



Programme of Integrated course "Advanced Software Architectures"

This course is composed of 2 Modules: 1) Research Topics in Software Architectures, 2) Software Architectures Project

Programme of Module "Research Topics in Software Architectures"

- Code: DT0324
- Type of course unit: Elective (Master Degree in Computer Science curriculum GSEEM), Elective (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:

Teachers: Massimo Tivoli (Massimo.Tivoli@univaq.it)

1	Course objectives	To acquire advanced knowledge in the domain of software architectures
2	Course content and learning outcomes (dublin descriptors)	<p>Topics of the module include:</p> <ul style="list-style-type: none"> • Introduction to the course and background notions on Software Architectures. The automated synthesis problem. • Automated Synthesis of Centralized Connectors for Component-based Systems • Automated Synthesis of Distributed Connectors for Component-based Systems • Automated synthesis of software adaptors for real-time systems • Automated synthesis of distributed coordinators for choreography-based systems • Automated synthesis of software mediators for the interoperability among heterogeneous software systems • IoT architectures modeling • IoT architectures modeling • Implementation platforms for the IoT <p>On successful completion of this module, the student should :</p> <ul style="list-style-type: none"> • have knowledge about current research topics in the domain of software architectures with particular focus on the automated synthesis of centralised or distributed software connectors (coordinators, adaptors, mediators) <p>be capable of: understanding, analysing, and addressing research problems in the software architecture domain with particular focus on ensuring the behavioural aspects of a software architecture</p> <p>acquire skills to deal with the design of real world distributed systems.</p> <p>explain and illustrate the fundamental notions studied in this course. Demonstrate ability in designing concrete software architectures</p> <p>acquiring competencies and abilities useful in software architecture practical contexts.</p>
3	Course prerequisites	Software Engineering Software Architecture
4	Teaching methods and language	Face to face lectures Project revision Language: Italian
5	Assessment methods	Project

Programme of Module "Software Architectures Project"

- Code: DT0325
- Type of course unit: Elective (Master Degree in Computer Science curriculum GSEEM), Elective (Master

Degree in Computer Science curriculum NEDAS), Elective (Master Degree in Computer Science curriculum SEAS), Elective (Master Degree in Computer Science curriculum UBIDIS)	
<ul style="list-style-type: none"> • Level of course unit: Postgraduate Degrees • Semester: 1 	
Number of ects credits:	
Teachers: Henry Muccini (henry.muccini@di.univaq.it)	
1	Course objectives Goal of this course is to instruct the students on IoT and Cyber-physical systems architectures.
2	Course content and learning outcomes (dublin descriptors) Topics of the module include: <ul style="list-style-type: none"> • Introduction to the Internet of Things and Cyber Physical Spaces • Modelling of Cyber Physical Spaces • Simulation of Cyber Physical Spaces • Patterns for Cyber Physical Systems Design • Emergency handling with the IoT • Self-adaptive Architectures with Machine Learning On successful completion of this module, the student should : <ul style="list-style-type: none"> • Knowledge: CP systems and spaces modeling Ability: being able to model and analyze cyber-physical spaces and IoT systems Comprehension: of CP systems architectural issues, patterns, and adaptation
3	Course prerequisites
4	Teaching methods and language Articles to read and laboratory Language: English
5	Assessment methods Project and oral examination