Quantitative Macroeconomics

University of Bern

Basic Information:

Instructor:	Nawid Siassi
E-Mail:	nawid.siassi@tuwien.ac.at
Office hours:	Thursday, 11:00-12:00
Class dates:	September 22nd - December 1st (see detailed schedule below)

Course Description:

In this course you will learn how to obtain numerical solutions to macroeconomic models for which closed-form solutions are unavailable. The first part of the course focuses on basic numerical techniques such as root finding, optimization and function approximation methods. The second part of the course is devoted to solution methods for dynamic general equilibrium models which are widely used in macroeconomics. We will assess quantitatively to what extent these models can account for empirical observations, and we will use them to conduct counterfactual experiments.

Throughout the course, the emphasis is on applications: based on a series of coding exercises, you will learn how to implement and solve the models discussed in class. We will discuss your solutions to these exercises in the tutorial classes. The course concludes with a final project where students present a paper of their own choice from the literature and attempt a partial replication of it.

Material:

Most of the material will be provided through lecture slides. I will mention additional references (textbooks, scripts, research papers) throughout the course.

Programming Language:

Throughout the course, we will perform numerical computations using Matlab, which is a popular and user-friendly language for scientific computations. I will not assume any prior experience with Matlab and will give a brief introduction to Matlab in the first week.

Prerequisites:

Familiarity with the theory of dynamic programming is advantageous, but not absolutely necessary.

Grades:

The final grade will be based on problem sets (30%) and a final project (70%). I will detail the grading policy in the first meeting.

Schedule:

Sep 22	14:15-16:00	Room A019	and	16:15-18:00	Room A322
Sep 23	12:15-15:00	Room A019			
Oct 6	14:15-16:00	Room A019	and	16:15-18:00	Room A322
Oct 7	12:15-15:00	Room A019			
Oct 20	14:15-16:00	Room A019	and	16:15-18:00	Room A322
Oct 21	12:15-15:00	Room A019			
Nov 3	14:15-16:00	Room A019	and	16:15-18:00	Room A322
Nov 4	12:15-15:00	Room A019			
Nov 17	14:15-16:00	Room A019	and	16:15-18:00	Room A322
Nov 18	12:15-15:00	Room A019			
Dec 1	14:15-16:00	Room A019	and	16:15-18:00	Room A322

Course Outline:

I. Basic Numerical Methods

- Linear and Nonlinear Equations
- Optimization and Function Approximation

II. Dynamic General Equilibrium Models

- Value Function Iteration
- Calibration and Stochastic Simulation
- Linear-Quadratic and Linear Approximation
- Projection Methods
- Incomplete Markets: Stationary Distribution
- Incomplete Markets with Aggregate Uncertainty
- Overlapping Generations Models