

Math 26100

Multivariate Calculus

Text: *Calculus*, 8th edition, by James Stewart

Prerequisites: Math 16600 and Math 17100

Syllabus: (number of days on each chapter in parenthesis, total 45)

REVIEW of Ch. 12 – Vectors, dot product, cross product, lines and planes (1)

Ch. 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

Ch. 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

Ch. 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

Ch. 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

Review (1)

Test Days (3)

Final Exam