

## MATH 101, Winter 2012

### COURSE OUTLINE

All lecture sections of MATH 101 cover the topics listed below in the given order. A “Week” represents *approximately* a week’s worth of lecture time, not necessarily a calendar week.

Section numbers below refer to the text; most of Chapters 5, 6, 7, and 11 are covered, as well as parts of Chapters 8 and 9.

- **Week 1**
  - §5.1 Areas and Distances
  - §5.2 The Definite Integral
- **Week 2**
  - §5.3 The Fundamental Theorem of Calculus
  - §5.4 Indefinite Integrals and the Net Change Theorem (ignore  $\sinh$  and  $\cosh$  formulas)
  - §5.5 The Substitution Rule
- **Week 3**
  - §6.1 Areas Between Curves
  - §6.2 Volumes
- **Week 4**
  - §6.4 Work
  - §6.5 Average Value of a Function
  - §7.1 Integration by Parts (ignore “reduction formulas”)
- **Week 5**
  - §7.2 Trigonometric Integrals (ignore  $\sin mx \cos nx$ , etc.)
  - §7.3 Trigonometric Substitution (ignore inverse secant and inverse hyperbolic substitutions)
  - §7.4 Integration of Rational Functions by Partial Fractions (ignore “CASE IV:  $Q(x)$  contains a repeated irreducible quadratic factor”)
- **Week 6**
  - §7.5 Strategy for Integration
  - §7.7 Approximate Integration
  - §7.8 Improper Integrals
- **Week 7**
  - §8.3 Applications to Physics and Engineering (ignore Hydrostatic Pressure and Force and Theorem of Pappus)
  - §9.3 Separable Equations (ignore Orthogonal Trajectories)
- **Week 8**
  - §11.1 Sequences (ignore Definitions 2 and 5, Example 6, proof of Monotonic Sequence Theorem, Example 14)
  - §11.2 Series
- **Week 9**
  - §11.3 The Integral Test and Estimates of Sums (ignore Estimating the Sum of a Series and Proof of the Integral Test)
  - §11.4 The Comparison Tests (ignore Estimating Sums)
- **Week 10**
  - §11.5 Alternating Series
  - §11.6 Absolute Convergence and the Ratio and Root Tests (ignore The Root Test)
- **Week 11**
  - §11.8 Power Series
  - §11.9 Representations of Functions as Power Series
- **Week 12**
  - §11.10 Taylor and Maclaurin Series (ignore Binomial Series)