Prof. Ross Starr
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ECONOMICS 113 - MATHEMATICAL ECONOMICS: GENERAL EQUILIBRIUM THEORY
(UC Berkeley Economics 103, UCLA Economics 188Z)
(December 24, 2002. Subject to Revision)

Web page: All course written material will be posted on the web page. This includes the syllabus, problem sets, suggested answers to problem sets and exams, and prepared lecture notes. The web address is http://econ.ucsd.edu/classes/113/w03/econ113.html .

Teaching assistant: The course teaching assistant is AUGUSTO NIETO, (AUGUSTO NIETO's email address: anieto@weber.ucsd.edu). AUGUSTO is responsible for grading assignments and responding to e-mail inquiries. AUGUSTO and Prof. Starr will share responsibility for grading examinations.

e-mail: Please send e-mail to anieto@weber.ucsd.edu. Include 'Econ 113' in the subject line.

Requirements: There will be biweekly problem sets, two midterms, and a take-home final exam. Feel free to co-operate with friends and classmates on problem sets.
All examinations are open-book, open-notes. Confidentiality is required during examinations. Please strictly observe academic integrity. Examinations should be your own personal work. During examinations, other people (classmates, friends, professors --- except AUGUSTO and Prof. Starr) are CLOSED; do not discuss examination materials until after the exam has been collected.

Examination Schedule:
Midterm 1 (covers syllabus sections 1 to 5). In Class, Friday, January 31, 2003.
Midterm 2 (covers syllabus sections 1 to 11). In Class, Wednesday February 26 and Take Home section available on the web Wednesday February 26, due Friday
February 28.
Final, Take Home, available on the web Friday, March 14, due Friday, March 21.

Grading: Problem sets, 5%; midterm 1, 15%; midterm 2, 30%; final exam, 50%. Additional credit for class participation.

Prerequisites: A year of calculus and a year of upper division microeconomic theory (at UCSD these courses are Math 20 A-B-C, and Economics 100A-B or 170A-B; at UCLA these courses are Math 31 A, Math 31B or 31E, Math 32A, and Economics 11, 101). The prerequisites may be taken concurrently. Students with very strong mathematics preparation (typically including one quarter of real analysis, UCSD Math 140A or 142A; UCLA Math 131A) may enroll without economics prerequisites.

Videotapes: Videotapes of the lectures will be made at the Berkeley campus only for January 6 - 17 and will be available at the Moffett library. This is intended to accommodate the calendar conflict across campuses. See local arrangements. Streaming video of 2002 lectures on topics covered January 6 -17 will be available on the web.

Text: R. Starr's General Equilibrium Theory: An Introduction , Cambridge University Press, 1997. Available in paperback from campus bookstores and from amazon.com. Update Starr with corrigenda on the web at http://object.cup.org/Errata/052156414Xerr.PDF ; you will need an acrobat reader to access this material.

Reserve Materials: The following items have been requested on reserve in the library:
Arrow, K. J. and F. H. Hahn, General Competitive Analysis
Bartle, R., The Elements of Real Analysis , 1st edition, 1964
Bartle, R. and D. R. Sherbert, Introduction to Real Analysis , 2nd edition, 1992 and 3rd edition, 2000
Cornwall, R. R., Introduction to the Use of General Equilibrium Analysis
Debreu, G., Theory of Value
Eatwell, J., M. Milgate, and P. Newman (eds.) The New Palgrave: General Equilibrium
Quirk, J. and R. Saposnik, Introduction to General Equilibrium and Welfare Economics

Starr, R. M., General Equilibrium Theory: An Introduction
Varian, H., Microeconomic Analysis, 3rd ed. , 1992

TOPIC OUTLINE

Lectures will closely follow Starr's General Equilibrium Theory: An Introduction . The text and the lecture notes posted on the web are intended to reduce the need to take lecture notes in class. Please print out and bring lecture notes to class. Please read the relevant portion of Starr's General Equilibrium Theory before the topic is covered in class. Approximate dates where topics will be treated in class appear below.

Scheduled holidays (lectures omitted) are Monday January 20 and Monday February 17.

Introduction
1. The simplest general equilibrium model: Robinson Crusoe (1/6, 1/8, 1/10)
Starr, 1.1, 1.2

Lecture 2003
Professor Starr's videotaped lectures on this topic from January 6, 8, and 10, 2003, will be available on the web as streaming video.

(If clicking on the date below does not start RealPlayer, start RealPlayer yourself and copy & paste the given location into RealPlayer's location box; each video should become available soon after the class date.)

January 6 (http://earth.ucsd.edu:8080/ramgen/courses/econ113/Econ113_010603.rm)

January 8 (http://earth.ucsd.edu:8080/ramgen/courses/econ113/Econ113_010803.rm)

January 10 (http://earth.ucsd.edu:8080/ramgen/courses/econ113/Econ113_011003.rm)

Lecture 2002
Prof. Starr's videotaped lectures on this topic from January 7, 9, and 11, 2002, will be available on the web as streaming video.

(If clicking on the date below does not start RealPlayer, start RealPlayer yourself and copy & paste the given location into RealPlayer's location box; each video should become available soon after the class date.)

January 7 (http://earth.ucsd.edu:8080/ramgen/courses/econ113/Econ113_01_07_2002.rm)

January 9 (http://earth.ucsd.edu:8080/ramgen/courses/econ113/Econ113_01_09_2002.rm)

January 11 (http://earth.ucsd.edu:8080/ramgen/courses/econ113/Econ113_01_11_2002.rm)

2. The Edgeworth Box (1/13, 1/15)
Starr, 1.3

Lecture 2003
Professor Starr's videotaped lectures on this topic from January 13 and 15, 2003, will be available on the web as streaming video.

(If clicking on the date below does not start RealPlayer, start RealPlayer yourself and copy & paste the given location into RealPlayer's location box; each video should become available soon after the class date.)

January 13 (http://earth.ucsd.edu:8080/ramgen/courses/econ113/Econ113_011303.rm)

January 15 (http://earth.ucsd.edu:8080/ramgen/courses/econ113/Econ113_011503.rm)

Lecture 2002
Professor Starr's videotaped lectures on this topic from March 4 and 6, 2002, will be available on the web as streaming video.

(If clicking on the date below does not start RealPlayer, start RealPlayer yourself and copy & paste the given location into RealPlayer's location box; each video should become available soon after the class date.)

March 4 (http://earth.ucsd.edu:8080/ramgen/courses/econ113/Econ113_03_04_2002.rm)

March 6 (http://earth.ucsd.edu:8080/ramgen/courses/econ113/Econ113_03_06_2002.rm)

3. A simple demonstration of existence of general equilibrium (1/17)
Starr, 1.4
Optional: Arrow-Hahn, chaps.1, 2
Cornwall, 1.1, 1.2, 1.3
Geanakoplos, John, "Arrow-Debreu Model of General Equilibrium" in The New Palgrave: General Equilibrium
Varian, 17.1 - 17.5

Lecture 2003
Professor Starr's videotaped lectures on this topic from January 17, 2003, will be available on the web as streaming video.

(If clicking on the date below does not start RealPlayer, start RealPlayer yourself and copy & paste the given location into RealPlayer's location box; each video should become available soon after the class date.)

January 17 (http://earth.ucsd.edu:8080/ramgen/courses/econ113/Econ113_011703.rm)

Lecture 2002
Professor Starr's videotaped lectures on this topic from January 14, 2002, will be available on the web as streaming video.

(If clicking on the date below does not start RealPlayer, start RealPlayer yourself and copy & paste the given location into RealPlayer's location box; each video should become available soon after the class date.)

January 14 (http://earth.ucsd.edu:8080/ramgen/courses/econ113/Econ113_01_14_2002.rm)

Mathematics
4. Set notation, Euclidean N-dimensional space, RN (1/22, 1/24, 1/27)
[Note that 1/20 is the Martin Luther King Day holiday]
Starr, 2.1 "Set Theory"
Starr, 2.4 "RN, Real N-dimensional Euclidean Space"
Optional: Bartle, Section 1, 7, 8, 11
Bartle and Sherbert, 2nd edition section 1.1, chap. 2, sections 3.1, 3.2, 3.3, chap.10; 3rd ed. section 1.1, chap. 2, sections 3.1, 3.4, 11.1, 11.2
Debreu, 1.2, 1.6, 1.9a - 1.9f

5. Continuous Functions (1/29)
Starr, 2.3 "Functions,"
2.5 "Continuous Functions"
Optional: Bartle, Sections 2, 15
Bartle and Sherbert, 2nd ed., sections 5.1, 5.2, 5.3; 3rd ed. sections 5.1, 5.2, 5.3, 11.3
Debreu, 1.3, 1.8
[Midterm 1, Friday, January 31]

6. Convexity (2/3)
Starr, 2.6 "Convexity"
Optional: Debreu, Section 1.9

The Arrow-Debreu Model of Economic General Equilibrium
7. Representation of Commodities and Prices (2/3)
Starr, chap. 3

Optional: Debreu, Chapter 2
Geanakoplos "Arrow-Debreu Model of General Equilibrium" in New Palgrave.

8. Firms, Producers (2/5,2/7)
Starr, chap. 4
Optional: Debreu, Chapter 3
Quirk and Saposnik, 1.7, 2.1, 2.3
Arrow-Hahn, Chapter 3

9. Households, Consumers (2/10,2/12, 2/14)
Starr, chaps. 5, 6
Optional: Debreu, Chapter 4
Cornwall, Section 1.4
Quirk and Saposnik, 1.5, 1.6
Arrow-Hahn, 4.1-4.3
Varian, 7.1, 7.2
[Monday, February 17 is the President's Day holiday]

10. Brouwer Fixed Point Theorem (2/19)
Starr, 2.7 "Brouwer Fixed Point Theorem"
Optional: Debreu, Section 1.10
Nikaido, "Fixed Point Theorems" in New Palgrave: General Equilibrium.

11. Equilibrium (2/21, 2/24)
Starr, chap. 7
Optional: Debreu, Chapter 5
Cornwall, Section 1.6
Quirk and Saposnik, 1.7, 2.1, 2.3
Arrow-Hahn, Chapter 5
Debreu, "Existence of General Equilibrium," New Palgrave: General Equilibrium
McKenzie, "General Equilibrium," New Palgrave: General Equilibrium
[Midterm Examination, Wednesday, February 26, Take-home portion on the web, due Friday, February 28]

Welfare Economics
12. Separation Theorems (2/28)
Starr, 2.8 "Separation Theorems"
Optional: Debreu, Section 1.9.v - 1.9.x
Cornwall, Section 8.1.4
Varian, 26.11

13. Fundamental Theorems of Welfare Economics (3/3, 3/5, 3/7)
Starr, chap. 12
Optional: Debreu, Chapter 6
Cornwall, Sections 4.1, 4.2, 4.3, 4.5
Quirk and Saposnik, 4.4, 4.5
Varian, 17.6, 17.7.

14. Problems in Welfare Economics: Fairness, Public Goods, External Effects (3/10)
Readings TBA

Extending the General Equilibrium Model
15. Futures Markets, Constant Returns and Scale Economies in Production (3/12, 3/14)
Starr, 15.1 "Introduction", 15.2 "Time: Futures Markets"
Starr, 16.7 "Kakutani Fixed-Point Theorem"
Additional notes TBA
[Take Home Final Examination on the web, Friday, March 14. Due Friday, March 21]