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

Course catalogue

Page compiled on 27/10/2020

Programme of Module "Distributed Systems"

- Code: DT0168
- Type of course unit: Compulsory (Master Degree in Computer Science curriculum NEDAS), Elective (Master Degree in Computer Science curriculum SEAS), Elective (Master Degree in Computer Science curriculum UBIDIS)
- Level of course unit: Postgraduate Degrees
- Semester: 1

Number of ects credits: (Master Degree in Computer Science) 6 (workload 150 hours)

Teachers: Guido Proietti (Guido.Proietti@univaq.it)

1	**Course objectives**	The course provides the foundations for designing and analyzing (distributed) algorithms for reliable, faulty, concurrent, and adversarial distributed systems.
2	**Course content and learning outcomes (dublin descriptors)**	Topics of the module include: • Algorithms for COOPERATIVE Distributed Systems (DS) 1. Leader Election 2. Minimum Spanning Tree 3. Maximal Independent Set • Algorithms for UNRELIABLE DS: network monitoring, consensus problem • Algorithms for CONCURRENT DS: Mutual exclusion On successful completion of this module, the student should : • By the end of this module students will be able to: 1) understand the difference between a centralized and a distributed algorithm; 2) analyze the resources (space and time) needed by a distributed algorithm; 3) known efficient algorithms for basic computational distributed problems (leader election, consensus, etc.); 4) understand the difference between a canonical and a strategic distributed system. • The aim is to make the student capable of abstracting models and formal algorithmic problems from real distibuted computational problems, and designing efficient algorithmic solutions. • Through the presentation and the comparison of different solutions to a given probelm, students will be guided to learn and to identify independently their most efficient solution. • The course will encourage the development of the following skills of the student: capability of formally presenting and modelling concrete problems, focusing on their main features and discarding the inessential ones. • The course aims to develop in graduate students competencies and abilities necessary in their future studies, especially with respect to doctoral studies on algorithmic topics.
3	**Course prerequisites**	Knowledge of basic courses of discrete mathematcs and algorithms.
4	**Teaching methodsand language**	Mainly lectures, with only few exercises. **Language**: English **Reference textbooks** • P. Ferragina e F. Luccio, ***Crittografia***. Bollati Boringhieri. • H. Attiya e J. Welch, ***Distributed Computing***. Wiley.
5	**Assessment methods**	Mid-term written examination, followed by a final oral examination, which, for those who performed successfully in the mid-term examination, will be restricted to the second part of the course.