

FD94
Pms

Syllabus MA311 (4) - Fall 1999

M W F 8:00 - 8:50 A.M. (class room H 391)

T 1:00 - 1:50 P.M. (class room H 331)

Instructor Information: Mi-Soo Smith, Ph.D. Office H018
Office Hour: by appointment. Call Ext 681 or (H)528-1978

Textbook: Multivariable Calculus 1994 (The 5th Edition)
by Roland E Larson, Robert P. Hostetler, Bruce H. Edwards
Publisher D.C. Heath and Company ISBN 0-669-39345-2

Course Description: This course will cover Vector Analysis, and
multivariable Calculus.

Prerequisites: Calculus II (MA211) or equivalent.

Evaluation: Homework (30%) QUIZZES and Midterms (30%)
Final Examination (40%)

Only those homework submitted timely fashion will receive credits. There will be
approximately 35 homework assignments. We plan to complete one section per
session. Homework assignments are due very next session upon completion of section.

Course Outline: The following course outline is a tentative one. As the course
progresses, it may become necessary to make adjustment

Chapter 11 (Vectors in the Plane and in Space; Dot Product and Cross
Product; Lines, Planes and surfaces in Space, Cylindrical and
Spherical Coordinate Systems) [8 lessons]

Chapter 12 (Differentiation and Integration of Vector-valued Functions,
Tangent and Normal Vectors, Arc Length and Curvature)[5 lessons]

Chapter 13 (Partial Derivatives, Tangent Planes,
Extrema of Functions of two variables)

Chapter 14 (Multiple Integration, Surface Area, Triple Integration in
Cylindrical and Spherical Coordinates, Jacobians)

Chapter 15 (Vector Fields and Vector Analysis)

Key words and (Homework Assignments) **Submit Only** (Bold numbers)

- §11.1 Vectors in Plane [1, 3, **5, 7, 17, 19, 23, 25, 31, 35, 39, 41, 43, 45, 47, 51, 57**]
§11.2 Vectors in Space [1, 5, **7, 9, 11, 13, 15, 17, 19, 23, 27, 31, 33, 37, 51, 61**]
§11.3 The Dot product of two vectors - angle between two vectors, Direction Cosines, projection and vector components [1, **3, 9, 15, 17, 19, 21, 23, 29, 31, 41, 45**]
§11.4 Cross Product, Algebraic and Geometric Properties of the Cross product [1, 3, 5, 7, **11, 17, 21, 23, 27, 29, 33**]
§11.5 Lines and Planes in Space, Parametric Equation vs. Vector Form Equation, Distance between Points, Planes, and Lines [1, 7, **9, 11, 15, 23, 25, 27, 29, 31, 35, 37, 41, 43, 57, 59, 63, 65, 67, 69**]
§11.6 Cylindrical Surfaces, Quadratic Surfaces, Surface of revolution (Read/ Discuss)
§11.7 Cylindrical Coordinates, Spherical Coordinates, Conversion Formulas [Do all odds # 1 -- 51, 59-77, **5, 11, 17, 23, 27, 37, 43, 69, 77**]
Chapter review [3, 29, 35, 49, 63 for bonus] Chapter Test Sept 15
§12.1 Space curves and Vector Functions, LIMIT and CONTINUITY [1, **3, 7, 9, 11, 12, 13, 14, 15, 17, 19, 21, 31, 33, 35, 39, 41, 43, 45, 59, 60**]
§12.2 Differentiation and Integration of Vector Valued Functions (Componentwise differentiation and integration) Take inses as reviewing your differentiation and integration skills [Do as many odd problems as possible, **3, 17, 19, 29, 35, 41**]
§12.3 Velocity and Acceleration [**3, 15, 21, 25, 37, 39, 40, 41, 42**]
§12.4 Tangent and Normal Vectors [**3, 13, 15, 31, 35**]
§12.5 Arc length, Curvature [**7, 12, 19, 25, 31, 35, 41, 51, 57, 65**]
Review Exercise for Chapter 12 [19, 23, 39, 41]
§13.1 Introduction to Functions of several variables [**9, 13, 15, 43, 51, 55**]
§13.2 Limits and Continuity [**9, 21, 27, 37, 39** make sure to read #15 - 22]
§13.3 Partial Derivatives [All Odds #1 - 65, **9, 17, 29, 35, 37, 45, 57, 63**]
§13.4 Differentiability, Total Differential, Error Analysis [**5, 9, 11, 23, 31, 33**]
§13.5 Chain Rules for Partial derivatives, and Implicit Partial Differentiation [1, 3, 5, 7, 9, **13, 15, 17, 19, 21, 27, 35**, READ # 44]
§13.6 Directional Derivatives, Gradient [1, 5, 7, **9, 13, 17, 23, 25, 27, 33, 35, 37, 41, 49, 51**]
§13.7 Tangent Planes and Normal Lines [1, 3, 5, 7, 11, **13, 17, 21, 23, 25, 29, 31, 37, 41, 43, 45**]
§13.8 Extrema, The second Partial test [1, 3, 5, 9, **13, 15, 17, 25, 29, 35, 41, 47-50**]
§13.9 (Read)
§13.10 Lagrange Multipliers [1, **5, 9, 13, 17, 20, 25, 31**]
Chapter review [15, 25, 29, 35, 37, 43, 49, 55, 59]
§14.1 Iterated Integral [1, 3, 7, 11, **13, 15, 19, 23, 25, 31, 35, 37--42, 51**]
§14.2 Double Integrals, Volume, Properties [1, 3, 7, 9, 11, 13, **15, 19, 23, 35, 41, 49, 55, 59**]
§14.3 Change of variables, Polar Coordinates [1, 3, 5, 7, 12, 13, **17, 19, 21, 23, 25, 29, 33, 34**]
§14.4 Surface Area [**3, 11, 29, 33, 35**]
§14.5 Triple Integrals [1, 5, 7, 13, **15, 19, 21, 23**] (Read Moments of Inertia)
§14.6 Triple Integrals in Cylindrical and Spherical Coordinates [1, 3, 5, 9, 11, 13, **15, 25**]
§14.7 Jacobians [1, 3, 5, 7, 9, 11, **13, 17, 19, 21, 25, 27, 28**]
Chapter Review [1, 3, 7, 19, 43, 45-48]
§15.1 Vector Fields - Conservative or not, Curl of a vector Field, Divergence [5, 23, 29, 33, 37, 41, 45, 49, 57]
§15.2 Line Integral [1, 3, 5, 7, 9, 11, **13, 17, 21, 23, 29, 39, 49, 53**]
§15.3 Green's Theorem [1, 3, 7, 9, 11, **15, 17, 27, 33, 37, 41**]
§15.4 Parametric Surfaces, Normal Vectors, Tangent Planes [1, 3, 7, 21, 25, 26, **34, 41**]
§15.5 Surface Integrals [1, 7, 11, 13, 15, **17, 23, 33**]
§15.6 Using Divergence Theorem, FLUX and Divergence Theorem, Stokes [**9, 11**]
§15.7 Stokes Theorem [9, 11, 17]
Chapter 15, Exercise [11, 15, 43]