Shanghai University of Finance & Economics

2020 Summer Program

MATH 111 Calculus 1

Course Outline

Term: June 1 – June 26, 2020

Class Hours: 10:00-11:50 (Monday through Friday)

Course Code: MATH 111

Instructor: Professor Vadim Olshevsky

Home Institution: University of Connecticut

Office Hours: TBA and by appointment

Email: olshevsky@gmail.com

Credit: 4

Class Hours: This course will have 52 class hours, including 32 lecture hours, professor 8 office hours, 8-hour TA discussion sessions, 4-hour review sessions.

Course Description:

Calculus 1 is the first of a sequence of three courses in calculus covering basic calculus. Topics to be covered include a review of functions, limits, differentiation, applications of the derivative, and introduction of integration.

Course Objectives:

The objective of the course is to build an understanding of the basic principles and applications of differential and integral calculus through lectures, homework, discussion and exams.

Required Textbooks:

Calculus: Calculus: Early Transcendentals, 8th Edition, by James Stewart with WebAssign Access Code. Can be purchased directly at
https://www.cengage.com/c/calculus-early-transcendentals-8e-stewart/9781337771498#compare-

buying-options

It is important that you purchase both the textbook and the WebAssign code, the latter is necessary for the homework assignments.

Homework:

There will be online WebAssign homework assignments for each section of the text. Each assignment will be made available on several days before the section is covered in class. The due date for each assignment will be set by your instructor and will generally be two or three days after the material is covered in class. You will get five attempts for each question.

Grading & Evaluation	Grade	Range
Attendance and participation: 10%	A	90-100
Homework: 30%	B	80-89
Midterm: 30%	C	70-79
Final: 30%	D	60-69
	F	0-59

Course Schedule:

Week1 Functions: definition, representation, types, operations, mathematical models. Limits and continuity: limit of a function, the limit law, continuity, definition of a limit. Derivatives: Definition, rates of change

Week2 Derivatives: Differentiation rules: polynomial, trigonometric, inverse, logarithmic, exponential, implicit functions. The product, quotient, and chain rules.

Week3 Applications of differentiation: Higher derivatives, linear approximation and differentials, minima and maxima, the Mean Value Theorem, L'Hôpital's rule, limits at infinity and asymptotes, curve sketching. Applications of differentiation: Applied optimization

Week4 problems Integrals (Anti-derivatives, approximating areas, the definite integral). Integrals: The Fundamental Theorem of Calculus, substitution rule.

Detailed Course Outline:
The course outline is tentative and I will modify accordingly depending on the pace of the class.

Week	Date	Chapter	Topic
	06/01/2019		1.1 Definition and representation of functions
		1 Functions	1.2 Types of functions

			1.3 Operations on functions (Composition, inverse)
			1.4 Mathematical models
1	06/02/2019	**2 Limits and continuity**	2.1 The limit of a function
			2.2 The limit laws
			2.3 Continuity
	06/03/2019	**3 Derivatives**	2.4 Precise definition of a limit
			3.1 Definition of a derivative
			3.2 Derivatives as rates of change
	06/04/2019		3.3 Differentiation rules (constants and polynomials)
			3.4 The chain, product, and quotient rules
	06/08/2019		3.5 Derivatives of trigonometric functions
			3.6 Derivatives of inverse functions
2	06/09/2019	**3 Derivatives**	3.7 Implicit differentiation
			3.8 Derivatives of exponential and logarithmic functions
	06/10/2019		3.9 Higher derivatives
			4.1 Linear Approximation and Differentials
	06/11/2019		Exam 1
	06/15/2019		4.2 Maxima and minima
3	06/16/2019		4.3 The Mean Value Theorem
			4.4 L'Hôpital's rule
	06/17/2019	**4 Applications of derivatives**	4.5 Limits at infinity and asymptotes
			4.6 Curve sketching
	06/18/2019		4.6 Curve sketching
			4.7 Applied Optimization problems
	06/22/2019		5.1 Anti-derivatives
4	06/23/2019	**5 Integrals**	5.2 Approximating areas
			5.3 The definite integral
	06/24/2019		5.5 Substitution Rule
	06/25/2019		Final Exam
	06/26/2018		Discussion of Final Exam

Student responsibilities/expectations:

The main course material will be presented through lectures. A discussion session, to be held every Friday will offer an opportunity for students to discuss course material and assigned problems with a teaching assistant (TA). Students are advised to keep pace with the course material as it is being presented. Consequently, students should endeavor to attend all class meetings and discussion sessions, be early for class, and spend sufficient time working on assigned homework problems. If for any reason a student misses a class, he/she should endeavor to obtain the notes and learn the missed material

before the next class meeting. Students should not hesitate to ask questions or seek additional assistance to ensure that they are staying on pace with the class. Students will be expected to come to class prepared and ready to participate actively. Please, turn off your cell phones and put aside any unrelated material before class begins. Students should exhibit a sense of responsibility and respect towards fellow students. Late-coming to class or early departure from class meetings will not be allowed.

Examinations:

There will be one midterm exam plus one cumulative final exam. The exams will contain problems to solve and definitions, brief explanations of concepts, and simple proofs.