Approved syllabus for MATH242

Analytic Geometry & Calculus B

Catalog Description

Brief review of MATH241; applications of integration; integration techniques; parametric curves; polar coordinates; infinite sequences and series. Includes use of computers to perform symbolic, numerical and graphical analysis.

PREREQ: MATH 241. RESTRICTIONS: Credit cannot be received for both MATH242 and MATH 222.

Textbook

Calculus: Early Transcendentals, by James Stewart et al., 9th edition (USA)

Syllabus

Each "unit" below is a 55-minute class meeting with the primary instructor. A regular semester has approximately 41 lecture units and 14 discussion section units. **Note: Chapter 11 is to be covered before Chapter 10.**

Review (1 unit, MATH241 material)

Chapter 6: Applications of Integration (5 units)

- **6.1** Areas Between Curves (1)
- **6.2** Volumes (2)
- **6.3** Volumes by Cylindrical Shells (2)

Chapter 7: Techniques of Integration (11 units)

- **7.1** Integration by Parts (2)
- **7.2** Trigonometric Integrals (emphasize the simple trigonometric integrals) (2)
- **7.3** Trigonometric Substitution (emphasize the basic trig substitutions) (2)
- **7.4** Integration of Rational Functions by Partial Fractions (cover division and all four cases, but emphasize division and cases 1,2, and 3) (2)
- **7.7** Approximate Integration (optional)

- **7.8** Improper Integrals (3)

Chapter 8: Further Applications of Integration (1 unit)

- **8.1** Arc Length (1)

Chapter 11: Infinite Sequences and Series (17 units)

- **11.1** Sequences (2)
- **11.2** Series (2)
- **11.3** Integral Test and Estimates of Sums (2)
- **11.4** The Comparison Tests (cover both, but emphasize Limit Comparison Test) (2)
- **11.5** Alternating Series and Absolute Convergence (alternating series is optional, coverage of the distinction between absolute and conditional convergence) (2)
- **11.6** The Ratio and Root Test (the Root Test is optional) (1)
- **11.8** Power Series (2)
- **11.9** Representation of Functions as Power Series (1)
- **11.10** Taylor and Maclaurin Series (2)
- **11.11** Taylor Polynomials (1)

Chapter 10: Parametric Equations and Polar Coordinates (6 units)

- **10.1** Curves Defined by Parametric Equations (1)
- **10.2** Calculus with Parametric Curves (1)
- **10.3** Polar Coordinates (1)
- **10.4** Areas and Lengths in Polar Coordinates (areas only) (1)
- **10.5** Conic Sections (concentrate on recognizing and sketching conic sections in standard form and with shifts in x and y) (2)

➢ Updated by Cristina Bacuta and approved by Lou Rossi on August 1, 2012.
➢ Updated by Cristina Bacuta and approved by Lou Rossi and Gilberto Schleiniger on August 15, 2013 and January 31, 2014.
➢ Updated by Christopher Raymond on February 9, 2017 and August 11, 2017.
➢ Updated by Dominique Guillot on August 23, 2023.