

**BARUCH COLLEGE**  
**DEPARTMENT OF MATHEMATICS**

**MATH 3030 SYLLABUS**  
**ANALYTIC GEOMETRY & CALCULUS II**

Textbook or ebook: Calculus – 11<sup>th</sup> Edition by Larson and Edwards, Cengage Learning Publisher.  
The Webassign homework correlates with the section number and topic in the textbook.

<b>Lesson #</b>	<b>Topics</b>	<b>Reading</b>	<b>Homework Problems</b>
1,2	Sequences	9.1	p. 596: 5, 6, 7, 11, 13, 17, 20, 25, 26, 31, 32, 33, 35, 37, 45, 47, 48, 51, 52, 53, 56, 57, 59, 60, 61
	Series and Convergence	9.2	p. 605: 7, 10, 11, 13, 15, 17, 19, 21, 23, 28, 30, 31, 32, 34, 35, 37, 43, 47, 48, 49, 53, 54, 55, 68
	The Integral Test and p-Series	9.3	p. 613: 3, 8, 9, 13, 23, 29, 33, 35, 45, 69 – 80 (all)
3,4	Comparisons of Series	9.4	p. 620: 5, 6, 8, 9, 10, 11, 13, 15, 17, 19, 21, 23, 26, 27 – 34 (all)
	Alternating Series	9.5	p. 629: 9, 11, 17, 18, 21, 29, 33, 34, 37, 39, 40, 42, 44, 45, 49, 50, 51, 53, 71-80 (all)
	The Ratio and The Root Tests	9.6	p. 637: 19, 20, 23, 27-37 (odd), 39, 43, 45, 53-70 (all)
5,6,7	Taylor Polynomials	9.7	p. 648: 5, 7, 17, 19, 23, 27, 31, 33, 39, 43, 45, 48, 57, 61
	Power Series	9.8	p. 658: 9 – 27 (odd), 30, 33, 41, 49, 51
	Representation of Functions by Power Series	9.9	p. 666: 5, 7, 11, 13, 17, 23, 26
	Taylor and Maclaurin Series	9.10	p. 677: 5, 7, 11, 13, 18, 22, 23, 27, 43, 45, 53, 57, 59, 65
8,9,10	Planes Curves and Parametric Equations	10.2	P. 707: 5 – 21 (odd), 25, 29, 31, 37, 41, 42, 49
	Parametric Equations and Calculus	10.3	P. 715: 5 – 15 (odd), 19, 23, 24, 27, 31, 35, 43, 50, 51, 53, 55, 63, 67
	Polar Coordinates and Polar Graphs	10.4	P. 726: 5, 7, 9, 13, 17, 19, 25, 29, 31, 32, 35, 39, 64, 65, 71, 73, 74, 79, 83, 85, 87, 89, 91, 92
	Area and Arc Length in Polar Coordinates	10.5	P. 735: 3 – 6 (all), 7, 9, 15, 16, 17, 19, 23, 27, 31, 35, 37, 39, 44, 53, 57, 65
11,12	Vectors in the Plane	11.1	P. 759: 3, 4, 5, 9, 11, 25, 27, 29, 33, 37, 39, 46, 51, 53, 61
	Space Coordinates and Vectors in Space	11.2	P. 767: 5, 9, 21, 29, 35, 38, 39, 43, 55, 57, 59, 67, 68, 75, 77, 79, 83
	Dot Product and Cross Product	11.3	P. 777: 3, 7, 9, 13, 15, 17, 19, 21, 31, 39, 41, 43, 51, 63, 64
		11.4	P. 785: 3, 4, 5, 7, 9, 11, 12, 13, 19, 23, 33, 35, 37
13,14	Lines and Plane in Space	11.5	P. 794: 5, 7, 9, 11, 15, 19, 21, 33, 40, 41, 47, 51, 53, 63, 65, 69, 71, 76, 79, 83, 85, 89, 91, 95
	Surfaces in Space	11.6	P. 806: 5 – 10(all), 11, 17, 19, 23, 25, 31, 32, 34, 38

## MTH 3030 SYLLABUS

15,16	Functions of Several Variables	13.1	P. 880: 5, 11, 13, 17, 27, 28, 29, 35, 36 37, 39, 41, 51, 54
	Limits and Continuity	13.2	P. 891: 9, 17, 23, 25, 31, 42, 44, 51, 58
	Partial Derivatives	13.3	P. 900: 7 – 15 (odd), 19, 23, 43, 49, 51, 55, 71, 74, 81, 83,
	Differentials	13.4	P. 909: 3, 5, 6, 7, 11, 18, 21, 23, 39
17,18	Chains Rule	13.5	P. 917: 3 – 11 (odd), 15, 18, 19, 27, 29, 33
	Directional Derivative and Gradients	13.6	P. 928: 5, 7, 9, 15, 21, 22, 23, 25, 28, 31, 35, 40, 41, 47
	Tangent Plane and Normal Lines	13.7	P. 937: 7, 8, 10, 12, 13, 15, 18, 20, 25, 27, 33, 35, 37
19,20	Extrema of Functions of Two Variables	13.8	P. 946: 3 – 13 (odd), 14, 17, 21, 23, 33, 35, 37, 41, 43, 45
	Applications	13.9	P. 953: 3, 7, 8, 9, 11, 12, 16, 21, 27
	Lagrange Multipliers	13.10	P. 962: 8, 11, 12, 13, 15, 17, 18, 35, 36, 40(a)
21,22	Iterated Integrals and Area	14.1	P. 976: 3, 4, 5, 7, 9, 11, 21, 23, 27, 31, 33, 35, 51, 55, 57, 59, 61, 65
	Double Integrals and Volume	14.2	P. 987: 7, 9, 11, 12, 13, 15, 19, 21, 23, 24, 25, 27, 29, 30, 34, 45, 46
	Change of Variables and Polar Coordinates	14.3	P. 995: 1, 2, 11, 13, 15, 17, 31, 33, 35, 43, 45, 47
23	Triple Integrals and Applications	14.6	P. 1021: 3 – 11 (odd), 19, 20, 27, 29
	Change of Variables	14.8	P.1036: 3, 5, 9, 11, 17, 21, 25, 27, 29, 33

**LEARNING GOALS OF COURSE:** Upon completion of this course, students will be able to:

- Determine the convergence or divergence of a sequence of real numbers, and find the limit of a convergent sequence;
- Apply appropriate tests to determine the convergence or divergence of an infinite series; find the interval and radius of convergence for a power series; determine power series representations (e.g. Taylor or Maclaurin series) for infinitely differentiable functions; find Taylor polynomials, and use Taylor's Remainder Theorem to determine the accuracy of a polynomial approximation.
- Perform vector operations with dot and cross products; analyze the motion of an object in the space.
- Use equations to describe curves and surfaces in the space; find arc length and curvature.
- Find domains, limits, and partial derivatives of multivariable functions, compute directional derivatives and gradients, apply derivative analysis to geometric problems, approximation problems, and optimization problems.
- Evaluate double and triple integrals, and use them to find volume, center of mass, moments of inertia and surface area.