

**MTH U341 Syllabus(Fall 2008)**  
**(CALCULUS 3)**

**Text:** Multivariable Calculus, Concepts and Contexts, 3 by J. Stewart, Brooks/Cole

**Instructor:** Marc Levine  
Office Number: 435LA  
Office hours: **M, W, Th 11:45 - 13:00 or by appointment**  
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**Scope of the course:** Calculus 3 will extend what you have learned in Calculus 1 and 2 to functions of several variables. In particular, you will be introduced to differentiable functions of several variables and to multiple integrals. As applications, we will discuss electrostatics and heat and mass transfer.

**Grading:** Graded material will consist of five quizzes and a final exam, as well as occasional homework/computer lab/in-class assignments. The final counts 40%, HW 10%, and the five quizzes 50%.

There will be no make-ups for quizzes. If one quiz is missed due to a legitimate reason and substantiating paperwork is presented, your grade on the final exam will later replace the zero grade on the missing quiz.

**Supplementary reading:** The material on vector calculus is the hardest part of the course; another treatment of this material can be found in **Div, grad, curl and all that**, 4th edition, by H.M. Schey, ISBN 0-393-92516-1. It is a short, easy to read book, and, like other generations of engineers and scientists, you will probably find there everything you need to know about vector calculus for your future profession.

**Class web page:** We will have a class web-page, at

<http://www.math.neu.edu/~levine/U341.F08/home.html>

**Recitation:** We will have a recitation, run by Mr. Sun, M 2:50-4:30, in SH 420. This will give you an opportunity to ask questions about the lectures or homework problems.

**Tutoring help:** Free tutoring will be available in room 540B Nightingale, starting Sept. 22. All tutoring is done on a first come first served basis. Students must come in person to schedule appointments. Tutoring hours are:

M, T, W: 10 AM - 9 PM  
Th: 10 AM - 6 PM  
Fr: 10 AM - 1 PM.

## Topics and Assignment

The assignments are important part of the course. You are strongly encouraged to work on the problems sets below. If you feel you cannot solve a problem please come in and discuss it with me during my office hours or by appointment.

### Week 1, 9/8-12

9.4 The cross product, # 1, 2, 3, 7, 15, 17.

9.5 Equations of lines and planes (pp. 666-670), # 3, 5, 7, 9, 21, 23.

### Week 2, 9/15-19

9.6 Functions and surfaces, # 1, 2, 5, 7, 9, 11, 13.

11.1 Functions of several variables, # 1, 3, 9, 11-14, 17, 31-36.

11.2 Limits and continuity, # 5, 7, 9, 11, 13, 25, 27.

### Week 3, 9/22-26

11.3 Partial derivatives, # 5, 8, 13, 14, 15-33(odd), 47, 51.

10.5 Parametric surfaces, # 1, 11-16

11.4 Tangent planes and linear approximations, # 1,3, 9, 11, 13, 19, 21, 25, 27, 33, 35, 37.

### Week 4, 9/29-3

11.5 Chain Rule, # 1-11(odd), 22, 23, 29, 30.

11.6 Directional derivatives, # 1, 3, 7, 9, 11, 13, 19, 29, 34, 46.

11.7 Maximum and minimum, # 1-7(odd), 25, 44, 45.

### Week 5, 10/6-10

11.7 Lagrange multipliers, # 1, 3, 7, 11, 23, 38, p. 825 # 64.

12.1 Double integrals over rectangles, # 3, 5, 9.

12.2 Iterated integrals, # 3-11(odd), 23, 31.

### Week 6, 10/13-17

12.3 Double integrals, # 1, 3, 5, 9, 11, 17, 23, 33, 35.

12.4 Double integrals in polar coordinates, # 1-6(all), 7, 9, 15, 17.

**Week 7, 10/20-24**

12.5 Applications of double integrals, # 1, 3, 7, 11, 12, 15.

12.7 Triple integrals, # 3, 5, 7, 9, 19, 39.

9.7 Cylindrical and spherical coordinates, # 3, 5, 7, 9, 11, 12, 13.

**Week 8, 10/27-31**

12.8 Integrals in cylindrical and spherical coordinates, # 1, 3, 5, 7, 19

13.1 Vector fields, # 1, 3, 5, 11-14(all), 23, 25

13.2 Line Integrals, # 1, 3, 5, 15, 16, 19, 27, 41.

**Week 9, 11/3-7**

13.3 The Fundamental Theorem of line integrals # 1, 2, 3, 5, 9, 11, 13, 19, 23.

13.4 Greens theorem, # 3, 9, 13, 15, 17, 21.

**Week 10, 11/10-14**

13.5 Curl and divergence # 1, 3, 5, 7, 8, 9, 10, 13, 17, 19.

13.6 Surface integrals, # 5, 7, 11, 15, 17, 19.

**Week 11, 11/17-21**

13.7 Stokes' Theorem, # 1, 3, 5, 7, 15.

13.8 The Divergence Theorem, # 1, 3, 7, 9, 19.

**Week 12, 11/24-28, Review**

**Week 13, 12/1-5, Review**

**Week 14, 12/8-12, Review**

**Miscellaneous:**

- An Incomplete grade is given only when a student who has at least a *C* grade is unable to finish a relatively small part of the course *due to circumstances clearly beyond her or his control*. Example: you cannot take the final exam because you are in the hospital. Non-example: You realize around Thanksgiving that there is no way you can get a B in the course, even if you ace the final.
- I reserve the right to make changes in the syllabus at any time. This includes homework assignments, exam dates, material covered, and grading policy. 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.

- 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 (approved by me) will take the final exam at the scheduled time. Do not make travel plans that conflict with the final exam.
- If there is an issue you would like to discuss, it is a good idea to start by discussing the problem with me. If this does not help, please see the course coordinator, Prof. P. Topalov (467 LA, x 5528, p.topalov@neu.edu). If the issue is still not resolved, you should discuss it with the undergraduate director Prof. A. Martsinkovsky (alexmart@neu.edu, 471 Lake Hall, x. 5510).

**Exam schedule:** We will have quizzes on: Sept. 22, Oct. 6, Oct. 20, Nov. 3 and Nov. 24. The final exam is Dec. 18 10:30 am-12:30 pm.

**Scale:** *A* 100-94; *A-* 93-90; *B+* 89-87; *B* 86-83, *B-* 82-80; *C+* 79-77; *C* 76-73; *C-* 72-70; *D+* 69-67; *D* 66-63; *D-* 62-60; *F* 59-0