

EC2104 Quantitative Methods for Economic Analysis summary

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Preface

This note is meant to be complementing EC2104 lecture and tutorials. The content is not the official lecture material and there might be errors that I do not foresee. Please refer to the lecturer content for the final explanation.

Introduction

What do I need to know

EC2104 is meant to cover the mathematics (linear algebra and calculus) needed for undergraduate economics study. The contents covered in this module is representative of the main contents covered in 5 mathematics modules. Therefore, the module is heavily focusing on applied and not proving.

In a layman term: you need to know how to use the tools but you are not expected to know how are those tools built.

Using an analogy: if this module is a microwave (those you have at home), what you need to know is what kind of food can be put inside the microwave (e.g. eggs should not be placed in microwave) and how to operate the timer, intensity of the microwave. Bonus might be to understand basic theory behind how microwave functions to make your own decisions on if an unknown food item can be placed in the microwave. However, you are not expected to work out the engineering logic behind the microwave. For example, how to design the circuit board to minimise possibility of short-circuit (I don't know much about engineering).

If you are interested to know how the definitions and theorems are derived, I strongly recommend you to audit or take the following modules for credit.

Content	Module
Single Variable Calculus	MA2002 Calculus
Multi-Variable Calculus	MA2104 Multivariable Calculus OR MA2311 Techniques in Advanced Calculus
Linear Algebra	MA2001 Linear Algebra I
Multi-Variable Optimization (Linear problems)	MA3252 Linear and Network Optimisation
Multi-Variable Optimization (Non-Linear problems)	MA3236 Non-Linear Programming

How do I master what I need to know

Since EC2104 emphasis on applied mathematics, the best way to ace this module and the content is to... apply them. One shall not ponder too long on why those methods works but focus on how to apply those methods in different context.

For the purpose of this method, it might be less useful to understand why limits are called limits than to solve the $\lim_{x \rightarrow \infty} x^2/e^x$. If you are interested in knowing the why, please refer to What do I need to know section on the modules offered by mathematics department.

Single Variable Calculus

Functions

Limits

Single variable optimization

Integration

Multi-Variable Calculus

Multi-variable calculus

Comparative Statistics

Linear Algebra

Matrix Algebra

Determinant and Inverse for Matrices

Multi-Variable Optimization

Multi-Variable Optimization

Constrained Optimization

Optimization with Inequality Constraints