

M122 – Precalculus

Sample Syllabus

Class Number & Meeting Time:

Instructor:

Room:

Email:

Office Hours:

Learning Outcomes:

This is a 4-credit hour class to prepare students for calculus. There is a prerequisite of Math 115 or the equivalent. See the end of the syllabus for a detailed list of content standards. This course satisfies the Mathematical and Quantitative Reasoning (MQR) requirement of the Pathways General Education Required Core with the following learning outcomes:

- **MQR 1:** Interpret and draw appropriate inferences from quantitative representations, such as formulas, graphs, or tables.
- **MQR 2:** Use algebraic, numerical, graphical, or statistical methods to draw accurate conclusions and solve mathematical problems.
- **MQR 3:** Represent quantitative problems expressed in natural language in a suitable mathematical format.
- **MQR 4:** Effectively communicate quantitative analysis or solutions to mathematical problems in written or oral form.
- **MQR 5:** Evaluate solutions to problems for reasonableness using a variety of means, including informed estimation.
- **MQR 6:** Apply mathematical methods to problems in other fields of study.

Textbook:

[Precalculus, 2nd edition](#) by Jay Abramson. This textbook is available for free online and as a PDF download. If you prefer a physical copy, you can order one at low cost online. The textbook has helpful practice problems and examples, so I recommend that you use it to supplement what you are learning in class.

Attendance and Participation:

Attending and participating in every class is crucial to success in this course. If you miss a class, you have the responsibility to catch up on covered material, announcements, and quizzes. Over time, absence from classes will impact your grades and financial aid.

During class time, phones should be silenced and stored (NOT on your desks!) and earbuds should be removed. Tablets are permitted only for the purpose of taking notes. I expect full engagement when you attend, so please don't spend your time surfing the web, listening to music, sleeping, or carrying on conversations unrelated to the class. You should expect to spend 5-8 hours a week completing assignments outside of class.

Homework:

Homework is not optional in this class, and practicing homework problems (on your own, without the help of the internet!) is key to your success in the course. Homework will be completed online using [MyOpenMath](#), a free online homework system. Our Course ID is **XXXXXX**, and the class key is **qcXXXXX**. You can watch [this video](#) for instructions on enrolling in the course. Once you are enrolled, you will find the content standards, homework assignments, links to the relevant sections of the textbook, and supplemental videos.

Quizzes and Exams:

The key concepts that you will learn in this class are summarized in a list of 20 standards at the end of the syllabus. Some weeks you will be given quizzes in class to assess your progress toward mastering these learning standards. You will also take three in-class exams and one cumulative final exam. All exams are closed book/notes. Additionally, calculators are NOT permitted on the cumulative final exam.

Exam 1	Intro & Standards X - X	Date
Exam 2	Standards X - X	Date
Exam 3	Standards X - X	Date
Final Exam	All Standards	Finals Week

Course Grades:

Your grade will be made up of the following categories:

Homework:	XX%
Quizzes:	XX%
In-Class Exams:	XX%
Final Exam:	<u>30%</u>
Total.....	100%

Grades are computed using the standard scale:

97%, 93% and 90%	<i>for grades of A+, A, and A-</i>
87%, 83%, and 80%	<i>for grades of B+, B, and B-</i>
77%, 73%, and 70%	<i>for grades of C+, C, and C-</i>
67% and 60%	<i>for grades of D+ and D</i>
Below 60%	<i>is an F</i>

Missed Assignments:

I understand that challenges can come up that can affect your ability to meet deadlines. You have been automatically granted **X** late passes in MyOpenMath that you can apply to extend a homework assignment by 48 hours ([here](#) is a video with instructions for applying late passes). If you miss an exam or a quiz, I will need to see documentation of an emergency before granting a makeup. You will receive a zero if you miss an exam or quiz without documentation.

Calculators:

Calculators will **not** be permitted for use on the final exam, so you are encouraged to work without a calculator throughout this course. You may want to review arithmetic operations such as multiplication, division, addition, and subtraction with integers and fractions. It is up to your instructor to decide whether you can use calculators on in-class exams and quizzes.

Help Outside of Class:

Learning takes time! You need to make time in your schedule to review your notes, complete homework assignments, and prepare for quizzes and exams. Your first level of support should come from your peers. I encourage you to work together by forming study groups and collaborating on homework. In addition to finding help from your classmates and coming to office hours, you can visit the [Math Lab](#) in Kiely Hall 331 or the [Learning Commons](#) in Kiely Hall 131 for free tutoring.

Academic Honesty:

Your work in this class must be your own! Copying someone else's quiz or exam, using a cellphone during exams, or communicating with another student during exams are all examples of academic dishonesty. You may form study groups to collaborate on homework and study for assessments, but the work submitted must be your own. The [CUNY Policy on Academic Integrity](#) states that academic dishonesty is punishable by penalties including failing grades, suspension, and expulsion. I take cheating very seriously. It is the fastest way to lose my respect for you as a student and to receive a zero on a quiz or exam.

Accommodations for Students with Disabilities:

The [Office of Special Services](#) (SPSV) is committed to supporting students with qualifying disabilities under the Americans with Disabilities Act (ADA) by providing reasonable accommodations to ensure equal access. If you have previously received accommodations due to a disability, believe you may have a disability, or have a temporary disability, please visit the office's website for further information on the assistance they can offer you. Accommodations are not retroactive, so you are encouraged to get registered sooner rather than later. You may also contact their office at qc.spsv@qc.cuny.edu or call 718-997-5870 during office hours for assistance as well.

Technical Support:

The [ITS Help Desk](#) provides technical support for students who need help with Queens College email, CUNY portal, Brightspace, and CUNYFirst. You may submit a ticket online or email support@qc.cuny.edu.

Schedule:

Tuesday/Thursday Classes

Class	Day	Date	Standards		Class	Day	Date	Standards
1	T	8/26	Standard 0		15	Th	10/23	Review/Catch-up
2	Th	8/28	Standard 0/1		16	T	10/28	Exam 2 (S6 – S10)
3	T	9/2	Standard 1/2		17	Th	10/30	Standard 12
4	Th	9/4	Standard 3		18	T	11/4	Standard 13
5	T	9/9	Standard 4		19	Th	11/6	Standard 14
6	Th	9/11	Standard 5		20	T	11/11	Standard 15
7	T	9/16	Review/Catch-up		21	Th	11/13	Standard 16
8	Th	9/18	Exam 1 (S1 – S5)		22	T	11/18	Standard 17
9	Th	9/25	Standard 6		23	Th	11/20	Review/Catch-up
10	T	9/30	Standard 7		24	T	11/25	Exam 3 (S11 – 12, S13 – 15a)
11	T	10/7	Standard 8		25	T	12/2	Standard 18
12	Th	10/9	Standard 9		26	Th	12/4	Standard 19
13	Th	10/16	Standard 10		27	T	12/9	Standard 20
14	T	10/21	Standard 11		28	Th	12/11	Review/Catch-up

Monday/Wednesday Classes

Class	Day	Date	Standards		Class	Day	Date	Standards
1	W	8/27	Standard 0		15	W	10/29	Standard 12
2	W	9/3	Standard 0/1		16	M	11/3	Review/Catch-up
3	M	9/8	Standard 1/2		17	W	11/5	Exam 2 (S7 – S10)
4	W	9/10	Standard 3		18	M	11/10	Standard 13
5	M	9/15	Standard 4		19	W	11/12	Standard 14
6	W	9/17	Standard 5		20	M	11/17	Standard 15
7	M	9/29	Standard 6		21	W	11/19	Standard 16
8	M	10/6	Standard 7		22	M	11/24	Standard 17
9	W	10/8	Review/Catch-up		23	W	11/26	Standard 18
10	T*	10/14	Exam 1 (S1 – S6)		24	M	12/1	Review/Catch-up
11	W	10/15	Standard 8		25	W	12/3	Exam 3 (S11 – 12, S13 – 15a)
12	W	10/22	Standard 9		26	M	12/8	Standard 19
13	F*	10/24	Standard 10		27	W	12/10	Standard 20
14	M	10/27	Standard 11		28	M	12/15	Review/Catch-up

* Due to the CUNY schedule, class # 10 will be held on Tuesday, 10/14 and class # 13 will be held on Friday, 10/24

Math 122 Content Standards

Introduction (Standard 0): You should be comfortable with the following prerequisite algebra skills. While we may review these topics in class as needed, we won't spend much time on them. For more support, read the sections from the textbook [*Intermediate Algebra, 2nd edition*](#) that are noted in parentheses after each skill.

- Sketching the graph of a line and writing its equation given the slope and y-intercept or two points on the line (3.2, 3.3)
- Dividing polynomials using long division (5.4).
- Factoring polynomials by factoring out the greatest common factor, factoring by grouping, factoring trinomials, and/or factoring the difference of squares (6.1 – 6.4)
- Simplifying rational expressions, including complex ones, and carrying out operations with rational expressions (7.1 – 7.3)
- Solving quadratic equations by factoring or using the quadratic formula (6.5, 9.3)
- Sketching the graph of a quadratic function in general form and identifying the vertex, axis of symmetry, intercepts, and minimum or maximum value (9.6)

The following content standards for Math 122 align with the textbook [*Precalculus, 2nd edition*](#) by Jay Abramson. Corresponding sections of the textbook are noted in parentheses after each standard.

Unit 1: Functions

Standard 1: I can identify functions represented in various ways (graphs, tables, sets of ordered pairs, or equations) and state their domain and range. I can identify whether a function is one-to-one and apply the vertical and horizontal line tests. I can evaluate functions and simplify the difference quotient for a function. (1.1)

Standard 2: I can find the domains of radical and rational functions. I can sketch the graphs of basic toolkit functions and state their domain and range. I can evaluate piece-wise functions and sketch their graphs. (1.2)

Standard 3: I can use a graph to identify the intervals where a function is increasing, decreasing, or constant and to identify the local and absolute maxima or minima. I can sketch graphs using transformations of basic toolkit functions, including vertical and horizontal shifts, reflections across the x -axis or y -axis, and compressions or stretches. (1.3, 1.5)

Standard 4: I can combine functions using algebraic operations or composition and state their domains. I can evaluate and decompose composite functions. (1.4)

Standard 5: I can verify inverse functions, find and evaluate inverses of one-to-one functions, and find the domain and range of inverse functions. I can restrict the domain of a function to make it one-to-one and use the graph of a function to graph its inverse. (1.7, 3.8)

Unit 2: Special Functions

Standard 6a: I can convert quadratic functions from general form to standard (vertex) form by completing the square, and I can sketch the graph of a quadratic function and identify its properties. I can solve application problems involving quadratic functions. (3.2)

Standard 6b: I can solve algebraic inequalities including quadratic, polynomial and rational inequalities.

Standard 7: I can state the degree and leading coefficient of a polynomial function and describe the end behavior of its graph. I can roughly sketch the graph of a polynomial function and identify the zeros with their multiplicities. (3.3, 3.4)

Standard 8: I can apply the Rational Zeros Theorem and Division or the Remainder Theorem to identify the zeros of a polynomial function. I can express a polynomial function as a product of linear/and or irreducible quadratic factors. (3.5, 3.6)

Standard 9: I can roughly sketch the graph of a rational function and identify the domain and range, intercepts, vertical and horizontal asymptotes, and removable discontinuities. (3.7)

Standard 10: I can evaluate exponential functions, including those with base e , and describe their properties. I can sketch the graph of an exponential function and identify the domain and range, intercept(s), and horizontal asymptote. I can solve compound interest problems where the interest is compounded periodically or continuously. (4.1, 4.2)

Standard 11: I can convert between exponential and logarithmic forms of equations. I can evaluate logarithmic functions, including the natural and common logarithms, and describe their properties. I can sketch the graph of a logarithmic function and identify the domain and range, intercept(s), and vertical asymptote. (4.3, 4.4)

Standard 12: I can use the laws of logarithms to expand, condense, and evaluate logarithmic expressions. I can apply the change-of-base formula to rewrite a logarithmic expression. I can solve logarithmic and exponential equations. (4.5, 4.6)

Unit 3: Trigonometry

Standard 13: I can apply the arc length formula, find the radian measure of an angle, convert between degrees and radians, and find coterminal and reference angles. I can use reference angles and the unit circle to evaluate the sine and cosine functions. (5.1, 5.2)

Standard 14: I can define the six fundamental trig functions. I can solve right triangles and evaluate trigonometric functions as ratios of the sides of right triangles. I can use reference angles, the signs of trigonometric functions in each quadrant, and special right triangles to evaluate all six trigonometric functions. (5.3, 5.4)

Standard 15: I can sketch the graphs of the sine and cosine functions and identify the period/frequency, amplitude, phase shift, and domain and range. I can sketch the graph of the tangent function and identify the domain and range. (6.1, 6.2)

Standard 16: I can use fundamental trigonometric identities to simplify trigonometric expressions and to verify new identities. (7.1)

Standard 17: I can apply the addition, subtraction, double-angle, and power-reduction formulas for sine and cosine to evaluate and simplify trigonometric expressions. (7.2, 7.3)

Standard 18: I can evaluate inverse trigonometric functions and state their domain and range. I can evaluate the composition of trigonometric functions with their inverses and use them to solve triangles. (6.3)

Standard 19: I can solve trigonometric equations, including equations requiring factoring and equations that incorporate identities. (7.5)

Standard 20: I can apply the Law of Sines and the Law of Cosines to solve triangles. (8.1, 8.2)