

Syllabus for Calculus IV Math 244 (3) - Summer 2015

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Course Description: Multiple integrals; line integrals and Greens Theorem, surface integrals, Stokes and Gauss Theorems.

Prerequisite: A grade of C or better in Math 243 or consent.

Text: *University Calculus (Alternate Edition)* by J. Haas, M. Weir, and G. Thomas, Addison Wesley, current edition.

Course objectives: Upon successful completion of Math 244 the student will have an understanding of the above listed topics, be able to solve routine problems, and be able to apply the ideas.

Program objectives: This is the fourth and last course of our calculus sequence for STEM (Science, Technology, Engineering, Mathematics) majors. As the sequence is introductory, the approach is more computational than theoretical. Mathematics is the basic language for STEM fields. Understanding the language, the basic ideas and results, and the computational techniques of calculus is prerequisite to advanced learning in any STEM field.

Format: This class meets MWF from 10:30-11:50 through 6/8/15-8/14/15.

Grade Breakdown:

Homework: 30 % - Homework will be posted on my website and due (roughly) every class period. Late work will not be accepted.

Quiz: 20 % - Dates will be announced as we go along. Problems will be similar to homework problems.

Midterm: 25 % - July 10th

Final: 25 % - August 14th

Office Hours: 10:00-10:30 and 11:50-12:20 MWF.

Timeline:**Week 1:** 6/8 - 6/12

- (1) Review Calc I - III
- (2) Double and Iterated Integrals over Rectangles (14.1)
- (3) Double Integrals over General Regions (14.2)

Week 2: 6/15 - 6/19

- (1) Area by Double Integrations (14.3)
- (2) Double Integrals in Polar Form (14.4)

Week 3: 6/22-6/26

- (1) Triple Integrals in Rectangular Coordinates (14.5)
- (2) Moments and Centres of Mass (14.6)

Week 4: 6/29 - 7/1 Note: No class 7/3 (Independence Day)

- (1) Triple Integrals in Cylindrical and Spherical Coordinates (14.7)

Week 5: 7/6 - 7/10

- (1) Substitutions in Multiple Integrals (14.8)
- (2) Review For Midterm 1
- (3) **Midterm 1 (7/10)**

Week 6: 7/13 - 7/17

- (1) Line integrals (15.1)
- (2) Vector Fields, Work, Circulation and Flux (15.2)

Week 7: 7/20 - 7/24

- (1) Path Independence, Potential Functions, and Conservative Fields (15.3)
- (2) Greens Theorem in the Plane (15.4)

Week 8: 7/27 - 7/31

- (1) Surfaces and Area (15.5)
- (2) Surface Integrals and Flux (15.6)

Week 9: 8/3 - 8/7

- (1) Stokes Theorem (15.7)
- (2) Divergence Theorem and a Unified Theory (15.8)

Week 10: 8/10 - 8/14

- (1) Review for Final Exam
- (2) **Final Exam (8/14)**