

## **Seminar: Macroeconomics**

### **Aim of the course:**

This course will mostly be concerned with analyzing public policy (like taxation, social security, etc.). We will learn how such policies redistribute between different generations and also within generations, how they may improve risk sharing when markets are incomplete and how they can trigger distortions and therefore hurt the aggregate economy. To accomplish this task, this course provides students with state of the art computational techniques for quantitative macroeconomic research in this very field and familiarizes them with the relevant literature. Ideally at the end of the course, they will be able to develop their own ideas and conduct their own policy analysis using the techniques acquired.

### **Outline:**

The course will consist of a series of lectures and a do-it-yourself part. The teaching sequence is divided into three units:

1. In the first unit, students will learn how to program in FORTRAN and acquire some basic skills in applying numerical methods. FORTRAN is a free, fast and easy to learn programming language that is used quite frequently in modern quantitative macroeconomic research.
2. Unit 2 will be concerned with solution techniques to dynamic programming problems and will introduce the basics of the model we are concerned with most of the time: the overlapping generations model (OLG) with uninsurable income risk.
3. In the last part we will learn how we can conduct reliable policy analysis in the stochastic OLG model and look at the recent literature that uses this model to analyze the effects of public policy reforms.

At the end of units one and two, students are given tasks that they will have to solve themselves using FORTRAN. Working in groups is explicitly encouraged. Ideally students will form groups of two people. After unit 3 they should be ready to start their own little project. I will be available for consultation, to give ideas and to assess the feasibility of the project. Towards the end of the semester, students will have to submit their project in the form of a program they wrote and a couple of pages of writing about how they solved things and what they found.

### **Prerequisites:**

Students that attend this course should know about basic macroeconomics. Knowledge of heterogeneous agent models will be helpful. It is not required to already have programming skills. Yet, students should know how to use a computer. In addition, they should bring along the willingness to learn programming (which requires that they will program a lot themselves). Ideally, if available, students should bring their own computer to class. This is however not a requirement.

**Grading:**

Grades will be based on students participation in the course as well as the project they submit.

**Course materials:**

There will be ample course material on how to program in FORTRAN, which compilers to use, numerical techniques, etc. In addition to a couple of chapters on these topics, there will be FORTRAN codes available for everything we do. There is no book, but lecture notes will be provided in pdf format.