MATH 1340  Intensive Calculus for Engineers  Fall 2016

Instructor: Dr. S. Wu  E-mail: s.wu@neu.edu
Phone: (617) 373-5640  Office: 541 Lake Hall
Office Hours:  Tu, W & Th: 1:35 – 2:35pm, and other time by appointment

Required Materials:

1. Textbooks: Worldwide Differential Calculus
   Worldwide Integral Calculus by David B. Massey
   PDF and printed versions can be purchased at http://www.centerofmath.org/textbooks
   It is absolutely NOT required that you purchase a printed textbook. A PDF version suffices. The PDF version is priced at $9.95 for each book. The black and white (grayscale) soft-back printed version is $29.95 for each book.

2. Supplementary Materials: Precalculus by Shu-Shih Wu

Course Objectives:

To assist students in overcoming deficiencies in pre-calculus mathematics while they learn the same materials as MATH 1341, the regular calculus I for science and engineering, and in building a solid foundation of mathematics.

To have students understand the concept of the derivative and to enable students to display that understanding through a variety of applications; to have students understand the concept of the integral and to introduce integration techniques and the applications.

Course Policies:

(1) Computers and cell-phones must be turned off during the class.

(2) It is essential that you attend class regularly. The easiest way for you to learn the material and to know what material has been covered is to come to class each day. Students are responsible for finding out what materials have been covered or what announcements have been made on days that they miss class.

(3) Homework will be assigned at each class. You are expected to keep up with the homework in order to perform well on the quizzes and exams. You are strongly encouraged to come for help, including help for homework, if needed.

(4) There will be no “extra credit work” or “special project” available to make-up for poor grades at the end of the semester.

(5) There will be in-class problems, weekly quizzes, two one-hour exams, and a two-hour cumulative departmental final exam. The total score of the in-class problems will be counted as that of two quizzes. There will be no make-up quizzes, but your lowest two quiz scores will be dropped. There will be no make-up for the one-hour exams except extreme circumstances with an official verification. No student will be granted a special final exam unless it is due to a Registrar-created conflict. Your course grade will be determined as follows:

   Quizzes (“In-class problems” is counted as two quizzes) -- 30% ;  Two One-Hour Exams -- 30% ;  Final Exam -- 40%

(6) Calculators: You may need access to a graphing calculator equivalent to TI-82, TI-83, TI-84, TI-85 or TI-86. Some functions on the TI-89 or 92 or other calculator (symbolic differentiation/ integration) are not allowed on quizzes or exams.

(7) In addition to my office hours, you may receive extra help for the course from tutoring center at 540B Nightingale Hall. Please seek help as soon as you experience any difficulty; do not wait until just before an exam or a quiz.

(8) The last day to drop without a W grade is September 27 (Tuesday). The last day to file a Final Exam Conflict Form is September 30 (Friday). The last day to drop with a W grade is December 8 (Thursday).

(9) If you have concerns/problems about the course that cannot be resolved by discussing with me, you may contact Professor David Massey (Teaching Director), 529 NI, x5527, d.massey@neu.edu.

(10) All items above are intended as a guide but may be changed due to circumstances.
Topics and Homework Assignments (Tentative):

Precalculus
§I. Algebra Review: Problem Set #1, 2
§II. Function: Problem Set #3, 4, 5
§III. Lines (Linear Functions): Problem Set #6
§IV. Quadratic Functions: Problem Set #7

Worldwide Differential Calculus
Chapter 1 Rates of Change and the Derivative
§1.1 Average Rates of Change: #1, 3, 4, 8, 9, 12, 19, 21, 24, 25(ab), 38, 43(abc)
§1.2 Prelude to Instantaneous Rates of Change: #1, 3, 11, 12, 13, 21, 24, 33(ab), 43
§1.3 Limits and Continuity: #1-3, 5, 11, 12, 22, 23, 25, 35, 44-50
  Limits Involving Infinity: Handout
  Horizontal and Vertical Asymptotes: Handout
§1.4 IROC's and the Derivative: #1, 3, 4, 12, 13, 17, 19, 21, 25-27, 29, 30, 44, 45, 52, 55-57
§1.5 Extrema and the Mean Value Theorem: #1, 9, 13, 17, 23, 28, 29, 39, 45
§1.6 Higher-order Derivatives: #1-4, 7, 9, 13, 20, 21, 23, 25, 32(ab), 45

Chapter 2 Basic Rules for Calculating Derivatives
§2.1 The Power Rule and Linearity: #1, 2, 4, 6, 17, 37, 39, 42, 43, 46, 47, 49(abc)
§2.2 The Product and Quotient Rules: #1, 2, 7, 9, 10, 23, 29, 35, 38, 48

Precalculus
§VI. Inverse Functions: Problem Set #9
§2.3 The Chain Rule and Inverse Functions: #1, 2, 4, 6, 13, 22, 24, 31-33, 37
§2.4 The Derivative of Exp. Function: #1, 2, 4, 5, 7, 12, 15, 25, 30, 31, 34, 39(a), 42, 43
§2.5 The Derivative of Natural Logarithm: #1-5, 13, 17, 21, 25, 26, 37, 39

Precalculus
§VII. Exponential Functions: Problem Set #10
§VIII. Logarithmic Functions: Problem Set #11
§2.6 General Exponential and Logarithmic Functions: #1-8, 16, 20, 26, 28, 36, 38, 49

Precalculus
§IX. Trigonometric Functions: Problem Set #12
§2.7 Sine and Cosine: #1-4, 7, 9, 11, 13, 15, 17, 19, 20, 21, 25, 27, 29, 30, 36, 38
§2.8 Other Trig. Functions: #5, 7, 8, 11, 16, 18, 45
  Appendix A: Parameterized Curves and Motion: #1, 5, 9, 11, 13, 15, 19

Precalculus
§X. Inverse Trigonometric Functions: Problem Set #14
§2.9 Inverse Trig. Functions: #1, 3-7, 14, 15, 21, 24, 27

Chapter 3 Applications of Differentiation
§3.3 Optimization: #1, 2, 7, 16, 17, 19, 21, 34, 39, 41; Handout
§3.5 l'Hôpital’s Rule: #2, 3, 5, 6, 7, 8, 9, 10, 11, 17, 39

Chapter 4 Anti-differentiation & Differential Equations
§4.1 Differential Equations: #1, 3, 17, 25, 26
§4.2 Anti-derivatives: #1-5, 22-25, 45, 46, 79, 80
§4.2 Integration by Substitution: #6, 7, 9, 11, 15, 19, 28, 29, 81

Worldwide Integral Calculus
Chapter 2 Continuous Sums: the Definite Integral
§2.1 Sums and Differences: #1, 2, 5, 12, 15, 16, 19, 29
§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, 13, 15, 17, 23, 41, 43

Chapter 3 Applications of Integration
§3.2 Area in the Plane: #1, 3, 5, 7, 11, 13, 19

Review and Cumulative Departmental Final Exam