EF5413: COMPUTATIONAL ECONOMICS

Effective Term
Semester B 2024/25

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
Nil

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 in the area of dynamic general equilibrium modelling. After an introduction to standard numerical methods, the course covers in detail numerical

dynamic programming, linear quadratic and linear approximation methods, projection methods, computation of stationary distributions in heterogeneous agent models, and numerical solution of many periods overlapping generations models.

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 (e.g. Parameter for GenAI use)
1	Homework assignments, discussions	1, 2	40	

Continuous Assessment (%)

40

Examination (%)

60

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 understanding of the computation economics.

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 computation economics.

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 understanding of the computation economics.

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 computation economics.

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 dynamic programming; Projection methods for functional equations; Optimal control problems; Linear quadratic and linear approximation methods; Parameterized expectations; Heterogeneous agent models; Computation of stationary distributions; Numerical solution of overlapping generations models

Reading List

Compulsory Readings

	Title
1	Heer, B. and Maussner, A. (2005) Dynamic General Equilibrium Modelling – Computational Methods and Applications. Springer.
2	Judd, K. (1999) Numerical Methods in Economics. MIT.
3	Kendrick, D., Mercado, P. and Amman, H. (2006) Computational Economics. Princeton.
4	Miranda, M. and Fackler, P. (2002) Applied Computational Economics and Finance. MIT.

Additional Readings

	Title
1	Nil