ICT Solutions Architect

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Master Programme in Computer Science
Motivations

• Modern ICT solutions built by composing heterogeneous software services and infrastructures

• IT solutions architects must be able to
  → master the design of complex systems
  → exploit and assess existing service- and cloud-based solutions
  → employ DevOps principles
  → understand and assess the exploitability of available IT (physical and/or virtualized) infrastructures
  → assess and certify non-functional properties – from performance to security-of IT solutions
Objectives

To educate the next generation of ICT solutions architects, capable of mastering the complexity of integrating heterogeneous and distributed software systems as well as of assessing non-functional properties of the obtained solutions.
Core courses

ICT infrastructures
- Physical infrastructures
- Networking
- Storage
- Computing

Advanced software engineering
- Service-based software engineering
- DevOps practices
- Cloud-based software engineering
- Hands-on laboratory

Advanced programming
- Run-time support
- Component-based programming
- Scripting languages
- Libraries, frameworks, interoperability
- Event-driven programming

Algorithm engineering
- Algorithms for massive datasets
- Advanced data structures in hierarchical memories
- Data compression
- Algorithms for large graphs

Cyber-physical systems
- Wireless technologies and mobility
- Cyber-physical systems
- Internet of Things

ICT risk assessment
- Risk assessment of ICT systems
- Security of cloud computing

P2P systems & blockchains
- P2P topologies
- Cryptocurrencies and blockchains
- Complex networks
- Legal aspects of cryptocurrencies
# Study plan

## First year

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>CFU</th>
<th>Semester 2</th>
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<tr>
<td>Advanced programming</td>
<td>9</td>
<td>Peer to peer systems and blockchains</td>
<td>6</td>
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<tr>
<td>Advanced software engineering</td>
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<td>Mobile and cyber-physical systems</td>
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<td>Algorithm engineering</td>
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<td>ICT risk assessment</td>
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<td>ICT Infrastructures</td>
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<td>Group: ICT electives 6 cfu</td>
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## Second year

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<th>Semester 3</th>
<th>CFU</th>
<th>Semester 4</th>
<th>CFU</th>
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<tr>
<td>Group: free choice</td>
<td>9</td>
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<td>Group: ICT elective 9 cfu</td>
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**Group: ICT electives (9 CFU)**

- Distributed systems: paradigms and models (WTW)
- Software validation and verification (SW)
- Data mining (KD)
- Machine learning (AI)

**Group: ICT electives (6 CFU)**

- Information retrieval (KD)
- Scientific and large data visualization (CNR)
- Security methods and verification (WTW)
- Intelligent systems for pattern recognition (AI)
Career opportunities

"ICT solutions architect" is one of the top in-demand jobs in the ICT sector - just Google it to check.

Besides traditional software companies, which continue to constantly face software integration issues, ICT solutions architects are sought by companies targeting new emerging arenas like the Cloud and the IoT (Internet of Things).

The Department has strong connections with many established companies and startups seeking for ICT solutions architects, both within Italy and outside (like Google or Microsoft).

This master course also provides a solid background for a Ph.D. program in Computer Science or an equivalent degree.

ICT Solutions Architect | Jora

ICT Solutions Architect | Requirements Engineer
https://www.aqonline.com/jobs-

ICT Solutions Architect | Jura

ICT Solutions Architect | Prepaidbank Australia

ICT Solutions Architect | Brussels - icjob.be

ICT Solutions Architect | Test Lab - Jobs at Ericsson

ICT Solutions Architect | Test Lab - Test Lab - ICT Solutions Architect - Test Lab - Data: Jan 22, 2014

ICT Solutions Architect | Perth - Jobs at Ericsson

ICT Solutions Architect | Melbourne - Jobs at Ericsson

ICT Solutions Architect | Perth - Jobs at Ericsson

ICT Solutions Architect | Sydney - Jobs at Ericsson

ICT Solutions Architect | Perth - Jobs at Ericsson
https://www.ericsson.com/jobs-ict-solutions-architect-130

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Forecasted global business/government spending IT consulting and systems integration equipment from 2013 to 2016, by segment (in billion U.S. dollars)

ABOUT THIS STATISTIC
The statistic depicts a forecast of business and government expenditure worldwide on IT consulting and systems integration equipment from 2013 to 2016, by segment. Global spending on system integration project work was expected to amount to 347 billion U.S. dollars in 2015.

SPECIAL FUNCTIONS
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- PDF

By 2018, 90% of new large systems will have budgets that include 50% spending on integration.

3 Billion approx.
Salesforce.com 50%

2 Billion approx.
Expedia 90%

50% Integration
50% Remainder