

**MIAMI-DADE COMMUNITY COLLEGE
INTERAMERICAN CAMPUS
SUMMER 2013-3
Mathematics Department**

**MAC 2312 – CALCULUS II
TR 11:40 am – 1:50 pm Room 1124
Ref # 794265**

COURSE SYLLABUS AND COMPETENCIES

Instructor: Dr. Jose Serpa
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Office: 1369
Phone: 237-6110

Textbook: Thomas' CALCULUS (Early Transcendentals) 12th Edition
Weir/Hass/Giordano
ISBN 0-321-58876-0

Course Description: Topics include: Techniques of integration; differentiation and integration of inverse trigonometric, exponential, logarithmic and hyperbolic functions; sequences and power series; parametric equations and polar coordinates; improper integrals; applications.

Pre-requisite: MAC 2311 with a grade of C or better or equivalent.

Evaluation Policy:

Five unit exams will be given during the semester, as well as a mandatory, comprehensive, final exam. The final grade will be an average of the 4 best scores out of 5 unit exams and the final exam score. Homework will be posted online. You can earn up to 10 extra credits toward each unit exam. I may assign the seating during any of the tests or Final Exam

Grading Policy:

90 – 100 = A
80 – 89 = B
70 – 79 = C
60 – 69 = D
0 – 59 = F

Drops/Withdrawals:

Drops and Withdrawals should be conducted through the office of the registrar. However, I periodically purge my class roster. If you are continuously absent and do not inform me of a reason, you may be purged from the class.

Attendance:

Attendance is highly encouraged. Students are responsible for all material covered in class. Students who attend and do not appear on the class roll will be asked to report to the Registrar's Office to obtain a paid/validated schedule.

Math Lab:

The math lab is located in room 1213. It is highly recommended.

Cell phones and beepers:

Cell phones and beepers must be on silent or be turned off before class. Under no circumstances will a student be allowed to use a cell phone inside the classroom.

Make-ups:

No Make-ups policy.

Incompletes:

Incompletes will be given only in very limited circumstances. The student must have a passing average and have a serious personal illness, family death, or unexpected crisis.

Course Outline (*Subject to change*):

I reserve the right to make changes in the test dates as needed. Any changes will be announced in class as early as possible

Week 1

Introduction

8.1 Basic Integration Formulas

8.2 Integration by Parts

Week 2

8.3 Integration of Rational Functions by Partial Fractions

8.4 Trigonometric Integrals

8.5 Trigonometric Substitutions

Week 3

Review

Exam 1

8.7 Numerical Integration

8.8 Improper Integrals

Week 4

6.1 Volumes by Slicing and Rotation About an Axis

6.2 Volumes by Cylindrical Shells

6.3 Lengths of Plane Curves

6.5 Areas of Surfaces of Revolutions and the Theorem of Pappus

Week 5

9.1 Slope Fields and Separable Differential Equations

Review

Exam 2

Week 6

10.4 Conics and Parametric Equations: The Cycloid

10.5 Polar Coordinates

10.6 Graphing in Polar Coordinates

10.7 Areas and Lengths in Polar Coordinates

Week 7

Review

Exam 3

11.1 Sequences

11.2 Infinite Series

Week 8

11.3 The Integral Test

11.4 Comparison Test

11.5 The Ratio and Root Test

Week 9

11.6 Alternating Series, Absolute and Conditional Convergence

Review

Exam 4

Week 10

11.7 Power Series

11.8 Taylor and Maclaurin Series

11.10 Applications of Power Series

Week 11

Review

Exam 5

Review for Final

Week 12

Cumulative Final Exam

Course Competencies:

Competency 1:

The Student will demonstrate knowledge of integrating functions by:

- a. using integration by parts,
- b. computing trigonometric integrals,
- c. using appropriate trigonometric substitutions,
- d. using partial fractions,
- e. using rationalizing substitutions.

Competency 2: The Student will demonstrate knowledge of approximate integration by:

- a. using mid-point rule,
- b. using trapezoidal rule,
- c. using Simpson's rule

Competency 3: The Student will demonstrate knowledge of improper integrals and their convergence by:

- a. computing convergent improper integrals of type-1 and type-2,
- b. identifying improper integrals that are divergent,
- c. using comparison theorems to test their convergence.

Competency 4: The Student will demonstrate knowledge of applications of integrals by:

- a. finding the arc length,
- b. finding the area of surface of revolution,
- c. finding moments and centers of mass

Competency 5: The Student will demonstrate knowledge of differential equations by:

- a. modeling differential equations,
- b. solving separable equations.

Competency 6: The Student will demonstrate knowledge of curves defined by parametric and polar equations by:

- a. drawing graphs of such curves,
- b. finding tangents and areas that involve such curves,
- c. finding arc lengths and areas of surface of revolutions of such curves.

Competency 7: The Student will demonstrate knowledge of sequences and series by:

- a. determining the convergence or divergence of a sequence with different techniques,
- b. computing the limits of convergent sequences,
- c. recognizing types of series, such as, geometric, telescopic, harmonic, alternating, p-series, power series etc.,
- d. determining convergence or divergence of a series by comparison test, limit-comparison test, integral test, alternating series test, p-series test,
- e. determining the absolute convergence or conditional convergence by ratio test and/or root test,
- f. determining the radius of convergence and the interval of convergence of a power series,

- g. finding the Taylor and MaClaurin series of an analytic function ,
- h. finding binomial series.

**Miami – Dade College / InterAmerican Campus
Mathematics Department**

How do the course objectives relate to the Miami-Dade Learning Outcomes?

What follows below is a list of the ten learning outcomes that have recently been prepared by Miami Dade faculty and administrators.

As graduates of Miami Dade College, students will be able to:

1. Communicate effectively using listening, speaking, reading, and writing skills.
2. Use quantitative analytical skills to evaluate and process numerical data.
3. Solve problems using critical and creative thinking and scientific reasoning.
4. Formulate strategies to locate, evaluate, and apply information.
5. Demonstrate knowledge of diverse cultures, including global and historical perspectives.
6. Create strategies that can be used to fulfill personal, civic, and social responsibilities.
7. Demonstrate knowledge of ethical thinking and its application to issues in society.
8. Use computer and emerging technologies effectively.
9. Demonstrate an appreciation for aesthetics and creative activities.
10. Describe how natural systems function and recognize the impact of humans on the environment.

Each course taken at the college addresses some of these learning outcomes. MAC2312 addresses outcomes 1, 2, 3, 4, 8, 9.