it is possible for some material to inadvertently fall outside of these guidelines.

Equity, Diversity, and Inclusion

The University of Pittsburgh does not tolerate any form of discrimination, harassment, or retaliation based on disability, race, color, religion, national origin, ancestry, genetic information, marital status, familial status, sex, age, sexual orientation, veteran status or gender identity or other factors as stated in the University's Title IX policy. The University is committed to taking prompt action to end a hostile environment that interferes with the University's mission. For more information about policies, procedures, and practices, visit the [Civil Rights & Title IX Compliance web page](#).

I ask that everyone in the class strive to help ensure that other members of this class can learn in a supportive and respectful environment. If there are instances of the aforementioned issues, please contact the Title IX Coordinator, by calling 412-648-7860, or e-mailing titleixcoordinator@pitt.edu. Reports can also be [filed online](#). You may also choose to report this to a faculty/staff member; they are required to communicate this to the University's Office of Diversity and Inclusion. If you wish to maintain complete confidentiality, you may also contact the University Counseling Center (412-648-7930).

Health and Safety Statement

During this pandemic, it is extremely important that you abide by the public health regulations, the University of Pittsburgh's health standards and guidelines, and Pitt's Health Rules. These rules have been developed to protect the health and safety of all of us. The University's requirements for face coverings will at a minimum be consistent with CDC guidance for the communities in which our campuses are located. Additional restrictions may be imposed by the CMRO, or other entity designated by the Chancellor, if it determines such protection is needed in certain locations or settings. Additionally, all community members are welcome to wear face coverings based on their own comfort levels and needs. Information and guidance on how to wear a face covering and types of face coverings is available here and on the CDC's website. For the most up-to-date information and guidance, please visit coronavirus.pitt.edu and check your Pitt email for updates before each class.

If you are required to isolate or quarantine, become sick, or are unable to complete online class activities and assignments by the required due date, contact me as soon as possible to discuss arrangements.

Nonstandard Grades (G Grade)

The "G" grade is applied only when students who have been attending a course and making regular progress are prevented from completing the course by circumstances beyond their control, such as a major medical emergency. These grades will only be given in very rare documented circumstances governed by the current University G Grade Policy

Religious Observances

The observance of religious holidays (activities observed by a religious group of which a student is a member) and cultural practices are an important reflection of diversity. As your instructor, I am committed to providing equivalent educational opportunities to students of all belief systems. At the beginning of the semester, you should review the course requirements to identify foreseeable conflicts with assignments, exams, or other required attendance. If at all possible, please contact me (your course coordinator/s) within the first two weeks of the first class meeting to allow time for us to discuss and make fair and reasonable adjustments to the schedule and/or tasks.

Course Schedule

See the University of Pittsburgh Academic Calendar for important dates like the final dates to add and drop or withdraw from courses.

All assignments are due on Sundays at 11:59PM on the weeks noted.

The course schedule is subject to change if I determine that changes will improve your learning experience. If I change the course schedule, I will notify you well in advance and post a new copy of the course schedule immediately.

Dates & Activities may be subject to change and will be announced on Canvas

Week(s) of:	Topic	Class Activities Assignments in **BOLD** are graded	Additional Notes
1 - Jan 9th	Inequalities Intervals Absolute Value Functions The Coordinate Plane and Graphs	**Syllabus Quiz** **Math-scussion: Week 1** Textbook reading – Axler: 0.3, 1.1, 1.2 **Lecture Knowledge Check –** **1-1, 1-2, 1-3** Axler Practice problems – Ed. 2: p.33, 1-60; p.49, 1-58; p. 62, 1-46 Ed. 3: p. 29, 1-62; p. 45, 1-60; p. 56, 1-50 **WebWork** **Quiz 1**	Syllabus Quiz will be your 1st HW assignment Ed. 2 is the 2nd Edition of the Axler textbook Ed. 3 is the 3rd Edition of the Axler textbook
2 - Jan 16th	Function Transformation and Graphs Composition of Functions Inverse Functions	**Lecture Knowledge Check –** **2-1, 2-2, 2-3** Axler Practice problems – Ed. 2: p.81, 1-58; p.98, 1-48; p.113, 1-30 Ed. 3: p.73, 1-60; p.88, 1-50; p.101, 1-34 **WebWork** **Math-scussion: Week 2** **Quiz 2** Textbook reading – Axler: 1.3, 1.4, 1.5	ADD/DROP ENDS JANUARY 20TH
3 - Jan 23rd	A Graphical Approach to Inverse Functions Lines and Linear Functions Quadratic Functions and Parabolas	**Lecture Knowledge Check –** **3-1, 3-2** Axler Practice problems – Ed. 2: p.125, 1-36; p.142, 1-44; p.162, 1-74 Ed. 3: p.111, 1-38; p.128, 1-46; p.146, 1-82 **WebWork**	

		Math-scussion: Week 3	
		Quiz 3	
		Textbook reading – Axler: 1.6, 2.1, 2.2	
4 - Jan 30th	Exponents Polynomials Rational Functions	**Lecture Knowledge Check –** **4-1, 4-2, 4-3** Axler Practice problems – Ed. 2: p.184, 1-98; p.202, 1-30; p.216, 1-38 Ed. 3: p.167, 1-100; p.183, 1-32; p.195, 1-32, 37-42 **WebWork** **Math-scussion: Week 4** **Quiz 4** Textbook reading – Axler: 2.3, 2.4, 2.5	
5 - Feb 6th	Logarithms as Inverses of Exponentiation Applications of the Power Rule for Logarithms Applications of the Product and Quotient Rules for Logarithms	**Lecture Knowledge Check –** **5-1, 5-2** Axler Practice problems – Ed. 2: p.232, 1-80; p.242, 1-40; p.253, 1-40 Ed. 3: p.209, 1-82; p.219, 1-44; p.228, 1-44 **WebWork** **Math-scussion: Week 5** **Quiz 5** Textbook reading – Axler: 3.1, 3.2, 3.3	
6 - Feb 13th	Exponential Growth Exponential Growth, Pt. 2	**Lecture Knowledge Check –** **6-1, 6-2** Axler Practice problems – Ed 2: p.271, 1-34; p.286, 1-50; p.306, 1-32 Ed. 3: p.245, 1-36; p. 256, 1-52; p.274, 1-32	

		WebWork	
		Math-scussion: Week 6	
		Quiz 6 – Use a calculator!	
		Textbook reading – Axler: 3.4, 3.5, 3.7	
7 - Feb 20th	Midterm 1	Midterm Review **Midterm**	<u>Testing Center</u> is located in G-33 in the Cathedral. Saturday exams MUST be scheduled by February 10th
8 - Feb 27th	The Unit Circle Radians	**Lecture Knowledge Check –** **8-1** Axler Practice problems – Ed 2: p.322, 1-52; p.338, 1-44 Ed. 3: p.289, 1-48, 53-58; p.302, 1-50 **WebWork** **Math-scussion: Week 8** **Quiz 7** Textbook reading – Axler: 4.1, 4.2	
9 - Mar 6th	Spring Break		
10 - Mar 13th	Cosine and Sine More Trigonometric Functions Trigonometry in Right Triangles	**Lecture Knowledge Check –** **10-1, 10-2, 10-3** Axler Practice problems – Ed. 2: p.351, 1-32; p.362, 1-40; p.371, 1-36 Ed. 3: p.313, 1-34; p.322, 1-42; p.331, 1-38 **WebWork** **Math-scussion: Week 10** **Quiz 8**	**Final Exam Conflict for Submission Ends March 17TH** **Monitored Withdrawal Ends March 17th**

Week	Topics	Assignments	
		Textbook reading – Axler: 4.3, 4.4	
11 - Mar 20th	Trigonometric Identities Inverse Trigonometric Functions Inverse Trigonometric Identities	**Lecture Knowledge Check –** **11-1, 11-2, 11-3** Axler Practice problems – Ed. 2: p.385, 1-70; p.403, 1-48; p.413, 1-32 Ed. 3: p.343, 1-72; p.359, 1-52; p. 371, 1-42 **WebWork** **Math-scussion: Week 11** **Quiz 9** Textbook reading – Axler: 4.6, 5.1, 5.2	
12 – Mar 27th	Using Trigonometry to Compute Area The Law of Sines and the Law of Cosines Double-Angle and Half-Angle Formulas Addition and Subtraction Formulas	**Lecture Knowledge Check –** **12-1, 12-2, 12-3** Axler Practice problems – Ed. 2: p.426, 1-40; p.439, 1-24; p.454, 1-70; p.467, 1-36 Ed. 3: p.383, 1-40; p.395, 1-24; p.407, 1-70; p.418, 1-36 **WebWork** **Math-scussion: Week 12** **Quiz 10** Texbook reading – Axler: 5.3, 5.4, 5.5, 5.6	
13 – Apr 3rd	Midterm 2	Midterm Review	
14 - Apr 10	Transformation of Trigonometric Functions Polar Coordinates Vectors	**Lecture Knowledge Check –** **14-1, 14-2, 14-3, 14-4** Axler Practice problems – Ed. 2: p.485, 1-34; p.501, 1-30; p.514, 1-20	

		Ed. 3: p.430, 1-36; p.491, 1-32; p.503, 1-22 **WebWork** **Math-scussion: Week 14** **Quiz 11** Textbook reading – Axler: Ed. 2: 6.1, 6.2, 6.3 Ed. 3: 5.7, 7.1, 7.2	
15 - Apr 17	Complex Numbers The Complex Plane	**Lecture Knowledge Check –** **15-1, 15-2** Axler Practice problems – Ed. 2: p.526, 1-40; p.538, 1-14 Ed. 3: p.514, 1-42; p.524 1-14 **WebWork** **Math-scussion: Week 15** **Quiz 12** Textbook reading – Axler: Ed. 2: 6.4, 6.5 Ed. 3: 7.3, 7.4	
16 - Apr 24	Exam Week	Final Exam Review	<u>No Saturday hours during finals week,</u> all testing center hours extended during the week.