NYU-Polytechnic School of Engineering
Department of Mathematics
Course Outline MA914 Pre-Calculus
A and F Sections (M&W) Fall 2014

Faculty

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- **Instructors: TBA**

Course Prerequisite
Math Placement Exam.

Course Description
This course is a fast paced and comprehensive review of the elements of high school Mathematics that are critical for a student's success in NYU-Poly's Mathematics, Science, and Engineering courses. While all of the material should be familiar to those enrolled in the course, the material will be presented in a novel and challenging manner so as to engage the student.

This course covers the foundations of Algebra: exponents, multiplication of algebraic expressions, factoring algebraic expressions, working with algebraic fractions, proportionality, rates of change, equation of a line, completing the square, the quadratic formula, solving equations, systems of equations, inequalities, domain and range of functions, exponential and logarithmic functions, piecewise defined functions, power functions, polynomial and rational functions, finding horizontal and vertical asymptotes, determining long-run and short-run behavior of functions, compositions, transformations of functions, trigonometry of triangles, trigonometric identities and their proofs, arithmetic and algebra of complex numbers.

Course Objectives
To develop a strong set of practical mathematical skills which are critical for success in Science and Engineering.

Course Structure
The class is comprised of lectures as well as discussions regarding exercises and problems from the textbook, worksheets, and homework. During the semester, there will be four quizzes (one before each exam), weekly homework assignments, three midterm exams and one final exam.

The textbook for the course: Pre-Calculus, Mathematics for Calculus, 6th *Edition* by James Stewart, Lothar Redlin and Saleem Watson. Published by Brooks/Cole ISBN-13 978-0-8400-6807-1. You may purchase a used book, loose-leaf version, or eBook if you wish. However, every student is required to have a WebAssign license for the online homework system.

Course Information and Grading: The policies regarding exams and homework assignments are found at the following address on the course website (www.math.poly.edu/courses/ma914/policy.phtml) and are strictly adhered to.

Mandatory requirements: Attendance of lectures, completion of homework, and demonstration of competency on the exams.

Academic Integrity: Any incident of cheating or dishonesty will be dealt with swiftly and severely. The University does not tolerate cheating. You may see the link at http://www.poly.edu/academics/code-of-conduct/conduct#3.3.

Homework: There will be weekly online assignments administered through the online homework software "WebAssign", which is a course requirement. You may see the link at NYU Classes.

Examinations: Three midterm exams and one comprehensive final exam.

Course Grade: Your letter grade will be based on the higher average computed according to the following two formulas:

Formula 1:
20% Homework, Quizzes, and in class performance. Attendance is mandatory.
20% Best mid-semester exam
20% Second best mid-semester exam
40% Comprehensive final exam

Formula 2:
20% Homework, Quizzes, and in class performance. Attendance is mandatory.
15% Mid-semester Exam 1
15% Mid-semester Exam 2
15% Mid-semester Exam 3
35% Comprehensive final exam

Course Average	*Course Grade*
90-100	A
87-89	A-
84-86	B+
80-83	B
77-79	B-
74-76	C+
70-73	C
67-69	C-
64-66	D+
60-63	D
Below 60	F

In case you miss an exam due to an illness, please see the "Student Development Office" to request a make-up exam. For all other reasons, please go to RH 303A Office of Freshman Mathematics.

There will be no make-up exams or quizzes, unless you have a documented reason and receive permission from the Office of Student Development.

Exam Dates:
Exam 1, September 30, 2014
Exam 2, October 28, 2014
Exam 3, November 25, 2014
Final Exam: TBA

Pre-Calculus Internet Resources:

Paul's Online Math Notes
(www.tutorial.math.lamar.edu/Alg/Alg.aspx)
S.O.S. Mathematics (www.sosmath.com)
Visual Pre-Calculus
(http://archives.math.utk.edu/visual.calculus/0/index.html)

For Extra Help:
1. Contact Your Instructor
2. The Resource Center: TBA
3. The math workshop: TBA
4. NYU-Poly Academic support and services at www.poly.edu/academics/support

Class Etiquette:
Please do not eat, drink, talk or text on your cell phone in class.

You may ONLY use a TI-30 calculator on Pre-Calculus exams. This is UCSC rule for all first year courses!

If you are student with a disability who is requesting accommodations, please contact New York University's Moses Center for Students with Disabilities at 212-998-4980 or mosescsd@nyu.edu.You must be registered with CSD to receive accommodations. Information about the Moses Center can be found at www.nyu.edu/csd. The Moses Center is located at 726 Broadway on the 2nd floor.

Lecture Schedule of MA914 Fall 2014

Lecture 1(09/03)
- 2.1 WHAT IS A FUNCTION?
- 1.10 LINES
- 10.1 SYSTEMS OF LINEAR EQUATIONS IN TWO VARIABLES
- CATCH UP AND REVIEW

Lecture 2(09/08)
- 2.2 GRAPHS OF FUNCTIONS
- 2.3 GETTING INFORMATION FROM THE GRAPH OF A FUNCTION
- CATCH UP AND REVIEW

Lecture 3(09/10)
- 2.4 AVERAGE RATE OF CHAGE OF A FUNCTIONS
- 2.5 TRANSFORMATIONS OF FUNCTIONS
- CATCH UP AND REVIEW

Lecture 4(09/15)
- 2.6 COMBINING FUNCTIONS
- CATCH UP AND REVIEW

Lecture 5(09/17)
- 2.7 ONE-TO-ONE FUNCTIONS AND THEIR INVERSES
- CATCH UP AND REVIEW

Lecture 6(09/22)
- 3.1 QUADRATIC FUNCTIONS AND MODELS
- SOLVING A QUADRATIC INEQUALITY (1.7 EXAMPLE 3, PAGE 75)
- CATCH UP AND REVIEW

Lecture 7(09/24)
- 3.2 POLYNOMIAL FUNCTIONS AND THEIR GRAPHS
- 3.3 DIVIDING POLYNOMIALS (LONG DIVISION AND SYNTHETIC DIVISION ONLY)
- CATCH UP AND REVIEW
- **Quiz 1** (DURING CLASS)

Lecture 8(09/29)
- 3.7 RATIONAL FUNCTIONS
- CATCH UP AND REVIEW FOR EXAM 1

Lecture 9(10/01)

- 3.5 COMPLEX NUMBERS
- CATCH UP AND REVIEW

Lecture 10(10/06)

- 4.1 EXPONENTIAL FUNCTIONS
- 4.2 THE NATURAL EXPONENTIAL FUNCTION
- CATCH UP AND REVIEW

Lecture 11(10/8)

- 4.3 LOGARITHMIC FUNCTIONS
- 4.4 LAWS OF LOGARITHMS
- CATCH UP AND REVIEW

Lecture 12(10/15)

- 4.5 EXPONENTIAL AND LOGARITHMIC EQUATIONS (Part I)
- CATCH UP AND REVIEW

Lecture 13(10/20)

- 4.5 EXPONENTIAL AND LOGARITHMIC EQUATIONS (Part II)
- CATCH UP AND REVIEW

Lecture 14(10/22)

- CATCH UP AND REVIEW
- **Quiz 2** (DURING CLASS)

Lecture 15(10/27)

- 4.6 MODELING WITH EXPONENTIAL AND LOGARITHMIC FUNCTIONS
- CATCH UP AND REVIEW FOR EXAM 2

Lecture 16(10/29)

- 6.1 ANGLE MEASURE
- 6.2 TRIGONOMETRY OF RIGHT TRIANGLES
- CATCH UP AND REVIEW

Lecture 17(11/03)

- 6.3 TRIGONOMETRIC FUNCTIONS OF ANGLES
- CATCH UP AND REVIEW

Lecture 18(11/05)

- 5.1 THE UNIT CIRCLE
- 5.2 TRIGONOMETRIC FUNCTIONS OF REAL NUMBERS
- CATCH UP AND REVIEW

Lecture 19(11/10)

- 5.3 TRIGONOMETRIC GRAPHS
- 5.4 MORE TRIGONOMETRIC GRAPHS (GRAPHS OF TAN, COT, SEC, AND CSC ONLY)

Lecture 20(11/12)

- 5.6 MODELING HARMONIC MOTION (SIMPLE HARMONIC MOTION ONLY)
- CATCH UP AND REVIEW

Lecture 21(11/17)

- 5.5 INVERSE TRIGONOMETRIC FUNCTIONS AND THEIR GRAPHS
- 6.4 INVERSE TRIGONOMETRIC FUNCTIONS AND RIGHT TRIANGLES

Lecture 22(11/19)

- 6.5 THE LAW OF SINES
- CATCH UP AND REVIEW
- **Quiz 3** (DURING CLASS)

Lecture 23(11/24)

- 6.6 THE LAW OF COSINES
- 7.1 TRIGONOMETRIC IDENTITIES
- CATCH UP AND REVIEW FOR EXAM 3

Lecture 24(12/01)

- 7.2 ADDITION AND SUBTRACTION FORMULAS (INTRODUCE THE FORMULAS, PAGE 500—502 ONLY)
- 7.3 DOUBLE-ANGLE AND HALF-ANGLE FORMULAS (INTRODUCE THE FORMULAS, PAGE 508 AND PAGE 510 ONLY)
- CATCH UP AND REVIEW

Lecture 25(12/03)

- 7.4 BASIC TRIGONOMETRIC EQUATIONS
- 7.5 MORE TRIGONOMETRIC EQUATIONS
- **Quiz 4** (DURING CLASS)

Lecture 26 (12/08)

- CATCH UP AND REVIEW FOR FINAL EXAM

Final Exam will be scheduled during Final Exam Week