

Course ID Number: DCC5210

Course Title: Mathematical Methods

No. of Credits: 2

Graduate School of International Relations

International University of Japan

Term: Fall 2013

Instructor: Koji Kotani

Course Description:

This course deals with basics of mathematical methods that enable you to concisely represent what you think in the analysis for your research. Taking this course, you will be able to systematically and intuitively operationalize mathematical methods applying to various analyses in social sciences, and utilize them for your research. The focus of this course is on (i) fundamental elements and (ii) application. Therefore, those who want to study more advanced and theoretical contents should take another course "advanced mathematical methods" taught by Prof. Kakinaka. It is important for you to realize in advance that this course is a building block for any further study of public policy and economics. To catch up with the course smoothly, you are strongly recommended to read a corresponding chapter of the textbook prior to each class and to solve problem sets in a timely manner.

Syllabus: Mathematical methods, Fall 2013

Instructor: Koji Kotani

Office Hour: 16:20~17:20 on Tuesday

E-mail: kkotani@iuj.ac.jp

Course synopsis: This course deals with basics of mathematical methods that enable you to concisely represent what you think in the analysis for your research. Taking this course, you will be able to systematically and intuitively operationalize mathematical methods applying to various analyses in social sciences, and utilize them for your research. The focus of this course is on (i) fundamental elements and (ii) application. Therefore, those who want to study more advanced and theoretical contents should take another course “advanced mathematical methods” taught by Prof. Kakinaka. It is important for you to realize in advance that this course is a building block for any further study of public policy and economics. To catch up with the course smoothly, you are strongly recommended to read a corresponding chapter of the textbook prior to each class and to solve problem sets in a timely manner.

Required textbooks for the course

- Bradley, T. (2013). *Essential mathematics for economics and business*. Wiley, 4 edition

Teaching assistant (TA): TAs shall assist the students in various concerns relating to this course. Tutorial sessions will be held weekly mainly to help the students answer the problem set (PS) questions. They shall also hold office hours on the stated time and place. There will be a walk-in consulting room at which students may meet with teaching assistants individually or in small ad hoc groups (having similar questions). The teaching assistants are also available on a priority basis to meet with individual study groups at mutually agreeable times. At anytime within the office hours, the students can pop in and ask questions related to the course. TAs will be responsible for grading your quizzes/PSs as well as conducting recitation sessions. The sessions will be devoted to review the material presented during lectures and solving problems. Please contact your TAs via e-mail or phone prior to a session with any question/problem you would like them to go over in class.

Regrade requests You can request a re-grade if you suspect a grading error on the tests (quizzes/PSs/tests). However, be very precise by double-checking your answer

before you claim a grading error. Your tests will then be re-graded if needed. Do not submit tests for re-grading unless you have a good reason to do so. Your entire test will be re-graded and there is a good chance that you may lose rather than earn points if the original grade was too generous.

Problem sets and quizzes Problem sets and quizzes are assigned throughout this course. In total, weekly problem sets will be given, and quizzes are randomly conducted in the classroom.

Course schedule

Topic 1: A review of basic operations (1 ~ 2 week)

- Summation, subtraction, multiplication and division
- Factorization, algebraic operations and graphing
- Series and limit

Topic 2: Linear, non-linear functions, differentiation and integration (2 weeks)

Topic 3: Simultaneous equations (less than 1 week)

Topic 4: Functions of several variables and partial differentiation (2 weeks)

Topic 5: Unconstrained optimization (1 ~ 2 weeks)

Topic 6: Constrained optimization (2 weeks)

Grading policy:

- Midterm exam, 25%: The midterm exam shall be held covering topics 1~3.
- Final exam, 70%
- Problem sets and quizzes, 5%