UNIVERSITY OF CALIFORNIA, SAN DIEGO

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DEPARTMENT OF ECONOMICS

ECON 172B: OPERATIONS RESEARCH II
ECON 304, MONDAYS & WEDNESDAYS, 5:00PM-7:50PM
DISCUSSION SECTION: WEDNESDAYS, 11:00AM-12:50PM

SUMMER SESSION I 2012
SYLLABUS

Instructor: Steven B. Levkoff, Ph.D.
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Instructor Webpage: http://stevelevkoff.com
Course Webpage: <WebCt>
Office: Annex
Office Hours: Mondays & Wednesdays, 1:00pm-2:00pm, open door, and by appointment

Course Description: This course is an extension of the methods and theories developed in ECON172A. Emphasis will be placed on nonlinear programming and deterministic and stochastic dynamic programming. Other applications include queuing theory, search models, inventory theory, game theory, and methods in productivity analysis.

Readings:

Required:

- [1] Introduction to Operations Research, by Hillier and Lieberman, 9th Edition (older editions are probably OK).

Recommended:

- [2] Schaum's Outline for Operations Research, by Bronson and Naadimuthu – excellent resource with large bank of solved practice problems.

Recommended for the programming savvy:

- [3] Applied Computational Economics and Finance, by Miranda and Fackler – excellent book focusing more on computational/numerical algorithms for the more advanced applied mathematical programmer.
- [4] Introduction to Algorithms, by Corman et al. – high level text on algorithms with recursion analysis and asymptotics.

Prerequisites: In order to be enrolled in this course, you should have taken ECON 172A or MATH 171A. In either case, you should have already have taken both MATH 20C (Multivariate Calculus) and MATH 20F (Linear Algebra). The course will be taught assuming you have a concrete understanding of these prerequisite materials. Should you feel uncomfortable with these prerequisite materials, please consult the instructor as soon as possible.

Homework: While not a formal part of the course grade, problem sets will play a crucial role in developing your problem solving skills and should be taken very seriously. In the past, it has been the case that the students that put the most effort into the problem sets tend to do the best on the exams. Problem sets will be assigned regularly via WebCT. You are encouraged to work together to solve problem sets, but the solutions you submit should be solely your own. ***IT IS YOUR RESPONSIBILITY TO MAKE SURE YOU ARE ENROLLED IN THE ONLINE COURSE AND ROUTINELY CHECK THE COURSE WEBPAGE AND YOUR EMAIL FOR ANNOUNCEMENTS AND TO ACCESS DISTRIBUTED MATERIALS***.

Examinations: There will be a midterm and a final examination. The registrar has scheduled the final exam for Friday, 8/3/12, from 7:00pm-10:00pm. The midterm will be tentatively scheduled for sometime during the middle of the course. All exams are cumulative.

Grading:	Midterm Exam	40%
	Final Exam	60%
	Total	100%

Absences & Attendance: Any exam or quiz missed for a legitimate reason may be made up at the discretion of the instructor (this may include an oral evaluation as an alternative to taking a written exam). You will receive a zero on any exam or quiz missed without a legitimate reason. If the instructor feels that attendance is slipping, he reserves the right to take attendance and give pop quizzes to be used in the determination of the course grade.

Classroom Decorum & Email: To avoid distracting others in the classroom, please arrive on time and do not leave early unless given prior permission. When class is in session, please respect others in the room and refrain from sending or receiving phone calls, pages, or text messages. Please be sure audible signals are turned off before class begins. Please restrict the use of email to the minimally necessary volume and put your full name at the end of email messages and the course name and number in the subject heading.

Statement of Academic Integrity: Academic Integrity relates to being honest in the completion of your academic coursework. Trust is the central principle underlying academic integrity. [The University] needs to trust that ideas are your own. This means that all your work should come solely from your effort. For example, you need to complete your tests without external assistance. In addition, you may not present another

students work as your own. Moreover, you should not plagiarize, which is non credited use of someone else's words or ideas. Overall, then, academic integrity means that [The University's] students will display honest scholarship.

Tentative Schedule of Topics (Subject to Change):

Lecture 1: Introduction, Sample Applications, Graphical Illustration of Nonlinear Programming Problems, Types of Nonlinear Programming Problems
Readings: [1] Chapter 12.1-12.3
Lecture 2: Some Set Theory, Convex Sets, Concavity and Convexity of Functions, Optimization
Readings: [1] Chapter Appendix 2-3
Lecture 3: Unconstrained Optimization, Univariate Problem, Multivariate Problem
Readings: [1] Chapter 12.4-12.5
Lecture 4: Equality Constraints, Inequality Constraints, Kuhn-Tucker (KKT) Conditions
Readings: [1] Chapter 12.6
Lecture 5: Quadratic Programming, Separable Programming, Convex Programming, Nonconvex Programming
Readings: [1] Chapter 12.7-12.10
Lecture 6: Midterm Exam / Intro to Dynamic Programming
Lecture 7: Dynamic Programming: Examples and Problem Characteristics
Readings: [1] Chapter 10.1-10.2
Lecture 8: Dynamic Programming: Deterministic vs. Stochastic
Readings: [1] Chapter 10.3-10.4
Lecture 9: Select Topics (see below)
Readings: TBD
Lecture 10: Select Topics (see below)
Readings: TBD

Additional Topics (Time Permitting): Game Theory, Queuing Theory, Inventory Theory, Search Models, Productivity Analysis