UNIVERSITY OF NEW BRUNSWICK
DEPARTMENT OF MATHEMATICS & STATISTICS

MATH 1003 SYLLABUS - UPDATE as of AUGUST, 2008

TEXT: Calculus - Early Transcendentals (6th. ed.), J. Stewart (Brooks/Cole 2008).

PART 1	CALCULUS OVERVIEW	Lectures
1.1 - 1.3	Functions and graphs with dynamics examples	2
2.1	Tangent and velocity	1
2.2	The limit of a function	2
2.7–2.8	Derivatives as limits, numerical comparisons of $\Delta x/\Delta t$ and dx/dt, polynomials	2
	Note: *Secs. 2.7,2.8, to be used only as guidelines for this material, with emphasis on intuitive understanding.*	

PART 2	LIMITS	
2.2	Finish off infinite limits if necessary	1
2.3	Calculating Limits using the Limit Laws	2
2.5	Continuity	1
2.6	Limits at Infinity: Horizontal Asymptotes	1
2.7–2.8	More on derivatives; higher derivatives, rates of change	1

PART 3	DERIVATIVES	
3.1	Derivatives of poly. and exp'l functions (with antiderivatives and material from **§1.5**)	2
3.2	Product and Quotient rules	2
3.3	Derivatives of Trigonometric Functions (with antiderivatives, review from App. D)	2
3.4	The Chain Rule	2
3.5	Implicit Differentiation (including inverse trig. functions $\sin^{-1}$ and $\tan^{-1}$, and general inverse functions **§1.6**	2–3

MIDTERM   *The midterm will cover the material to Implicit Differentiation,*
Oct 28   *but NOT inverse (including inverse trig) functions.*

3.6	Derivatives of Logarithmic Functions (and antiderivatives)	1–2
3.7	Rates of Change in the Natural & Social Sciences	1
	The most important problems of 3.7 are distance-velocity-acceleration. Try to do some other applications as well	
3.9	Related Rates	1
3.11	Hyperbolic Functions (with antiderivatives, but no inverses)	1

PART 4 should be completed before the midterm but the material will not be included on the midterm. Sections 4.9 and 5.1 should be used as guidelines. The students should understand how areas can be computed with antiderivatives, and have had some practice computing simple antiderivatives. Integral notation must be introduced.

		Lectures
PART 4	ANTIDERIVATIVES and AREA	
4.9	Antiderivatives (for polynomials, introducing integral notation)	1
5.1	Areas and distances (with numerical calculation of areas under lines and parabolas for illustrating the fundamental theorem)	2
PART 5	APPLICATIONS	
4.1	Maximum and Minimum Values	1
4.2	The Mean Value Theorem	1
4.3	How Derivatives affect the shape of a graph	2
4.4	Indeterminate forms; L'Hospital's rule only for $[0/0]$, $[\infty/\infty]$	2
4.5	Curve Sketching	2
4.7	Optimization	2
	Total suggested lectures:	41

In Fall, 2008 there are about 38 MWF periods and 13 T/Th classes (left after the usual holidays). The indicated times are based on doing tutorial work occasionally throughout the week. With one day reserved for tutorial, the indicated hours have to be lessened.

Daryl Tingley, August , 2008.