MATH 120
Calculus of Functions of Several Variables

Course Number and Title: MATH 120 Calculus of Functions of Several Variables

METU Credit & ECTS Credit: (4-2)5 & 7.5

Catalogue Description: Sequences and infinite series. Power series. Taylor series. Vectors and analytic geometry in 3-space. Functions of several variables: limits, continuity, partial derivatives. Chain rule. Directional derivatives. Tangent planes and linear approximations. Extreme values. Lagrange multipliers. Double integrals. Double integrals in polar coordinates. General change of variables in double integrals. Surface parametrization and surface area in double integrals. Triple integrals in Cartesian, cylindrical and spherical coordinates. Parametrization of space curves. Line integrals. Path independence. Green's theorem in the plane.

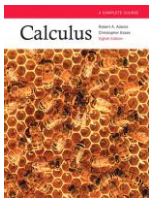
Course Objectives: The sequence Math 119-120 is the Standard complete introduction to the concepts and methods of calculus. It is taken by all engineering students. The emphasis is on concepts, solving problems, theory and proofs. Students will develop their reading, writing and questioning skills in Mathematics.

Prerequisites: Math 119

Course Coordinator: Dr. Fırat Arıkan

MidTerm1:	100 Points (July.13, 2017 Thursday at 17:30)
MidTerm2:	100 Points (July.27, 2017 Thursday at 17:30)
Final (3rd) Exam:	100 Points (Aug. 12, 2017 Saturday at 09:00)

Suggested textbook:



Robert A. Adams, Christopher Essex
CALCULUS
A Complete Course Calculus. Eight Edition.
ISBN 978 0-321-78107-9
QA303.2.A33 2013

Reference Books: Calculus
James Stewart, Fifth Edition

Current Semester Course Home Page: http://file.ma120.math.metu.edu.tr/

Week	Dates	Syllabus(Math 120) 2016-3 (Summer)	Suggested Problem List
1	July 3- July 7	**Ch. 9: Sequences, Series, and Power Series** 9.1 Sequences and Convergence 9.2 Infinite Series 9.3 Convergence Tests for Positive Series 9.4 Absolute and Conditional Convergence 9.5 Power Series 9.6 Taylor and Maclaurin Series	Worksheet on Sequences and Series 9.1: 6,8,10,17,18,19,24 ,26,29,31,35 9.2: 4,6,8,10,12,14,26,27,28,29,30,31 9.3: 4,6,12,16,18,20,24,26,38,42 9.4: 2,4,8,10,16,20,24,27 9.5: 4,8,10,13,14,17,18,22,26,28,30 9.6: 6,8,12,18,22,26,34,35,40
2	July 10- July 14	9.7 Applications of Taylor and Maclaurin Series **Ch. 10: Vectors and Coordinate Geometry in 3-Space** 10.1 Analytic Geometry in Three Dimensions 10.2 Vectors 10.3 The Cross Product in 3-Space 10.4 Planes and Lines 10.5 Quadric Surfaces **Ch. 12: Partial Differentiation** 12.1 Functions of Several Variables 12.2 Limits and Continuity ☺Midterm 1 (July.13, 2017 Thursday at 17:30)	9.7: 6,7,12,16,18,24 10.1: 6,19,22,27,32,36,40 10.2: 4,13,16,18,22,26,31 10.3: 3,5,14,15,17,20,23 10.4: 3,6,9,18,23,26,28,29 10.5: 3,5,8,10,12,15,17,20,21 12.1: 4,5,8,12,13,14,20,24 12.2: 2,6,8,10,12,14,18
3	July 17- July 21	12.2 Limits and Continuity 12.3 Partial Derivatives 12.4 Higher-Order Derivatives 12.5 The Chain Rule 12.6 Linear Approximations 12.7 Gradients and Directional Derivatives 12.8 Implicit Functions *("Systems of Equations" is not included)*	12.2: 2,6,8,10,12,14,18 12.3: 4,5,6,11,12,16,17,21,24,28,31,36,39 12.4: 4,10,16 12.5: 4,8,16,18,29,30 12.6: 4,6,10,16 12.7: 4,8,10,17,18,19,22,26,36 12.8: 2,5,6,11
4	July 24- July 28	**Ch. 13: Applications of Partial Derivatives** 13.1 Extreme Values 13.2 Extreme Values of Functions Defined on Restricted Domains 13.3 Lagrange Multipliers **Ch. 14: Multiple Integration** 14.1 Double Integrals 14.2 Iteration of Double Integrals in Cartesian Coordinates 14.4 Double Integrals in Polar Coordinates ☺Midterm 2 (July.27, 2017 Thursday at 17:30)	13.1: 1, 3, 6, 7, 9, 11, 17, 19, 24, 26 13.2: 3, 5, 7, 8, 9, 11, 17 13.3: 1, 3, 5, 7, 9, 11, 19, 21, 22 14.1: 5,13,15,18,19 14.2: 1-27 odd 14.3: 1-9 odd 14.4: 1-25 odd
5	July 31- August 4	14.4 Double Integrals in Polar Coordinates 14.5 Triple Integrals 14.6 Change of Variables in Triple Integrals [Omitted: 14.7 Applications of Multiple Integrals(The Surface Area of a Graph)] **Ch. 11: Vector Functions and Curves** 11.1 Vector Functions of One Variable 11.3 Curves and Parametrizations	14.4: 1-25 odd 14.5: 2,4,6,7,9,10,14,15 14.6: 2,3,4,6,10,12,16 14.7: 1,3,5,7,8,10 11.1: 8,10,16,18 11.3: 1,2,3,4,6,8,17,18,24
6	August 7- August 11	11.3 Curves and Parametrizations **Ch. 15: Vector Fields** 15.3 Line Integrals 15.1 Vector and Scalar Fields 16.1 Gradient, Divergence, and Curl 15.2 Conservative Fields 15.4 Line Integrals of Vector Fields **Ch. 16: Vector Calculus** 16.3 Green's Theorem in the Plane	11.3: 1,2,3,4,6,8,17,18,24 15.3: 2,6,8,13,14 15.1: 2,3,6 16.1: 3,4 15.2: 2,6,9 15.4: 4,6,8,9,13,22 16.3: 1, 2, 3, 4, 5, 6, 7, 9
		☺Final Exam (Aug 12, 2017 Saturday at 9:00)	