Introductory Mathematics | ECP77101

Year	1
ECTS Credits	0
Contact Hours	30 hours of lectures
Pre-Requisite	Nil
Semester	1
Module Leader and Lecturer	Michael McRae
Contact Email	mcraemi@tcd.ie

Module Outline:

This module is an overview of the most important mathematics techniques used in economic analysis. The module consists of two parts. The first week will be devoted to the tools used in microeconomics, ranging from set theory to optimization with nonlinear constraints. In the second week, we will go through techniques typically used in macroeconomics such as integral calculus and dynamic analysis, both in discrete and continuous time.

1. **Lectures (first week):**
    a. Sets, vectors and linear algebra
    b. One-variable calculus
    c. Multi-variable calculus
    d. Optimization with equality constraints
    e. Optimization with inequality constraints **Lectures (second week):**
    f. Integral calculus and first-order differential equations
    g. First-order difference equations and discrete time analysis
    h. Simultaneous differential equations
    i. Optimal control theory (introduction)
    j. Test

Module Learning Outcomes:

Upon the completion of the modules, students will be familiar with the most important mathematics tool applied in micro and macroeconomics.

Assessment:

The module does not award any credit therefore there will be no formal exam. There will be an open-book test in the last lecture which will not be graded. Personalised feedback will be offered to each student on the basis of the results.

Recommended Reading List:

- Simon and Blume (1994) Mathematics for Economists. Norton
- Chiang and Wainwright (2005) Fundamental Methods of Mathematical Economics. McGraw-Hill.