

COURSE DETAIL

RESOURCES OPTIMIZATION

Country

Italy

Host Institution

University of Bologna

Program(s)

University of Bologna

UCEAP Course Level

Upper Division

UCEAP Subject Area(s)

Engineering

UCEAP Course Number

178

UCEAP Course Suffix**UCEAP Official Title**

RESOURCES OPTIMIZATION

UCEAP Transcript Title

RESOURCES OPTMZTN

UCEAP Quarter Units

6.00

UCEAP Semester Units

4.00

Course Description

This course is part of the Laurea Magistrale program. The course is intended for advanced level students only. Enrollment is by permission of the instructor. The objective of the course is to present the most effective techniques for the solution of complex decisional problems arising in the optimal planning and management of large-scale systems concerning both the public and the private sectors. Mathematical models and heuristic algorithms for the practical solution of the corresponding optimization problems are described. Particular attention is given to the algorithmic and implementation aspects. Applications of the proposed techniques to real-world problems are presented and analyzed. The course discusses topics including: basic integer programming optimization: integer programming models, formulations, relaxations; basic heuristic approaches: constructive algorithms and local search procedures, examples for KP01 and TSP; worst-case performance analysis; metaheuristics: Multistart, Tabu Search, Simulated Annealing, Genetic Algorithms, Iterated Local Search, Variable Neighborhood Search, Large Neighborhood Search, Ruin and Recreate, and Ant Systems; optimization on graphs: shortest path, minimum spanning tree, and maximum flow; heuristic and metaheuristic algorithms for difficult combinatorial optimization problems; and real-world applications. Prerequisites for this course are: basic knowledge of Operations Research, as well as the implementation of computer codes and complexity theory.

Language(s) of Instruction

English

Host Institution Course Number

35192

Host Institution Course Title

RESOURCES OPTIMIZATION

Host Institution Campus

BOLOGNA

Host Institution Faculty

Host Institution Degree

LM in ENGINEERING MANAGEMENT

Host Institution Department

Industrial Engineering

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