

MAT123 Precalculus Fall 2022

Welcome to Precalculus! This is an introductory course designed primarily for science, business, engineering, and technical majors to prepare for the regular calculus sequences. I hope that this course is useful for your future studies.

Instructor: Young-Seon Lee, PhD

Class Hour: M/W 5:00 pm ~ 6:20 pm

Office: Academic Building B609

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Office Hour: 11:00 am – 12:30 pm (Thursday), 1:00 pm – 2:30 pm (Wednesday)
5:05 pm ~ 6:35 pm (Tuesday and Thursday)
B609 or virtual (Zoom), particular times are possible by arrangement

TA and TA office hours: TBA

Course Description: We will study functions and their properties with a special emphasis on polynomial, rational, logarithmic, exponential, and trigonometric functions. We will also highlight the use of mathematical concepts, which not only allows for a deeper understanding but allows students to express themselves accurately. All of the things combined allow for success in a calculus course.

The goal of this course: you have a proper background to take calculus at Stony Brook. This means that we will need to accomplish several things:

- Ensure that you have fluency with a variety of topics, such as trigonometry, exponentials, and logarithms, algebraic functions (polynomials and rational functions).
- Ensure that you are comfortable and conversant with the underlying concepts such as functions, domain, range, inverse functions, functional composition, and so on.
- Ensure that you have mastered the various means of manipulating functional and algebraic expressions, solving basic equations, and their graphical representations.

- Be able to apply the above to problems both within and outside of mathematics. Part of this is a deeper understanding of functions, whether viewed as graphs, tables, or formulae. Fluency in understanding the language of mathematics is essential for success in the sciences or engineering.

Prerequisite: C or better in MAP 103 or level 3 on the mathematics placement exam. (Prerequisite must be met within one year prior to beginning the course.)

Textbook: Precalculus by Jay Abramson

<https://openstax.org/details/books/precalculus> (Free download)

Supplementary Textbook: Precalculus by David H. Collingwood, David Prince, and Matthew M. Conroy

<https://open.umn.edu/opentextbooks/textbooks/176> (Free download)

Homework policy:

1. Homework will be assigned once a week on the blackboard.
2. The lowest homework grade will be dropped before the final grading.
3. Submit one file of your homework in pdf format on the blackboard. If you are not able to submit it via the blackboard, you should submit it to me by email.
4. Organize your solutions in the same order as the problems listed.
5. You **must** write neatly and legibly so that TA can recognize your writing.
6. **Late homework will NOT be graded for credit!**
7. Collaboration with other classmates is encouraged in this course. Also, you may ask homework questions during office hours with TAs, or with me. But write-ups must be done independently.
8. Show all your work by writing all the steps to arrive at the solutions. A correct answer without the steps will receive minimal credit. This is good practice for what will be expected on exams.

Homework Guidelines:

1. Do **not** expect that you are able to solve every single problem on your own; instead, you are encouraged to discuss questions with each other
2. Download or print homework problems on the blackboard.
3. Write your solutions in blank (or ruled) papers or use an electronic pen to write in a file
4. Clearly write your name, the course number (MAT123), and the assignment number (HW#) on the top of the first page of each homework. For example, you can write 'MAT123 HW1'.

5. Scan your homework papers with your phone by using free scanner apps (Download 'Adobe scan' for both iOS and Android or 'CamScanner' for Android users or 'Scannable' for iOS users), and change it to a 'pdf' file. Scan the multiple pages of your homework and save into one pdf file format.
6. Save the pdf file of your homework as '**Your-First-Last Name-MAT123-HW1.pdf**'.
7. Working through problems is crucial to understanding math. Online practice problems will be available after each week of lectures so you can get practice with the material.

Exams: There are two midterms and one comprehensive final exam. No make-up exams will be allowed. Calculators are **NOT** allowed in the exams. Every exam is closed book.

- Exam 1: TBA
- Exam 2: TBA
- Final Exam: TBA

Quizzes: I will give a 10-15 minutes Quiz once a week. **No** make-up quizzes will be allowed.

Grading: Your course grade will be determined by the following items:

Attendance = 5%, where attendance includes attending classes and class participation

Homework = 15%, Quiz = 15%, Exam 1 = 20%, Exam 2 = 20%, Final Exam = 25%

The final letter grade will be determined by the following 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%

Attendance: You are required to attend every class regularly. The percentage of participation in each class should be more than 50% to be considered attending each class.

Attendance Policy

- (1) All students of SUNY Korea are required to attend every class.
- (2) Unexcused absences will affect seriously the students' final grades in the course.
- (3) If a student has over 20% unexcused absence, the student's final course grade will be an F.

- (4) Students should report the reason for absence to the instructor in advance, or immediately after the absence.
- (5) When a student excuses his/her absence, the student must provide documentation of the reason for the absence to the instructor.
- (6) The instructor of the course reserves the right to excuse absences.
- (7) The course instructor may excuse the absence if the submitted documentation fulfills the conditions below.
 - i) Extreme emergencies (e.g. death in the family)
 - ii) Severe medical reasons with a doctor's note (Not a slight illness)
 - iii) Very important events (e.g. national conference, official school event)
- (8) At the end of the semester, the course instructor should submit a copy of the attendance sheet to the Academic Affairs Office.

Absence due to officially approved trips: The person responsible for a student missing class due to a trip should notify the instructor of the departure and return schedule in advance of the trip. The student may not be penalized and is responsible for the material missed.

Concerns: If you have ANY problem related to the course, please feel free to discuss it with us. We truly want you to succeed in this course and will do whatever we can to help resolve the problem. You can talk to me before or after class, during office hours, or via email.

Students with Disabilities:

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact One-Stop Service Center, Academic Building A201, (82) 32-626-1117. They will determine with you what accommodations if any, are necessary and appropriate. All documentation regarding your personal information will be kept confidential.

Academic Integrity:

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of

Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>

Critical Incident Management:

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.

Conduct:

Stony Brook University expects students to maintain standards of personal integrity that are in harmony with the educational goals of the institution; to observe national, state, and local laws and University regulations; and to respect the rights, privileges, and property of other people. Faculty are *required* to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.

Course Evaluations

Stony Brook University values student feedback in maintaining the high-quality education it provides and is committed to the course evaluation process, which includes a mid-semester assessment as well as an end-of-the-semester assessment, giving students a chance to provide information and feedback to an instructor which allows for development and improvement of courses. Please click the following link to access the course evaluation system: <http://stonybrook.campuslabs.com/courseeval/>

Tentative Class Schedule:

MAT123

Fall 2022

Week	Date (M/W)	Topics	Relevant Sections
1	8-29, 8-31	Administrative material, Functions and graphs, Composition of functions, Transformations	1.1, 1.2, 1.4, 1.5
2	9-5, 9-7	Inverse Functions, Linear equations, and graphs Modeling with linear functions,	1.7, 2.1, 2.2, 2.3
3	9-14	Complex numbers, Quadratic functions	3.1, 3.2
4	9-19, 9-21	Power functions and Polynomial functions, Graphs of polynomial functions, Dividing Polynomials, Zeros of Polynomial functions	3.3, 3.4, 3.5, 3.6
5	9-26, 9-28	Rational functions, Inverses, and Radical functions modeling using a variation	3.7, 3.8, 3.9
6	10-4 (substitute of 9-12), 10-5	<i>Exam 1 Review; Exam 1</i>	
7	10-12	Exponential functions, Graphs of Exponential Functions, Logarithmic functions, Graphs of Logarithmic functions	4.1, 4.2 4.3, 4.4
8	10-17, 10-19	Logarithmic Properties, Exponential and Logarithmic Equations, Exponential and Logarithmic Models, Fitting Exponential Models to Data	4.5, 4.6 4.7, 4.8
9	10-24, 10-26	Angles, Unit Circle: Sine and Cosine Functions, The other Trigonometric Functions, Graphs of the Sine and Cosine Functions,	5.1, 5.2, 5.3, 6.1
10	10-31, 11-2	Graphs of the Other Trigonometric Functions, Inverse Trigonometric Functions, Solving Trigonometric Equations with identities	6.2, 6.3 7.1
11	11-7, 11-9	<i>Exam 2 Review, Exam 2</i>	

12	11-14, 11-16	Sum and Difference Identities, Double Angles and Half Angles, Sum-to-Product and Product-to-sum formulas	7.2, 7.3, 7.4
13	11-21, 11-23	Solving trigonometric equations, Modeling with Trigonometric Equations, Law of Sines/Cosines	7.5, 7.6, 8.1
14	11-28, 11-30	Law of Cosines	8.2 8.1, 8.2
15	12-5, 12-7	Final Exam Review	
Final Exam: TBA			