GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2024-2025

Quantitative Methods for Dynamic Economics (F001005)

Course size *(nominal values; actual values may depend on programme)*

Credits 6.0 **Study time 180 h**

Course offerings and teaching methods in academic year 2026-2027

A (semester 2)	English	Gent	peer teaching
			lecture
			group work

Lecturers in academic year 2026-2027

Önder, Yasin Kursat	EB21	lecturer-in-charge

Offered in the following programmes in 2026-2027	crdts	offering
Master of Science in Economics	6	A
Master of Science in Economics (Double Degree)	6	A

Teaching languages

English

Keywords

Quantitative economics, solution methods

Position of the course

This is an elective course for students who would like to pursue a PhD in economics.

Contents

The main objective of this course is to have the first step to bring a model closer to the data. Typically, in quantitative economics today, models do not have analytical solutions which makes computational tools as well as the knowledge of applying the right one indispensable.

Initial competences

Knowledge of computational methods and software that is commonly used in macroeconomics (Fortran, Matlab) is not required but will be helpful. If you are not familiar with such software, then be ready to work harder than others. A good understanding of recursive formulation is required which is typically covered in first year macro.

Final competences

1 Be able to use computational methods and recursive methods.
2 Students can build upon their skills and execute the thesis or job market paper masterfully.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Group work, Lecture, Peer teaching

Extra information on the teaching methods

Adjusted teaching methods may be used if necessary

Study material

Type: Slides

Name: slides
Indicative price: Free or paid by faculty
Optional: no
Additional information: my own slides

Type: Other

Name: journal articles
Indicative price: Free or paid by faculty
Optional: no

References

This is a restricted list of various interesting articles and useful books that will be touched during the course. Papers are listed there for reference only, and the essential ones will be discussed in class.
Kenneth L. Judd Numerical Methods in Economics, MIT Press, 1998.

William H. Press & Saul A. Teukolsky & William T. Vetterling & Brian P. Flannery, Numerical Recipes in Fortran 77: The Art of Scientific Computing, Second Edition, MIT Press, 1992. (There is a subsequent book entitled Numerical Recipes in Fortran 90.

Discretization methods for a continuous shock process: (Tauchen (1986), Tauchen and Hussey (1991), Rouwenhorst (1995), and several new variants of this last method).

Huggett, M. (1993), \The Risk-Free Rate in Heterogeneous-Agents, Incomplete Markets Economies,"
Journal of Economic Dynamics and Control 17, 953{969}.

Krusell, P. and A.A. Smith, Jr. (1998), Income and Wealth Heterogeneity in the Macroeconomy"
Journal of Political Economy 106, 867{896}.

Onder, Yasin Kursat and Enes Sunel, Default or Depreciate," Unpublished manuscript.

Hatchondo, Juan Carlos, Leonardo Martinez, and Horacio Sapriza, Quantitative properties of
sovereign default models: solution methods matter," Review of Economic Dynamics, 13, October
2010, 919-933.

Course content-related study coaching

Office hours can be arranged through appointment.

Assessment moments

continuous assessment

Examination methods in case of periodic assessment during the first examination period

Examination methods in case of periodic assessment during the second examination period

Examination methods in case of permanent assessment

Oral assessment, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible in modified form

Calculation of the examination mark

The final grade will be based on assignments and a take home final. Students will be given a number of assignments that involve computation. The assignments are encouraged to be done in teams of 2. Teams should be ready to present their results, key parts of the algorithm (not the entire code, but only the key parts). The idea is NOT to give a seminar and NOT to waste time on non-essential parts.

We mostly meet every other week so that teams can have ample time to complete assignments. There will also be a take-home final. Students are allowed to discuss the final in the hallway". Yet, all students are required to (i) type, (ii) produce and code the algorithm, (iii) produce the output, and (iv) present any theoretical findings or claims.