Dynamic optimization has become the central method of modern macroeconomics. Rather than working with arbitrary static demand and supply curve, dynamic optimization derives the equations of economic behavior as dynamic optimization of optimizing agents. I have made a short Note (to be distributed) which covers the following mathematical and economic topics:

0. Introduction. Lecture 1: Sept. 25

1. Linear Difference Equations. Lecture 2: Sept. 26 (reduction of inhomogeneous to homogeneous equations; scalar, planar and n-dimensional systems; higher-order systems, stability)

2. Discrete-time Linear Models. Lecture 3: Oct. 2 (cobweb, Hicks' trade-cycle)

3. Nonlinear Difference Equations. Lecture 4: Oct. 3 (fixed points, theorem on contraction mappings; stability, cycles, chaos)


5. Differential Equations. Lecture 6: Oct. 10 (linear and nonlinear systems)

6. Continuous-time Models. Lecture 7: Oct. 16 (growth models)

7. Dynamic Programming. Lecture 8: Oct. 17 (direct method, the Optimum Principle for finite and infinite horizons)


Appendix. Overlapping generations Lectures 12: Oct. 31 (Steady states, dynamics, local and global analysis).

Additional literature

