

MATH 1341, Calculus 1 for Science and Engineering. Spring 2014

Section 02. Syllabus.

Instructor: Neranga Fernando, Ph.D.

Office: 535 NI

E-mail: w.fernando@neu.edu

Office phone: 617-373-2080

Office hours: MWR 3.30 – 5 pm, or by appointment.

CRN: 30684

Meeting times and location: MWR, 8 – 9.05am at Robinson Hall 107.

Textbook: "*Worldwide differential calculus*" and "*Worldwide integral calculus*" by David B. Massey. We will be using both books this semester. PDF and printed versions can be purchased at: <http://www.centerofmath.org/textbooks/calc1/index.html> and <http://www.centerofmath.org/textbooks/calc2/index.html>. The second book "*Worldwide Integral Calculus*" is also the textbook of MATH1342 so you do not need to buy again if you take that course later. It is absolutely **NOT** required that you purchase a printed textbook. A PDF version suffices.

The PDF is priced at \$9.95 each book, while the black and white (grayscale) soft-back printed version is \$29.95 each book. The PDF textbook contains links, 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, you need a PDF reader app.

Course content:

- Differentiation: definition via limits, derivation rules, applications incl. optimization.
- Basic functions (exp and log, trig and inverse trig) and their derivatives.
- Integration: antiderivatives and integration by substitution, definite integral, Fundamental theorem of Calculus.

Learning objectives: Students completing the course should be able to recognize and use the concepts and methods of calculus when they occur in their disciplines.

Quizzes and exams: No homework will be collected. An in-class quiz will be given on every Thursday starting from the second week. No quiz will be given during test weeks and week 14. It is strongly advised that you do all of assigned homework since the quizzes will closely resemble the homework problems. Two lowest quiz scores will be dropped. Any missed quizzes will be counted in the dropped worst scores; there will be no makeup quizzes. Quizzes will constitute 20% of your total score. There will be two tests, and a final exam in this course. The tests are 65-minute in-class tests; they will be on Thursday, Feb 13 and Thursday, March 27, and each of them will constitute 20% of your total score. The final exam will constitute the remaining 40%.

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

Attendance: It is expected that you will attend every class. The course moves very fast. It is possible to fall behind in a single day. If you miss class for any reason, make an immediate attempt to contact instructor or another student to discuss what you missed and how to catch up. 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.

Final exam: *All students without legitimate conflicts (approved by the instructor) will take the final exam at the scheduled time. Do not make travel plans that conflict with the final.* Only two finals at the same time or three in one day is a University recognized legitimate reason to be excused from taking the final at the scheduled time. Students with such a conflict should complete a final exam conflict form, available on the registrar's website. Exam conflicts must be resolved in advance with the Registrar's Office and your instructor. If you miss the final, it will count as a 0 and you will fail the course. The final exam date is TBD. *Check for exam schedule conflicts as soon as possible.*

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

Calculators: You may need access to a graphing calculator equivalent to TI-82, TI-83, TI-85 or TI-86 (latter three are best). Some functions on the TI-89 or 92 or other calculator (symbolic differentiation/integration) are not allowed on quizzes or exams: consult your instructor about this policy if you have one of these.

Issues with the course/instructor: If there is an issue you would like to discuss, it is a good idea to start by discussing it with your instructor. If you are not comfortable discussing issues with the instructor, you should contact the Teaching Director of the Department of Mathematics, Prof. Massey, d.massey@neu.edu.

Additional resources.

1) The Mathematics Department Tutoring Center is in Room 540B, Nightingale Hall <http://www.math.neu.edu/undergraduate-program/mathematics-tutoring-services>. This is walk-in tutoring; no appointment is necessary. You can sign-up for appointments on <http://neumath.mywconline.com>. However, even if the schedule looks booked, you can still drop-in for help.

2) The course has a teaching assistant (TA), .

If there is a discrepancy between how a tutor or a TA presents the material and how your instructor presents the material, you should follow your instructor's presentation, but you should discuss the matter with your instructor.

3) 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>. 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.

Withdrawal and Incomplete: Withdrawal is done through the registrar by deadline. Important deadlines are given on the last page of the syllabus. Instructors are only permitted to give “incompletes” under very limited circumstances. The student must have completed at least 75% of the course material and must have a C or better grade at the time.

Schedule of Topics and Suggested Homework Exercises

Week 1: January 6-10

§1.1 Average Rates of Change: #1, 3, 4, 8, 9, 12, 19, 21, 24, 25, 38

§1.2 Prelude to Instantaneous Rates of Change: #1-4, 10-12, 14, 21, 24, 31, 33, 42-45

§1.3 Limits and Continuity: #1-3, 5, 11, 12, 22, 23, 25, 35, 44-47

Week 2: January 13-17

§1.3 Limits and Continuity (continued) : #1-3, 5, 11, 12, 22, 23, 25, 35, 44-47

§1.4 IROC's and the Derivative: #1-4, 12, 13, 16, 19, 21, 25, 26, 27, 29-31, 44

Week 3: January 20-24

Monday, January 20, Martin Luther King Jr.'s Birthday, no classes

§1.5 Extrema and the Mean Value Theorem: #4, 9, 10, 18, 23, 28, 29, 39, 45

§1.6 Higher-order Derivatives: #1-4, 7, 9, 12, 16, 20-26, 32, 36, 42, 45

Week 4: January 27-31

§2.1 The Power Rule and Linearity: #1, 2, 13, 14, 17, 18-20, 32, 33, 37, 39, 42, 43, 46, 49

§2.2 The Product and Quotient Rules: #1, 2, 8-10, 22, 23, 27, 29, 35, 36, 43, 45, 48

§2.3 The Chain Rule and Inverse Functions: #1, 2, 4, 6, 13, 22-24, 32, 33, 37, 39, 43

Week 5: February 3-7

§2.3 The Chain Rule and Inverse Functions (contd): #1, 2, 4, 6, 13, 22-24, 32, 33, 37, 39, 43

§2.4 The Exponential Function: #1, 2, 4, 5, 7, 12, 17, 25, 30, 31, 34, 39, 40, 42, 43, 52

§2.5 The Natural Logarithm: #1-5, 13, 17, 21, 23, 25, 26, 35, 37, 48

Week 6: February 10-14

§2.6 General Exponential and Logarithmic Functions: #1-8, 16, 21, 22, 37, 39, 50, 51

Review

Test 1

Week 7: February 17-21

Monday, February 17, Presidents' day, no classes

§2.7 Sine and Cosine: #1, 2, 4, 5, 8, 13, 14, 19, 20, 25, 27, 33, 36-38, 52, 53

§2.8 Other Trig. Functions: #5, 7, 8, 11, 16, 18, 24, 30, 39, 45, 47, 49

Week 8: February 24-28

§2.9 Inverse Trig. Functions: #1-7, 21, 24, 27, 44, 47, 48

Appendix A: Parametrized Curves and Motion: #1, 3, 5, 7, 9-11, 14, 15, 17, 19

Week 9: March 3-7 Spring break, No classes

Week 10: March 10-14

§3.3 Optimization: #1, 2, 4, 7, 16, 17, 19, 21, 34, 39, 42, 43

§3.5 L'Hôpital's Rule: #1-3, 5, 6, 8, 9, 12, 15, 39, 46, 48, 52

Week 11: March 17-21

§4.1 What is a Differential Equation?: #1, 3, 17, 19, 25, 26, 39, 43, 44

§4.2 Anti-derivatives, Integration by Substitution: #1-7, 9, 11, 15, 19 22-25, 28, 31, 57, 59, 69, 70, 71

§1.1 (continued) Anti-derivatives, Integration by Substitution

Second book *Worldwide Integral Calculus* (§1.1 same as §4.2 of first book)

Week 12: March 24-28

§2.1 Sums and Differences #1, 2, 5, 12, 16, 19, 29

Review

Test 2

Week 13: March 31-April 4

§2.2 Prelude to the Definite Integral #1, 17, 19, 20, 21, 25, 28, 31, 37

§2.3 The Definite Integral #1, 2, 3, 8, 14-16, 23, 35, 39

§2.4 The Fundamental Theorem of Calculus #1, 2, 3, 10, 17, 23, 24, 41

Week 14: April 7-11

§3.2 Area in the Plane #1, 3, 6, 8, 11, 14, 19, 36

Review for the final exam

Week 15: April 14-15

Review for the final exam

Thursday, April 16, reading day

April 17, and April 21-25 final exams

Academic Honesty: Collaboration on tests and exams is not allowed. From Student Code of Conduct (see <http://www.northeastern.edu/osccr/academicintegrity>): "A necessary prerequisite to the attainment of the goals of the University is maintaining complete honesty in all academic work. Students are expected to present as their own only that which is clearly their own work in tests and in any material submitted for credit. Students may not assist others in presenting work that is not their own. ... Offenders are subject to disciplinary action." For more on Academic Integrity see: <http://www.northeastern.edu/registrar/courses/cat1213-univ-proc.pdf>

Some important dates:

January 21st, is the last day to elect pass/fail for Spring classes

January 27th, is the last day to drop a Spring class without a W grade.

January 28th, is the last day to file a Final Exam Conflict form for Spring classes.

April 1st, is the last day to drop a Spring class with a W grade.

Miscellaneous Policies:

- 1) Any student with a disability is encouraged to meet with the instructor during the first week of classes to discuss accommodations. The student must bring a current Memorandum of Accommodations from the Office of Student Disability Services.
- 2) If you are an athlete and have conflicts with an important class activity (quiz, mid-term, or final), you should let your instructor know before the end of second week of classes. You should also bring an official letter from the Office of Athletics.
- 3) Mobile phones and laptops should be turned off during class time, quizzes, and tests.

TRACE: Please complete the TRACE evaluations at the end of the course.