**Bronx Community College of the City University of New York**

**Department of Mathematics and Computer Science**

SYLLABUS: MTH 31 - Analytic Geometry and Calculus I (4 credits/6 hours per week)

PREREQUISITE: MTH 30 or equivalent and, if required, ENG 2 and RDL 2

TEXT: Calculus (Eighth Edition) by James Stewart, Cengage Learning. ISBN 978-1285740621

 Students who do not need MTH 33 may use

Single Variable Calculus (Eighth Edition) by James Stewart, Cengage Learning ISBN 978-1305266636

SECTION TOPIC SUGGESTED EXERCISES

Chapter 1: Functions and Limits

1.4 The Tangent and Velocity Problems 49/ 1, 3, 5, 7

1.5 The Limit of a Function 59/ 1-5, 12-14, 17, 23-28

1.6 Calculating Limits Using Limit Laws 70/ 1, 3-23 odd

1.8 Continuity 91/ 3, 7, 9, 15-21 odd, 25, 33, 37, 39, 41, 44, 45,

 47, 49, 53, 55, 57

Review 96/ 1-11 odd, 17, 23, 27, 29

Chapter 2: Derivatives

2.1 Derivatives 113/ 1, 3, 7, 21-31 odd, 39-47 odd, 53, 57, 59

2.2 The Derivative as a Function 125/ 1, 3, 4, 7, 19, 20, 21, 25-33 odd, 39-51 odd

2.3 Differentiation Formulas 140/ 1-43 odd, 51, 53, 69, 77

2.4 Derivatives of Trigonometric Functions 150/ 1-17 odd, 25, 29, 39-49 odd

2.5 The Chain Rule 158/ 1-45 odd, 47, 51, 55, 69, 71

2.6 Implicit Differentiation 166/ 1-19 odd, 25, 27, 31, 35, 43, 45

2.7 Rates of Change in the Natural and 178/ 1-9 odd, 15, 18

 Social Sciences

2.8 Related Rates 185/ 1, 3, 9, 10, 11, 13-33 odd

2.9 Linear Approximations and Differentials 192/ 1, 3, 5, 7-25 odd, 31

Review 196/ 3, 5, 11, 13-37, 45, 51, 59, 61, 75, 77, 79, 82

Chapter 3: Applications of Differentiation

3.1 Maximum and Minimum Values 211/ 3, 5, 15-27 odd, 29-55 odd

3.2 The Mean Value Theorem 219/ 1, 11, 13, 17, 21

3.3 How Derivatives Affect the Shape of a Graph 227/ 1, 5, 7, 8, 9-17 odd, 33-41 odd

3.4 Limits at Infinity; Horizontal Asymptotes 241/ 3, 9-29 odd, 37, 41

3.5 Summary of Curve Sketching 250/ 1-35 odd

3.7 Optimization Problems 256/ 3, 5, 7, 11, 17, 21, 27, 31

3.8 Newton’s Method 276/ 5, 7, 13-19 odd, 29

3.9 Antiderivatives 282/ 1-41 odd, 43, 45, 47

Review 286/ 1-27 odd, 38, 41, 46, 49, 55, 57

Chapter 4: Integrals

4.1 Areas and Distance 303/ 1, 3, 5, 13, 15, 21, 25

4.2 The Definite Integral 316/ 3, 5, 9, 17, 21-25 odd, 31, 33, 37

4.3 The Fundamental Theorem of Calculus 327/ 3, 7-35 odd, 45, 51, 53

4.4 Indefinite Integrals and the Net Change Theorem 336/ 1-11 odd, 19-41 odd, 55, 57

4.5 The Substitution Rule 346/ 1-29 odd, 35-51 odd

Review 349/ 2, 5, 11-29 odd, 35, 37, 39

8/03 C.O’S.

8/07 MM

7/11 MM, 9/11 AM

6/12 EA

1/16 EA