

City University of Hong Kong
Course Syllabus

offered by Department of Economics and Finance
with effect from Semester A 2024 /25

Part I Course Overview

Course Title: Computational Economics

Course Code: EF5413

Course Duration: 1 semester

Credit Units: 3

Level: P5

Medium of Instruction: English

Medium of Assessment: English

Prerequisites:
(Course Code and Title) Nil

Precursors:
(Course Code and Title) Nil

Equivalent Courses:
(Course Code and Title) Nil

Exclusive Courses:
(Course Code and Title) Nil

Part II Course Details

1. 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.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs	Weighting (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Replicate and apply the computational methods covered in this course.	60%	√	√	
2.	Critical evaluate applications of computational economics in the literature.	40%	√	√	
		100%			

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.

3. Learning and Teaching Activities (LTAs)

(LTAs designed to facilitate students' achievement of the CIOs.)

LTA	Brief Description	CILO No.		Hours/week (if applicable)
		1	2	
Lectures, in-class discussions, assignments	Evaluate applications of computational economics in the literature and discuss how to replicate and apply them.	√	√	3 hours lecture per week

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CIOs.)

Assessment Tasks/Activities	CILO No.		Weighting	Remarks
	1	2		
Continuous Assessment: <u>40%</u>				
Homework assignments, discussions	√	√	40%	
Examination: <u>60%</u> (duration: 3 hours, if applicable)				
Examination	√	√	60%	
			100%	

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Applicable to students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Homework assignments, discussions	Demonstrate the capability of understanding and applying computation economics.	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Exam	Demonstrate the understanding of the computation economics.					

Applicable to students admitted from Semester A 2022/23 to Summer Term 2024

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
1. Homework assignments, discussions	Demonstrate the capability of understanding and applying computation economics.	High	Significant	Basic	Not even reaching marginal levels
2. Exam	Demonstrate the understanding of the computation economics.				

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

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

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

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.

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

Nil