

DEPARTMENT OF MATHEMATICS, NORTHEASTERN UNIVERSITY

MATH 1342-06: CALCULUS 2 FOR SCI/ENGR (HON).

FALL 2012

**Class:** T,W,F 3:25 pm — 4:30 pm, in 411 Robinson Hall

**Instructor:** Leonid Petrov

**Office:** 433 Lake Hall; phone 617-373-3893

**email:** l.petrov@neu.edu (preferred), lenia.petrov@gmail.com

**Course webpage:** on Blackboard

**Office hours:** T,W,F from 2:00 to 3:00pm, or by appointment (I encourage you to make as many appointments as you need if you have a scheduling conflict with my official hours. The preferred way to make them is by email.)

**Course coordinator:** John Lindhe, 543NI, 617-373-4882, j.lindhe@neu.edu.

**TA:** Ruoran Zhang, 542 NI, 617-373-5512, zhang.ruor@husky.neu.edu.

**TA's office hours:** Monday, Thursday, 2:00-3:00pm

**Textbook:** **Worldwide Integral Calculus, with infinite series**, by David B. Massey. PDF and printed versions available at: <http://www.centerofmath.org/intcalc.html>

The PDF is priced at \$9.95, while the black and white (grayscale) soft-back printed version is \$29.95. The PDF textbook contains a link, at the beginning of each section, to one or more free video lectures, by Prof. Massey, on the contents of that section. The PDF has hyperlinked Tables of Contents, Indices, and cross-references; you may need to activate the Forward and Back buttons in your PDF viewer to take full advantage of the hyperlinks. To use the textbook on an iPad, we recommend the GoodReader app (despite the recent large price increase to \$4.99). The PDF textbook includes a separate PDF study guide. If you want local copies of the videos, you can order the PDF's plus all of the videos on DVD or flash drive.

It is absolutely **NOT** required that you purchase a printed textbook.

**Class Structure:** This class will be taught in an “**inverted**” manner.

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.org/video.html>.

The homework will consist of watching the recorded video lectures plus several simple exercises. Then, in class, we will work on what have traditionally been assigned as homework exercises. I expect this approach to be much more successful than the traditional approach, since practicing problems is what students seem to need the most.

There are links to the video lectures at the beginning of each section of the pdf textbook.

**Homeworks and quizzes:** Homework will be assigned daily, but will not be collected. To make sure that students are keeping up with the homework, there will be 8-15 short quizzes during the semester. Each quiz will consist of 1-3 problems based on homework assignments up to that point, though the emphasis will be on homework assigned since the the last quiz. If you have a lot of questions on the homework, it will be essential for you to come to my office hours, make special appointments to see me, or go for tutoring in the Mathematics Department (see schedule below) or in the College of Engineering.

**Midst-terms and final exams:** There will be two midst-term exams, and a final exam in this course. The midst-term exams are 65-minute in-class exams; they will be on Oct. 5 and Nov. 9. The final exam date is to be determined. **Check for exam schedule conflicts as soon as possible.**

**Snow days:** If classes are cancelled due to snow, or for other official reasons, any scheduled midst-term exam will occur on the next class meeting.

**Grading:** The course numerical grade will be determined as follows:

Final exam: 40%

Midst-term exams: 30% (15% each).

Quizzes: 30%. I will drop your worst two quiz grades.

Letter grades are determined from the numerical grades as follows:

$$\begin{array}{rcc} & A > 92, & 92 \geq A- > 89, \\ 89 \geq B+ > 86, & 86 \geq B > 82, & 82 \geq B- > 79, \\ 79 \geq C+ > 76, & 76 \geq C > 72, & 72 \geq C- > 69, \\ 69 \geq D+ > 66, & 66 \geq D > 62, & 62 \geq D- > 59, \\ & F \leq 59. & \end{array}$$

Numerical grades may be curved before a letter grade is assigned. The instructor reserves the right to raise any student's final grade based on superior performance on the final exam.

**ADDITIONAL RESOURCES:**

**The Mathematics Department Tutoring Center:** in Room 540B, Nightingale Hall. The tentative schedule is:

Monday through Wednesday 10 am – 8 pm

Thursday 10 am – 6 pm

Friday 10 am – 1 pm

Tutoring will start full time on Sept 17th. Starting on Sept 17th you will be able to sign-up for appointments on <http://neumath.mywconline.com>. Even if the schedule looks booked, you can still drop-in, since occasionally students sign up for an appointment and don't show up.

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.

**Study guide for the textbook:** is downloaded at the same time as the textbook pdf. This study guide is available in app form at the iTunes Store for \$0.99.

**Khan Academy:** An independent video-tutoring company, Kahn Academy, has produced a large collection of free, short video tutorials and examples on many topics, including Calculus; the url is <http://www.khanacademy.org>. 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.

**Wolframalpha:** This knowledge base/search engine may help you to check answers to some exercises. Visit <http://www.wolframalpha.com/examples/Calculus.html> to see what it is capable of. Then you may replace the examples with your own formulas.

**IMPORTANT:**

**CALCULATORS:** Allowed throughout classes, quizzes and exams. You should ask the instructor for a permission to use a calculator in your smartphone during quizzes and exams.

**COMPUTERS, CELL-PHONES:** These must be turned off during the class. Exception is made for reading the PDF of the textbook.

**CHANGES IN THE SYLLABUS:** It is your responsibility to be aware of any changes the instructor may make to the syllabus as they are announced in class, or as posted on the course webpage. Students are responsible for all information given when they are absent.

**ISSUES:** 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. If the course coordinator does not settle the matter, contact Professor D. King (Undergraduate Director), 447LA, x5679, [d.king@neu.edu](mailto:d.king@neu.edu).

**ACADEMIC HONESTY:** The Northeastern University's Rules of Academic Honesty and Integrity apply to this course. Cheating in this class includes (but is not limited to): looking at the papers of others during a quiz or test, talking to other students during a quiz or test, using a mobile electronic device to

acquire information during a test. All incidents of cheating will be reported to OSCCR (the Office of Student Conduct and Conflict Resolution).

For more information please see <http://www.northeastern.edu/osccr/academichonesty.html>

**INCOMPLETE GRADE:** The grade I (Incomplete) will be given only if you have a good attendance record, have missed the Final for a good reason, and otherwise you are doing passing work. Incomplete grade is given at discretion of instructor.

**CHANGE OF GRADES:** 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.

**TRACE EVALUATION:** It is expected that every student will complete the TRACE evaluation as part of the course.

**FINAL EXAM TRAVEL PLANS:** It will not be possible to change the time and date of the final exam. So, all students without legitimate conflicts (approved by the instructor) will take the final exam at the scheduled date and time. Go to <http://www.registrar.neu.edu/finexsched.html> to see the dates of your final exam. **Do not make travel plans that conflict with the final exam.**

**Schedule of Topics and Suggested Homework Exercises:**

W1	Sep. 5–7	§1.1 Recall anti-derivatives #2, 3, 5, 11, 19, §1.1 Integration by Parts #32, 33, 34, 36, 37, 39, 41, 43, 55
W2	Sep. 11–14	§1.3 Integration by Partial Fractions #1, 3, 7, 11, 13 §2.1 Sums and Differences #1, 2, 5, 12, 16, 19, 29 §2.2 Prelude to the Definite Integral #1, 17, 19, 20, 21, 25, 28, 31, 37
W3	Sep. 18–21	§2.3 The Definite Integral #1, 2, 3, 8, 9, 14-16, 23, 35, 39 §2.4 The Fundamental Theorem of Calculus #1, 2, 3, 10, 11, 15-17, 23, 24, 41
<b>September 25th: last day to drop a Fall class without a W grade</b>		
<b>September 27th: the last day to file a Final Exam Conflict form for Fall classes</b>		
W4	Sep. 25–28	§2.5 Improper Integrals #1, 4, 5, 9-11 §2.6 Numerical Techniques #1, 20, 23, 25, 26 §3.1 Displacement and Distance Traveled #1, 2, 10, 11, 19, 26, 32, 45, 46
W5	Oct. 2–5	§3.2 Area in the Plane #1, 3, 6, 8, 11, 14, 19, 36 Review <b>1st midst-term exam: Oct. 5</b> HW: Read Appendix A: Vectors in the Plane and in Space
W6	Oct. 9–12	§3.3 Distance Traveled in Space and Arc Length #1, 3, 19, 21, 24, 44 §3.4 Area Swept Out and Polar Coordinates #1-3, 7, 9, 10, 13, 14 §3.5 Volume #1, 2, 8-11, 13, 28, 29, 39, 48, 51
W7	Oct. 16–19	§3.7 Mass and Density #7, 15, 18, 25, 27 §3.8 Centers of Mass and Moments #7, 8, 15, 16, 21 §3.9 Work and Energy #1, 3, 5, 8, 9, 13, 23, 25, 29, 39, 42
W8	Oct. 23–26	§4.1 Approximating Polynomials #1-3, 7-11, 15, 16, 20 §4.2 Approximation of Functions by Polynomials #1-3, 6, 9, 11, 16, 19-21, 23, 32
W9	Oct. 30–31, Nov. 2	§4.3 Error in Approximation by Polynomials #1, 2, 5, 13, 21 §4.4 Functions as Power Series #1-3, 5, 7, 11, 13, 15
W10	Nov. 6–9	§4.5 Power Series as Functions I #1, 3, 6, 8, 10, 13, 14, 16, 23 Review <b>2nd midst-term exam: Nov. 9</b>
W11	Nov. 13–16	§4.6 Power Series as Functions II #1, 3, 5, 10-14, 16, 27, 35-37, 40, 44 §5.1 Theorems on Sequences #1-9, 17, 19, 20, 27, 28, 30
<b>November 20th: last day to drop a Fall class with a W grade</b>		
<b>November 21–25: Thanksgiving recess, no classes</b>		
W12	Nov. 20	§5.2 Theorems on Series I #1-5, 11-13, 21-26, 31-33, 45, 47, 51, 52, 55
W13	Nov. 27–30	§5.3 Theorems on Series II #2-7, 11-13, 17, 19, 22-25, 27, 29, 31, 33, 35, 38, 40, 42 §5.4 Theorems on Series III #1-5, 9, 10, 13, 15, 21, 22, 33-36, 42
W14	Dec. 4–5	Review