

Math-M119 Brief Survey of Calculus

List of Course Topics

TEXTBOOK: Hughes-Hallett, Gleason, Lock, Faith, et al. *Applied Calculus*, Third Edition

Chapter One: FUNCTIONS AND CHANGE

- 1.1 WHAT IS A FUNCTION?
- 1.2 LINEAR FUNCTIONS
- 1.3 RATES OF CHANGE
- 1.4 APPLICATIONS OF FUNCTIONS TO ECONOMICS
- 1.5 EXPONENTIAL FUNCTIONS
- 1.6 THE NATURAL LOGARITHM
- 1.7 EXPONENTIAL GROWTH AND DECAY

Chapter Two: RATE OF CHANGE: THE DERIVATIVE

- 2.1 INSTANTANEOUS RATE OF CHANGE
- 2.2 THE DERIVATIVE FUNCTION
- 2.3 INTERPRETATIONS OF THE DERIVATIVE
- 2.4 THE SECOND DERIVATIVE

Chapter Three: SHORT-CUTS TO DIFFERENTIATION

- 3.1 DERIVATIVE FORMULAS FOR POWERS AND POLYNOMIALS
- 3.2 EXPONENTIAL AND LOGARITHMIC FUNCTIONS
- 3.3 THE CHAIN RULE
- 3.4 THE PRODUCT AND QUOTIENT RULES

Chapter Four: USING THE DERIVATIVE

- 4.1 LOCAL MAXIMA AND MINIMA
- 4.2 INFLECTION POINTS
- 4.3 GLOBAL MAXIMA AND MINIMA
- 4.4 PROFIT, COST, AND REVENUE

Chapter Five: ACCUMULATED CHANGE: THE DEFINITE INTEGRAL

- 5.1 ACCUMULATED CHANGE
- 5.2 THE DEFINITE INTEGRAL
- 5.3 THE DEFINITE INTEGRAL AS AREA
- 5.4 THE INTERPRETATIONS OF THE DEFINITE INTEGRAL
- 5.5 THE FUNDAMENTAL THEOREM OF CALCULUS

Chapter Six: USING THE DEFINITE INTEGRAL

- 6.3 PRESENT AND FUTURE VALUE

Chapter Seven: ANTIDERIVATIVES

- 7.1 CONSTRUCTING ANTIDERIVATIVES ANALYTICALLY
- 7.3 USING THE FUNDAMENTAL THEOREM TO FIND DEFINITE INTEGRALS