

Case Western Reserve University

MATH 124 - MATHEMATICS II (Fall 2009)

Credits: 04

TuTh 10:00 – 11:15 in Sears 435

Wedn 9:30 – 10:20 in Wick 306

Instructor: Daniela Calvetti

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Office Hours: TuTh 2:30-3:30 Wed 11:00 – 12:00 or by appointment

Math 124 is the honors version of the second semester of a four-semester sequence covering single and multivariable calculus and differential equations. It is a 4 credit-hour course meeting 4 times per week. Math 124 is offered in place of Math 122 by invitation only. As you will see, we will be diving into some very different areas of calculus as the semester progresses, which make Math 124 a very fun course to take (and to teach!). I am very excited to have been given the opportunity to work with you this semester!

COURSE CONTENT:

We will cover a variety of topics including integration, differential equations, infinite series, polar and parametric equations, and an introduction to vector calculus. The course content is found in Chapters 7-11 of the following book:

Textbook: Calculus with Analytic Geometry Early Transcendentals (7th edition)

Edwards & Penny

Prentice Hall

ISBN 0-13-156989-9

GRADING:

Grades will be based on 700 points, earned as follows:

4 Exams, 100 points:	400 points
Written Homework and Groupwork	70 points
Semester Project	30 points
Final Exam (Tuesday, Dec. 8, 4:00-7:00 PM)	200 points

HOMEWORK:

Math not being a spectator sport, homework is the most important part of the course. The purpose of the homework is to make you feel so at ease with the mathematical formalism and basic operation to really appreciate and enjoy the depth of the more advanced problems. As is languages, sports and music, we cannot really appreciate the beauty of the discipline until we have mastered the technical skills required by the trade. Nobody ever brags about the beauty of

grammar, but if we do know it well we cannot appreciate the beauty of the language, whatever form it may take. The bottom line is that no matter how well you follow in class, if you do not do your homework you will not master the material.

The homework for this course will comprise the routine problems assigned in any calculus course, for example, Math 122. Many problems on the exams will be based on routine problems from the book, so students should work on enough of these problems to be able to solve them correctly with ease. How much is enough? That will vary from student to student and from topic to topic. The rule of thumb is that you have done enough homework when you can solve well and fast all the routine problems. More challenging problems, which require a deeper understanding of the material, will be also assigned.

Homework will be very Tuesday and Thursday that we meet. A subset of the problems will be graded. Discussion of the homework will be part of the Groupwork sessions.

GROUPWORK:

Approximately once a week, usually on Wednesdays, but not always, students will work on some problems in class in small groups of 2 or 3. This provides an in-class opportunity to discuss mathematics among peers, which can really enhance understanding of material. Groups may spend some time discussing homework in addition to working on the Groupwork.

SEMESTER PROJECT:

Each student will be required to complete a calculus project. There are many possible topics suggested in the text, but you are not limited to these. Projects can be great ways to unleash your creativity and explore topics that particularly interested you. We will start defining the final projects around fall break, so that you will have enough time to dedicate to their completion.

KEYS TO SUCCESS:

- Attend **all** Class Meetings
- Do ALL Assigned Homework and however many additional problems you need to become very familiar and feel at ease with the material. Keep up to date on the routine problems.
- Before an exam, do EXTRA work on concepts/sections that are challenging for you.
- Ask me questions, both inside and outside of class (email, office hours, at the Sages café, etc.).
- Come for help early and often.
- Work with other students if possible. Study groups are very valuable learning tools.

MATH 124

Honors Calculus II Lecture Plan

Fall Semester 2009

Class meets TuTh 10:00 – 11:15 in Sears 435
and also meets W11:35-12:25 in Wick 306.

Tu 8-25-09	W 8-26-09	Th 8-26 -09
7.1 Introduction 7.2 Integration Tables and substitution 7.3 Integration by parts	7.4 Trig Integrals Groupwork 1	7.5 Partial Fractions
Tu 9-1-09	W 9-2-09	Th 9-3-09
Partial Fractions	Trig Substitutions Groupwork 2	7.6 Trig Substitutions 7.7 Quadratic Polynomials
Tu 9-8-09	W 9-9-09	Th 9-10-09
7.8 Improper Integrals	7.8 Improper Integrals Groupwork 3 Review for Exam 1	8.1 Differential Equations 8.2 Slope Fields Special Office Hours
Tu 9-15-09	W 9-16-09	Th 9-17-09
Exam 1	Workgroup 4 8.3 Separable Equations	8.4 Linear Equations
Tu 9-22-09	W 9-23-09	Th 9-24-09
8.4 Linear Equations	8.4 Applications of Linear Equations Workgroup 5	8.5 Population Models
Tu 9-29-09	W 9-30-09	Th 10-1-09
8.6 Linear Second-Order Equations	8.7 Mechanical Vibrations	9.2 Polar Coordinates
Tu 10-6-09	W 10-7-09	Th 10-8-09
Review for Exam 2	9.3 Area in Polar Coordinates	Exam 2
Tu 10-12-09	W 10-13-09	Th 10-14-09

9.4 Parametric Equations	9.5 Parametric Equations/Calculus Groupwork 7	10.1-10.2 Infinite Sequences
Tu 10-19-09	W 10-20-09	Th 10-21-09
Fall Break No Class	10.3 Infinite Series	10.3 Infinite Series Groupwork 8
Tu 10-27-09	W 10-28-09	Th 10-29-09
10.4 Taylor Series	10.5 Integral Test 10.6 Comparison Test	Review for Exam 3
Tu 11-3-09	W 11-4-09	Th 11-5-09
Exam 3	10.7 Alternating Series	10.7 Ratio and Root Tests Groupwork 9
Tu 11-10-09	W 11-11-09	Th 11-12-09
11.8 Power series	11.8 Power Series	Groupwork 10 10.8 Power Series Computations
Tu 11-17-09	W 11-18-09	Th 11-19-09
10.9 Power series Computations	10.10 Power Series and Differential Equations	Review for Exam 4 Groupwork 11
Tu 11-24-09	W 11-25-09	Th 11-26-09
Exam 4	11.1 Vectors	Thanksgiving No class
Tu 12-1-09	W 12-2-09	Th 12-3-09
11.2 Vectors in 3D space	11.3 Cross products	11.4 Planes Groupwork 12
Tu 12-8-09		
Final exam		