



上海财经大学

Shanghai University of Finance & Economics

中国上海市国定路777号 邮编200433 777 Guoding Road, Shanghai, 200433, China

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## Shanghai University of Finance & Economics

### 2020 Summer Program

### MATH 300 Multivariable Calculus

### Course Outline

**Term: June 1 – June 26, 2020**

**Class Hours: 18:00-19:50 (Monday through Friday)**

**Course Code: MATH 300**

**Instructor: Professor Vadim Olshevsky**

**Home Institution: University of Connecticut**

**Office Hours: TBA and by appointment**

**Email: [olshevsky@gmail.com](mailto:olshevsky@gmail.com)**

**Credit: 4**

**Class Hours:** This course will have 52 class hours, including 38 lecture hours (including 6 excise hours ), professor 8 office hours, 2-hour TA discussion sessions, 4-hour review sessions.

#### **Course Description:**

This is a third course in the calculus sequence that provides a thorough introduction to multivariable calculus. It focuses on functions of several variables, differential and integral calculus of two and three variables, and their applications, and vectors and the geometry of curves and surfaces in three dimensional space.

#### **Course Objectives:**

The goal of the course is to provide a strong foundation and mastery of calculus in two and three variables and the geometry of vectors, lines, planes, curves, and surfaces for students who intend to continue in mathematics, physics, engineering, computer science, and other quantitative disciplines such as economics and finance.

#### **Required Textbooks:**



Calculus: *Calculus: Early Transcendentals*, 8th Edition, by James Stewart with the 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:** Introduction, vectors in three-dimension, dot and cross products, lines and planes in three dimension, implicit/parametric surfaces, curves and arc length.

**Week2:** Functions of several variables, limits and continuity, partial derivatives, tangents, differentiability, the chain rule, gradient and directional derivatives.

**Week3:** Extrema, Lagrange multipliers, and double integrals. Double, triple and line integrals

**Week4:** Change of variables. Curl, Green's, Stoke, and Divergence Theorems.

### Detailed Course Outline:

Week	Date	Chapter	Topic
	06/01/2019		1.1 Introduction and notation 1.2 Space and vectors in three-dimension



1	06/02/2019	1 Geometry, space, surfaces and curves	1.3 Dot and cross products
	06/03/2019		1.4 Lines and planes in three-dimension
	06/04/2019		1.6 Implicit and parametric surfaces
	06/08/2019		1.7 Curves, arc length
2	06/09/2019	2 Differential calculus of functions of several variables	2.1 Limits and continuity
	06/10/2019		2.2 Partial derivatives
	06/11/2019		2.3 Tangent, planes, differentiability
	06/15/2019		2.4 The chain rule
	06/16/2019		2.5 Gradient and directional derivatives
	06/17/2019		Exam 1
3	06/18/2019	3 Extrema and double integrals	3.1 Extrema
	06/22/2019		3.2 Lagrange multipliers
	06/23/2019		3.4 Double integrals over rectangles
	06/24/2019		3.5 Double integrals over general regions
4	06/25/2019	4 Triple and line integrals	4.1 Triple and line integrals
	06/26/2019		4.2 Change of variables
	06/27/2019		5 Vector fields and integral Theorems
	06/28/2019		5.1 Curl, Green's Theorem, Flux
	06/29/2019		5.2 Stoke/Divergence Theorems
	06/30/2019		Final Exam
	07/01/2019		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:



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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.