

1. MA 16600 – Analytic Geometry and Calculus II

2. Credits and contact hours:

4 credits

Lecture – 3 days per week at 50 minutes for 15 weeks.

Recitation - 1 day per week at 50 minutes for 15 weeks.

3. Instructor's or course coordinator's name: Antonio C. Sa Barreto, Alexandros Kafkas, Yigi Gu, Yinzhen Li, Iason Vasileios Moutzouris ...

4. Textbook(s): *Bundle: Calculus: Early Transcendentals, Loose-Leaf Version, 8th + Enhanced WebAssign Printed Access Card for Calculus, Multi-Term Courses*, James Stewart, Brooks Cole, 8th Edition, (Notes-other options include access sheet for e-book (9781285858265) or buying e-book & homework access directly through WebAssign.) ISBN 9781305616691

a. Other supplemental materials: None

5. Specific course information

a. Catalog description: Continuation of MA 16500. Vectors in two and three dimensions. Techniques of integration, infinite series, polar coordinates, surfaces in three dimensions. Not open to students with credit in MA 16200. Typically offered Fall Spring. CTL:IMA 1603 Calculus – Long II

b. Prerequisites or co-requisites: MA 16100 Minimum Grade of C- or MA 16300 Minimum Grade of C- or MA 16500 Minimum Grade of C- or MATH 16500 Minimum Grade of C- or MA 16700 Minimum Grade of C- or (MA 22100 Minimum Grade of C- and (MA 22200 Minimum Grade of C- or MA 16021 Minimum Grade of C-)) or (MA 22300 Minimum Grade of C- and MA 22400 Minimum Grade of C-) or ((MA 23100 Minimum Grade of C- or MA 16010 Minimum Grade of C-) and (MA 23200 Minimum Grade of C- or MA 16020 Minimum Grade of C-))

c. Course status:

6. Specific goals for the course

a. Student Learning Outcomes:

1. Apply techniques of integration (integration by parts, trigonometric substitution and partial fractions) to compute areas of planar regions, volumes of solids of revolution and areas of surfaces of revolution, work, moments and centers of mass of homogeneous laminas.

2. Apply tests of absolute convergence of series to find the interval of convergence of some power series.

3. Find the Taylor and Maclaurin series of some exponential, rational and trigonometric functions.

4. Use polar coordinates to make it possible to sketch the graphs of some curves.
5. Understand the definition of a Riemann sum, and should be able to apply elementary approximation methods of integration.

b. Relationship of course to program outcomes:

7. Topics

Weeks

- 1 Three-Dimensional Coordinate Systems+, Vectors, The Dot Product
- 2 The Cross Product, Areas Between Curves, Volumes
- 3 Volumes by Cylindrical Shells, Average Value of a Function
- 4 Integration by Parts, Trigonometric Integrals
- 5 Trigonometric Substitution
- 6 Integration of Rational Functions by Partial Fractions, Integration Using Tables, Approximate Integration
- 7 Improper Integrals, Arc Length, Area of a Surface of Revolution, Applications to Physics and Engineering
- 8 Sequences, Series, The Integral Test
- 9 The Integral Test and Estimates of Sums, The Comparison Tests
- 10 Alternating Series, Absolute Convergence and the Ratio Test
- 11 The Root Test, Strategy for Testing Series, Power Series, Representations of Functions as Power Series
- 12 Taylor and Maclaurin Series, Curves Defined by Parametric Equations
- 13 Calculus with Parametric Curves
- 14 Polar Coordinates, Appendix H