MA1115: Multi-variable Calculus

Prerequisite

- MA1114 *Single Variable Calculus II with Matrix Algebra*

Required Texts

- *Calculus: Early Transcendentals*, 8th Edition by James Stewart (2015).
  ISBN-10: 1285741552 ISBN-13: 9781285741550.

Assessment

- No calculators, books, crib sheets, or notes are allowed in any testing.

Topics

Hours	Topic	Section(s)
1-1	Curves Defined by Parametric Equations	10.1
2-3	Calculus with Parametric Curves	10.2
2-5	Polar Coordinates	10.3
1-6	Areas and Lengths in Polar Coordinates	10.4
1-7	Three-Dimensional Coordinate Systems, Vectors	12.1, 12.2
1-8	The Dot Product	12.3
1-9	The Cross Product	12.4
2-11	Equations of Lines and Planes	12.5
1-12	Cylinders and Quadric Surfaces	12.6
1-13	Vector Functions and Space Curves	13.1
1-14	Derivatives and Integrals of Vector Functions	13.2
1-15	Arc Length and Curvature	13.3
1-16	Motion in Space: Velocity and Acceleration	13.4
1-17	Functions of Several Variables	14.1
1-18	Limits and Continuity	14.2
1-19	Partial Derivatives	14.3
1-20	Tangent Planes and Linear Approximations	14.4
2-22	The Chain Rule	14.5
2-24	Directional Derivatives and the Gradient Vector	14.6
2-26	Maximum and Minimum Values	14.7
2-28	Lagrange Multipliers	14.8
2-30	Double Integrals over Rectangles & Iterated Integrals	15.1
2-32	Double Integrals over General Regions	15.2
1-33	Double Integrals in Polar Coordinates	15.3
2-35	Triple Integrals	15.6
2-37	Triple Integrals in Cylindrical and Spherical Coordinates	15.7, 15.8
2-39	Change of Variables in Multiple Integrals	15.9
0-0	Conic Sections (Optional)	10.5
6-45	Exams, Review and Holidays	

Homework

Section	Problems
10.1	1, 3, 9, 13, 14, 15, 24, 28
10.2	1, 2, 3, 5, 7, 9, 11, 13, 15, 17, 29, 31, 33, 41, 43, 61, 63
10.3	1, 3, 5, 7, 11, 15, 19, 21, 25, 54, 57
10.4	1, 3, 5, 9, 23, 45
12.1	1, 3, 9, 11, 13, 17, 19, 21a, 31, 45
12.2	9, 11, 13, 15, 17, 19, 21, 23, 25
12.3	1, 3, 5, 7, 9, 15, 19, 23, 25, 27, 39, 41
12.4	1, 3, 5, 7, 13, 17, 19, 27, 29, 31, 35, 45
12.5	1, 3, 7, 11, 21, 25, 27, 31, 35, 45, 51, 59, 63, 69, 81
12.6	3, 5, 13, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30
13.1	1, 3, 5, 11, 17, 19, 21, 23, 27, 43
13.2	3, 5, 7, 13, 17, 23, 37, 39
13.3	1, 3, 5, 17, 19, 21, 23, 25, 38, 39
13.4	5, 7, 13, 15, 19, 23, 45
14.1	5, 7, 11, 13, 15, 17, 25, 27, 32, 61–66
14.2	5, 7, 9, 13, 17, 19, 29, 33
14.3	5, 7, 9, 15, 17, 19, 21, 41, 47, 49, 65, 81
14.4	1, 3, 5, 11, 13, 17, 21, 27, 36
14.5	1, 3, 9, 13, 17, 21, 27, 31, 43, 53
14.6	1, 5, 7, 9, 13, 15, 17, 19, 21, 29, 41, 43
14.7	1, 3, 5, 7, 11, 19, 31, 33, 45, 47, 59
14.8	3, 5, 11, 19, 23
15.1	17, 21, 23, 29, 37, 39
15.2	1, 5, 7, 9, 15, 21, 25, 27, 35, 45, 49, 51, 55
15.3	1, 9, 11, 15, 19, 23, 29, 31
15.4	7, 9, 15, 19, 27
15.6	3, 7, 13, 19, 21, 35
15.7	9, 11, 17, 19
15.8	1, 3, 5, 9, 17, 21, 30
15.9	11, 13, 15, 17, 19
10.5	1, 5, 11, 15, 19, 23, 27, 35, 39, 43