University of Houston
Department of Mathematics
MATH 1431 — Calculus I

SYLLABUS

Text: *CALCULUS, 9 th Edition*, by Salas, Hille, Etgen, published by John Wiley & Son. Text is in electronic form .

CourseWare

Homework Assignments html pdf

Exam Calendar
All exams will be departmental exams given at CASA .

Chapter 2 LIMITS AND CONTINUITY

Section 2.1 The Idea of Limit
Section 2.2 Definition of Limit
Section 2.3 Some Limit Theorems
Section 2.4 Continuity
Section 2.5 The Pinching Theorem; Trigonometric Limits
Section 2.6 Two Basic Theorems

Chapter 3 DIFFERENTIATION

Section 3.1 The Derivative
Section 3.2 Some Differentiation Formulas
Section 3.3 The d/dx Notation; Derivatives of Higher Order
Section 3.4 The Derivative as a Rate of change
Section 3.5 The Chain Rule
Section 3.6 Differentiating the Trigonometric Functions
Section 3.7 Implicit Differentiation; Rational Powers
Section 3.8 Rates of Change Per Unit Time

EXAM I

Section 3.9 Differentials; Newton-Raphson Approximation

Chapter 4 THE MEAN-VALUE THEOREM

Section 4.1 The Mean-Value Theorem
Section 4.2 Increasing and Decreasing Functions
Section 4.3 Local Extreme Values
Section 4.4 Endpoint and Absolute Extreme Values
Section 4.5 Some Max-Min Problems
Section 4.6 Concavity and Points of Inflection
Section 4.7 Vertical and Horizontal Asymptotes
Section 4.8 Some Curve Sketching

EXAM II

Chapter 5 INTEGRATION

Section 5.1 An Area Problem; A Speed-Distance Problem
Section 5.2 The Definite Integral of a Continuous Function
Section 5.3 The Function $\int_a^x f(t)dt$
Section 5.4 The Fundamental Theorem of Integral Calculus
Section 5.5 Some Area Problems
Section 5.6 Indefinite Integrals
Section 5.7 The u -Substitution; Change of Variables
Section 5.8 Additional Properties of the Definite Integral
Section 5.9 Mean-Value Theorem for Integral; Average Values

Chapter 6 SOME APPLICATIONS OF THE INTEGRAL

Section 6.1 More on Area
Section 6.2 Volume by Parallel Cross Section; Discs and Washers
Section 6.3 Volume by the Shell Method
Section 6.4 The Centroid of a Region; Pappus's Theorem on Volumes
Section 6.5 The Notion of Work

EXAM III