IEOR 4405
Spring 2011
Production Scheduling

Professor Cliff Stein

Course Information

Instructor

- **Name**: Prof. Cliff Stein
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- **Office Hours**: M 4:00-5:00PM

Teaching Assistant

- **Name**: Shyam S. Chandramouli
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- **Office Hours**: W 3-5PM

Course

- **Meets**: T, Th 10:35-11:50
- **Room**: 415 CEPSR

Prerequisite

- IEOR 3608/4004 and IEOR 3600/4150

Text

- **Required**: *Scheduling: Theory, Algorithms and Systems*, Michael Pinedo, 3rd Edition

Electronic Mail

I will send various kinds of information by way of electronic mail addresses, and I will respond to questions from you sent by email. Please check your email frequently, and before working on an assignment, check whether I have sent out any changes.

I will assume that when I send email out to the class, you have read it.

Homework
Assignments

There will be weekly written assignments, generally available on the web on Thursday, and due at the beginning of class the following Thursday.

Late Homework

will not generally be accepted. Exceptions will be made only for exceptional extenuating circumstances (e.g. serious illness, family crisis). In all cases, exceptions must be discussed before the homework is due.

Homework Policy

The goal of the homework assignments is education, not evaluation. We must also be mindful of rules regarding academic honesty and plagiarism. To facilitate these goals, we will use the following policy.

- All work submitted for credit must be your own.
- You may discuss the homework problems with your classmates, the teaching assistant(s), and Professor Stein. For each problem, you must acknowledge the people with whom you discussed your work, and you must write up your own solutions. Any written sources used (apart from the text) must also be acknowledged; however, you may not consult any solutions from previous years’ assignments whether they are student or faculty generated.
- Please ask if you have any questions about this policy. Violations will be treated harshly.

Homework grading

Each homework problem will be graded on the following scale:

- 5 Outstanding. Especially elegant or clever solution or exceptionally clear justification and writeup.
- 4 Good. The answer is basically correct and clearly presented, but is not special.
- 3 OK. Got the basic idea, but either some details are wrong or the presentation is not clear.
- 2 Poor. Something of value, but below the standard that I expect.
- 1 You tried, but this is not passing work.

Note that this scale is not linear! A 4 does not correspond to 80% and a 3 does not correspond to 60%. Someone who gets a 4 on every homework problem and an A on each exam will receive an A in the course.

Term Project

The course will have a term project, due the last week of class. The project will be assigned around the middle of the term.

Exams

- There will be a midterm and a final exam. For the midterm, you will be allowed to bring one 8.5 by 11 inch piece of paper with notes into the exam. The final will be open book.

Grading

- Homeworks: 15%
- Term Project: 20%
- Midterm: 30%
- Final: 35%

Academic Dishonesty
I take academic integrity very seriously. I reserve the right to fail anyone for the entire semester based on any infractions. Ignorance of what constitutes dishonesty is not a defense. Please see me with any questions.

**Students with Disabilities**

I encourage students with disabilities, including invisible disabilities such as chronic diseases and learning disabilities, to discuss with me any appropriate accommodations that I might make on their behalf.

Switch to:

- [IEOR 4405 Home Page](http://www.columbia.edu/~cs2035/courses/ieor4405.S11/course-in...)

http://www.columbia.edu/~cs2035/courses/ieor4405.S11/course-in...
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<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
<th>Reading</th>
<th>HW assigned</th>
<th>HW due</th>
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<td>1/18, 1/20</td>
<td>Introduction, Administration, examples of scheduling problems, role of scheduling, classification of scheduling problems, complexity, Single machine problems</td>
<td>Chapters 1, 2, 3</td>
<td>HW 1</td>
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<td>2</td>
<td>1/25, 1/27</td>
<td>Single machine problems: simple dispatching rules</td>
<td>Chapter 3</td>
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<td>HW 1</td>
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<td>3</td>
<td>2/1, 2/3</td>
<td>Single machine problems: real-time scheduling, NP-hard scheduling problems, branch-and-bound</td>
<td>Chapter 3, Appendix D, Appendix E</td>
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<td>4</td>
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<td>Single machine problems: NP-hard scheduling problems, dynamic programming, approximations</td>
<td>Chapter 3, Appendix B</td>
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<td>HW 3</td>
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<td>6</td>
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<td>Parallel machine problems: precedence constraints, heterogeneous environments</td>
<td>Chapter 5</td>
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<td>7</td>
<td>3/1, 3/3</td>
<td>Parallel machine problems: average completion time</td>
<td>Chapter 5</td>
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<td>3/22, 3/24</td>
<td>Project Scheduling, Heuristics, Flow shop scheduling</td>
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<td>Flow Shop, Job shop scheduling</td>
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<td>4/5, 4/7</td>
<td>Job Shop Scheduling, Scheduling in Transportation</td>
<td>Chapter 14, 15, 16</td>
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<td>12</td>
<td>4/12, 4/14</td>
<td>Stochastic models</td>
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<td>HW 9</td>
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<td>4/19 (no class), 4/21</td>
<td>Multi-Armed Bandits, Nuclear Weapons Scheduling</td>
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<td>Student presentations</td>
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<td>Final</td>
<td>Tuesday, May 10, 9AM 415 CEPSR</td>
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