

Syllabus for Math 2173

Math 2173=Engineering Mathematics Semester III: (3 semester credit hours)				
Textbook sections from J. Stewart:				
<b>CALCULUS: Early Transcendentals, 6E</b>				
<b>Part One = 21 Days: Multivariable Integral Calculus;</b>				
Days	Section#	# of pages		
3	14.6	9	(Review of) Directional Derivatives and the Gradient Vector	
	14.7	8	Maximum and Minimum Values	
	14.8	5	Lagrange Multipliers	
3	15.1	7	Double Integrals over Rectangles	
	15.2	4	Iterated Integrals	
	15.3	6	Double Integrals over General Regions	
3	15.4	5	Double Integrals in Polar Coordinates: Change of Coordinates	
	15.6	8	Triple Integrals	
	15.7	3	Triple Integrals in Cylindrical Coordinates	
3	15.8	4	Triple integrals in Spherical Coordinates	
	15.9	7	Change of Variables in Multiple Integrals	
	Midterm 1			
4	16.1	5	Vector Fields	
	16.2	5	Line Integrals (3-D)	
	16.2	4	Line Integrals (2-D)	
	16.3	8	The Fundamental Theorem for Line Integrals; Independence of Path	
	Midterm 2			
Partial # Of Lect. Days=	13	6.0769231	Average number of assigned pages/lecture	
<b>Part Two= 11 Lecture Days: 2<sup>nd</sup> Order Constant Coefficient O.D.E.'s</b>				
Textbook sections from J. Stewart:				
<b>CALCULUS: Early Transcendentals, 6E</b>				
<b>Warning:</b> Although Stewart's motivation for the differential equations in Section 9.1 is <b>excellent</b> , his characterization of these equations as "models" (of population growth, for the motion of springs) and his discourse on "mathematical models" in Section 1.2 are examples of a fundamental error, namely, the <i>fallacy of context dropping</i> . The context being dropped from all his statements (about population growth, motion of a spring, etc) is that a valid mathematical characterization of any observed phenomenon necessarily has (a) a well-defined (explicit or implicit) <i>domain of applicability</i> and (b) a well-defined <i>accuracy</i> . As a consequence of his unfamiliarity with this aspect of the inductive process leading to his differential equations, Stewart is reduced to characterizing them in terms of the subjectivity inherent in "models" whose evanescence is characterized by the motto "here today, gone tomorrow". Implicitly (or explicitly) branding scientific knowledge as intrinsically transient would violate the truth in labeling principle.				
1	9.1	4	Modeling with Differential Equations	
1	9.2	6	Direction Fields and Euler's Method	
Textbook Sections from Boyce & DiPrima:				
<b>Elementary Diff'l Eq'ns or from Elementary Diff'l Eq'ns and Boundary Value Prob's (9<sup>th</sup> Edition)</b>				
1	3.1	7	Homogeneous Equations with Constant Coefficients	
1	½ of 3.2	5	Solutions of Linear Homogeneous Equations; the Wronskian	
1	½ of 3.2	5	Solutions of Linear Homogeneous Equations; the Wronskian	
1	3.3	5	Complex Roots of the Characteristic Equation	
1	3.4	5	Repeated Roots; Reduction of Order	
1	Midterm 3			
1	3.5	9	Nonhomogeneous Equations; Method of Undetermined Coefficients	
1	3.7	11	Mechanical and Electrical vibrations	
Week 11	1	3.8	8	Forced Vibrations
Partial # of Lect. Days=	11	5.9090909		
Tot. # of Lect. Days	24			
Rec'n. Days	16			
Grand Total # of days	40			
credit hours (40x5/70)	2.857			