

Syllabus for MTH 229 – Calculus I

DEPARTMENT OF MATHEMATICS AND STATISTICS, WRIGHT STATE UNIVERSITY

Text: James Stewart, *Calculus: Concepts and Contexts*, 4th Edition

Section	Time	Sample Homework Assignment
<i>A Preview of Calculus</i>	0	[This section is worth reading.]
Chapter 1: Functions and Models	0-1 wk	
<i>1.1 Four Ways to Represent a Function</i>	<i>0-1</i>	<i>Instructor's Choice</i>
<i>1.2 Mathematical Models</i>	<i>0-1</i>	<i>Instructor's Choice</i>
<i>1.3 New Functions from Old Functions</i>	<i>0-1</i>	<i>Instructor's Choice</i>
<i>1.5 Exponential Functions</i>	<i>0-1</i>	<i>Instructor's Choice</i>
<i>1.6 Inverse Functions and Logarithms</i>	<i>0-1</i>	<i>Instructor's Choice</i>
<i>1.7 Parametric Curves</i>	<i>0-1</i>	<i>Instructor's Choice</i>
<i>Appendix C: Trigonometry Review</i>	<i>0-1</i>	<i>Instructor's Choice</i>
Chapter 2: Limits and Derivatives	3 wk	
2.1 The Tangent and Velocity Problems	0.5	2, 4, 6
2.2 The Limit of a Function	1	2, 3, 5, 10, 14, 19, 24, 28
2.3 Calculating Limits Using the Limit Laws	1.5	1, 2, 4, 10, 14, 18, 22, 42
2.4 Continuity	1	1, 4, 6, 9a, 16, 27, 32, 34
2.5 Limits Involving Infinity	1.5	1, 4, 6, 9, 16, 24, 26, 30, 32, 54, 55
2.6 Derivatives and Rates of Change	2.5	4, 6, 11, 14, 18, 20, 28, 34, 36, 44, 48, 50
2.7 The Derivative as a Function	1.5	2, 4, 6, 8, 10, 12, 24, 36, 42, 43
2.8 What Does f' Say about f ?	1.5	2, 4, 8, 12, 16, 20, 22, 30
Chapter 3: Differentiation Rules	3 wk	
3.1 Derivatives of Polynomials and Exponential Functions	1.5	8, 10, 16, 18, 22, 28, 46, 58, 59, 62
3.2 The Product and Quotient Rules	1	2, 4, 6, 12, 18, 24, 34, 42, 48, 49, 52
3.3 Derivatives of Trigonometric Functions	1	2, 6, 10, 14, 16, 24, 32, 36
3.4 The Chain Rule (skip “ <i>Parametric Curves</i> ”)	2	10, 14, 18, 22, 26, 28, 42, 53, 55, 60, 71, 74
3.5 Implicit Differentiation (skip “ <i>Orthogonal Trajectories</i> ”)	1.5	6, 12, 16, 24, 27, 30, 51
3.6 Inverse Trigonometric Functions and Their Derivatives	1	2, 4, 10, 14, 18, 22, 25, 30
3.7 Derivatives of Logarithmic Functions (skip “ <i>Logarithmic Differentiation</i> ”)	0.5	4, 6, 12, 18, 22
3.8 Rates of Change in the Natural & Social Sciences	2	4, 6, 10, 16, 18, 20, 22, 25, 28, 34
3.9 Linear Approximations and Differentials	1	4, 8, 16, 20, 26, 32
Chapter 4: Applications of Differentiation	2+ wk	
4.1 Related Rates	3	6, 10, 14, 18, 22, 26, 30, 34, 38
4.2 Maximum and Minimum Values	1.5	4, 8, 12, 42, 44, 48, 52, 62, 64
4.3 Derivatives and the Shapes of Curves	1.5	2, 6, 8, 12, 16, 24, 38, 58
4.4 <i>Graphing with Calculus and Calculators</i>	<i>0-1</i>	<i>Instructor's Choice</i>
4.6 Optimization Problems	3	8, 10, 16, 18, 22, 32, 48, 52, 58
4.7 <i>Newton's Method</i>	<i>0-1</i>	<i>Instructor's Choice</i>

Sections listed in *italics* are optional and will not be tested on the common final exam.

Time for sections represents suggested number of classroom “hours”, based on 4 hours per week. The suggested hours for required sections add to 31.5 out of the 40 nominally available for the non-lab portion of the course. The remaining hours can be used for exams, projects, review, optional sections, etc.

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Course policy regarding calculators and computers: Departmental policy forbids the use of calculators capable of symbolic differentiation or integration on the common final exams of MTH 229 and MTH 230. Your instructor may also forbid them on midterm exams. Examples of calculator models excluded under this policy are the TI-89, TI-Nspire, TI Voyage 200, HP-48, HP-50, and Casio Classpad 330. Use of these calculators outside of exams is usually not a problem.

Common Final Examination: All sections of MTH 229 and MTH 230 take common final exams at the time given in the WSU Class Schedule for the Mathematics Common Examination. *This includes evening sections.* By registering for this course you accept responsibility for being at the final exam. You must a photo ID to the common final exam.

General Education Program: MTH 229, together with MTH 230, is an Area I General Education substitute.

A bachelor's degree awarded by a university implies more than career preparation or specialized technical competency. A university education should be broadly based in order to promote intellectual understanding, encourage breadth and flexibility of perspective and provide students an opportunity to develop skills and knowledge that will form the basis for their life-long learning. Accordingly, the General Education Program at Wright State University is a planned and coherent program that is designed to help students:

- Sharpen critical thinking, problem solving, and communication skills.
- Learn about the aesthetic, ethical, moral, social, and cultural dimensions of human experience needed for participation in the human community.
- Increase knowledge and understanding of the past, of the world in which we live, and of how both past and present have an impact on the future.

Area I General Education Learning Outcomes:

- Use, formulate, and interpret mathematical models
- Summarize and justify analyses of mathematical models or problems using appropriate words, symbols, tables and/or graphs

Laboratory: Richard Mercer, *Calculus I Laboratory Manual*

Lab	Related Text Sections	Sample Assignment
Chapter 1: Functions and Models	0-1wk	
01 Graphs and Mathematica	1.3	L01.1, L01.2
Chapter 2: Limits and Derivatives	3 wk	
11 Limits and Derivatives	2.2, 2.3	L11.1 (omit part (iv)), L11.2, L11.5
12 Limits and Infinity	2.5	L12.1, L12.3, L12.5
04 Tangent Lines	2.1, 2.6	L04.1, L04.2, L04.5, L04.7
05 Rates of Change	2.1, 2.6	L05.3
06 Derivatives and Graphs	2.7, 2.8	L06.1, L06.3b, L06.4b, L06.6
10 The Derivative	2.7, 2.8	L10.1, L10.3, L10.5, L10.6
Chapter 3: Differentiation Rules	3 wk	
13 Polynomial Functions	3.1, 4.2	L13.1, L13.2, L13.4, L13.5
14 Transcendental Functions	3.1, 3.3	L14.1cd, L14.2, L14.5, L14.5
15 Algebra and Derivatives	3.2	L15.1, L15.3, 15.4
16 The Chain Rule	3.4, 3.5	L16.1, L16.2, L16.3, L 15.2, L16.7
21 Linear Approximation	3.9	L21.1, L21.2b, L21.3
Chapter 4: Applications of Differentiation	2-3 wk	
20 Derivatives and Rates	3.8, 4.1	L20.2, L20.3, L20.5, L20.6, L20.7
25 Optimization	4.6	L25.1, L25.4, L25.5
24 Newton's Method	4.8	L24.1bd, L24.2b, L24.3