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MAT 133 - 01: Precalculus
On Ground: Higgins 117,
MT 9:30-10:45 am
Credits: 3 credit
Grading: Standard A-F



Office Hours:

Office hours for the Fall 2024 Semester are on ground in Higgins 101D.

- Monday & Thursday: 11am - 12pm & 3:30pm - 4:30pm
- Wednesday & Friday: 1pm - 2pm
- or by appointment

If you need to meet virtually we can make an appointment to do so via my WebEx Virtual Office: [Higgins 101-DV \(https://wcsu.webex.com/meet/roccac\)](https://wcsu.webex.com/meet/roccac)

Course Materials:

- “*Precalculus 2e*” by Abramson et.al. This text is freely available as a PDF at <https://openstax.org/details/books/precalculus-2e>.
- Free Account on the Learning Management System MyOpenMath at <https://www.myopenmath.com/>
 - Course Name: 2024 Fall MAT 133: Precalculus
 - Course ID: 237743
 - Enrollment Key: 314159RoccaMAT133Fall2024
- Other Materials: Notebook & *Graphing* Calculator

Course Description:

The functions needed for the study of calculus are presented from a numerical, graphical, and algebraic point of view. Polynomial, exponential, logarithmic, and trigonometric functions are included. Graphics calculators are used throughout the course.

Student Learning Outcomes:

After successful completion of this course students will be able to:

- Demonstrate understanding of polynomial, rational, exponential, logarithmic and trigonometric functions by
 - Describing domain
 - Describing or estimating range
 - Graphing and
 - Evaluating

- Solve equations involving functions in the list above.
 - Describe the effect of each of the parameters in $g(x) = af(bx \equiv d) \equiv d$ on the graph of $f(x)$ where f is any function in the list above.
 - Solve problems that require mathematical interpretation of a written statement.
 - Examine a graph and choose the type of function that best represents the graph.
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Course Content:

- Unit 1: Algebraic Functions: Chapters 1 - 3
 - Unit 2: Transcendental Functions: Chapters 4 - 7
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Grading:

- Quizzes 31% (\approx 6% each)
- Practice Exams 15% (5% each)
- Unit Exams 36% (18% Each)
- Final Exam 18%

Quizzes (31%): You have 8 quizzes online on *MyOpenMath*. The first quiz is to help you learn to navigate MyOpenMath and each of the others focuses on a chapters worth of content. For each quiz you get three attempts at each question and three attempts on each quiz. For each quiz, the highest of your attempts counts toward your final grade. The lowest three quiz grades are dropped.

Practice Exams (15%): For each of the three exams you need to complete a practice exam online on *MyOpenMath*. As with the quizzes, you get three attempts at each practice exam and at each question on each attempt. Also, as before, the highest attempt on each practice exam is the one that counts. **However, for the practice exams you must get a grade of 75% for them to count in the grade book.** The objective of the practice exams is to help you prepare for the exams. In order to meet that objective, you should complete at least one attempt at each practice exam as if it were a timed in-class exam. This will help you know what you really do and don't know.

Unit Exams (36%): Each unit exam will be a one hour and fifteen minute in-class exam covering all the content from the unit. Each exam will be based on the exact same question bank as the corresponding practice exam. Taking advantage of all your practice exam attempts will help maximize your exam grade.

Final Exam (18%): The final exam will be a two hour and thirty minute in-class exam covering all the content from the course. It will be based on the exact same question bank as the practice final exam. Taking advantage of all your practice exam attempts will help maximize your exam grade. **The final exam for this class is Thursday, December 12th, 2024 at 8am, please put this on your calendars now.**

Course Calendar:

MONDAY	THURSDAY
8/26	8/29 1 Syllabus, Linear & Quadratic Functions and Function Notation
9/2 <i>Labor Day - No Class</i>	9/5 2 Gallery of Functions: Linear, Polynomial, Power, Rational, and Absolute Value
9/9 3 Properties: Domain, Range, Even, Odd, Onto and 1-1	9/12 4 Composition of Functions and Inverses
9/16 5 Transforming Functions and Their Graphs	9/19 6 Perpendicular, Parallel, Vertical, and Horizontal Lines
9/23 7 Solving Problems Involving Linear Equations	9/26 8 Quadratic Roots and Factors, and Complex Numbers
9/30 9 Factors of Polynomials and Division	10/3 10 Connecting Roots and Factors
10/7 11 Rational Functions, Asymptotes, and End Behavior	10/10 12 Relative and Global Maximums and Minimums <i>(End of Unit 1 Material)</i>
10/14 13 Exponential Functions and Their Graphs	10/17 14 <i>Unit 1 Exam In-class</i>
10/21 15 Logarithmic Functions and Their Graphs	10/24 16 More Properties of Logs and Exponents
10/28 17 Applications of Logs and Exponents	10/31 18 Triangles and Trigonometry: Sine and Cosine
11/4 19 Angles, Angle Measures and Unit Circle Trigonometry	11/7 20 Other Trigonometric Functions
11/11 21 Graphs of Trigonometric Functions	11/14 22 Inverses of Trigonometric Functions
11/18 23 Pythagorean, Sum, and Difference Identities	11/21 24 Double Angle and Half Angle Identities
11/25 25 Catch Up or Review	11/28 <i>Thanksgiving Break - No Class</i>
12/2 26 <i>Unit 2 Exam In-class</i>	12/5 27 Review
12/9 <i>Beginning of Final Exams</i>	12/12 28 <i>Final Exam at 8am</i>

Course Outline:

Polynomial Functions

1. Function concepts
 - (a) Definition
 - (b) Domain and range
2. Analysis: graph, domain, range, transformations
 - (a) Linear functions
 - (b) Quadratic functions
 - (c) Compositions
 - (d) Inverses
 - (e) Higher polynomials
 - (f) Rational functions
3. Applications

Exponential and Logarithmic Functions

1. Exponential functions
 - (a) Domain/range
 - (b) Graphs
2. Logarithmic functions
 - (a) Domain/range
 - (b) Graphs

3. Equations

4. Applications

Trigonometric Functions

1. Right triangle trigonometry
2. Sine and cosine functions
 - (a) Period
 - (b) Amplitude
3. Other trigonometric functions
4. Inverse trigonometric functions
5. Identities
 - (a) Cofunction
 - (b) Pythagorean
 - (c) Angle sum and difference
 - (d) Double and half angle

6. Equations

7. Laws of sines and cosines

8. Applications

Optional Topics

1. Parametric equations
2. Sum to product and product to sum identities
3. Systems of equations

You and Your Grades:

- “A” (Exceptional) range 90% to 100%:

The student has demonstrated significant mastery of the appropriate knowledge and skills relevant to the course. The student is able to solve standard formulaic exercises and most nonstandard problems which require deeper insight.

– “A” $\iff 92.5\% \leq \textit{Grade} \leq 100\%$

– “A-” $\iff 90\% \leq \textit{Grade} < 92.5\%$

- “B” (Good) range 80% to 90%:

The student has demonstrated mastery of the appropriate knowledge and skills relevant to the course. The student is able to solve standard formulaic exercises and some nonstandard problems which require deeper insight.

– “B+” $\iff 87.5\% \leq \textit{Grade} < 90\%$

– “B” $\iff 82.5\% \leq \textit{Grade} < 87.5\%$

– “B-” $\iff 80\% \leq \textit{Grade} < 82.5\%$

- “C” (Adequate) range 70% to 80%:

The student has demonstrated adequate mastery of the appropriate knowledge and skills relevant to the course. The student is able to solve most standard formulaic exercises but struggles with nonstandard problems which require deeper insight.

– “C+” $\iff 77.5\% \leq \textit{Grade} < 80\%$

– “C” $\iff 72.5\% \leq \textit{Grade} < 77.5\%$

– “C-” $\iff 70\% \leq \textit{Grade} < 72.5\%$

- “D” (Inadequate) range 60% to 70%:

The student has demonstrated inadequate or incomplete mastery of the appropriate knowledge and skills relevant to the course. The student is able to solve some standard formulaic exercises but few if any nonstandard problems which require deeper insight.

– “D+” $\iff 67.5\% \leq \textit{Grade} < 70\%$

– “D” $\iff 62.5\% \leq \textit{Grade} < 67.5\%$

– “D-” $\iff 60\% \leq \textit{Grade} < 62.5\%$

- “F” (Unacceptable) below 60%:

The student has demonstrated essentially no mastery of the appropriate knowledge and skills relevant to the course. The student is unable to solve most standard formulaic exercises and essentially no nonstandard problems which require deeper insight.

End User Agreement:

General Expectations: As a student in this class you are expected to:

- attend class and take notes,
- actively read material in each section, taking notes,
- review your notes on a regular basis,
- check your university email every day,
- check the class site *at least* every other day,
- begin studying for exams in a timely fashion,
- ask questions early and often,
- attend office hours,
- seek help in the math clinic or tutoring center, and
- complete assignments and readings on time.

Assignment Guidelines: (These apply to *all out of class work*.)

- Work handed in must always look neat, legible, and professional. Work must be very neatly written or preferably typed. The quality of your work will be factored into your grade, up to 10%. In extreme cases work may be rejected and then counted as late.
- Answers on all assignments should be given in complete sentences. I should be able to tell what your answer means without re-reading the problem. This does not mean you simply rewrite the question.
- An assignment is considered late after I have handed it back or gone over it in class. Late assignments are accepted but may receive at most 75% credit. Late assignments go to the absolute bottom of the stack of papers to be graded; *all on time work is graded before any late work*.
- If you work on an assignment as part of a group, then there may be no more than three individuals in the group and all your names must be on the assignment. You should hand in only one copy of the work.
- All work must be submitted in the manner directed.

Email Etiquette Guidelines: When sending an email you must include the course number and semester in the subject line. For example, if you are taking MAT 314 in Fall 1592 then the the subject line should begin with “[MAT 314 Fall 1592].” Also, you should always begin with a salutation such as “Dear Dr. Rocca” and end with a closing such as “Sincerely, I. Newton.”

Technology Use: You are free to use technology in the classroom to support the learning of the content, i.e. for note taking, recording, taking pictures of the board etc.. Technology use will be restricted if it becomes disruptive, a distraction, or invades others privacy.

Exam Makeup Policy: To qualify for a makeup exam you must have a valid reason for missing the exam and, if at all possible, let me know ahead of time that you are missing the exam. You will need to meet with me in order to arrange a time for the make up exam. If you do not have a valid reason, do not give prior notice when possible, or simply do not show up for an exam, you are not entitled to a makeup and will not be given one. If you fail to show up for your makeup exam, you will not be given a second opportunity.

The 2% Exception: If a class has any quiz or class work which is ultimately worth no more than 2% of your final grade can not be made up.

Time on Task: As a 3 credit class you should expect to average 7.5 to 8.5 hours of work a week including class time. Some weeks you may get away with less and some may require more.

Attendance: There is no specific policy for attendance in this course. However, if you have *three consecutive unexcused absences* within the first half of the semester I am required to report to the University that you have *stopped attending*.

Academic Honesty: If on any assignment, quiz, or exam you turn in someone else’s work, regardless of the source, as if it were your own you will receive a zero on that assignment, quiz, or exam. If you are caught doing this three times you will receive an F in the course and the Dean will be informed of your academic dishonesty.

(<https://www.wcsu.edu/faculty-handbook/2019-2020/policies-pertaining-to-students/academic-honesty-policy/>)

Accommodations: If you have need of an accommodation for testing or note taking, please visit AccessAbility Services, located in the HAAS Library room 406 (<http://www.wcsu.edu/accessability>).