

EF3452: METHODS IN ECONOMIC THEORY

Effective Term

Semester A 2024/25

Part I Course Overview

Course Title

Methods in Economic Theory

Subject Code

EF - Economics and Finance

Course Number

3452

Academic Unit

Economics and Finance (EF)

College/School

College of Business (CB)

Course Duration

One Semester

Credit Units

3

Level

B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

EF2452 – Mathematics for Economics and Finance, and
CB2200 – Business Statistics

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

This course aims to provide students majoring in economics with the necessary technical training to support successful learning in upper year courses (in both economics and finance). Students of trade theory, econometrics, micro and macro theory at the upper undergraduate levels require training in constrained optimization, difference and differential equations, integration, probability theory and the elements of dynamic models including Markov processes. This course provides these techniques.

Course Intended Learning Outcomes (CILOs)

CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1 Demonstrate mathematical techniques and skills for conducting economic research and analyzing economic theory.	40	x	x	x
2 Apply theoretical methods to typical problems in various fields and synthesize the knowledge of the use and application of these tools.	50	x	x	x
3 Analyze specific problems in economics and finance. For example, design optimal bidding strategies in auctions using knowledge of distribution theory; and explain constrained optimization.	10	x	x	x

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1 Lectures	Students will participate in lectures through discussion, problem formulation and problem-solving.	1, 2, 3	3 hours lecture per week
2 Class discussion	Students will engage in class discussion to learn the application of mathematical methods to solve real-world problems.	1, 2, 3	

Assessment Tasks / Activities (ATs)

ATs		CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Midterm examination The midterm exam will provide an early performance benchmark for students and identify weaknesses in the students understanding or approach to the material. This will provide an opportunity for self-evaluation and the development of new approaches as necessary.	2	30	
2	Problem sets Assignments are designed to help students fully absorb the material and achieve a stronger grasp of technique application.	2	30	

Continuous Assessment (%)

60

Examination (%)

40

Examination Duration (Hours)

2

Assessment Rubrics (AR)**Assessment Task**

1. Midterm examination

Criterion

Exam questions

Excellent (A+, A, A-)

Strong evidence of mastering the mathematical tools in economics and finance. Students have demonstrated very strong overall ability to independently formulate an economic problem into a mathematic optimization problem.

Good (B+, B, B-)

Evidence of mastering the mathematical tools in economics and finance. Students have demonstrated strong overall ability to independently formulate an economic problem into a mathematic optimization problem.

Fair (C+, C, C-)

Some evidence of knowing the mathematical tools in economics and finance. Students have demonstrated some ability to formulate an economic problem into a mathematic optimization problem.

Marginal (D)

Marginal familiarity with the mathematical tools in economics and finance. Students have demonstrated marginal ability to solve an optimization problem independently.

Failure (F)

Little evidence of knowing the mathematical tools in economics and finance. Students have demonstrated little ability to solve optimization problem independently.

Assessment Task

2. Problem sets

Criterion

Exercise answers

Excellent (A+, A, A-)

Strong evidence of knowing how to apply the mathematical techniques outlined in CILOs. Students have demonstrated very strong overall ability to discover and innovate, and shown very strong evidence of accomplishments in discovery.

Good (B+, B, B-)

Evidence of knowing how to apply the mathematical techniques outlined in CILOs. Students have demonstrated strong overall ability to discover and innovate, and shown very strong evidence of accomplishments in discovery.

Fair (C+, C, C-)

Some evidence of knowing how to apply the mathematical techniques outlined in CILOs. Students have demonstrated some ability to discover and innovate, and shown very strong evidence of accomplishments in discovery.

Marginal (D)

Marginal evidence of knowing how to apply the mathematical techniques outlined in CILOs. Students have demonstrated marginal ability to discover and innovate, and shown very strong evidence of accomplishments in discovery.

Failure (F)

Little evidence of knowing how to apply the mathematical techniques outlined in CILOs. Students have demonstrated little ability to discover and innovate, and shown very strong evidence of accomplishments in discovery.

Assessment Task

3. Final Examination

Criterion

Exam Questions

Excellent (A+, A, A-)

Strong evidence of mastering the mathematical tools in economics and finance. Students have demonstrated very strong overall ability to independently formulate an economic problem into a mathematical optimization problem.

Good (B+, B, B-)

Evidence of mastering the mathematical tools in economics and finance. Students have demonstrated strong overall ability to independently formulate an economic problem into a mathematical optimization problem.

Fair (C+, C, C-)

Some evidence of knowing the mathematical tools in economics and finance. Students have demonstrated some ability to formulate an economic problem into a mathematical optimization problem.

Marginal (D)

Marginal familiarity with the mathematical tools in economics and finance. Students have demonstrated marginal ability to solve an optimization problem independently.

Failure (F)

Little evidence of knowing the mathematical tools in economics and finance. Students have demonstrated little ability to solve optimization problem independently.

Part III Other Information**Keyword Syllabus**

1. Input-output techniques, demand systems, shadow pricing and
2. marginal value of resources.
3. Expected utility theory, risk aversion, small risk and welfare loss.
4. Macroeconomics systems, fiscal and monetary policy multipliers.
5. Welfare, consumer and producer surplus, Ramsey pricing, optimal taxation.
6. Profit, cost, long and short run cost.
7. Utility and expenditure and welfare evaluation.
8. Auctions.
9. Contract theory and mechanisms.
10. Agency problems.
11. Innovation and R&D, competition for a prize.
12. Growth dynamics and evolutionary models.

Reading List**Compulsory Readings**

Title	
1	Mathematics for Economists with Applications, J. Bergin, Routledge, 2015

Additional Readings

Title	
1	Mathematics for Economists by Carl P. Simon and Lawrence E. Blume, W.W. Norton, 1994.
2	Essential Mathematics for Economic Analysis (2nd ed.) by Knut Sydsaeter and Peter Hammond, Prentice Hall, 2006.