

**Math 2321 – Calculus 3 for Science and Engineering: Syllabus**  
**Northeastern University, Spring 2014**

**Instructor:** Chris Kottke

**Office:** #455 Lake Hall

**Email:** c.kottke@neu.edu

**Course website:** <http://www.northeastern.edu/ckottke/2321/>. Blackboard will not be used, except perhaps to record grades.

**Office hours:** M 12:30-1:30, W 11:30-12:30, Th 10:30-11:30 or by appointment.

**Text:** *Worldwide Multivariable Calculus*, by David B. Massey. PDF and printed versions available at: <http://www.centerofmath.org/textbooks/calc3/>

The PDF textbook contains links at the beginning of each section to online full-length, free, video lectures on the contents of that section. These videos can also be accessed directly by going to:

[http://www.centerofmath.com/video\\_mc.html](http://www.centerofmath.com/video_mc.html). If there is a discrepancy between how the videos present material and how your instructor presents material, you should follow your instructor's presentation, but you should discuss the matter with your instructor.

**Exercises:** Exercises will be assigned after every lecture, but will not be collected. If you have questions on the exercises, it will be essential for you to come to office hours, make a special appointment to see me, go to our TAs office hours, or go for tutoring in the Mathematics Department or in the College of Engineering.

**Homework:** Homework will be assigned periodically and will be collected and graded.

**Quizzes:** There will be ~~five~~ six (30-minute or so) in-class quizzes, and the lowest will be dropped. The dates will be announced later. If classes are cancelled due to snow, or for other official reasons, any scheduled quiz will occur on the next class meeting.

**Final Exam:** There will be a final exam in this course, on Thursday April 24, 3:30-5:30pm, which will be cumulative, and will cover all topics listed below (unless otherwise announced).

**Grading:** The course grade will be determined as follows: Final exam: 40%, Homework: 10%, Quizzes: 50%.

Letter grades are determined numerically:

$A > 92,$	$92 \geq A- > 89,$	$89 \geq B+ > 86,$	$86 \geq B > 82,$
$82 \geq B- > 79,$	$79 \geq C+ > 76,$	$76 \geq C > 72,$	$72 \geq C- > 69,$
$69 \geq D+ > 66,$	$66 \geq D > 62,$	$62 \geq D- > 59,$	$F \leq 59.$

**Tutoring:**

The Mathematics Department Tutoring Center is in Room 540B, Nightingale Hall. This is walk-in tutoring; no appointment is necessary. If there is a discrepancy between how the tutors present material and how your instructor presents material, you should follow your instructor's presentation, but you should discuss the matter with your instructor.

The College of Engineering also provides tutoring for Calculus. The times and location are to be determined.

**Course TAs:** Brian Hepler, Toni Rangachev, and Gufang Zhao

**Recitation:** Wednesday, 2:50-4:30pm, 102 West Village G

**Issues with the course/instructor:** If you have issues with this course and/or instructor which you are not comfortable discussing with your instructor, you should contact the course coordinator, Prof. Topalov [p.topalov@neu.edu](mailto:p.topalov@neu.edu).

## Order of Sections Covered and Exercises:

Week 1: January 6-10

- 1.4 Review: Lines, planes, and hyperplanes #1-4, 9-12, 13-17, 19, 21-23, 27-30
- 1.5 Review: Cross product #1-4, 9-12, 17-20, 27-29, 31, 35, 37, 41
- 1.7 Review: Multivariable functions #1, 2, 4, 7-10, 15, 17-19
- 2.1 Review: Partial derivatives #1, 2, 5, 7, 13, 16, 18, 19, 22, 27, 29, 32, 34

Week 2: January 13-17

- 2.5 Review: Directional derivatives #1-3, 7-9, 15-17, 21-23, 29-31, 33, 34, 35
- 2.7 Level sets and gradient vectors #1-3, 7-13, 17, 18, 21, 24
- 2.8 Parameterizing surfaces #1-3, 5, 9-11, 17-19, 21, 29, 30

Week 3: January 20-24

- Monday, January 20, Martin Luther King Jr.s Birthday, no classes
- 2.9 Local extrema #1-6, 9-14, 17-20, 35
- 2.10 Optimization #1, 2, 7, 8, 9, 10, 13, 17, 19, 20

Week 4: January 27-31

- 2.10 Optimization (continuation) #1, 2, 7, 8, 9, 10, 13, 17, 19, 20
- 2.11 Lagrange multipliers #1, 3, 12, 13, 15, 19, 23, 27, 29

Week 5: February 3-7

- 3.1 Iterated integrals #1, 3, 4, 5, 9, 16, 17-24, 27, 28
- 3.2 Integration in  $\mathbb{R}^2$  #1-3, 6-8, 17, 18, 23, 24, 27-29, 31-33
- 3.3 Polar coordinates #1-7, 17

Week 6: February 10-14

- 3.4 Integration in  $\mathbb{R}^3$  and  $\mathbb{R}^n$  #1, 3, 6, 7, 9, 11, 13, 14, 16-18, 20
- 3.5 Volume #1-3, 9-11, 17, 18

Week 7: February 17-21

- Monday, February 17, Presidents day, no classes
- 3.6 Cylindrical and spherical coordinates #1-3, 7-9, 13-15, 19-21, 25-27, 31, 32, 35, 36
- 3.8 Density and mass #1, 2, 7-10

Week 8: February 24-28

- 3.11 Surfaces and area #1-3, 9, 11-13, 15-17, 19-21
- 4.1 Vector fields #1, 3, 7, 8-14, 17, 18, 21, 22, 26-28

Week 9: Spring break, no classes

Week 10: March 10-14

- 4.2 Line integrals #1-3, 7, 8, 15, 16, 18-20, 23, 25, 27
- 4.3 Conservative vector fields #1-3, 7-9, 15-17, 23, 24, 27, 33, 35, 41, 43

Week 11: March 17-21

- 4.4 Green's Theorem #1, 3, 5, 7-9, 13, 15
- 4.5 Flux through a surface #1, 2, 7, 9, 10, 11, 15, 19, 20

Week 12: March 24-28

- 4.6 The Divergence Theorem #1-4, 6-11
- 4.7 Stokes' Theorem #1, 2, 5, 6, 9, 10, 13

Week 13: March 31-34

- 4.7 Stokes' Theorem (continuation) #1, 2, 5, 6, 9, 10, 13

Week 14: April 7-10

Review