

## SS 201C: ANALYTICAL FOUNDATIONS OF SOCIAL SCIENCE

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Lectures: MWF 9:00-9:55am  
Webpage: [www.hss.caltech.edu/~fede/ss201/](http://www.hss.caltech.edu/~fede/ss201/)
  
2. TEXTS: Bewley, *General Equilibrium, Overlapping Generations Models and Optimal Growth Theory*  
Sundaram, *A First Course in Optimization Theory*  
Stokey and Lucas *Recursive Methods in Economic Dynamics*,  
Mailath and Samuelson *Repeated Games and Reputations*.  
Optional:  
Fudenberg and Tirole, *Game Theory*  
Osborne and Rubinstein, *A Course in Game Theory*.
  
3. SYLLABUS
  - (a) DYNAMIC PROGRAMMING. Discounted dynamic programming. Contraction Mapping Theorem. Bellman Equation. Numerical dynamic programming. Applications in economics. Read: Sundaram Ch. 11 and 12, Stokey and Lucas Ch. 3 and 4.
  - (b) DYNAMIC ECONOMIES One-sector optimal growth model. Overlapping generations. Optimality. Social Security. Turnpike theorem. Bewley Ch. 9 and 10.
  - (c) REPEATED GAMES WITH PERFECT AND IMPREPERFECT MONITORING. One-step deviation principle. APS self-generation. Folk Theorems (Nash reversion,  $n$ -player, and the Fudenberg-Levine-Maskin Theorem). Comparative statics of equilibrium payoffs. Read: Fudenberg and Tirole, Ch. 5.1, 5.5, and 5.6.
  - (d) COMMON KNOWLEDGE AND HIGHER ORDER BELIEFS. Knowledge and common knowledge. Agreeing to Disagree results. No-trade and speculation. Higher order beliefs: the email game. The universal type space construction. Read: Fudenberg and Tirole, Ch. 12.