

EF5413: COMPUTATIONAL ECONOMICS

Effective Term

Semester A 2026/27

Part I Course Overview

Course Title

Computational Economics

Subject Code

EF - Economics and Finance

Course Number

5413

Academic Unit

Economics and Finance (EF)

College/School

College of Business (CB)

Course Duration

One Semester

Credit Units

3

Level

P5, P6 - Postgraduate Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

EF5471 Advanced Microeconomics, EF5472 Advanced Macroeconomics and EF5474 Quantitative Methods in Economics

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

This course provides an introduction to the frontier of computational economics, particularly the application of numerical methods to solve a set of macroeconomic, microeconomic, and financial models. The course covers linear and nonlinear

equations, finite-dimensional optimization, numerical integration and differentiation, and applications to solving static and dynamic models in macroeconomics, microeconomics, and portfolio choice.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Replicate and apply the computational methods covered in this course.	60	x	x	
2	Critical evaluate applications of computational economics in the literature.	40	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, in-class discussions, assignments	Evaluate applications of computational economics in the literature and discuss how to replicate and apply them.	1, 2	3 hours lecture per week

Assessment Tasks / Activities (ATs)

ATs		CILO No.	Weighting (%)	Remarks	Allow Use of GenAI?
1	Homework assignments, discussions	1, 2	10	-	Yes
2	Individual term paper	1, 2	40		Yes

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

3

Assessment Rubrics (AR)

Assessment Task

Exam (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Demonstrate the capability of understanding and applying computational methods to solve economic and finance models.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

Homework assignments, discussions (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Demonstrate the capability of understanding and applying computational methods to solve economic and finance models.

Homework assignments, class participation and discussions (20%), and individual term project (80%).

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

Exam (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Demonstrate the capability of understanding and applying computational methods to solve economic and finance models.

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

Homework assignments, discussions (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Demonstrate the capability of understanding and applying computational methods to solve economic and finance models.

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Basic

Failure

(F) Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

Numerical methods; MATLAB/Octave; linear programming; optimization; linear equations; nonlinear equations; optimizations; numerical integration; numerical differentiation; static models; dynamic models.

Reading List**Compulsory Readings**

Title	
1	Miranda, M. and Fackler, P. (2002) Applied Computational Economics and Finance. MIT.
2	Afonso, O. and Vasconcelos, P. B. (2016) Computational Economics: A Concise Introduction. Routledge.
3	Kendrick, D., Mercado, P. and Amman, H. (2006) Computational Economics. Princeton.
4	Judd, K. (1999) Numerical Methods in Economics. MIT.

Additional Readings

Title	
1	Nil