

Objective

The two year Master degree program (Laurea Magistrale) in Computer Science and Networking has been designed to meet the growing demand for an emerging kind of professionals with expertise in both

- *computer and information science and technologies, and*
- *communication networking science and technologies*

in a strongly integrated manner. This expertise is needed in the design and implementation of both innovative hardware-software distributed infrastructures and service-based distributed applications in several areas of industry, e-business, research, social and citizen services, public administration.

A professional with strong expertise in both information and networking sciences and technologies is without precedence in the current scenario of national master programs (Lauree Magistrali), and few are the examples at the international level.

A Joint initiative

This Master degree program is a joint initiative (Laurea Interateneo) of

- *University of Pisa – Department of Computer Science (Faculty of Sciences) and Department of Information Engineering (Faculty of Engineering),*

and

- *Sant'Anna Superior School – Excellence Centre for Information and Communication Engineering (Class of Experimental Sciences).*

The official Master qualification diploma (Laurea Magistrale) is jointly provided by University of Pisa and by Sant'Anna Superior School. (Program administration by University of Pisa, Faculty of Sciences).

will be activated
in Academic Year 2009-2010

Master Degree Program (LAUREA MAGISTRALE) in COMPUTER SCIENCE AND NETWORKING

A joint initiative of University of Pisa and Sant'Anna Superior School

Towards an integration of Computer Science and Networking: an emerging kind of professional

In the last twenty years Internet has radically transformed the approach to realizing many activities in the industrial, social and scientific world, as well as in everyday life. Recently, the ICT scientific and industrial community has shown how further drastic evolutions and changes in intelligent distributed networks and infrastructures will be needed in the next 10-15 years to meet new and pressing requirements by the applications. Among them: industrial automation, e-business, real-time and mission-critical systems, emergency and disaster management, ubiquitous health care, social networks, intelligent urban sensors, remote control, energy source management, very large data management, vehicular networks, and many others. The foreseen, and partially current, evolutions and changes (Future Internet) must allow new applications to be developed in few months, instead of several years as traditionally, thus granting a much more efficient and secure utilization of networks and distributed systems by the industry and society in a world-wide scale.

The professionals in Computer Science and Networking will be able to perform activities requiring advanced methodologies in design, development, direction, evaluation, testing and management of distributed infrastructures and networked applications. With this goal in mind, they will possess a deep knowledge of Computer Science and Networking fundamentals and specialized knowledge in ICT aspects:

- distributed systems and enabling platforms, service oriented architectures, high-performance computing, pervasive & mobile computing,
- access networks at various scale levels, transmission and optical technologies, traffic engineering models and techniques,
- paradigms, programming models and tools for Quality-of-Service-driven design methods and techniques in analysis, design, implementation, evaluation and verification.

Admission requirements

For students with a first level graduation degree released in Italy (Laurea Triennale), the minimal qualification requirements, for admission to the selection test, consist of 12 credits in one or more of the scientific-disciplinary sectors in Mathematics (MAT/02-03-05-06-07-08-09) and Physics (FIS/01-02-03), 60 credits in one or more of the scientific-disciplinary sectors in Computer Science (INF/01 Informatica), Communication Engineering (ING-INF/03 Telecomunicazioni), and Information Engineering (ING-INF/05 Sistemi di Elaborazione dell'Informazione).

These requirements are automatically satisfied by Laurea/Diploma Triennale in Informatica (class 26 or L-31) and by Laurea/Diploma Triennale in Ingegneria Informatica or in Ingegneria delle Telecomunicazioni (class 9 or L-8), and must anyway be possessed by students with a Laurea/Diploma in different sectors.

Qualification titles released by Foreign Countries will be evaluated by the Admission Commission about their disciplinary de-facto equivalence with the curricular requirements. Interested foreign students are invited to send a detailed curriculum studiorum (see contact persons on the back side).



UNIVERSITÀ DI PISA



Scuola Superiore
Sant'Anna
di Studi Universitari e di Perfezionamento

Course structure and objectives

As every Laurea Magistrale, the two year Master degree program in Computer Science and Networking has a total number of credits (CFU) equal to 120, where a credit corresponds to 8 hours of lectures/laboratory and 17 hours of personal working activity.

The program is organized around 12 teaching courses (6 or 9 or 12 credits per teaching course), of which 9 major (fondamentali) and 3 minor (complementari) teaching courses, plus the Master Thesis (15 credits).

Majors (fondamentali):

1st year

- *Distributed Systems: Paradigms and Models*
- *Advanced Programming*
- *Algorithm Engineering*
- *High-performance Systems and Enabling Platforms*
- *Optical Communication Theory and Techniques*
- *Access, Metropolitan and Core Networks*

2nd year

- *Software Service Engineering*
- *Models of Computation*
- *Network Management and Configuration*

Curricula

Three curricula are provided

- *Distributed Systems and Architectures*
- *Distributed Systems and Applications*
- *Distributed Systems and Infrastructures*

according to the guided selection of the 3 minor (complementari) teaching courses at the 2nd year.

An International Master course

The Master degree program in Computer Science and Networking will have an international character, **the official language is English**, in order to attract students from various parts of the world. This is feasible owing to the prestige of the partner institutions and to their high quality of research, well recognized at the international level.

Teaching organization and advanced laboratories

To achieve the basic objectives of this joint initiative by Sant'Anna Superior School and University of Pisa (also through Excellence Courses), many teaching courses will be supported by advanced laboratories in architecture, programming and communication in complex centralized, parallel and distributed configurations.

The organization of teaching courses and laboratories will allow each student to achieve the most suitable and effective working environment.

Limited access / Numerus clausus

In order to achieve the described goals for high qualification and working environment, the maximum number of admitted students per year is **40**, including Italian, European and Extra-European students.



Information and contacts

Any additional information, including official rules for admission and selection as well as course organization and schedule, will be provided at <http://www.mcsn.sssup.it>, <http://www.di.unipi.it/mcns2009>

Contacts persons

- Prof. Marco Vanneschi, Department of Computer Science, University of Pisa, vannesch@di.unipi.it
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as well as the *Faculty Members*:

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