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 M

Host Institution Course Details
https://www.unibo.it/en/teaching/course-unit-catalogue/course-unit/2022/376556

Host Institution Campus BOLOGNA
Host Institution Faculty
Host Institution Degree LM in ENGINEERING MANAGEMENT
Host Institution Department Industrial Engineering
Course Last Reviewed 2022-2023

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