

MAT150 College Algebra (3 credit hours)
(MAT115 College Algebra (4 credit hours)**)

Instructor: Yasushi NARA

Office hours: T,R: 14:00-15:30

Office: A36

e-mail: nara@aiu.ac.jp

Phone: 5940

Semesters: Spring, Fall

Meeting times: T,R: 12:30-13:45

Description:

This is an introductory level course in mathematics with emphasis on algebraic methods. The material of the course includes standard subjects necessary to solve real life problems, for instance, from business and economics, life and social sciences. The topics include sets and functions, natural, real, complex numbers, trigonometry, matrices, polynomial, exponential, logarithmic functions, linear, quadratic and other polynomial equations, graphical representations of functions, matrices. This course emphasizes on logical and conceptual aspects of mathematics rather than merely focusing on the developing computational skills in mathematics. Development of students' understanding of mathematical/abstract concepts will be supported by appropriate examples and practical applications.

Objectives:

First of all, one of the objectives in this course is to provide students with skills in mathematical thinking, especially in quantitative reasoning which is one of the most critical and fundamental aspects of the Liberal Arts program. Secondly, students will develop skills in the applications of mathematical concepts in their areas of study and interest. Note that the latter goal cannot be achieved, without achieving the first goal.

Study Materials:

Earl W. Swokowski, Jeffery A. Cole, "Algebra and Trigonometry with Analytic Geometry" classic 11th ed, Brooks/Cole, 2006. ISBN: 0-534-40469-3

Assessment:

The components of your grade are the following:

Homework: 20% Quizzes for all chapters: 30% Final Examination: 50%

Expected Academic Background:

There are no prerequisites for this course.

Course Format and Activities:

Class sessions have format of lectures, however questions, even when frequent, are always very welcome.

Schedule:

Week 1: 1.1 Real Numbers, 1.2 Exponents and Radicals.

Week 2: 1.3 Algebraic expressions, 1.4 Fractional expressions.

Week 3: 2.1 Equations, 2.3 Quadratic equations.

Week 4: 2.4 Complex numbers, 2.5 Other Type of Equations.

Week 5: 2.6 Inequalities, 2.7 More on Inequalities.

Week 6: 3.1 Rectangular coordinate systems, 3.2 Graphs of equations.

Week 7: 3.3 Lines, 3.4 Definition of a function.

Week 8: 3.5 Graphs of functions, 3.6 Quadratic Functions.

Week 9: 3.7 Operations on Functions, 4.1 Polynomial Functions of Degree Greater Than 2.

Week 10: 4.2 Properties of Division, 4.3 Zeros of Polynomials.

Week 11: 4.5 Rational functions, 5.1 Inverse Functions.

Week 12: 5.2 Exponential Functions, 5.3 The Natural Exponential Function.

Week 13: 5.4 Logarithmic Functions, 5.5 Properties of Logarithms.

Week 14: 5.6 Exponential and Logarithmic Equations.

Week 15: Final Examination.

* The schedule above is only tentative and some parts of the secondary importance material may be omitted. However, all material listed will be covered if time permits.

** Contact the instructor if you need to take the course MAT115 for 4 credits.