# MATH 26100 Multivariate Calculus

## Textbook:

*Calculus*, 8th edition, by James Stewart

## Prerequisites:

MATH 16600 and MATH 17100.

## Syllabus:

The number of days spent on each chapter is in parenthesis, which is a total of 45.

### Chapter 12 - Vectors, dot product, cross product, lines and planes (1)

* Review

### Chapter 13 - Vector Functions and Space Curves (6)

* Space curves and their tangent vectors
* Projectile motion
* Arc length of curves
* Curvature and normal vectors
* Tangential and normal components of acceleration
* Velocity and acceleration in polar coordinates

### Chapter 14 - Partial Derivatives (12)

* Functions of several variables, level curves and surfaces
* Limits and continuity
* Partial Derivatives
* Tangent planes and the total differential
* The chain rule and implicit differentiation
* Directional derivatives and gradients
* Extreme values and saddle points
* Lagrange multipliers
* Taylor's formula in two variables

### Chapter 15 - Multiple Integrals (11)

* Double and iterated integrals, Fubini's theorem
* Double integrals over general regions, polar coordinates
* Triple integrals
* Moments and centers of mass
* Triple integrals in cylindrical and spherical coordinates
* Change of variables formula for double and triple integrals

### Chapter 16 - Vector Calculus (11)

* Vector fields and line integrals
* Path independence, conservative fields, and potential functions
* Green's theorem
* Curl and divergence of a vector field
* Parametrized surfaces and area
* Surface integrals
* Stokes' Theorem and the Divergence Theorem

### Exams

* Review (1)
* Test Days (3)
* Final Exam