OUTLINE FOR MATH 100

Math 100 (3) Differential Calculus with Applications to Physical Sciences and Engineering
Derivatives of elementary functions. Applications and modelling: graphing, optimization. Credit will be given for only one of MATH 100, 102, 104, 111, 120, 180 or 184. Prerequisite: High school calculus, and a standing of C^+ or better in Principles of Mathematics 12. [3-0-0]

Text Edwards and Penny, "Single Variable Calculus with Analytic Geometry, Early Transcendentals, 6th ed."

Week 1 Tangent lines, Limits, Continuity and the Intermediate Value Theorem (§§2.1-2.4)
Suggested Problems:

§2.1, p. 62: 9, 27, 33, 35
§2.2, p. 73: 23, 27, 29, 31, 33, 35, 39, 43, 61
§2.3, p. 85: 1, 7, 13, 17, 25, 27, 31, 41, 45, 53, 55, 59, 69
§2.4, p. 97: 23, 33, 39, 47, 49, 51, 55, 59, 65, 71, 75, 77

Week 2 First and Second Derivatives with Interpretations. Basic Differentiation Rules (§§3.1-3.2)
Suggested Problems:

§3.1, p. 112: 17, 19, 23, 27, 31, 33, 35, 39, 43, 45, 49, 51, 55, 57
§3.2, p. 123: 7, 11, 15, 19, 21, 35, 39, 45, 49, 51, 55, 57, 75

Week 3 Chain and power rules. (§§3.3-3.4)
Suggested Problems:

§3.3, p. 132: 11, 19, 21, 25, 29, 31, 35, 45, 47, 49, 53, 55, 57, 61
§3.4, p. 138: 29, 33, 35, 39, 41, 43, 47, 57, 59, 61, 63, 67, 69, 71

Week 4 Maxima and Minima (§§3.5-3.6).
Suggested Problems:

§3.5, p. 148: 3, 7, 17, 19, 25, 29, 35, 39, 41, 47, 49, 51
§3.6, p. 159: 3, 11, 15, 19, 25, 31, 41, 47, 49, 57, 59

Week 5 Derivatives of trigonometric, exponential, log and
general inverse functions (§§3.7-3.8).

Suggested Problems:

§3.7, p. 171: 5, 11, 19, 23, 29, 45, 47, 55, 63, 69, 77, 81, 83, 87

§3.8, p. 187: 11, 17, 29, 35, 41, 61, 63, 65, 71

Test #1, Wednesday Oct. 9

Week 6 Exponential growth and
decay. First order linear, constant coefficient, differential equations
(Newton's Law of Cooling). (§§8.1,8.3).

Suggested Problems:

§8.1, p. 557: 1, 24, 27, 31, 33, 35, 37

§8.3, p. 576: 31, 33, 35

Week 7 Inverse trig functions. Related Rates (§§6.8, 3.9).

Suggested Problems:

§6.8, p. 475: 3, 9, 11, 19, 25, 27, 61, 63, 65, 71, 73

§3.9, p. 195: 9, 11, 13, 17, 25, 31, 35, 39, 45, 49, 51, 59, 63, 65, 67

Week 8 Newton's method. Linear approximations (§§3.10, 4.2).

Suggested Problems:

§3.10, p. 209: 3, 7, 13, 21, 35, 39

§4.2, p. 225: 19, 23, 27, 33, 41, 43, 47, 51

Week 9 Increasing and decreasing functions. Mean Value
Theorem.(§4.3)

Suggested Problems:

§4.3, p. 235: 1, 3, 5, 9, 15, 19, 21, 33, 37, 47, 51, 57, 61, 63

Week 10 Curve Sketching (§§4.4,4.5).

Suggested Problems:

§4.4, p. 244: 19, 23, 25, 29, 37, 41, 45, 47, 55

§4.5, p. 255: 3, 11, 15, 23, 25, 35, 41, 43, 47, 49, 51, 53, 55, 57

Test #2, Wednesday, Nov. 13

Week 11 Curve sketching cont. (§§4.6,4.7)

Suggested Problems:

§4.6, p. 268: 3, 5, 11, 15, 19, 21, 23, 27, 31, 35, 43, 49, 57, 59, 63, 67, 71, 77, 79, 81, 85,89

§4.7, p. 281: 5, 9, 13, 15, 17, 19, 21, 23, 27, 31, 35, 39, 45, 47

Week 12 Taylor Series and Polynomials (§10.4).

Suggested Problems:

§10.4, p. 715: 13, 15, 19, 23, 27, 29, 33, 35, 39, 55

Week 13 Review.