

Syllabus
MTH 243
Calculus 2
MWTh 1:35-2:40
Fall 2004

Instructor: Kristin Webster
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Course Description: Calculus 2 builds upon the differential and integral calculus topics of MTH U241. The course considers three of the basic ideas of calculus: integrals, differential equations, and power series.

Pre-requisites: MTH U241 or equivalent

Text: Calculus. Johnston, Mathews. Addison-Wesley, 2002.

Calculator: TI-83 or higher

Course Objectives:

- To develop an understanding of integration and apply this to areas and volumes.
- To form rules for differentiation and integration of transcendental functions.
- To be familiar with the various techniques of integration including parts, partial fractions, and tables.
- To apply the methods of evaluating definite integrals and improper integrals.
- To study the calculus of functions of more than one variable.
- To develop an understanding of three-dimensional space, the graphing of functions of two variable.
- To study power series and to write Taylor Polynomials.
- To solve differential equations and apply this to the solution of problems.

Major Topics:

1. Indefinite Integral, Sigma Notation, Definition and Evaluation of the Indefinite Integral
2. Application of the Definite Integral to Area, and Volume of a Solid of Revolution
3. Differentiation and Integration of Logarithmic, Exponential, and Inverse Trigonometric Functions
4. Techniques of Integration and Evaluation of Improper Integrals
5. Surfaces in Three Dimension Space, Functions of Two or More Variables and the Graphs of Functions of Two Variables.
6. Derivatives and Integrals of Functions of More than One Variable
7. Double Integration Applied to Areas and Volumes
8. Power Series for Taylor Polynomials

9. First and Second Order Linear Differential Equations and Their Applications

Final Grade Components:

Homework: 10%
Quizzes: 40%
Midterm: 20%
Final: 30%

- Good attendance is essential to success in the course and class participation is desired.

Homework:

- Homework assignments for each section will be due the class meeting after the lecture on the section was finished.
- Homework assignments must be prepared on time. No late homework accepted for any reason!
- Homework should be done neatly with detailed solutions to problems.

Quizzes:

- Quizzes will be given at least every two weeks.
- Your lowest quiz grade will be dropped.
- If a quiz is missed for a legitimate reason, an oral quiz will be given as a make-up.

Academic Honesty: Cheating will not be tolerated. Any incidents of cheating will be reported to the Office of Judicial Affairs. These incidents are investigated and adjudicated. The judicial process is a fair one with procedures for appealing decisions, and leads to substantial consequences: a deferred suspension and a fine of up to \$200 for the first offense, expulsion from the University for a second offense.

Other Information:

It is your responsibility to be aware of any changes the instructor may make to the syllabus as they are announced in class. Students are responsible for all information given when they are absent.

If you have a concern about the course or the instructor that is not or cannot be resolved by speaking with the instructor, the next step is to speak with the course coordinator, Bob Lupi (x4882, bobl@neu.edu). If the course coordinator does not settle the matter, please contact Professor D. King, 447 Lake Hall, x5679, donking@neu.edu.

It is University policy that no grade, including an incomplete, can be changed after one year. Exceptions must be authorized by the Academic Standing Committee.

All students without legitimate conflicts will take the final exam at the scheduled time. Do not make travel plans that conflict with the final exam.

Topics and Assignments:

5.1: Summation Notation

p. 348 – 349 #2, 11, 16, 20, 22, 29, 34

5.2: The Definite Integral

p. 361 #2, 4, 6, 7, 9, 12, 15, 21

5.3: The Fundamental Theorem of Calculus

p. 371-372 #1-12 all. 13, 16, 19, 24, 28, 35, 51

5.4 The Indefinite Integral

p. 376-377 #1, 7, 12, 16, 20, 25

5.5 Integration by Substitution

p. 384 #1-9 odd, 12-22 even, 35-40 all

5.6 Areas between curves

p. 392 #1, 4, 7, 11, 15, 18, 21, 24, 26, 28, 29

5.7 Integration by Parts

p. 402-403 #1-19 odd, 24, 25, 29

5.8 Integration by Partial Fractions

p. 412-413 #1-5, 19, 21, 29, 31, 34, 35, 36

5.9 Solving Simple Differential Equations

p. 419-420 #1-22 all, 24, 27

5.10 Numerical Integration

p. 429, #1-10

6.1 Volume by Cross Section

p. 453 #1-11 odd, 13, 16, 19, 20, 23, 24, 29

6.2 Volumes by Shells

p. 459 #3, 7, 10, 13, 16, 22, 25

4.8 Indeterminate Forms and L'Hopital's Rule

p. 328 #1-23 odd

6.9 Improper Integrals

p. 528 #1-20 all

Midterm

7.1 Taylor Polynomials

p. 550 #1-11 odd, 18, 20, 23, 30, 31

7.2 Approximation and Error

p. 560 #2-18 even, 24, 26

7.3 Sequences

p. 576 #1, 4, 5, 8, 11, 12, 15, 18, 19, 25, 30, 33, 38

7.4 Infinite Series

p. 587 #1-4, 7, 9, 11, 14, 15, 16, 21, 23, 26, 32

7.5 Tests for Convergence

p. 603 #2, 4, 5, 11, 16, 18, 22, 25, 29, 31, 34

7.6 Power Series and Taylor Series

p. 615 #1, 3, 5, 7, 8, 12, 17, 18

7.7 Working with Power Series

p. 623 #2, 4, 10, 11, 12, 16, 24

8.1 Vectors in Three Dimensions

p. 643 #3, 4, 5, 11, 13, 15, 24, 29, 31, 33

8.6 Planes

p. 700 #1-9, odd, 19, 21, 23, 26, 28

10.1 Differentiability

p. 859 #1-21 odd, 24, 27, 31,

10.2 The Chain Rule

p. 872 #2-8 even, 17, 20, 23, 24, 25, 26

10.3 Applications of the Chain Rule

p. 887 #1-18, 23 – 28

11.1 The Double Integral on Rectangles

p. 951, #1-6, 7, 9

11.2 Extending the Double Integral and Applications

p. 964, #1-11 odd, 17-25 odd

First and Second Order Differential Equations and Their Applications (not in text)

Assignment will be handed out in class.

Final Exam