MATH 255 **Applied Honors Calculus III** **Winter 2008**

Section 3, MTuWF, 9:10 - 10:00 a.m., Dennison 427

Instructor:

Dr. Jack Waddell, 4823 EH, (734)763-1181, seoc@umich.edu

Office Hours: M 2:10 - 3:30 pm, F 10:10 - 11:30am, or by appointment, at 4823 EH

Course Website: www-personal.umich.edu/∼seoc/math255.html

Text: "Calculus", by James Stewart, 5th edition. See website for versions.

Math 255 is an applied honors calculus course for engineering and science students. The course emphasizes computational skills, conceptual understanding, and applications. Math 255 provides students with the calculus background they need for subsequent courses in math, science and engineering. The course also includes practice exercises with MAPLE, a software tool for solving math problems on a computer.

Prerequisite: MATH 156, MATH 186 or permission from instructor.

Homework

Homework will be assigned and collected in class each week on Tuesday at the beginning of class. **Late homework is not accepted**. Students may work together in groups and discuss the homework problems with each other, but each student should write up and submit their own solutions. The homework should be written neatly. Please staple the sheets together.

Grading

Homework	= 30%	
1st midterm exam	= 20%	Wed. Feb. 6, 6:30 - 8 pm (tentative)
2nd midterm exam	= 20%	Wed. Mar. 19, 6:30 - 8 pm (tentative)
Final exam	= 30%	Thu. Apr. 23, 4:00 pm - 6:30 pm

Advice

1. Questions in class are encouraged -if something is unclear, ask a question.

2. Take notes in class and review them regularly. When you review the notes, make a list of anything that is unclear and ask your instructor about these points, either in class or office hours. A good strategy is to share the job of taking notes with a partner.

3. On homework and exams, show your work and explain the steps clearly. Getting the correct answer is fine, but for full credit you must also explain it clearly so someone else (e.g. the grader) can understand.

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Course Syllabus

Text: "Calculus", by James Stewart, 5th edition, Brooks/Cole Publishing

The following sections from the text will be covered:

Parametric Equations and Polar Coordinates

11.1 Curves Defined by Parametric Equations

11.2 Calculus with Parametric Curves

11.3 Polar Coordinates

11.4 Areas and Lengths in Polar Coordinates

Vectors and the Geometry of Space

13.1 Three Dimensional Coordinate Systems

13.2 Vectors

13.3 The Dot Product

13.4 The Cross Product

13.5 Equations of Lines and Planes

13.6 Cylinders and Quadratic Surfaces

13.7 Cylindrical and Spherical Coordinates

Vector Functions

14.1 Vector Functions and Space Curves

14.2 Derivatives and Integrals of vector Functions

14.3 Arc Length and Curvature

14.4 Motion in Space: Velocity and Acceleration

Partial Derivatives

15.1 Functions of Several Variables

15.2 Limits and continuity

15.3 Partial Derivatives

15.4 Tangent Planes and Linear Approximations

15.5 The Chain Rule

15.6 Directional Derivatives and the Gradient Vector

15.7 Maximum and Minimum Values

15.8 Lagrange Multipliers

Multiple Integrals

16.1 Double Integrals over Rectangles

16.2 Iterated Integrals

16.3 Double Integrals over General Regions

16.4 Double Integrals in Polar Coordinates

16.5 Applications of Double Integrals

16.6 Surface Area

16.7 Triple Integrals

16.8 Triple Integrals in Spherical and Cylindrical Coordinates

16.9 Change of Variables in Multiple Integrals

Vector Calculus

17.1 Vector Fields

17.2 Line Integrals

17.3 The Fundamental Theorem of line Integrals

17.4 Green's Theorem

17.5 Curl and Divergence

17.6 Parametric Surfaces and their Areas

17.7 Surface Integrals

17.8 Stokes' Theorem

17.9 The Divergence Theorem