

ISE 689 Manufacturing Scheduling

Fall 2004

Credit Hours: 3, **Prereq:** None, **Call Number:** 04056

Description:

Defining scheduling function, performance measures and terminology. Topics include *scheduling algorithms* for single machine, parallel machine, flow shop, job shop, cellular manufacturing systems and also *solution methodologies* such as heuristic procedures, constructive algorithms, branch and bound approaches, dynamic programming, linear programming and genetic algorithms. Focusing on manufacturing scheduling in practice with relations to capacity, multiple resource requirements and material availability.

Sessions:

TTh 10:40am-12:00noon, Stocker Center 190.

Instructor:

Dr. Gürsel A. Süer, Room 274, Stocker Center
Phone: (740) 593-1542
E-mail: suer@bobcat.ent.ohiou.edu

Office Hours:

TTh 14:00-15:30pm or by appointment.

Textbook:

Michael Pinedo, Scheduling; Theory, Algorithms and Systems, Second Edition, Prentice Hall, 2002.

Reference Books:

Kenneth Baker, Introduction to Scheduling and Sequencing, John Wiley, 1974.
Simon French, Sequencing and Scheduling, John Wiley, 1982.

Course Objective:

To prepare students to recognize different shop configurations, manufacturing scheduling problems, and performance measures. To help them identify basic algorithms and procedures to use in different shop configurations. To provide an understanding of alternative solution methodologies available in solving manufacturing scheduling problems. To make them aware of all significant factors in manufacturing scheduling.

After the course, students will be able to apply basic algorithms and methods for solving scheduling problems and hopefully they will be able to modify the existing procedures to adapt to their environment as needed.

Computer Usage:

Student may use spreadsheet (Excel, 1-2-3 Lotus, etc.) to solve homework problems. Software is available in Ohio University and ENT computer labs (Stocker rooms 127, 264, 267, 305, 308, 414). If you don't have an account, please see the lab administrator in room 264A. Students may also choose programming as part of their project work.

Homeworks:

Homework problems will be assigned every week and they will be due the following Tuesday.

Project:

Each student will work on a project. Students will select a topic suggested by the instructor, or propose a project themselves or work on a real problem in an industrial setting (this will require integration/adaptation skills and creativity since many algorithms/models presented in the literature cannot be directly adapted to industrial setting). Group projects will be allowed if the project involves the development of algorithms and computer programs for a complex problem.

Topic Selection: September 21 (Follow the given format)

Progress Report: October 12 (Follow the given format)

Final Report: November 16 (Follow the given format)

Project Presentation: November 16

Exams:

Two midterm exams will be given. Exams will be announced at least one week in advance. Students must take the exams on the date and the time scheduled. Exceptions can only be made if the student submits a written request before the exam with valid reasons and if it is approved by the instructor. A bonus question can also be asked in some exams. Final exam is comprehensive.

Presentation:

Each student is required to make a presentation on a recent journal article.

Paper Selection: October 5

Paper Report: October 19 (I'll give feedback in a few days)

Paper Presentation: October 26-28

Readings: You are recommended to read the material to be covered before the class.

Grading:

Midterm I	20%	<u><i>(Tentatively scheduled for Oct 7, Tuesday)</i></u>
Midterm II	20%	<u><i>(Tentatively scheduled for Nov. 9, Tuesday)</i></u>
Final Exam	25%	
Homework	15%	
Article Presentation	5%	
Project	15%	

Attendance Policy:

Attendance to all sessions is strongly recommended. Students are responsible for all of the material covered in the class.

Academic Misconduct:

No collaboration of any kind is permitted during any of the examinations, homework, or quizzes. All suspected cases will be treated according to the University Policy as stated in the Catalog and the Student Handbook.

Tentative Schedule:

1. September 7-9 Introduction (Chapters 1, 2 & Notes)
2. September 14-16 Single Machine Scheduling (Chapter 3 and Notes)
3. September 21-23 Single Machine Scheduling (Chapter 4 and Notes)
Project Topic Selection (21)
4. **September 28-30** Parallel Machine Scheduling (Chapter 5 and Notes)
5. October 5-7 Parallel Machine Scheduling (Chapter 5 and Notes), ***EXAM I***
Paper Selection (5)
6. October 12-14 Flow Shop Scheduling (Chapter 6 and Notes)
Project Progress Report (12)
7. October 19-21 Scheduling in Cellular Manufacturing (Notes)
Paper Report (19)
8. October 26-28 Job Shop Scheduling (Chapter 7 and Notes)
Paper Presentation (26-28)
9. **November 2-4** Open Shop Scheduling (Chapter 8)
Multiple Resource Constrained Scheduling (NOTES)
10. November 9 ***EXAM II***
11. November 16 Flexible Manufacturing Systems (NOTES)
Final Report
Presentation

Final Exam is scheduled on Thursday November 18, 8:00 am in the same classroom.