Master of Science in Embedded Computing System

AIMS

The Master of Science in Embedded Computing Systems is jointly offered by the University of Pisa (Department of Information Engineering) and Scuola Superiore Sant'Anna (Institute of Communication, Information and Perception Technologies - TeCIP).

Over 98% of the computers existing in the world are embedded, that is, integrated into a larger system with the purpose of managing its resources and monitoring/controlling its functions using special hardware devices.

In the last thirty years, embedded computing systems grew exponentially in areas like industrial automation, avionics, automotive, telecommunications, consumer electronics, and robotics.

The number of application domains is rapidly expanding in other fields, like sport and medicine (portable monitoring devices), agriculture, game and toy industry, civil protection, and intelligent transportation systems.

COURSE DESCRIPTION AND CAREER PROSPECT

Designing and developing software for embedded computing systems requires an interdisciplinary knowledge in different technical areas like:

- real-time operating systems;
- sensory acquisition and processing;
- motor control;
- microprocessor, multiprocessor, and multi-core architectures;
- distributed systems and sensor networks;optimization methods;
- modeling and timing analysis;
- software verification;
- advanced man-machine interfaces.

The Master in Embedded Computing Systems is aimed at providing both theoretical foundations and practical aspects in the disciplines listed above, forming engineers capable of designing and programming complex computing systems using the most advanced methodologies.

COURSE CONTACTS

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ENTRY REQUIREMENTS

The admission to the Master of Science in Embedded Computing Systems is based on a public competition. The aim is to select at most 40 candidates with a selection process divided into two sessions resulting as follows:

-Up to 10 positions dedicated to non-EU applicants (citizens of countries not belonging to the European Union) not resident in Italy.

-30 positions dedicated to EU applicants (and non-EU applicants resident in Italy).If less than 10 non-EU selected applicants are joining the Master, the number of positions available for the EU applicants session will be increased by the positions left vacant from the non-EU applicants session.

Selection of applicants is based, in both sessions, upon the assessment of all the submitted documents and an interview. Applicants admitted to the interview are informed via e-mail (sent to the account indicated in the application form) about the score received, as well as time and date of the interview. Interviews are held through videoconference using Skype. A candidate not attending the interview within the scheduled slot will be excluded from the final ranking list.

By the end of the selection procedures, the Selection Committee issues a final ranking list of the applicants for each selection session. Selected applicants are appointed by decree of the School's Rector and need to fulfil the requirements enrolling to the Master of Science in Embedded Computing Systems at the University of Pisa, according to the positions available for each session of the selection.

By the stated deadlines, applicants must hold a three-year Bachelor of Science ("Laurea di I livello") or equivalent first-cycle degree awarded by a foreign University. Computer Engineering, Computer Science, Electrical Engineering, Electronic Engineering, Information Technology degrees are preferred.

In any case, the evaluation committee will evaluate the curriculum studiorum of the applicant. The committee may refuse application due to evident lack of sufficient background (e.g., in maths, physics, computer engineering/science, other engineering

disciplines), or it may require applicants to sit for additional examination in some particular disciplines.

Applicants muts be able to understand and speak English at an intermediate level or better. Their proficiency in English will be assessed by the evaluation committee during the interview.

As far as the selection reserved to EU Applicants, under specific terms and conditions, admission is extended also to non-graduated applicants. In this case, a successful application will be conditional to the subsequent completion of the degree and the transmission of adequate documentation not later than December of the currenc academic year. In addition to the academic degree, applicants must also hold a good knowledge of English, at least corresponding to an intermediate level, which will be verified by the selection committee during the interview.

STUDY PLAN

First Year	ECTS
Optimization Methods	6
Dependable and Secure Systems	9
Computer Architecture and Digital Systems	12
Digital Control Systems and Mechatronics	12
Design of Embedded Systems	9
Real Time and Distributed Systems	12

Second Year	ECTS
Industrial Applications	12
Virtual and Augmented Reality	6
Internet of Things	6
Computational Intelligence	6
Robotics and Human-Machine Interfaces	6
Free activity	9
Final Project	15
Free Activity	ECTS

Networked Embedded Systems	9
Component-based Software Design	9