Hunter College
of the City University of New York
Department of Mathematics and Statistics

COURSE SYLLABUS
Math 12550.02 – Precalculus with Workshop
5 Hrs – 4 Credits
Fall 2024
Time: MTH 9:30AM – 11:20AM

Instructor (Lectures): Kwang Cha
Email: kwcha@hunter.cuny.edu
Office Hours: MTH 1:30-2:20 PM(by appointment)
Recitation Instructor:
E-mail:

Prerequisite:
A grade of B- or better in Math 10100/Math101EN or a grade of C or better in Math10100/Math101EN plus a grade of C or better in Math10150; or the appropriate score on the Hunter College Placement Test, or Math Milestone Placement Level 1.

After this course:

- Students receiving a B- or better in this course, can take register for Math150 or Math152.
- Students receiving a C/C+ in this course, must also register for Math140 as a co-requisite to Math150 or Math152.
- Note, if you do not need/intend to take calculus (Math150 or Math152) you should be take Math12400.
- If you are also taking CHEM102, please note that to take CHEM104, you need a grade of C or above in this course ***and*** in CHEM102.

Work expectation:
It is expected that you spend on average 10-15 hours each week outside of lecture, working on the homework or studying for this class.

Textbook: Required Lumen OHM (Online Homework Management) $35
Primary textbook: OpenStax *Precalculus*, Jay Abramson, et al (ISBN-10 1938168348)
https://openstax.org/details/precalculus

Secondary textbook: *Precalculus*, Stitz and Zeager
http://www.stitz-zeager.com/

Learning Outcomes:
Upon completion of the course you should be able to:

1) Identify the domain, range and properties of linear, polynomial, power, rational, radical, exponential, logarithmic, and trigonometric functions.

2) Find combinations, compositions and inverses of functions: algebraically, numerically, graphically, and in applied settings.

3) Analyze, graph, and apply transformations to for quadratic, polynomial, trigonometric, exponential, logarithmic and rational functions.

4) Identify the properties of polynomial and rational functions such as degree, maximum number of zeros, maximum number of turns, multiplicity of zeros, vertical and horizontal asymptotes, and end-behavior.

5) Solve polynomial, absolute value and rational inequalities.

6) Solve equations containing polynomial, rational, absolute value, exponential, logarithmic and trigonometric expressions.

7) Use the relationship between logarithmic and exponential functions to solve equations and problems involving growth/decay, and compound interest.

8) Convert between radians and degrees and use the unit circle to determine the six trigonometric functions of a given angle.

9) Graph the sine, cosine, and tangent functions using phase shifts, periodicity, and amplitude.

10) Verify trigonometric identities and use the sum, difference, double, and half-angle identities.

11) Write down the standard form for the circle, ellipse and hyperbola.

12) Write down the general term of a sequence and manipulate summation notation.

13) Sum up finite arithmetic and geometric series.

14) State and use the Binomial Theorem.

Attendance:
Attendance is mandatory for both lecture and recitation sessions. In-class quizzes, classwork, and participation are part of your overall grade.

Homework:
All homework is done on Lumen Learning's Online Homework System (OHM), there is an assignment for every section of the textbook, due about once a week. Always check OHM for upcoming assignments. OHM is a wonderful, modern, interactive resource, including features such as graphing applets and videos.

You can access the online homework system, in order to see the assignments for this course, and you must set up an OHM account here:

https://ohm.lumenlearning.com

The online homework system, costs $35 if purchased directly from Lumen, if purchased through the bookstore Akademos, the price may be more. **This is required to complete the course!** Select "enroll in a new course", you will be prompted to enter the course id and the enrollment key, which for this section is:

Course Id: 84820 Enrollment Key: Math12550Section02

*Please note that you will have to do the **"Prerequisite Material Review"** assignment with a score of 80%+ before any of the homework assignments open up.*

Quizzes:
There will be short in-class quizzes and/or assignments.

Recitation sessions:
Class-work must be completed and submitted during recitation sessions. Topics in recitation sessions will go in parallel to the lecture topics and will be tested on exams. Recitation topics will often "zoom in" on particular concepts mentioned during lecture. Topics may be covered during recitation, that are not covered in lecture, these topics (types of questions) will be on the exams. **This is why attendance and participation of recitation sessions is required**. Class-work completed during recitation will be grade as complete or incomplete. If you do not complete it during recitation, or have too many errors, your instructor may ask you to correct/complete it to receive full credit.

Exams:
There will be 4 exams AND a final exam. The final exam will count as 2 exams. Of these 6 scores, the lowest is dropped, and the remaining 5 parts are averaged to obtain the exam average.

Make Up Exam Policy:
All exams dates are preset in the beginning of the semester, because of room reservations. If you have an excused planned conflict (such as medical procedures, religious observances) please contact instructor at least 2 weeks prior to the exam date to schedule a make-up. If you missed an exam due to an unexpected event (illness, family emergency), contact your instructor immediately. In that event, your makeup exam will either be scheduled at the testing center (pending their availability) or your final exam score will be used in place of the missed exam, sat the instructor's discretion. The latter option can only be used for one exam for the semester.

Grading Policy:
Your final average is calculated as follows:

75% Exams
10% Recitation Class-work
10% Lumen OHM Homework
5% Lecture participation and quizzes

To receive an incomplete, you must have taken at least three of the in-class exams, have a C average on those exams, and have a legitimate excuse for missing the final exam. The letter grade is determined as follows:

Grade	Percent
A+	97.5-100
A	92.5-97.4
A-	90.0-92.4
B+	87.5-89.9
B	82.5-87.4
B-	80.0-82.4
C+	77.5-79.9
C	70.0-77.4
D	60.0-69.9
F	0-59.9

P/NC – grades
This course **DOES NOT** accept the P/NC grading system.

Tutoring:
Table tutoring and audiovisual materials are available at The Dolciani Mathematics Learning Center, located at the Silverstein Student Success Center 7th Floor Hunter East. Review materials to be prepared for this course are available for Math 125 on the Dolciani website www.hunter.cuny.edu/dolciani by clicking on Brush-Up Skills. (Certain tutoring services will be available remotely.)

Calculators:
A scientific calculator is allowed for the exams. Graphing calculators, cell phones, iPads, laptops, etc. are not permitted for the exams.

Lecture-by-lecture Outline

Lec. #	Sections (OpenStax Precalculus	Topics	Recitation Session (recitations on different days may come before or after indicated lectures.)
1	1.1 - Functions and Function Notation 1.2 - Domain and Range 1.3 - Rates of Change and Behavior of Graphs	Functions, graphing, increasing, decreasing, local max, local min, average rate of change	***Week 1:*** Algebra review, absolute value
2	1.4 - Composition of Functions 1.5 - Transformations of Functions 1.6 - Absolute Value Functions	Transformations of functions, combination of functions, composite functions,	
3	1.7 - Inverse Functions 2.1 - Linear Functions 2.2 - Graphs of Linear Functions 2.3 - Modeling with Linear Functions	Inverse functions, linear functions, slopes, graphs, parallel and perpendicular lines,	***Week 2:*** Computing the difference quotient, composing and decomposing functions;
4	3.1 - Complex Numbers 3.2 - Quadratic Functions	Complex numbers, quadratic functions, graphing quadratics	
5	3.3 - Power Functions and Polynomial Functions 3.4 - Graphs of Polynomial Functions 3.5 - Dividing Polynomial	Polynomial functions and graphs, long division of polynomials, remainder and factor theorems, end behavior of polynomials	***Week 3***: Graphing review, piecewise functions, quadratic functions
6	3.6 - Zeros of Polynomial Functions	Fundamental Theorem of Algebra, linear factorization theorem, zeros of polynomial functions	
7	3.7- Rational Functions* (*Material on Exam 2, not on Exam 1)	Rational functions, graphs, asymptotes,	***Week 4:*** Classifying roots of polynomials using the linear factorization theorem
8	1.1-1.7, 2.1-2.3, 3.1-3.6	Review Exam 1	***Week 5:*** Graphing rational functions
9		**EXAM 1**	
10	Supp (Stitz-Zeager): SZ - 2.4 - Quadratic Inequalities SZ - 3.3 - Polynomial Inequalities SZ - 4.3 - Rational Inequalities 4.1 - Exponential Functions 4.2 - Graphs of Exponential Functions	polynomial and rational inequalities Exponential functions	
11	4.3 - Logarithmic Functions 4.4 - Graphs of Logarithmic Functions 4.5 - Logarithmic Properties 4.6 - Exponential and Logarithmic Equations	Properties of logarithms, and logarithmic equations	
12	4.6 - Exponential and Logarithmic Equations (con't) 4.7 - Exponential and Logarithmic Models	Exponential equations, exponential growth a decay,	***Week 6:*** Polynomial and Rational Inequalities and logarithm properties (2 sessions)
13*	5.1 – Angles 5.2 - Unit Circle: Sine and Cosine Functions 3,7 (*Material on Exam 3, not on Exam 2)	Angles and radian measure, unit circle, right angle trigonometry, trigonometric functions	
14	Supp, 4.1-4.7	Review Exam 2	***Week 7:*** Conversion between degrees and radians, unit circle review, common trig function value
15		**EXAM 2**	
16	5.3 - The Other Trigonometric Functions	Graphs of trigonometric	***Week 8:*** Common

	5.4 - Right Triangle Trigonometry 6.1 - Graphs of the Sine and Cosine Functions	functions	trigonometric identities
17	6.2 - Graphs of Other Trigonometric Functions 6.3 - Inverse Trigonometric Functions	Inverse trigonometric functions, applications; verifying trigonometric identities,	
18	7.1 - Solving Trigonometric Equations with Identities 7.2 - Sum and Difference Identities	Sum/difference/double angle/half angle formulas;	***Week 9:*** Practice with sum/difference/double-angle/half-angle identities
19	7.3 - Double-Angle, Half-Angle, and Reduction Formulas 7.5 - Solving Trigonometric Equations	Trigonometric equations	
20	5.1-5.4, 6.1-6.3, 7.1-7.3, 7.5	Review Exam 3	***Week 10:*** Linear and nonlinear systems, intersection of curves (9.1, 9.3)
21		**EXAM 3**	
22	(Supp) – Circles 10.1 - The Ellipse 10.2 - The Hyperbola	Distance, circles, ellipses, hyperbolas	***Week 11:*** Completing the square; standard forms
23	11.1 - Sequences and Their Notations 11.2 - Arithmetic Sequences 11.3 - Geometric Sequences	Sequences, indexing, factorials	***Week 12:*** Writing the general term of a sequence;
24	Supp (Stitz-Zeager): SZ - 9.3 - Summation Notation 11.4 - Series and Their Notations	Sigma summation notation, re-indexing series, algebraic operations; Arithmetic and geometric series	
25	11.6 - Binomial Theorem	Binomial coefficients , the Binomial Theorem	***Week 13:*** Practice with summation notation Arithmetic and Geometric Series; Binomial coefficients
26	10.1-10.2, 11.1-11.4, 11.6	Review Exam 4	
27		**EXAM 4**	***Week 14:*** *Final Exam Review*
28		Final review	
	Final Exam week **12/16/2024 – 12/20/2024**	**FINAL EXAM**	

Academic Integrity:
Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures.

Disability:
In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical and/or Learning) consult the Office of AccessABILITY located in Room 1214B Hunter East to secure necessary academic accommodations. For further information and assistance please call (212-772-4857)/TTY (212-650-3230).

Hunter College Policy on Sexual Misconduct:
"In compliance with the CUNY Policy on Sexual Misconduct, Hunter College reaffirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationships. Students who have experienced any form of sexual violence on or off campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College.

a. Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline (646-610-7272) or their local police precinct, or contacting the College's Public Safety Office (212-772-4444).

b. All Other Forms of Sexual Misconduct: Students are also encouraged to contact the College's Title IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or 212-650-3262) or Colleen Barry (colleen.barry@hunter.cuny.edu or 212-772-4534) and seek complimentary services through the Counseling and Wellness Services Office, Hunter East 1123.
CUNY Policy on Sexual Misconduct Link: http://www.cuny.edu/about/administration/offices/la/Policy-on-SexualMisconduct-12-1-14-with-links.pdf