

MTH 2240 (4 semester hours)
APPLIED CALCULUS
DEPARTMENTAL SYLLABUS

Revised 2/23

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TEXTBOOK: Calculus for the Life Sciences, 2nd Edition, Greenwell, Ritchey, Lial (Pearson)

CALCULATOR: TI 81-86 or equivalent calculator required, calculators with symbolic manipulation like

TI 89 not permitted, rentals available with refundable deposit through Math Learning Center, 122 SSC

OFFICE OF DISABILITY SERVICES LOCATION: 180 University Hall

CONTENT:

<u>Days</u>	<u>Section</u>	<u>Suggested Homework Problems</u>
1.5	1.1 Lines and Linear Functions	1,3-33 div. by 3,39,41,45-69 div. by 3, 71a-d,73,75,79,80,83
1.5	1.3 Properties of Functions	1,3,6,17-25odd,33-61odd,63,69,71-72
1	1.4 Quadratic Functions	13-14,49,57,58
1	1.5 Poly & Rational Functions	7-8,12-13,16-20,27,34,41,48-50,52
1	2.1 Exponential Functions	1,3-4,8,10,13,15,18,20,24,28,37-38,39a-d,52
2	2.2 Logarithmic Functions	1-23odd,24,27,30,36,37,41,44,46,49,54, 58-59,69,77,87
1	2.3 Applications	1,6,9,14,21,24
2	3.1 Limits	1-3,5-6,7,9,11,15-16,19,35,38,40,49, 53,56,58-59,61,67,70,89,92,94
1	3.2 Continuity	1-2,5,7,8,11,16,21,24,27,38,41a-b,d
2	3.3 Rates of Change	1,3,6,10,13,15,20,31-32,33a-e,40,42,43a
2	3.4 Definition of the Derivative	1,6,9,11,14,16,21,23,39,49,51,53,55,57
1	3.5 Graphical Differentiation	4,5,7,11,13,17,20,22
2	4.1 Techniques for Finding Derivatives	1-2,4-5,7,10,12,17,19,21,23,26,29,32, 33,35,38,42-43,47,51,54,57,70,75
2	4.2 Derivatives of Products and Quotients	2-3,8-9,12-13,16,21,24,29,30,34-35,41-43
2	4.3 The Chain Rule	3,9,11,16-17,20,21-29odd,30,33,36-37, 46-47,49,54-55,58,62a-b
2	4.4 Derivatives of Exponential Functions	2-3,8-9,12-13,17-18,23,31,40,46,51,61,65-66
2	4.5 Derivatives of Logarithmic Functions	2-3,8-9,14,19,21,24-25,27,35,57,64
2	5.1 Increasing and Decreasing Functions	2-3,6,10-11,14-15,17-18,19,21,24,29,32, 52-53,55
2	5.2 Relative Extrema	2-4,7,9,11,14-15,17,26,30-31,48,54-55
2	5.3 Higher Derivatives, Concavity, and the Second Derivative Test	3-4,7,11,14,16,19,29,33-43odd,48,51,57-58 66-67,70,79,82,88,98
2	5.4 Curve Sketching	4-5,8,10-11,18,23,28,37,39
2	6.1 Absolute Extrema	3-4,8,11-15odd,18,21,25,27,34-35,40,43,46,50
2	6.2 Applications of Extrema	2-3,5-6,9,13,20,22,25-26
2	7.1 Antiderivatives	1,4,5-37odd,45,47-48,50,54
2	7.2 Substitution	4-5,8-10,12-13,15,17-18,20-21,29,31,62-63
1	7.3 Area and the Definite Integral	3,5,8,15,17,26,31,39
2	7.4 The Fundamental Theorem of Calculus	2-3,6-7,11,14,16-17,20-21,24-25,29,37,40 50-51,63-64,70,72,82
2	7.5 The Area Between Two Curves	2-3,5-6,9-11,14,17,19,22

MTH 2240 is an Element 2 course in the Wright State Core.

WSU Core Learning Outcomes

- Identify the various elements of a mathematical or statistical model
- Determine the values of specific components of a mathematical/statistical model or relationships among various components
- Apply a mathematical/statistical model to a real-world problem
- Interpret and draw conclusions from graphical, tabular, and other numerical or statistical representations of data
- Summarize and justify analyses of mathematical/statistical models for problems, expressing solutions using an appropriate combination of words, symbols, tables or graphs

Course Learning Outcomes

Students in MTH 2240 can

- 1) Identify, represent, develop, use, analyze, and graph linear, quadratic, polynomial, power, exponential, and logarithmic functions, including for real-world modeling in the life sciences
- 2) Evaluate and interpret limits including from tables of values and graphs
- 3) Determine and prove continuity or discontinuity of a function
- 4) Find and interpret average rate of change and instantaneous rate of change through use of formulas, derivatives, and graphs, and relate to secant and tangent lines respectively
- 5) Write the equation of a tangent line and interpret rate of change as slope
- 6) Find and interpret derivatives including from definition, table, and use of shortcut rules
- 7) Use derivatives to describe properties of graphs including critical points, points of inflection, intervals of increase/decrease, intervals of concave up and down, and local and absolute extrema
- 8) Solve optimization problems related to the life sciences through use of Calculus techniques
- 9) Evaluate and interpret indefinite and definite integrals, including with life science applications
- 10) Find and graph the area under a curve and between curves using integration techniques