East China Normal University
International Summer Session

MAT11 Calculus I

Term: July 5th –August 8th, 2018
Instructor: Bernard Brooks
Home Institution: Rochester Institute of Technology
Office hours: 12:40-1:50 Monday and Wednesday
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Teaching Assistant: TBD

Course Description

This course introduces differential and integral calculus for functions of a single variable, emphasizing techniques and applications as well as major theorems such as the fundamental theorem of calculus. Topics include limits, derivatives, extrema, integrals, and the fundamental theorem, each motivated and illuminated by applications. This course is a standard first semester course in calculus.

Course Overview

The course emphasizes the understanding of concepts, and using them to solve physical problems. The course covers techniques and applications of differentiation. Some integration techniques are introduced including substitution. This is a standard first calculus course that will prepare the student both for a second semester of calculus and a calculus based physics course.

Course Goals:

A student who satisfactorily completes this course should:
1. know calculus definitions, concepts, rules, vocabulary, and mathematical notation.
2. be able to develop logical arguments and communicate them in written form.
3. have an understanding of the usage and application of mathematical abstraction.
4. have the necessary manipulative skills required for solving problems in calculus.
5. gain knowledge and appreciation of calculus as a tool in solving applied problems.

Required Text

(M. Weir and J. Hass, Thomas' Calculus: Early Transcendentals, 12th edition, Addison-Wesley, (Pearson,)Reading, MA. ISBN: 978-0-321-58876-0
On Coursesmart as eText: ISBN-13 9780321640932

Academic Honesty

Students are expected to maintain high standards of academic honesty. Specifically, unless otherwise directed by the professor, students may not consult other students, books, notes, electronic devices or any other source, on examinations. Failure to abide by this may result in a zero on the examination, or even failure in the course.

Course Hours

The course has 25 class sessions in total. Each class session is 110 minutes in length, for a total of 2750 minutes of in-class time. The course meets from Monday to Friday from July 5 to August 8. ECNU awards 4 credits for this course. Different universities may count course credits differently. Consult officials at your own home institution.

Attendance

Summer school is very intense and to be successful, students need to attend every class. Occasionally, due to illness or other unavoidable circumstance, a student may need to miss a class. ECNU policy requires a medical certificate to be excused. Any absence may impact on the student's grade. Moreover, **ECNU policy is that a student who has more than 3 absences will fail the course. Arriving late or leaving early will count as a partial absence.**

Grading Policy

ECNU awards grades of A, A-, B+, B, B-, C+, C, D, and F. Most colleges and universities do not award transfer credit for grades of D or F.

In this course, grading will be based on the following:
- 20% **Daily** homework quizzes
- 30% Midterm exam
- 40% Final exam
- 10% Classroom engagement (attendance, attention, participation in discussions)

General expectations:

Students are expected to:

- *Attend all classes and be responsible for all material covered in class and otherwise assigned. Any unexcused absence may impact a student's grade. Moreover, ECNU policy is that a student who has more than 3 absences will fail the course. Arriving late or leaving early will count as a partial absence.*

- *Complete the day's required reading and assignments* before *class*

- *Review the previous day's notes before class; make notes about questions you have about the previous class or the day's reading*
- *Participate in class discussions and complete required written work on time.*
- *Refrain from texting, phoning or engaging in computer activities* unrelated *to class during class Students who do not do this will be asked to leave the class*

- *While class participation is welcome, even required, you are expected to refrain from private conversations during the class period.*

Course Schedules

The planned schedule sketched out below may be modified to suit the interests or abilities of the enrolled students or to take advantage of special opportunities or events that may arise during the term.

WEEK ONE: July 5-11

Thurs: Intros, function algebra: shifting, scaling, composition	
Fri: Exponential, and Hyperbolic Trig,	quiz on Thurs. material
Mon: Inverse functions (logarithms arc trig functions)	quiz on Fri. material
Tues: Rates of change and tangent lines	quiz on Mon. material
Wed: Properties of limits and their use in calculations,	quiz on Tues. material

WEEK TWO: July 12-18

Thurs: Continuity, limits at infinity,	quiz on Wed. material
Fri: Infinite limits and asymptotes, tangents	quiz on Thurs. material
Mon: Product, quotient rules	quiz on Fri. material
Tues: Chain rule	quiz on Mon. material
Wed: Implicit differentiation	quiz on Tues. material

WEEK THREE: July 19-25

Thurs: inverse functions	quiz on Wed. material
Fri: Linear approx., differentials midterm review	quiz on Thurs. material
Mon: **Midterm Examination (35%)**	
Tues: review the midterm, Diff. applications, rates of change	
Wed: concavity, curve sketching	quiz on Tues. material

WEEK FOUR: July 26-Aug. 1

Thurs: Related rates	quiz on Wed. material
Fri: Extreme values, critical pts, Fermat's thm, Monotonicity	quiz on Thurs. material
Mon: 1st derivative test, Indeterminate forms (l'Hospital's)	quiz on Fri. material
Tues: Optimization, Rolle's, MVT thm,	quiz on Mon. material
Wed: Newton's method, Antiderivatives	quiz on Tues. material
LAST DAY TO DROP CLASSES	

WEEK FIVE: Aug. 2-8

Thurs: Integration: Estimating area, Sigma (Riemann),	quiz on Wed. material
Fri: (In)definite integrals, Fundamental Thm of Calculus	quiz on Thurs. material
Mon: Substitution and other integration techniques	quiz on Fri. material
Tues: logarithm as integral, summary and exam review	quiz on Mon. material
Wed: **Final Cumulative Examination (45%)**	