## Math 103–Introduction To Calculus (4h, 1 CU)

Introduction to concepts and methods of Calculus for students with little or no previous Calculus experience. Limits; polynomial and transcendental functions and their applications, derivatives, extremum problems, curve sketching, approximations; integrals and the fundamental theorem of calculus. Note: this course uses Maple® Fulfills the FORMAL REASONING & ANALYSIS General Requirement.

Texts:	Stewart, <i>Calculus</i> , 6th Edition Maple/Calculus Lab Manual for Math 103/104/114/115				
Chapter and Section 1 Functions and Models		Page	Core Problems		
1.1 Four Ways to Represent a Function		20	1, 5, 23, 44, 62, 66		
1.2 Mathematical Models: A Catalog of Essential Functions		34	2, 4, 12, 17, 19, 23		
1.3 New Functions from Old Functions		43	2, ,14, 16, 20, 25, 35, 50, 52		
1.4 Graphing Calculators and Computers		51	2, 7, 24, 32		
2 Limits	and Rates of Change				
2.1 The Tangent and Velocity Problems		65	1, 6		
2.2 The Limit of a Function		74	2, 6, 10, 14, 27, 28, 29, 40		
2.3 Calculating Limits Using the Limit Laws		84	2, 10, 17, 20, 52		
2.4 The Precise Definition of a Limit (optional)		95	1, 4, 20, 39		
2.5 Cont	tinuity	105	3, 6, 8, 16, 29		
3 Deriva	tives				
3.1 Deri	vatives and Rates of Change	119	17, 25, 38, 45		
3.2 The	3.2 The Derivative as a Function		2, 3, 20, 36		
3.3 Diffe	erentiation Formulas	144	2, 4, 22, 36, 46, 53, 67		
3.4 Deri	3.4 Derivatives of Trigonometric Functions		2, 10, 14, 26, 36, 38, 48		
3.5 The Chain Rule		161	12, 13, 17, 23, 47, 36, 42, 56, 66, 87		
3.6 Implicit Differentiation		169	11, 16, 18, 32, 52		
3.7 Rate	s of Change in the Natural and Social Sciences	179	1, 10, 13, 28		
3.8 Rela	ted Rates	186	12, 16, 31, 41		
3.9 Line	ar Approximations and Differentials	193	11, 16, 33, 38		
7 Inverse	e Functions				
7.1 Inve	rse Functions	391	3, 9, 17, 24, 34, 41		
7.2 Expo	onential Functions and Their Derivatives	402	1, 10, 13, 16, 20, 32, 38, 48, 74, 85		
7.3 Loga	arthmic Functions	409	1, 2, 12, 18, 23, 35, 50, 54, 60		
7.4 Derivatives of Logarithmic Functions		419	3, 6, 10, 30, 34, 39, 72		
7.5 Exponential Growth and Decay		453	2, 9, 13, 16, 20		
7.6 Inverse Trigonometric Functions		461	3, 23, 31, 46, 50, 61, 67		
7.7 Hyperbolic Functions		468	4, 6, 9, 38, 41, 50		
7.8 Inde	terminate Forms and L'Hospital's Rule	478	1, 2, 3, 4, 9, 15, 31		

## **4** Applications of Differentiation

4.1 Maximum and Minimum Values		2, 4, 39, 55, 67
4.2 The Mean Value Theorem		1, 6, 9, 14, 25, 34
4.3 How Derivatives Affect the Shape of a Graph		6, 8, 12, 13, 16, 23, 29, 40, 52, 61
4.4 Limits at Infinity; Horizontal Asymptotes		4, 12, 22, 36, 41, 60
4.5 Summary of Curve Sketching		8, 15, 19, 22, 42, 48
4.6 Graphing with Calculus and Calculators		23, 26
4.7 Optimization Problems	262	1, 14, 30, 33, 42, 62
4.8 Newton's Method	272	1, 4, 13, 26, 30
4.9 Antiderivatives	279	62, 70
5 Integrals		
5.1 Areas and Distances	298	2, 6, 22
5.2 The Definite Integral	310	4, 6, 43, 48
5.3 The Fundamental Theorem of Calculus		1, 3, 9, 14, 20, 22
5.4 Indefinite Integrals and the Net Change Theorem		10, 14, 28, 45, 49, 54
5.5 The Substitution Rule		8, 12, 14, 31, 44, 58, 70, 79

## NOTES:

## • All sections of Math 103 will have a common final examination.

- Midterm examinations *may* be given outside regular class times at the professor's option.
- Problems from the sample Final Examinations (which may be found at the end of the Maple Lab Manual and on the Mathematics Department's web site) also form part of the core problem set.