

University of Puerto Rico. Mayagüez Campus College of Engineering. Industrial Engineering Department



Course Syllabus

General Information

Course Number:InIn 5575Course Title:Sequencing and Scheduling of ResourcesCredit-Hours:Three

Course Description

Conceptual and practical aspects involved in the scheduling of resources. Examples and applications drawn from areas such as manpower, computer, and transportation.

Prerequisite:

ININ 4021 (Deterministic Models in Operations Research) or ININ 4150 (Introduction to

Models in Operations Research) or Authorization of the Director of the Department

Textbook

Baker, K.R., Trietsch, D. 2009, Principles of Sequencing and Scheduling, John Wiley & Sons.

References

- Baker, K.R., 1974, Introduction to Sequencing and Scheduling, John Wiley & Sons
- French, S., 1982, Sequencing and Scheduling, John Wiley & Sons, Inc.
- Morton, T. & Pentico, D., 1993, Heuristic scheduling systems: with Applications to Production Systems and Project Management, John Wiley & Sons, Inc.
- Neumann, K., Schwindt, C., and Zimmermann, J., 2002, Project Scheduling with Time Windows and Scarce Resources, Springer.

Purpose

This is an advanced undergraduate and graduate course and may serve as a technical elective for undergraduate students or as part of a graduate student's degree requirement.

Course Goals

To familiarize the students with the classification of scheduling problems, available algorithms and techniques for solving scheduling problems in different environments. The student is required to do a semester project where he/she is expected either to apply his/her knowledge to a real life problem, investigate in a relatively unknown area or be creative and define/solve a new problem within the duration of the semester. Computer programs are also required to develop heuristic methods and to set up equations for Linear and Integer Programming Solvers.

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Requirements

All students are expected to:

Do all assigned readings and related homework.

Be able to program algorithms in a high level language like C, C++, Fortran, or Visual Basic Maintain an e-mail address and check it daily for course related announcements. Interact with the IE-learning Platform as this is an IE-Learning managed course.

Laboratory Work:

Computer workshops are considered a major part of the class, and all students are expected to participate. Radios, tape recorders, and other audio or video equipment are not permitted in the computer lab or classroom at any time.

Smoking is not permitted in any area other than those areas designated for smoking.

Department and Campus Policies

- **Class attendance:** Class attendance is compulsory. The University of Puerto Rico, Mayagüez Campus, reserves the right to deal at any time with individual cases of non-attendance. Professors are expected to record the absences of their students. Frequent absences affect the final grade, and may even result in total loss of credits. Arranging to make up work missed because of legitimate class absence is the responsibility of the student. (Bulletin of Information Undergraduate Studies)
- Absence from examinations: Students are required to attend all examinations. If a student is absent from an examination for a justifiable reason acceptable to the professor, he or she will be given a special examination. Otherwise, he or she will receive a grade of zero of "F" in the examination missed. (Bulletin of Information Undergraduate Studies)
- **Final examinations**: Final written examinations must be given in all courses unless, in the judgment of the Dean, the nature of the subject makes it impracticable. Final examinations scheduled by arrangements must be given during the examination period prescribed in the Academic Calendar, including Saturdays. (see Bulletin of Information Undergraduate Studies).
- **Partial withdrawals**: A student may withdraw from individual courses at any time during the term, but before the deadline established in the University Academic Calendar. (see Bulletin of Information Undergraduate Studies).
- **Complete withdrawals**: A student may completely withdraw from the University of Puerto Rico, Mayagüez Campus, at any time up to the last day of classes. (see Bulletin of Information Undergraduate Studies).
- **Disabilities**: All the reasonable accommodations according to the Americans with Disability Act (ADA) Law will be coordinated with the Dean of Students and in accordance with the particular needs of the student.
- **Ethics**: Any academic fraud is subject to the disciplinary sanctions described in article 14 and 16 of the revised General Student Bylaws of the University of Puerto Rico contained in Certification 018-1997-98 of the Board of Trustees. The professor will follow the norms established in articles 1-5 of the Bylaws.

Course Syllabus		
Lecture	Торіс	Reading
1	Introduction	Baker & Trietsch Ch. 1 Baker, Ch. 1, Morton Ch. 1, Ch. 2, & Ch. 3
	The Scheduling Function Scheduling Theory Performance Measures	Baker, Ch. 1 Baker, Ch. 1, French Ch. 1 Baker, Ch. 2, French Ch. 1
2 - 5	Relations between performance measures The Single Machine Problem	Baker, Ch. 2, French Ch. 2 Baker & Trietsch Ch. 2 Baker Ch. 2 & Ch. 3, French Ch. 3 Morton Ch. 4
6 - 7	Extensions of Single Machine Problem	Baker & Trietsch Ch. 2, Ch. 3 & Ch.8 Baker Ch. 4, French Ch. 4 Morton Ch. 7 & Ch. 8
8 - 9	Parallel Machine Models	Baker & Trietsch Ch. 9 Baker Ch. 5 Morton Ch. 11
10 - 11	Flow Shop Scheduling	Baker & Trietsch Ch. 10 Baker Ch. 6, French Ch. 5 Morton Ch. 13 & Ch. 14
12 - 13	Job Shop Scheduling	Baker & Trietsch Ch. 14 Baker Ch. 7, French Ch. 5 Morton Ch. 15 & Ch. 16
13	Dynamic Programming Approach	Baker & Trietsch Ch. 15 Baker Ch. 8, French Ch. 6 Morton Ch. 7
15	Project Scheduling	Baker & Trietsch Ch. 17 Baker Ch. 9 & Ch. 10 Morton Ch. 17 & Ch. 18 Neumann, et. al. Ch. 2

Coordinator: Dr. Sonia M. Bartolomei Suárez smbs/rev. enero 2016