Università degli Studi di L'Aquila - Dipartimento di Ingegneria e Scienze dell'Informazione e Matematica

Course catalogue

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Programme of Module "Process and Operations Scheduling"

- Code: DT0219
- Type of course unit: Compulsory (Master Degree in Mathematical Engineering curriculum Comune)
- Level of course unit: Postgraduate Degrees
- Semester: 1

Number of ects credits: (Master Degree in Mathematical Engineering) 6 (workload 150 hours)

Teachers: Stefano Smriglio (Stefano.Smriglio@univaq.it)

1	**Course objectives**	Train the students in recognizing machine scheduling problems, classify them in terms of computational complexity and solve them by heuristic, approximation or exact algorithms.
2	**Course content and learning outcomes (dublin descriptors)**	Topics of the module include: • Elements of a (deterministic) scheduling problem, examples of practical applications • Classification of scheduling problems • Integer Linear Programming formulations • Single machine scheduling: computational complexity, heuristic and exact algoritms • Parallel machine scheduling: exact, heuristic and approximation algorithms • Relationships with basic Combinatorial Optimization problems • Optimization problems in Project Scheduling • Job Shop scheduling: formulations, heuristic and exact algorithms On successful completion of this module, the student should : • Acquire knowledge of Machine Scheduling problems, their classification in terms of computational complexity and algorithmic techniques developed for their solution. Acquire the fundamentals of optimization methods for project management. • Acquire the ability to recognize Machine Scheduling problems in different application contexts, such as computer science, industrial engineering and management, and to identify effective solution paradigms. • Acquire autonomy in modeling and algorithmic choices for complex problems related to scheduling and project management. • Being able to hold a conversation and to read texts on topics related to the modeling of scheduling problems and the evaluation of algorithms for their solution • Acquire skills upgrading flexible knowledge and skills in the field of scheduling problems that arise in various areas, such as computer science, industrial engineering and management
3	**Course prerequisites**	basic elements of computational complexity, linear programming and network flows
4	**Teaching methodsand language**	standard lessons and exercise sessions **Language**: English **Reference textbooks** • Michael Pinedo, ***Scheduling Theory, Algorithms, and Systems***. Prentice Hall.
5	**Assessment methods**	a paper test concerning with theoretical or computational exercises; an oral test, accessible only with a sufficient grade at the paper test, about general machine scheduling theoretical issues