Framingham State University

MATH 219 Calculus I

Course Information:

Semester : May 30, 2022 – July 1, 2022
Credit 4
Teaching Hours : 50 Hours
Location : Online
Professor : Wanchunzi Yu
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Course Catalog Description

A study of functions, limits, continuity, the derivative, rules of differentiation of algebraic, trigonometric, exponential and logarithmic functions, applications of differentiation, definite and indefinite integrals, the Fundamental Theorem of Calculus, applications of integration, and first-order differential equations.
Prerequisite: Completion of MATH 180 Precalculus with a minimum grade of C (2.00) or better, or a satisfactory score on the mathematics placement examination.

Textbook

Calculus – Early Transcendentals (With **WebAssign**), 8th edition, by James Stewart.
Students must purchase access to WebAssign, but a hard copy of the text is **optional**. Access to WebAssign includes access to an electronic version of the textbook.

Topic Calendar

No.	Sections Covered (Tentative)	Week
1	1.1 Four Ways to Represent a Function	Week 1
2	1.2 Mathematical Models: A Catalog of Essential Functions	Week 1
3	1.3 New Functions from Old Functions	Week 1
4	1.4 The Tangent and Velocity Problems	Week 1
5	1.5 The Limit of a Function	Week 1
6	1.6 Calculating Limits Using the Limit Laws	Week 1
7	1.7 The Precise Definition of a Limit	Week 1
8	1.8 Continuity	Week 1
9	2.1 Derivatives and Rates of Change	Week 1

10	2.2 The Derivative as a Function	Week 1
11	2.3 Differentiation Formulas	Week 1
12	2.4 Derivatives of Trigonometric Functions	Week 1
13	2.5 The Chain Rule	Week 1
14	2.6 Implicit Differentiation	Week 2
15	2.7 Rates of Change in the Natural and Social Sciences	Week 2
16	2.8 Related Rates	Week 2
17	2.9 Linear Approximations and Differentials	Week 2
18	3.1 Maximum and Minimum Values	Week 2
19	3.2 The Mean Value Theorem	Week 2
20	3.3 How Derivatives Affect the Shape of a Graph	Week 2
21	3.4 Limits at Infinity; Horizontal Asymptotes	Week 2
22	3.5 Summary of Curve Sketching	Week 2
23	3.6 Graphing with Calculus and Calculators	Week 2
24	3.7 Optimization Problems	Week 2
25	3.8 Newton's Method	Week 3
26	3.9 Antiderivatives	Week 3
27	4.1 Areas and Distances	Week 3
28	4.2 The Definite Integral	Week 3
29	4.3 The Fundamental Theorem of Calculus	Week 3
30	4.4 Indefinite Integrals and the Net Change Theorem	Week 3
31	4.5 The Substitution Rule	Week 4
32	5.1 Areas Between Curves	Week 4
33	5.2 Volumes	Week 4
34	5.3 Volumes by Cylindrical Shells	Week 4
35	5.4 Work	Week 4
36	5.5 Average Value of a Function	Week 4
37	6.1 Inverse Functions	Week 4
38	6.2 Exponential Functions and Their Derivatives	Week 4

39	6.3 Logarithmic Functions	Week 5
40	6.4 Derivatives of Logarithmic Functions	Week 5
41	6.5 Exponential Growth and Decay	Week 5
42	6.6 Inverse Trigonometric Functions	Week 5
43	6.7 Hyperbolic Functions	Week 5
44	6.8 Indeterminate Form and l'Hospital's Rule	Week 5
45	9.1 Modeling with Differential Equations	Week 5
46	9.2 Direction Fields and Euler's Method	Week 5
47	9.3 Separable Equations	Week 5

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Course Outcomes

By the end of this course, you will be expected to:

- Calculate limits, derivatives, and indefinite integrals of a single variable
- Apply the definition of the derivative to differentiate functions of a single variable
- Understand derivatives of power, hyperbolic, exponential, logarithmic, trigonometric and inverse trigonometric functions
- Utilize the chain rule to find derivatives of composite functions
- Find maxima and minima, critical points and inflection points of functions
- Be able to sketch graphs, find asymptotes, and find tangents
- Understand the Fundamental Theorem of Calculus and the techniques of integration

Homework

Homework problems are online, we will use the online resource WebAssign for weekly homework assignments and tutorial videos. Make sure to select the correct course, the url for this section link.

Please refer to WebAssign Instruction on the blackboard for more details. Written homework may also be collected.

NO LATE HOMEWORK WILL BE ACCEPTED.

Attendance

Attendance for the course will be the **Watch It/Lecture** videos with questions on WebAssign. For each section, videos with questions are available on WebAssign. Please complete the **Watch It/Lecture** to receive the full attendance credits.

Midterm Exam

You will take 1 midterm exam during the winter semester. Exam is given online, time will be limited to class time. Each will involve a mix of mechanical skills and conceptual reasoning. The best possible preparation for them is regular attendance and completion of assigned homework. You may have 1 page 8x11 of hand written notes (1 side only) on each exam, including a final exam, specific problems solved cannot be included. Make-up exams are only given in case of documented emergencies.

Final Exam
The final exam will take place on online on Blackboard. The official FSU Final Exam Schedule is here.

Grading
Your final course grade will be determined by
Homework: 30%
Attendance: 30%
Midterms: 20%
Final Exam: 20%

Grading Scale:
Letter grades will be assigned as follows:

A	93-100	C	73-76
A-	90-92	C-	70-72
B+	87-89	D+	67-69
B	83-86	D	63-66
B-	80-82	D-	60-62
C+	77-79	F	below 60

Workload Expectations
For our accreditation, it is essential that all Framingham State University credit courses follow the Federal Definition of credit hour: for every one hour of classroom or direct faculty instruction, a minimum of two hours of out-of-class student work is required. Since the summer courses meet for two contact hours daily (10 contact hours of classroom time weekly), the expectation is that students spend 20 hours per week doing out-of-class work. For the five week 4-credit hour course, this reflects 50 hours of classroom time and 100 hours of out-of-class time since the credit hour is defined as 50 minutes.

Academic Honesty Policy

Framingham State University's policy regarding academic honesty (taken from the undergraduate catalog):
"Integrity is essential to academic life. Consequently, students who enroll at Framingham State University agree to maintain high standards of academic honesty and scholarly practice. They shall be responsible for familiarizing themselves with the published policies and procedures regarding academic honesty. In addition to the required statement, faculty members shall, at their discretion, include in the course syllabus additional statements relating the definition of academic honesty to their courses Infractions of the Policy on Academic Honesty include, but are not limited to: 1. Plagiarism: claiming as one's own work

the published or unpublished literal or paraphrased work of another. It should be recognized that plagiarism is not only academically dishonest but also illegal; 2. Cheating on exams, tests, quizzes, assignments, and papers, including the giving or acceptance of these materials and other sources of information without the permission of the instructor(s); 3. Unauthorized collaboration with other individuals in the preparation of course assignments; 4. Submitting without authorization the same assignment for credit in more than one course; 5. Use of dishonest procedures in computer, laboratory, studio, or field work; 6. Misuse of the University's technical facilities (computer machinery, laboratories, media equipment, etc.), either maliciously or for personal gain; 7. Falsification of forms used to document the academic record and to conduct the academic business of the University."

U.S. COPYRIGHT LAW

"This course website may contain copyrighted materials that are used in compliance with the U.S. Copyright Law. Under that law, materials may not be saved to your computer, revised, copied, or distributed without permission. They are to be used in support of instructional activity as part of this course only and shall be limited to the duration of the course, unless otherwise specified by the instructor or owner of the material. You may only download or print materials at the direction of your instructor who knows which materials are copyrighted and which are not."

Math Services

Math Services provides free tutoring online.

* This syllabus may be amended during the semester.