

SYLLABUS FOR MATH 2250  
**Text:** Johnston and Mathews, *Calculus*  
 Fall, 2005

Section	Topics and Recommended Exercises	# Days
<b>Chapter 1: Rates of Change, Limits, and the Derivative</b>		
1.1-1.2	Functions and Composition of Functions §1.1: #7, 8, 10, 11, 21, 22, 26, 33 §1.2: #4, 5, 7, 8, 10, 13, 14, 15, 17, 34, 35, 36, 40	1
1.3-1.4	Slope as a Rate of Change and Calculating Rates of Change §1.3: #1, 2, 10, 11, 12, 13, 23, 24, 25-30 §1.4: #1, 8, 11, 17, 18, 23	2
1.5-1.6	Limits and More Work with Limits §1.5: #1-10, 18, 19, 25, 26, 27, §1.6: #7, 8, 10	3
1.7	The Derivative §1.7: #1, 3, 4, 15, 16, 17, 20, 22, 24, 31-34	2
<b>Chapter 2: Finding the Derivative</b>		
2.1	Derivatives of Polynomials §2.1: #1, 3, 5, 8, 9, 13, 14, 23, 24, 25	1
2.2	Derivatives of Products and Quotients §2.2: #1, 5, 6, 12, 13, 15, 16, 17, 19, 24, 25, 27, 34, 35	1
2.3-2.4	Differentiating Compositions and Implicit Differentiation §2.3: #1, 5, 7, 8, 11, 16, 22, 23, 28-32 §2.4: #1, 2, 6, 7, 10, 11, 12, 14, 17, 19, 25, 30	3
2.5	Trigonometric Functions §2.5: #1, 2, 4, 6, 14, 17, 18, 20, 21, 24, 31, 36, 37, 38, 40, 43, 45	2
2.6	Exponential Functions §2.6: #1, 2, 3, 5, 6, 12, 13, 16, 17, 20, 21, 28, 32, 33, 36*, 42, 43, 44, 46	1
2.7	Logarithms §2.7: #1, 2, 4, 5, 6, 7, 9, 11, 14, 15, 17, 18, 20, 21, 32, 33, 34, 35, 46, 49	1
2.8	Inverse Functions §2.8: #1, 4, 5, 9, 10, 15, 18, 19, 20, 24, 36, 37	1
2.9	Inverse Trigonometric Functions §2.9: #1, 2, 4, 5, 6, 8, 10, 11, 12, 14, 15, 16, 19, 22, 23	2
2.10	Modeling: Translating the World into Mathematics §2.10: Go over a couple of the models and assign appropriate exercises.	1
<b>Chapter 3: Motion, Vectors, and Parametric Equations</b>		
3.1	Motion along a Line §3.1: 1, 2, 4, 5, 6, 7, 9, 10, 11, 13, 14, 18, 26	2

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\*Writing required

## Chapter 4: Applications of the Derivative

4.1	The Tangent Line Approximation	1
	§4.1: #2, 3, 7, 8, 9, 10, 11, 16, 17, 18, 19, 22	
4.2	Newton's Method	1
	§4.2: <sup>†</sup> #1, 4, 9, 11, 21	
4.3	Increasing/Decreasing Functions, Concavity	2
	§4.3: #1, 3, 13, 14, 15, 17, 20, 21, 24, 25, 27, 30, 31, 32, 35, 37, 42, 48, 50, 51, 54, 55, 56	
4.4	Horizontal and Vertical Asymptotes	1
	§4.4: #1, 2, 6, 7, 8, 11, 12, 14, 15, 17, 20, 22, 28, 35, 43, 49, 51, 52	
4.5	Tools for Optimization	1
	§4.5: #1–6, 7, 9, 11, 14, 21, 22, 25, 30	
4.6	Modeling Optimization Problems	3
	§4.6: #1, 3, 6, 8, 9, 11, 12, 13, 14 <sup>†</sup> , 19, 20, 21, [22], 24, 29, 31, [32], 33, 34	
4.7	Related Rates	2
	§4.7: #1, 2, 7, 11, 13, 14, 17, 18, 19, 20, 22, 24, [27]	
4.8	Indeterminate Forms and L'Hôpital's Rules	2
	§4.8: #1–10, 15, 16, 17, 21, 25, 26, 28, 30, 33, 35, 39	

## Chapter 5: The Integral

5.1	Summation Notation	1
	§5.1: #1, 2, 3, 9, 10, 12, 15, 16, 18, 23	
5.2	The Definite Integral	1
	§5.2: #1, 2, 5, 6, 9, 12, 15, 16, 17, 18, 23	
5.3	The Fundamental Theorem of Calculus	2
	§5.3: #1, 2, 4, 5, 7, 8, 12, 13, 14, 16, 18, 19, 20, 23, 24, 28, 29, 35, 36, 37, 39, 40, 45	
5.4	The Indefinite Integral	1
	§5.4: #1, 4, 5, 11, 12, 13, 14, 16, 18, 20, 21, 22	
5.5	Integration by Substitution	2
	§5.5: #1, 2, 3, 5, 6, 8, 10, 12, 17, 18, 25, 26, 27, 30, 31, 35, 36, 41–45, 51, 53, 54, 67	
5.6	Area between Curves	1
	§5.6: #1, 2, 3, 5, 6, 7, 8, 10, 11, 14, 26, 30, [33]	
5.7	Integration by Parts	2
	§5.7: #1–4, 7, 8, 10, 12, 13, 14, 18, 19, 20, 22, 24, 27	
5.8	Integration by Partial Fractions	2
	§5.8: #1, 4, 7, 9, 19, 20, 21, 23, 25, 26, 31, 32, 33, [38]	
5.9	Solving Simple Differential Equations	1
	§5.9: #1, 2, 3, 4, 7, 10, 11, 14, 15, 16, 19, 25	
5.10	Numerical Integration	1
	§5.10: <sup>†</sup> 1, 3, 4, 6, 13, 14	

This syllabus allows 10 days for tests and review (based on a 60-day semester). You should probably assign roughly 2/3 of the problems suggested here. Problems listed in brackets are best saved for the better students.

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<sup>†</sup>Technology required