

## 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**

[Master of Science in Economics](#)

**crdts**

**offering**

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 Saprizza, "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.