

University of Southern California
Daniel Epstein Department of Industrial and Systems Engineering
ISE 514: Advanced Production Planning and Scheduling (Summer 2014)

Updated: 4/6/2014

Instructor:	Jae D. Kim	Office Hours (OH):	TBA
E-mail:	Jaedkim@usc.edu	OH Location:	TBA
Lecture Time:	Wed 6 – 9:10 p.m.	Room:	OHE 100B
Course TA:	TBA		
Text:	Stephen N. Chapman, “The Fundamentals of Production Planning and Control,” Pearson Prentice Hall, 2006. (Indicated as “Chapman” in schedule)		

Course Objective:

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 dependences 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.

Tentative Course Schedule (“BB” indicates posting on DEN Blackboard):

Week	Topic	Reading/Assignments
1	Course introduction Production planning	Chapman 1, 3 Assignment #1
2	Material resource planning (MRP)	Chapman 4, 6, 7 Assignment #2
3	Operations scheduling Performance measures Generation of schedules	Week 3 Reading (BB) Assignment #3
4	Constructive algorithms (single machine) Dynamic programming	Week 4 Reading (BB) Assignment #4
5	Branch and Bound Midterm exam review	Week 5 Reading (BB) Assignment #5 (due Week 7)
6	Midterm exam (no lecture)	
7	Midterm solution review Johnson’s algorithm and its derivatives	Week 7 Reading (BB) Assignment #6
8	Heuristic approaches Searches Parallel machines	Week 8 Reading (BB) Assignment #7
9	Early/tardy problems Stochastic problems Batch processing	Week 9 Reading (BB) Assignment #8
10	Net present value Project scheduling	Assignment #9
11	Sequence dependence Final exam review	
12	Final exam (no lecture)	Project due

Course Requirements:

1. Exams (25% + 35%): There will be a midterm and a final exam. They will be worth 60% of your course grade. Contents from lectures, readings, assignments, and class discussions are covered on the exams. Each exam is closed-book and closed-notes with the exception of a single 8.5"x11" sheet of paper (both side) for notes, formulas, etc. Calculators (non-programmable) are allowed. There will be no make-up exams nor will exams be given early.

2. Assignments (30%): There will be nine assignments in the course. Each assignment may have a different point total.

- Collaboration is allowed but each student is required to solve the problems independently and must submit a separate assignment.
- It is expected that submitted assignment is the work of the submitting student; do not provide your files to other students and do not copy answers.
- DO NOT e-mail assignment submissions to DEN, instructor, or TA; they will not be accepted.
- Assignments will be posted and submitted through the course website (DEN Blackboard); 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 before submission in the DEN Blackboard system. You are responsible for ensuring your submissions are correctly submitted and recorded by the DEN Blackboard system. To confirm that your assignment was submitted correctly, go to "Tool" then "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, then e-mail the TA immediately.
- Assignments are due by the start of the following session (unless otherwise specified). LATE SUBMISSIONS WILL NOT BE ACCEPTED.
- All assignment submissions should be in Word (.doc or .docx), Excel (.xls or .xlsx), or PDF (.pdf) format. ZIP files will not be accepted. If you prefer to complete your assignment by hand, then you may scan the pages and submit as a single PDF file.
- Submitted assignments should be professional in appearance, clearly presented, easy to read, and logically organized – if the grader cannot easily find or comprehend the relevant parts of your assignments, then you will not receive credit. Please be neat and check spelling and grammar. All answers and conclusions should be clearly identifiable.

3. Class Participation (10%): This will be determined by each student's interaction/participation in the classroom and online. Typical examples are: class attendance (on-campus), questions, contribution to discussions, e-mails, office hours, postings on the discussion board, etc. Note that 10% of the course grade is participation so please participate.

Course Grading:

Midterm Exam	25%
Final Exam	35%
Assignments	30%
Class Participation	10%

Academic Integrity:

USC will not tolerate academic dishonesty. 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 strictly enforced – if you cheat and get caught, then 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 the Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure that the letter is delivered to the instructor as early in the semester as possible. DSP is located in STU 301 and can be contacted by calling (213) 740-0776.

Additional References (listed here for reference only, not required for the course):

- Kenneth R. Baker, “Principles of Sequencing and Scheduling”, Wiley and Sons, 2009
- Silver, Pyke and Peterson, Inventory Management and Production Planning and Scheduling, 3rd Ed. John Wiley, 1998
- R.W. Conway, W.L. Maxwell and L.W. miller, Theory of scheduling, Addison Wesley, 1967
- S. E. Dreyfus and A.M. Law, The art and theory of dynamic programming, Academic press 1977
- F.S. Hillier and G. J. Lieberman, Introduction to Operation Research, McGraw-Hill, 1990
- George W. Plossl, Orlicky’s Material Requirements Planning, Second Edition, McGraw-Hill, Inc. 1994
- Michael Pinedo, Scheduling, Second Edition, Prentice Hall, 2002
- T.E. Morton and D.W. Pentico, Heuristic Scheduling Systems, Wiley, 1993
- K. R. Baker, Elements of sequencing and scheduling, 2002
- D.R. Sule, Industrial Scheduling, PWS Publishing, 1997