

ISE 514

Advanced Production Planning and Scheduling

Units: 3

Summer 2021 Mon. & Wed. 2:30 – 5:40 pm(PST)

Location: Online

Instructor: Dr. Shalini Gupta

Office: GER 216 C

Office Hours: Tuesday from 1:00 – 2:00 pm(PST)

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Teaching Assistant: TBD

Office: TBD

Office Hours: TBD

Contact Info: TBD

Course Description

The major objective of this course is to have you understand the nature of a production or service system – the intricate dependencies among long, intermediate and short range planning. The context of these systems - organizational, behavioral and technological must also be understood. Finally, it is a thorough understanding of the objectives, mathematical and applied methods and limitations of finite scheduling.

Course Notes

D2L

Required Readings and Supplementary Materials

“Introduction to the Mathematics of Planning and Scheduling”, Geza P. Bottlik, Taylor and Francis, 2017, ISBN 978-1482259216.

References:

- 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 ISBN – 0-13-028138-7 T.E. Morton and D.W. Pentico, Heuristic Scheduling Systems, Wiley, 1993
- K. R. Baker, Elements of sequencing and scheduling, 2002 ISBN 0 – 9639746 – 1 – 0 D.R. Sule, Industrial Scheduling, PWS Publishing, 1997, ISBN – 0-534-95456-1
- “The fundamentals of production planning and control”, Stephen N. Chapman, Pearson Prentice Hall, 2006, ISBN 0-13-017615-X
- “Principles of Sequencing and Scheduling”, Kenneth R. Baker and Dan Trietsch, John Wiley and Sons, 2009, ISBN 978-0-470-39165-5
- Factory Physics, 3rd edition, Wallace J. Hopp and Mark L. Spearman

Description and Assessment of Assignments

All assigned sections of the texts, plus topics discussed in lecture by the instructor.

Exams: Each exam will cover the material presented up to and including the preceding homework assignment. Points will be assigned to each section of the exam. No re-takes will be allowed. No make-up exam will be given. The FINAL EXAM will cover material presented since the second midterm exam. Grading will be similar to the midterm exam. Any person caught cheating on an examination will be referred to judicial affairs.

Projects: The project is designed to exercise the skills which you develop over the course of the semester. The project will require you to collect data, model and perform analysis. Additional details will be provided during the course.

Homework: Problems sets will be assigned. Homework is not accepted late. If a paper shows an acceptable answer to each assigned exercise, the grade for the assignment is 10 points. An answer to a quantitative exercise is acceptable if it uses the correct method and complete step by step procedure.

Surprise Quizzes: Surprise Quizzes will be given. The score will be used to determine the semester points for the quizzes. Any person caught cheating on an examination or quiz will receive a zero score for that examination or quiz.

Grading Breakdown

Exams (1)	30 %
Final Exam	30 %
Project	15%
Project Presentation	10 %
Homework	5 %
Surprise Quizzes	5 %
Attendance	5 %
Total	100%

Grading Scale (Example)

Course final grades will be determined using the following scale

A	95-100
A-	90-94
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
D-	60-62
F	59 and below

Grading Timeline

7 – 8 Days

Academic Integrity

Any form of cheating, plagiarism, personation, falsification of a document as well as any other form of dishonest behavior related to the obtention of academic gain or the avoidance of evaluative exercises committed by a student is an academic offence under the Academic Code of Conduct and may lead to severe penalties up to and including suspension and expulsion. As examples only, you are not permitted to:

- Falsify data or research results
- Sharing assignments
- Benefit from others' work
- Unfair advantage
- External assistance
- Possession of solutions
- Copy from anywhere without indicating where it came from
- Let another student copy your work and then submit it as his/her own
- Hand in the same assignment in more than one class
- Have unauthorized material/ collaboration or devices in an exam.
- Copy from someone's else exam/assignments
- Communicate with another student during an exam
- Add or remove pages from an examination booklet or take the booklet out of an exam room
- Acquire exam or assignment answers or questions
- Write an exam for someone else or have someone write an exam for you
- Submit false documents such as medical notes or student records

You are subject to the Academic Code of Conduct.

Student's Responsibilities

- Students are expected to attend every class. Some material may only be covered in class and not made available on the course website. Students are expected to read the assigned material and to actively participate in class discussions.
- Students are expected to be respectful of other people's opinions and to express their own views in a calm and reasonable way. Disruptive behavior will not be tolerated.
- Students are expected to be familiar with the Academic Code of Conduct.

To quote from a USC guidebook: "Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior, and may be subject to disciplinary action. Such behavior inhibits other students' ability to learn and an instructor's ability to teach. A student responsible for disruptive behavior may be required to leave class pending discussion and resolution of the problem, and may be reported to the Office of Student Judicial Affairs for disciplinary action."

Course Schedule: A Weekly Breakdown

<u>Date</u>	<u>Topic</u>	<u>Text Chapters</u>
19 May	EOQ Models	Ch. 3 & Suppl.
24 May	MRP	Ch. 5 & Suppl.
26 May	MRP	Ch. 5 & Suppl.
31 May	Memorial Day	
2 June	Job shop scheduling rules & Gantt chart	Suppl.
2 June	Algorithms for one machine problems	Ch. 8 & Suppl.
7 June	Algorithms for one machine problems	Ch. 8 & Suppl.
7 June	Algorithms for two machine problems	Ch. 9 & Suppl.
7 June	Algorithms for two machine problems	Ch. 9 & Suppl.
9 June	Implicit Enumerations & Dynamic Program.	Ch. 10 & Suppl.
9 June	Implicit Enumerations & Dynamic Program.	Ch. 10 & Suppl.
14 June	Examination – 1	
16 June	Branch and Bound	Ch. 10 & Suppl.
16 June	Branch and Bound	Ch. 10 & Suppl.
16 June	Project Scheduling	Suppl. Material
16 June	Project Scheduling	Suppl. Material
21 June	Heuristics Approaches	Ch. 12 & Suppl.
21 June	Flow Shop Scheduling	Ch. 12 & Suppl.
21 June	Parallel Machine Scheduling	Ch. 13 & Suppl.
21 June	Relaxation of Assumptions	Ch. 14 & Suppl.
23 June	Project Presentations	
28 June	Final Examination	

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, “Behavior Violating University Standards” <https://policy.usc.edu/scampus-part-b/>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Support Systems:

Student Counseling Services (SCS) - (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. <https://engemannshc.usc.edu/counseling/>

National Suicide Prevention Lifeline - 1-800-273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. <http://www.suicidepreventionlifeline.org>

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 - 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. <https://engemannshc.usc.edu/rsvp/>

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: <http://sarc.usc.edu/>

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. <https://equity.usc.edu/>

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. <https://studentaffairs.usc.edu/bias-assessment-response-support/>

The Office of Disability Services and Programs

Provides certification for students with disabilities and helps arrange relevant accommodations. <http://dsp.usc.edu>

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic.

<https://studentaffairs.usc.edu/ssa/>

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. <https://diversity.usc.edu/>

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible,

<http://emergency.usc.edu>

USC Department of Public Safety – 213-740-4321 (UPC) and 323-442-1000 (HSC) for 24-hour emergency assistance or to report a crime.

Provides overall safety to USC community. <http://dps.usc.edu>