

Course guide 220671 - 220671 - Combinatorial Optimisation Methods

 Last modified: 19/04/2023

 Unit in charge:
 Terrassa School of Industrial, Aerospace and Audiovisual Engineering

 Teaching unit:
 715 - EIO - Department of Statistics and Operations Research.

 Degree:
 MASTER'S DEGREE IN MANAGEMENT ENGINEERING (Syllabus 2012). (Optional subject).

 Academic year: 2023
 ECTS Credits: 3.0
 Languages: English

 LECTURER
 MARIA ALBAREDA SAMBOLA

Others: MARIA ALBAREDA SAMBOLA

TEACHING METHODOLOGY

The course is divided into two parts: Sessions where contents will be exposed and discussed.

Autonomous work that will include self-study, guided readings, and exercises and activities.

During the presential sessions, teachers will introduce the theoretical basis of the subject, concepts, methods and results will be illustrated with suitable examples to facilitate understanding. There will be also discussions on the guided readings that the students will have done independently.

Students, will work independently, on the material provided by teachers in order to prepare the work sessions, sudying and doing problems to assimilate and fix concepts. The teachers will provide activity monitoring (ATENEA).

LEARNING OBJECTIVES OF THE SUBJECT

The aim os this course is giving an overview of the methods used commonly in combinatorial optimization applications using as examples facility location problems and vehicle routing problems.

STUDY LOAD

Туре	Hours	Percentage
Hours large group	8,0	10.67
Self study	48,0	64.00
Hours medium group	3,0	4.00
Guided activities	16,0	21.33

Total learning time: 75 h



CONTENTS

- Combinatorial Optimization

Description: Introduction Heuristic Methods Bounding procedures.

Specific objectives:

The aim is to give a general overview of the usual methodologies in combinatorial optimization, using as reference applications facility location and vehicle routing problems.

Related activities: Class expositions Paper discussions Project

Full-or-part-time: 75h Theory classes: 8h Practical classes: 3h Guided activities: 16h Self study : 48h

GRADING SYSTEM

The rating of the course will be based on two different activities:

- A written exam, with a weight of 50%

- Written reports to the readings, with a weight of 50%

The day scheduled by the School within the final exams period, there will be an additional exam that will be used to overcome unsatisfactory results in the written exam, and also to evaluate the students who, for any reason, could not attend to the written exam. The grade of this exam, between 0 and 10, will replace the grade obtained in the written exam as long as it is higher.

BIBLIOGRAPHY

Basic:

- Ahuja, R. K.; Magnanti, T. L.; Orlin, J. B. Network flows: theory, algorithms, and applications. Harlow: Pearson, 2014. ISBN 9781292042701.

- Nemhauser, G. L.; Wolsey, L. A. Integer and combinatorial optimization. New York: John Wiley & Sons, cop. 1999. ISBN 047182819x.