

IE #### – Production Scheduling and Sequencing

Fall 2019

Course Syllabus

Instructor

Dr. Surya D. Liman (email: surya.liman@scupi.cn)

Office: 4-220

Office Hours: Tuesdays & Wednesdays – 3:00 PM to 5:00 PM

Teaching Assistants

Ms. Avril Jia (email: 2015141523009@stu.scu.edu.cn)

Office:

Office Hours:

Lecture

Tuesdays, 9:10 AM - 11:55 AM; Room: Zone 4 - 201

Course Description

Production scheduling is becoming increasingly important in today's manufacturing industries placing strong emphasis on product deliverability. In this course, we will study deterministic sequencing of single machine, parallel machines, flow shops, and job shops; Theory of Complexity; and optimization and heuristic algorithms for combinatorial sequence generations. 3 credit hours.

Course Pre-Requisites

Calculus I and upper level classification, or instructor's permission.

Course Objectives

1. Understand the importance of production scheduling in daily operations.
2. Understand the various measures of performance of scheduling criteria.
3. Learn to determine appropriate scheduling criteria and schedules under various production processes (single and multiple machines).
4. Understand the complexity of real scheduling applications.
5. Develop an appreciation of the importance of life-long learning.

Applicable ABET Outcomes

1. Ability to apply knowledge of mathematics, science, and engineering.
2. Ability to identify, formulate, and solve the problems of industrial engineering.
3. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
4. Knowledge of the roles of industrial engineering in contemporary issues.
5. Ability to use techniques, skills, and economic theories in evaluating usefulness of projects necessary for engineering practice.

Textbook

Instructor's notes and presentations.

Assessments

Homework assignments, projects, and exam questions related specifically to the objectives above.

Attendance:	10 %
Homework:	20 %
Mid-Semester Examination:	30 %
Final Examination:	40 %
	100 %

Score	Letter Grade
90.00 – 100.00	A
85.00 – 89.99	A–
80.00 – 84.99	B+
76.00 – 79.99	B
73.00 – 75.99	B–
70.00 – 72.99	C+
66.00 – 69.99	C
63.00 – 65.99	C–
61.00 – 62.99	D+
60.00 – 60.99	D
0.00 – 59.99	F

Attendance

There are 17 165-minute lecture weeks in the semester. Attendance will be taken for each lecture week. Each student is allowed **two absences**. Each absence, after the second absence, will result in a **1% deduction** from the attendance grade. After the **twelfth** absence, the student will **not** be allowed to take the final exam. Late arrivals of more than 15 minutes will be considered as absences.

Homework and Other Assignments

Homework problems and other assignments will be assigned periodically and are due as stated. Late submission **will not** be accepted. Submissions must be done on **A4 papers** and **stapled** together at the top left-hand corner. Students' names and ID numbers must be listed on the first page at the top right-hand corner.

Exams

There will two exams (one Mid-Semester and one Final), all are CLOSED BOOK, CLOSED NOTES, CLOSED COMPUTER. Students can bring **one** A4 page note and it must be **hand-written** on **one side** of the paper only. It cannot be a photocopy. If you must miss an exam, you should make alternative arrangements with the instructor before the exam is given. If you miss an exam without prior notification, you will receive a score of “zero” for that exam except under extenuating circumstances.

Make-Up Exams

Students who have not taken either the mid-semester exam or the final exam are not eligible to take the make-up exam. Make-up exams can only be taken by students who have attained between 50.00 % and 59.99 % (out of 100 %) of the total score. Only 75 % of the make-up exam grade can be used to **replace** the final exam grade. Students taking make-up exams can only attain at most a “**D**” grade.

Avoiding Plagiarism

1. Unacknowledged direct copying from the work of another person, or the close paraphrasing of somebody else's work, is called plagiarism and is a serious offence, equated with cheating in examinations. This applies to copying both from other students' work and from published sources such as books, reports or journal articles.
2. Paraphrasing, when the original statement is still identifiable and has no acknowledgement, is plagiarism. A close paraphrase of another person's work must have an acknowledgement to the source. It is not acceptable for you to put together unacknowledged passages from the same or from different sources linking these together with a few words or sentences of your own and changing a few words from the original text: this is regarded as over-dependence on other sources, which is a form of plagiarism.

Tentative Course Schedule

Week	Day	Dates	Topics
1	Tue	Sep 3	Course Introduction and Syllabus Notations, Performance Measures, Gantt Charts
2	Tue	Sep 10	Single Machine - Flow Time Based
3	Tue	Sep 17	Single Machine - Due Date Based
4	Tue	Sep 24	Single Machine - Nonregular Measures
5	Tue	Oct 1	National Week Holiday
6	Tue	Oct 8	Parallel Machines – Makespan Parallel Machines - Flow Time Based
7	Tue	Oct 15	Parallel Machines - Nonregular Measures
8	Tue	Oct 22	Mid-Semester Exam Review Mid-Semester Exam (TBD)
9	Tue	Oct 29	Flow Shop
10	Tue	Nov 5	Job Shop
11	Tue	Nov 12	NP-Completeness
12	Tue	Nov 19	NP-Completeness (cont'd)
13	Tue	Nov 26	Dynamic Programming
14	Tue	Dec 3	Branch and Bound
15	Tue	Dec 10	Worst Case Analysis
16	Tue	Dec 17	Recent Issues (Simulated Annealing, Tabu Search, Genetic Algorithm)
17	Tue	Dec 24	Final Exam Review
18		Dec 30	Final Exam Week
19		Jan 6	Final Exam Week