



NEW JERSEY CENTER
FOR TEACHING & LEARNING

Progressive Mathematics Initiative® (PMI®)
MATH6447: Learning and Teaching Precalculus

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Course Credit: 3.0 NJCTL credits

Dates & Times:

This is a 3-credit, self-paced course, covering 7 modules of content. The exact number of hours that you can expect to spend on each module will vary based upon the module coursework, as well as your study style and preferences. You should plan to spend 12-20 hours per module, completing the module slides, readings, short answer assignments, labs, mastery exercises, practice problems, and module exams.

Course LMS: <https://moodle.njctl.org/course/view.php?id=208>

COURSE DESCRIPTION:

This course is for teachers to learn the content of PMI Precalculus and how to teach that course to students. Topics include functions; polynomial & rational functions; exponential & logarithmic functions; systems & matrices; vectors; sequences & series; and probability & statistics.

STUDENT LEARNING OUTCOMES:

Upon completion of the course, the student will be able to:

1. Apply the principles of mathematics in the areas of graphical analysis, graphing functions/equations, solving equations and writing algebraic proofs.
2. Apply student-centered pedagogy to teach mathematics to students.
3. Apply mathematical tools commonly used in precalculus including arithmetic operations, inverse operations, algebraic proofs, problem solving and function/equation analysis.
4. Identify, understand, and communicate the elements, representations, and models of equations and functions to solve word problems.
5. Examine, investigate, and assess the relationships between various mathematical models and their variables.

TEXTS, READINGS, INSTRUCTIONAL RESOURCES

Required Texts:

- This course uses a free digital text book accessible at:
<https://njctl.org/courses/math/pre-calculus/>

Recommended Readings:

- Related articles within short answer assignments.

COURSE REQUIREMENTS:

Consistent attendance in your online courses is essential for your success. Failure to verify your attendance within the first 7 days of this course may result in your withdrawal. If for some reason you would like to drop a course, please contact the Dean of Students.

Online classes have assignments and participation requirements just like on-campus classes. Budget your time carefully. If you are having technical problems, problems with your assignments, or other problems that are impeding your progress, let your instructor know as soon as possible.

GRADE DISTRIBUTION AND SCALE:

In order to receive a Passing grade, the participant must complete the following course requirements: all short answer assignments, mastery exercises, labs, exams, and the reflection paper outlined in the *Assignments* section of the Class Schedule (below).

Grade Distribution:

Module Exams	70%
Final Exam	10%
Labs	6%
Short Answer Assignments	6%
Mastery Exercises	6%
Reflection Paper	2%

Grade Scale:

A	93 – 100
A-	90 – 92
B+	86 – 89
B	83 – 86
B-	80 – 82
C+	77 – 79
C	73 – 76
C-	70 – 72
D	60.0 – 69.9
F	59.9 or below

GRADING RUBRIC:

The following rubric is used to score:

- Short Answer Assignment – 6% of grade
- Reflection Paper – 2% of grade

The minimum possible score for this rubric is 4 points, and the score will be converted to the minimum grade available in this module (which is zero unless the scale is used). The maximum score 25 points will be converted to the maximum grade.

Intermediate scores will be converted respectively and rounded to the nearest available grade. If a scale is used instead of a grade, the score will be converted to the scale elements as if they were consecutive integers.

	Meets Expectation	Approaches Expectation	Below Expectation	Limited Evidence
	<i>7 points</i>	<i>5 points</i>	<i>3 points</i>	<i>1 point</i>
Content	<ul style="list-style-type: none"> · Demonstrates excellent knowledge of concepts, skills, and theories relevant to topic. 	<ul style="list-style-type: none"> · Demonstrates fair knowledge of concepts, skills, and theories. 	<ul style="list-style-type: none"> · Demonstrates incomplete or insubstantial knowledge of concepts, skills, and theories. 	<ul style="list-style-type: none"> · Demonstrates little or no knowledge of concepts, skills, and theories.
Depth of Reflection	<ul style="list-style-type: none"> · Content is well supported and addresses all required components of the assignment. 	<ul style="list-style-type: none"> · Content is partially supported; addresses most of the required components of the assignment. 	<ul style="list-style-type: none"> · Content contains major deficiencies; addresses some of the required components of the assignment. 	<ul style="list-style-type: none"> · Content is not supported and/or includes few of the required components of the assignment.
Evidence and Practice	<ul style="list-style-type: none"> · Response shows strong evidence of synthesis of ideas presented and insights gained throughout the entire course. The implications of these insights for the respondent's overall teaching practice are thoroughly detailed, as applicable. 	<ul style="list-style-type: none"> · Writing is mostly clear, concise, and well organized with good sentence/paragraph construction. Thoughts are expressed in a coherent and logical manner. There are no more than five spelling, grammar, or syntax errors per page of writing. 	<ul style="list-style-type: none"> · Response is missing some components and/or does not fully meet the requirements indicated in the instructions. Some questions or parts of the assignment are not addressed. Some attachments and additional documents, if required, are missing or unsuitable for the purpose of the assignment. 	<ul style="list-style-type: none"> · Response excludes essential components and/or does not address the requirements indicated in the instructions. Many parts of the assignment are addressed minimally, inadequately, and/or not at all.
	<i>4 points</i>	<i>3 points</i>	<i>2 points</i>	<i>1 point</i>

Writing Quality	<ul style="list-style-type: none"> · Writing is well-organized, clear, concise, and focused; no errors. 	<ul style="list-style-type: none"> · Some minor errors or omissions in writing organization, focus, and clarity. 	<ul style="list-style-type: none"> · Some significant errors or omissions in writing organization, focus, and clarity. 	<ul style="list-style-type: none"> · Numerous errors in writing organization, focus, and/or clarity.
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The following rubric is used to score:

- Labs – 6% of grade

The minimum possible score for this rubric is 2 points, and the score will be converted to the minimum grade available in this module (which is zero unless the scale is used). The maximum score 14 points will be converted to the maximum grade.

Intermediate scores will be converted respectively and rounded to the nearest available grade. If a scale is used instead of a grade, the score will be converted to the scale elements as if they were consecutive integers.

	Meets Expectation	Approaches Expectation	Below Expectation	Limited Evidence
	<i>7 points</i>	<i>5 points</i>	<i>3 points</i>	<i>1 point</i>
Completeness	<ul style="list-style-type: none"> · Lab write-up is complete with no missing fields. 	<ul style="list-style-type: none"> · Lab write-up has 1-2 missing fields. 	<ul style="list-style-type: none"> · Lab write up has 3-5 missing fields. 	<ul style="list-style-type: none"> · There are more than 5 missing fields on the lab write-up.
Calculations	<ul style="list-style-type: none"> · All answers are calculated correctly. 	<ul style="list-style-type: none"> · Most answers are calculated correctly, but there are 1-2 minor calculation errors. 	<ul style="list-style-type: none"> · Most answers are calculated correctly, but there are multiple minor calculation errors, or 1-2 gross miscalculations. 	<ul style="list-style-type: none"> · There are calculation errors throughout the lab.

The remaining types of assignments are not scored using a rubric. These assignments are scored using percentage correct to assign a letter grade. The assignments in this manner are as follows:

- Mastery Exercises – 6% of grade
- Module Exams – 70% of grade
- Final Exam – 10% of grade

Mastery Exercises can be retaken as many times as desired to ensure a high score. Due to the nature of these assignments, each time they are taken, they will be composed of ten unique questions pulled randomly from a larger question bank.

Module and Final Exams are scored using a curve, which allows us to keep content exams rigorous. Module Exams can be retaken one time. Final Exams cannot be retaken.

ACADEMIC STANDING:

NJCTL has established standards for academic good standing within a student's academic program. Students enrolled in any NJCTL online course must receive an 80 or higher to successfully complete a course and receive credit for that course. An 80 is equivalent to a GPA of 2.7 or B-. Additionally, students in an endorsement

program must receive a cumulative GPA of 3.0 for all courses combined in order to successfully complete the program.

ACADEMIC INTEGRITY:

Students must assume responsibility for maintaining honesty in all work submitted for credit and in any other work designated by the instructor of the course. Academic dishonesty includes cheating, fabrication, facilitating academic dishonesty, plagiarism, reusing /re-purposing your own work, unauthorized possession of academic materials, and unauthorized collaboration.

CITING SOURCES WITH APA STYLE:

All students are expected to follow proper writing and APA requirements when citing in APA (based on the APA Style Manual, 6th edition) for all assignments.

DISABILITY SERVICES STATEMENT:

We are committed to providing reasonable accommodations for all persons with disabilities. Any student with a documented disability requesting academic accommodations should contact the Dean of Students, Dr. Jamie Korn, additional information to coordinate reasonable accommodations for students with documented disabilities (Jamie@njctl.org).

NETIQUETTE:

Respect the diversity of opinions among the instructor and classmates and engage with them in a courteous, respectful, and professional manner. All posts and classroom communication must be conducted in accordance with the student code of conduct. Think before you push the Send button. Did you say just what you meant? How will the person on the other end read the words?

Maintain an environment free of harassment, stalking, threats, abuse, insults or humiliation toward the instructor and classmates. This includes, but is not limited to, demeaning written or oral comments of an ethnic, religious, age, disability, sexist (or sexual orientation), or racist nature; and the unwanted sexual advances or intimidations by email, or on discussion boards and other postings within or connected to the online classroom.

If you have concerns about something that has been said, please let your instructor know.

CLASS SCHEDULE:

Module	Required Readings	● Assignments
1 – Functions	<ul style="list-style-type: none">● PDFs of presentations within the module.	<ul style="list-style-type: none">● Short Answer● Lab● Mastery Exercise● Module Exam
2 – Polynomial & Rational Functions	<ul style="list-style-type: none">● PDFs of presentations within the module.	<ul style="list-style-type: none">● Short Answer Assignment● Lab● Mastery Exercise● Module Exam
3 – Exponential & Logarithmic Functions	<ul style="list-style-type: none">● PDFs of presentations within the module.	<ul style="list-style-type: none">● Short Answer Assignment● Lab● Mastery Exercise● Module Exam

4 – Matrices & Systems	<ul style="list-style-type: none"> • PDFs of presentations within the module. 	<ul style="list-style-type: none"> • Short Answer Assignment • Lab • Mastery Exercise • Module Exam
5 – Sequences & Series	<ul style="list-style-type: none"> • PDFs of presentations within the module. 	<ul style="list-style-type: none"> • Short Answer Assignment • Lab • Mastery Exercise • Module Exam
6 – Probability & Statistics	<ul style="list-style-type: none"> • PDFs of presentations within the module. 	<ul style="list-style-type: none"> • Short Answer Assignment • Lab • Mastery Exercise • Module Exam •
7 – Reflection & Final Exam	<ul style="list-style-type: none"> • Review course topics • Zoom call with instructor, as needed 	<ul style="list-style-type: none"> • Reflection Paper • Final Exam