



Programme of Course "Intelligent Systems And Robotics Laboratory"

- Code: DT0201
- Type of course unit: Elective (Bachelor Degree in Computer Science curriculum General), Elective (Master Degree in Computer Science curriculum NEDAS), Elective (Master Degree in Computer Science curriculum UBIDIS)
- Level of course unit: Undergraduate Degrees, Postgraduate Degrees
- Semester: 1

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

Teachers: Giovanni De Gasperis (giovanni.degasperis@univaq.it)

1	Course objectives	The future master graduate on ICT will have a hands-on experience with a project involving most of the technologies of the sector, with particular focus on cognitive robotics.
2	Course content and learning outcomes (dublin descriptors)	<p>Topics of the module include:</p> <ul style="list-style-type: none"> • Advanced network programming with Python / PyPy with Flask, Falcon extension libraries • Using open source tools for cloud computing, no-sql servers, asynchronous inter-process communication • Using a virtualization / back end simulation system on personal cloud computing • Experimenting with virtual physical simulation environments and virtual worlds • In-depth study of the Robotic Operation System R.O.S. and YARP middleware, DDS. • Application of the extended DALI framework (PyDALI) for Multiagent Systems in controlling real or virtual robotic systems in cloud computing. • Control of the anthropomorphic NAO robot through the Coreographe environment <p>On successful completion of this module, the student should :</p> <ul style="list-style-type: none"> • Know how to design a cognitive robotics application, know how to implement a working prototype by means of virtualization and cloud computing techniques and to validate the implementation on real roboti platform.
3	Course prerequisites	The course will use knowledge about: • Object oriented programming • Interprocess communication by TCP/UDP sockets or more • Software development experience in team work, especially for network distributed applications • topics addressed by the Artificial Intelligence course • DALI extended framework for multi agent systems • Unix or GNU/Linux bash shell bash • Linux kernel
4	Teaching methods and language	<p>Lectures, collaborative learning activity through the e-Learning platform, laboratory sessions.</p> <p>Language: English</p> <p>Reference textbooks</p> <ul style="list-style-type: none"> • Learning Robotics Using Python, <i>Lentin Joseph</i>. PACKT Publishing. • Joseph Howse, <i>OpenCV Computer Vision with Python</i>. PACKT Publishing. • <i>Robotics Operative System User Manual (online)</i>. http://www.ros.org
5	Assessment methods	Written exam about the Prolog language and oral discussion of a small robotics project on real or virtual cognitive robotics.