



Programme of Module "Social Networks"

- Code: DT0175
- Type of course unit: Compulsory (Master Degree in Computer Science curriculum NEDAS)
- Level of course unit: Postgraduate Degrees
- Semester: 1

Number of ects credits: (Master Degree in Computer Science) 3 (workload 75 hours)

Teachers: Gianpiero Monaco (gianpiero.monaco@univaq.it)

1	Course objectives	The course investigates how the social, technological, and natural worlds are connected, and how the study of graphs and networks sheds light on these connections. Particular topics include: how opinions, fads, and political movements spread through society, the theory behind strong and weak ties in relationships, and the small-world phenomenon. Students will learn to use models and theory to explain and exploit the structure of information and social networks.
2	Course content and learning outcomes (dublin descriptors)	<p>Topics of the module include:</p> <ul style="list-style-type: none"> • The (tentative) schedule of the course is the following (with respect to the chapters of the textbook): Ch. 1 of the textbook: overview; Ch. 2 of the textbook: Graphs; Ch. 3 of the textbook: Strong and Weak Ties; Ch. 4 of the textbook: Networks in their Surrounding Contexts; Ch. 5 of the textbook: Positive and Negative Relationships; Part of Ch. 12 of the textbook: Bargaining and Power in Networks; Ch. 18 of the textbook: Power Laws and Rich-Get-Richer Phenomena; Ch. 19 of the textbook: Cascading Behavior in Networks; Ch. 20 of the textbook: The Small-World Phenomenon.
3	Course prerequisites	Students should have general knowledge of: Discrete Mathematics, Probability, Computer Networks, Algorithms and Complexity.
4	Teaching methods and language	<p>Lectures and exercises.</p> <p>Language: English</p> <p>Reference textbooks</p> <ul style="list-style-type: none"> • David Easley, Jon Kleinberg., <i>Networks Crowds and Market: Reasoning about a highly Connected World</i>. Cambridge Press. 2010.
5	Assessment methods	<p>Written test followed by an optional oral exam. The oral exam can be required either by the student, to improve grades, or by the teacher, in presence of significant mistakes/misunderstandings in the written exam. The written test is aimed at: (1) verification of theoretical competence, and in particular of knowledge and comprehension of Course contents (2) verification of skills in understanding and solving significant exercises, and in explaining the proposed solutions. This in order to verify the ability of application of techniques learnt during the Course, of analysis of problems and synthesis of suitable solutions, and of evaluation of alternative solutions. Criteria of evaluation will be: the level of knowledge and practical ability; the property of use of the technical/mathematical language; the clarity and completeness of explanations. The written test (about 2 hours) consists in: (i) Short essays and open questions to cover point (1), 30-50% of total marks; (ii) Exercises, to cover point (2), 50-70% of total marks. All parts can result in negative marks if the answer is omitted or seriously flawed. The oral exam (max 1 hour) will occur within the same exam session of the written test and will typically cover the areas of the written answers that need clarification plus, possibly, additional subjects proposed by the teacher.</p>