AMS151-90   Applied Calculus I (Section 1)   Spring 2022

Welcome to Applied Calculus I! This is an introductory course designed primarily for science, business, engineering, technical majors to provide students the fundamental concepts of differential calculus and the fundamental theorem of calculus. I hope that this course is useful for your future studies.

Instructor: Young-Seon Lee, PhD

Class Hour: M/W 3:30 ~ 4:50 pm

Office: Academic Building B609

Phone: 032-626-1917

E-mail: young-seon.Lee@stonybrook.edu

Office Hour: 1:30 pm – 3:00 pm (Monday through Thursday)
　　　　　　5:00 pm ~ 6:30 pm (Tuesday and Thursday)
　　　　　　B609 or virtual (Zoom), particular times are possible by arrangement

TA and TA office hours:
TBA

Course Description, and Textbooks

Course Title: Applied Calculus I

Course Description: Review of functions and their applications; analytic methods of differentiation; interpretations and applications of differentiation; introduction to integration. Intended for CEAS majors. Not for credit in addition to MAT 125 or 126 or 131 or 141.

Prerequisite: B or higher in MAT 123 or level 5 on Math Placement Test.

Textbooks:

(1) **"Calculus Early Transcendentals"** by James Stewart, 8th or 9th ed.

(2) "Calculus (Single Variable)", by Hughes-Hallett, Gleason, McCallum, et.al., 6th ed (International Student Version) or 7th Asia ed

The goal of this course

o   Demonstrate how use the behavior of common mathematical functions model important real-world situations.

* linear functions;

* exponential functions;

* logarithmic functions;

* trigonometric functions.

o   Demonstrate a conceptual and technical understanding of the derivative, including:

* different mathematical and applied settings where the derivative represents a rate of change;

* the technical definition of the derivative and using this definition to calculate the derivative of simple functions.

o   Demonstrate proficiency with the rules for differentiation of.

* power function and polynomials;

* exponential and logarithmic functions;

* trigonometric functions and inverse tangent;

* products and quotients of functions;

* compositions of functions using the chain rule.

o   Demonstrate facility in applying differentiation to problems in:

* physics and engineering;

* economics and business;

* biomedical sciences.

o   Build mathematical models for optimization problems and solve them.

* maximization problems, with and without side constraints

* minimization problems, with and without side constraints.

o   Demonstrate a conceptual understanding of integration, including

* integration as the inverse operation to differentiation;

* integration as the area under the graph of a function;

* the definite and infinite integral.

Course Structure

This course consists of two lectures each week lasting 75 min each.

Methods for Assessment of Learning Outcomes

The expected learning outcomes for the course will be assessed through grading activities that include homework, attendance, exam, quiz.

Homework policy:

1. Homework will be assigned once a week on the blackboard.
2. The lowest one homework grades will be dropped before the final grading.
3. Submit one file of your homework in the pdf format on the blackboard. If you are not able to submit via the blackboard, you should submit to me by email.
4. Organize your solutions in the same order as the problems were 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 (AMS151), and the assignment number (HW#) on the top of the first page of each homework. For example, you can write 'AMS151 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-AMS151-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: **April 1 (Friday) 7:00 – 8:20 pm**

Exam 2: **April 29 (Friday) 7:00 – 8:20 pm**

Final Exam: **June 13 (Monday) 6:30 PM – 9 PM**

Quizzes: 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%, 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. In online-classes, class attendance will be recorded automatically in the zoom session. The percentage of participation of 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 grade in the course.

(3) If a student has over 20% unexcused absence, the students final course grade will be an F.

(4) Students should report the reason of 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 doctors note (Not a slight illness)

iii) Very important events (e.g. national conference, official school event)

(8) At the end of 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.

Disability Support Services (DSS) Statement:

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 in 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.

Cheating policy:

The grade of Q is assigned to a student found guilty of academic dishonesty. The Q remains on the transcript and is computed in your G.P.A. as a grade of F. Furthermore, a note describing the academic dishonesty is attached to your permanent records with the university.

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:

AMS151 Applied Calculus 1   **Spring 2022**

We ek	Date	Topics	
1	Feb 21, Feb 23	Administrative material Functions and Models: Exponential and logarithmic functions, Trigonometric functions, Inverse trigonometric functions	
2	Feb 28, Mar 2	The Tangent and velocity problems, The limit of a function Calculating Limits Using the Limit Laws	
3	Mar 7	The precise definition of a limit	
4	Mar 14, Mar 16	Continuity, and Limits at infinity; Horizontal Asymptotes Derivatives and Rates of Change, The Derivative as a Function,	
5	Mar 21, Mar 23	Derivatives of Polynomials and Exponential Functions The Product and Quotient Rules, Derivatives of Trigonometric Functions	
6	Mar 28, Mar 30	The Chain Rule, The Implicit Differentiation **Midterm 1 Review**	**Exam 1, April 1**
7	Apr 4, Apr 6	The Implicit Differentiation, Derivatives of Inverse Trigonometric Functions, Derivatives of Logarithmic Functions, Rates of Change in the Natural and Social Sciences	
8	Apr 11, Apr13	Rates of Change in the Natural and Social Sciences Linear Approximations and Differentials	
9	Apr 18, Apr 20	Hyperbolic Functions, Maximum and Minimum Values,	
10	Apr 25, Apr 27	The Mean Value Theorem **Midterm 2 Review**	**Exam 2, April 29**
11	May 2, May 4	How Derivatives Affect the Shape of a Graph Optimization Problems,	

12		Indeterminate Forms , L'Hospital's Rule Newton's Method	
	May 11	Newton's Method	
13	May 16, May 18	Antiderivatives, Introduction to Integrals: Areas and Distances	
14	May 23, May 25	The Definite Integral, Fundamental theorem of calculus,	
15	May 30, June 7	Indefinite Integrals and the Net Change Theorem **Final Exam Review**	

Final Exam: June 13 (Monday) 6:30 pm ~ 9:00 pm