



暨南大學
JINAN UNIVERSITY

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JINAN UNIVERSITY

Multivariable Calculus

Lecturer: Ahmad Mojiri

Time: Monday through Friday (June 18, 2018-July 20, 2018)

Office hours: 2 hours (according to the teaching schedule)

Contact Hours: 60 (50mins each)

Credits: 4

Location: MBA Center

Office: MBA Center 107

E-mail: mojiri@sxu.edu

Content

Vectors and the geometry of three-dimensional space. Vector-valued functions. Real-valued functions of many variables and optimization. Multiple integrals. Vector fields, Green's, Stokes', and the divergence theorems.

Required Textbook

'Essential Calculus,' 2nd edition, by Stewart.

We will cover most of chapters 10 through 13.

Prerequisites:

We assume students are familiar with the standard content of calculus I and II courses for scientists and engineers covering differential and integral calculus of real-valued functions of a single variable in the context of algebraic, exponential, logarithmic, trigonometric, and hyperbolic functions. In particular, this includes the optimization of functions of a single variable and techniques and applications of integration.

Course Hours

The course has 25 sessions in total. Each class session is 120 minutes in length. The course meets from Monday to Friday.

Calculators: Calculators may not be used during tests. Cell phones must be turned off and put away during tests.

Assignments and Graded Work:

Homework: There will be regular homework assignments posted on the course website. It is totally fine and, indeed, encouraged, to help each other solve homework problems, but it is not okay to turn in essentially identical solutions; once you have discussed the problems you should *write the solutions up on your own*. Not all homework problems will be graded.

Attendance and in-class work: Students are expected to be in class every day for the full class period. We will be covering a lot of material very quickly, so if you get behind it will be very difficult to catch up. We will spend some time in class working on problems in groups. Some of this work may be presented or turned in.

Quizzes: We will also have regular quizzes possibly including ‘pop’ quizzes.

Exams: There will be two midterms and a final exam.

Grading Policy

Attendance and In-class Work	5%
Homework	15%
Quizzes	10%
Midterm Exams	40% (20% each)
Final Exam (comprehensive)	30%
Total	100%

Make-Ups:

This class will go by *very* quickly. I strongly recommend that you never miss class, since it will be very hard to make up the material you missed and, since mathematics

is cumulative, you will run the risk of getting hopelessly behind. However, I understand that life happens, so up to two missed classes will not count against you. If you miss a midterm you must have an excellent documented reason and the standard procedure will be to put extra weight on your final exam.

Grading Scale

The instructor will use the grading system as applied by JNU:

Definition	Letter Grade	Score
Excellent	A	90-100
Good	B	80-89
Satisfactory	C	70-79
Poor	D	60-69
Failed	E	Below 60

Approximate Day-to-Day Schedule:

Week 1

Monday: Introduction and three-dimensional space. (Section 10.1)

Tuesday: Vectors, the dot product, projections and the cross product. (Sections 10.2 and 10.3)

Wednesday: The cross product and parametric and non-parametric equations of planes. (Sections 10.4 and 10.5)

Thursday: Parametric and non-parametric equations of lines. Cylinders and quadric surfaces. (Sections 10.5 and 10.6)

Friday: Review, group work and quiz

Week 2

Monday: Real-valued functions of several variables; graphs, level sets, cross-sections, limits and continuity. (Sections 11.1 and 11.2)

Tuesday: Partial derivatives, tangent planes, and linear approximation. (Sections 11.3 and 11.4)

Wednesday: The chain rule, directional derivatives, and the gradient. (Sections 11.5 and 11.6)

Thursday: Local and global optimization over regions in space. (Section 11.7)

Friday Test 1

Week 3

Monday: Constrained optimization and Lagrange multipliers. (Section 11.8)

Tuesday: Double integrals over rectangular and non-rectangular regions. (Sections 12.1 and 12.2)

Wednesday: Double integrals in polar coordinates and applications of double integrals. (Sections 12.3 and 12.4)

Thursday: Triple integrals (Section 12.5)

Friday: Review, group work and quiz

Week 4

Monday: Triple integrals in cylindrical and spherical coordinates (Sections 12.6 and 12.7)

Tuesday: Vector-valued functions of one variable, velocity and acceleration in space, line integrals of real-valued functions. (Sections 10.7, 10.9 and 13.2)

Wednesday: Vector-valued functions of two variables, areas of surfaces and surface integrals of real-valued functions. (Sections 13.6 and 13.7)

Thursday: Vector fields; line integrals; the fundamental theorem of line integrals. (Sections 13.1 - 13.3)

Friday: Test 2

Week 5

Monday: Line integrals across curves, surface integrals across surfaces. (Sections 13.2 and 13.7)

Tuesday: Curl and divergence of vector fields. Stokes' theorem and Green's theorem. (Sections 13.5, 13.8 and 13.4)

Wednesday: The divergence theorem and Green's theorem again. Different versions of the fundamental theorem of calculus. (Section 13.9 and 13.4)

Thursday: Review

Friday: Final Exam

Caveat: This syllabus is subject to change in the event of extenuating circumstances.

Academic Honesty

Jinan University defines academic misconduct as any act by a student that misrepresents the students' own academic work or that compromises the academic work of another scholastic misconduct includes (but is not limited to) cheating on assignments or examinations; plagiarizing, i.e. misrepresenting as one's own work any work done by another; submitting the same paper, or substantially similar papers, to meet the requirements of more than one course without the approval and consent of the instructors concerned; sabotaging another's work within these general definitions, however, Instructors determine what constitutes academic misconduct in the courses they teach. Students found guilty of academic misconduct in any portion of the academic work face penalties ranging from lowering of their course grade to awarding a grade of E for the entire course.