



### Programme of Module "Software Quality Engineering"

- Code: DT0204
- Type of course unit: Compulsory (Master Degree in Computer Science curriculum GSEEM), Elective (Master Degree in Computer Science curriculum General), Elective (Master Degree in Computer Science curriculum NEDAS), Compulsory (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)

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1	<b>Course objectives</b>	This course aims to more deeply explore some of the concepts covered during the course of Software Engineering Basics and to introduce new concepts. In particular, this course deals with: non-functional properties of software architecture (such as reliability and performance), with a particular emphasis on their quantitative assessment. It intends to let the student acquiring not only software modeling and analysis skills, through the use of tools that support these activities, but it also aims at developing the student ability to adapt to different tools and to interpret the results that these tools can offer.
2	<b>Course content and learning outcomes (dublin descriptors)</b>	<p>Topics of the module include:</p> <ul style="list-style-type: none"> <li>• Software Architectures</li> <li>• Model-Driven Engineering</li> <li>• UML profiling</li> <li>• Non-functional Validation of Software</li> <li>• Dependability (definitions)</li> <li>• Performance Analysis</li> </ul> <p>On successful completion of this module, the student should :</p> <ul style="list-style-type: none"> <li>• o Be aware of potential of software models as primary artifacts in the whole software engineering process.</li> <li>• o Be able to use UML profiles for tailoring software architectures to specific domains.</li> <li>• o Be experienced in the integration of multiple tools for the development and analysis of software systems.</li> <li>• o Be able to design models that reflect abstract architectures of software systems.</li> <li>• o Be able to analyze a software architecture from a non-functional viewpoint, with particular emphasis for reliability and performance aspects.</li> <li>• o Be able to identify and define the computing requirements appropriate to its solution.</li> <li>• o Have effectively worked on team to deliver some group homework.</li> </ul>
3	<b>Course prerequisites</b>	This is an advanced course in the area of Software Engineering, so it is assumed that students have already taken a course of Software Engineering foundations. UML knowledge is also required.
4	<b>Teaching methods and language</b>	<p>The course language is English. It includes 48 hours of frontal lectures, which are partitioned in theory, exercises and homework discussions.</p> <p><b>Language:</b> English</p> <p><b>Reference textbooks</b></p> <ul style="list-style-type: none"> <li>• Vittorio Cortellessa, Antinisca Di Marco, Paola Inverardi, <i>Model-based Software Performance Analysis</i>. Springer.</li> <li>• Connie U. Smith, Lloyd Williams, <i>Performance Solutions</i>. Addison Wesley.</li> <li>• Ian Sommerville, <i>Software Engineering</i>. Addison Wesley.</li> </ul>
5	<b>Assessment methods</b>	There is no formal pre-assessment, apart from Course pre-requisites. Fulfilment of such pre-requisites is verified by formative assessment. The formative assessment is performed via interactions between teacher and students during lectures. Students are aware since the beginning of the Course that they will be involved (in turns) in: Questioning and discussion, by means of open oral questions to the class or to single students; Summative Assessment Group project followed by an optional oral exam. The group project is aimed at: (1) verification of theoretical competences, and in particular of

knowledge and comprehension of Course contents; (2) verification of skills in understanding and solving significant problems, and in explaining the proposed solutions, (3) capability of collaborative work. This is aimed at verifying 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 a technical/mathematical language; the clarity and completeness of explanations. The oral exam will occur within one week from the project delivery and will typically cover the areas of the project that need clarification plus additional subjects proposed by the teacher and included in the syllabus. The oral test takes place for all students. Assessment breakdown: 100% end-of-semester summative assessment.