ISE 514: Advanced Production Planning & Scheduling

Syllabus date: 8/9/2013

Semester:	**Fall 2013**
Lecture:	**Monday, 6:40 to 9:20 PM, OHE 136**
Instructor:	**Dr. Jared Fortune, fortune@usc.edu**
Office Hours:	**Monday 5:30 to 6:30 PM (email beforehand if attending), GER 216C**
TA:	**Jae Kim, jaedkim@usc.edu**
TA Office Hours:	**TBD, Tutor Café (outdoor seats)**

Required Texts:

1. Fundamentals of Production Planning and Control, Stephen N. Chapman, Pearson Prentice Hall, 2006. **CHAP** in schedule.

2. Principles of Sequencing and Scheduling, Kenneth R. Baker and Dan Trietsch, John Wiley and Sons, 2009. **BAKER** in schedule.

Additional (NOT Required) References:

a. Silver, Pyke and Peterson, Inventory Management and Production Planning and Scheduling, 3rd Ed. John Wiley, 1998
b. R.W. Conway, W.L. Maxwell and L.W. miller, Theory of scheduling, Addison Wesley, 1967
c. S. E. Dreyfus and A.M. Law, The art and theory of dynamic programming, Academic press 1977
d. F.S. Hillier and G. J. Lieberman, Introduction to Operation Research, McGraw-Hill, 1990
e. George W. Plossl, Orlicky's Material Requirements Planning, Second Edition, McGraw-Hill, Inc. 1994
f. Michael Pinedo, Scheduling, Second Edition, Prentice Hall, 2002
g. T.E. Morton and D.W. Pentico, Heuristic Scheduling Systems, Wiley, 1993
h. K. R. Baker, Elements of sequencing and scheduling, 2002
i. D.R. Sule, Industrial Scheduling, PWS Publishing, 1997

Course objectives: This course is intended to give the industrial or systems engineer an understanding of the nature of a production (or service) system and the intricate dependencies among long, intermediate and short-range planning. The organizational, behavioral, technological, and economic context of these systems will be covered. Mathematical and applied methods and limitations of finite scheduling will also be covered.

Course Grading:

	Percentage
Homework	25%
Exam #1	25%
Exam #2	40%
Project	10%

Homework:

- DO NOT email submissions to DEN, the professor, or the TA, they will not be accepted.
- Assignments will be posted and submitted through the course website; to submit an assignment, click on the link for the specific assignment and follow the instructions to attach and submit your file.
- Students are strongly encouraged to verify each assignment was successfully submitted to the DEN system. You are responsible for ensuring your submissions are correctly submitted to and recorded by the DEN system. To confirm your assignment was received, go to "Tools" > "My Grades". All your submissions will be recorded here, if you do not see a link to a "score" or a "!" symbol, your submission was not successful. If you have any technical issues with the submission process, email the TA immediately.
- Assignments are due by the start of the following session; following a five-minute grace period, late submissions will not be accepted.
- Assignments should follow the file naming convention (last_name, first_name HWX.doc or .xls or .pdf). "X" should be replaced with the corresponding assignment number.
- All submissions should be in the Microsoft Word (.doc) or Excel (.xls) or PDF (.pdf) format—no ZIP files will be accepted. If you prefer to complete your homework by hand, you may scan as a PDF and submit.
- Submitted assignments should be professional in appearance, clearly presented, easy to read, and logically organized (out of sequence problems will not receive any credit)—neatness, spelling, and grammar count. All answers/conclusions should be clearly identifiable.
- It is expected that submitted homework is the work of the submitting student; do not provide your files to other students, do not copy answers.
- Collaboration on homework is allowed, but problems should be completed independently and each student is required to submit a separate homework (except for the final project). If students collaborate, each must state at the top of their submission who they collaborated with.
- Plagiarism detection software (TurnItIn.com) will be used on the final project.

Exams

Each exam will emphasize the course material covered since the previous exam; however, any material covered in the course to date may be on the exam. Each exam will be open book and open note, calculators and computers are allowed. If you are a DEN student, it is your responsibility to coordinate your exam time/location with the DEN office. Students are expected to apply what they should have learned up to that point in the course to analyze situations, recognize problems, and apply appropriate techniques.

Final Project

The final project will be a team project, selected by the team of three to four students. The purpose of the project is to familiarize students with the process of search, analysis, evaluation, and critique of pertinent and current literature on scheduling or related topics. A special project on actual problems may be substituted. A proposal and instructor consent will be required prior to project completion. The report is limited to six pages (excluding appendices) and must include: a cover page with name, title, and abstract; text containing conclusions, definition, development of the topic, and analysis; and references (books and articles) including title, author, publication, date, volume, and cited pages. The project report should be written such that with only minor formatting changes it could be used as a journal or conference paper submission.

Academic Integrity

As students of the School of Engineering and the Department of Industrial & Systems Engineering, you hold yourselves to the highest standards of conduct and the instructor expects that from you. The instructor also expects you to abide by the expectations of the University; to familiarize with those, please see the USC publication ***SCampus***, which can be found online at www.usc.edu/dept/publications/SCAMPUS. The provisions of this publication will be explicitly enforced—if you cheat and get caught, you will fail the course. If you have questions about what is allowed, please discuss it with the instructor or TA.

Students with Disabilities

Any Student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to the professor (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m. - 5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

Course Schedule

Session/Date	*Subjects*	*Reading*	*Homework*
1) August 26	**- Course introduction - Production planning**	**- CHAP: Ch. 1, 3-4**	**#1**
2) September 2	**Labor Day No lecture**		
3) September 9	**- Planning equations - MPS**	**- CHAP: Ch. 6-7 - BAKER: Intro, Ch. 1-2.2**	**#2**
4) September 16	**- MRP**		**#3**
5) September 23	**- Job shop model - Ops. scheduling - Performance measures - Algorithms I**	**- Bottlik Chapter**	**#4**
6) September 30	**- Algorithms II - Dynamic programming**	**- BAKER: Ch. 3.5, pgs 237-241**	**#5**
7) October 7	**- Exam #1 review - Project introduction**		**Proposal (due 10/28)**
8) October 14	**Exam #1 No lecture**		
9) October 21	**- Exam #1 solutions - Branch and bound**	**- BAKER: Ch. 9**	**#6**
10) October 28	**- Heuristics - Dispatching rules**		**#7**
11) November 4	**- Searches - Parallel machines - Early/tardy problems**	**- BAKER: Ch. 5**	**#8**
12) November 11	**- Stochastic problems - Batch processing**	**- BAKER: Ch. 8.4**	**#9**
13) November 18	**- Net present value - Project scheduling**	**- BAKER: Ch. 13**	**#10**
14) November 25	**- Sequence dependence - Exam #2 review**	**- BAKER: Ch. 11**	
15) December 2	**Exam #2 No lecture**		
16) December 16	**No final exam**		**Project due**