PhD Course in INFORMATION AND COMMUNICATION TECHNOLOGIES

<table>
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<tr>
<th>Coordinator</th>
<th>Prof. Giancarlo Fortino – Department of Computer Science, Modeling, Electronics and Systems Engineering - DIMES – Via Pietro Bucci, Arcavacata di Rende (CS) – Phone: +390984.494063 – E-mail: <a href="mailto:g.fortino@unical.it">g.fortino@unical.it</a></th>
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<tr>
<td>Duration</td>
<td>3 years</td>
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<tr>
<td>Main Department</td>
<td>Department of Computer Science, Modeling, Electronics and Systems Engineering – DIMES</td>
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| Research topics     | The curriculum is multidisciplinary and strongly oriented to the integration and development of new systems of Information and Communication Technology (ICT). The main research topics are listed below:  
• Design of Internet of Things (IoT) systems.  
• Cybersecurity.  
• Big Data analysis techniques and applications.  
• Artificial intelligence.  
• Wearable computing and m-health systems.  
• Modeling and simulation for reliability analysis of IoT systems.  
• Software engineering methodologies for the development of complex distributed software systems.  
• Models and algorithms for social networks.  
• Management and analysis systems of Big Data and scalable processing: distributed systems, parallel systems, cloud computing architectures and systems, provisioning models.  
• Knowledge Management: document management, knowledge extraction, integration and modeling, formalization methodologies, taxonomy classification, thesauri and ontologies, distributed data management, data mining and data warehousing.  
• Simulation and optimization: models and algorithms.  
• Mathematics for machine learning.  
• Microsystems: design, development and characterization of intelligent MEMS devices.  
• Development of low power and high performance circuits and systems for 3D image processing.  
• Photovoltaic conversion: models and technologies for solar cells and intelligent systems for energy management, conversion and storage.  
• High performance, energy efficient integrated circuits for logic and memory applications.  
• Nanodevices for logic and memory applications.  
• Modeling and design of spintronic nanodevices.  
• Systems and techniques for the management of infrastructures for electric mobility.  
• Reconfigurable antennas. |
- Smart antennas and their integration.
- Advanced techniques for the measurement of electromagnetic fields.
- Electromagnetic diagnostics and biomedical applications.
- Radar systems for the environmental monitoring.
- Electronic circuits for RF applications.
- Monolithic integration of transmitters and receivers.
- Efficient energy management in wireless sensor networks.
- Cognitive networks and 5G systems.
- Network technologies, protocols and architectures for IoT systems.
- Vehicle networks and new generation protocols for smart cities.
- Control and estimation for agent-based interconnected network systems.
- Control strategies resilient to cyber-attacks in network control systems.
- Secure navigation schemas and environment reconstruction for autonomous robot teams.
- Techniques and devices for navigation, guidance and control in autonomous submarine vehicles.
- Techniques and devices for submarine acoustic communications and localization.
- Non-destructive evaluation of materials.
- Electronic measurement systems.
- Fault detection and isolation and control reconfiguration techniques in dynamical systems.
- Synchronization methods for IoT-based distributed measurement systems.
- IoT-based distributed measurement systems for structural monitoring.
- Food engineering.
- Legal Informatics

**Partecipation requirements**
- Equivalent Degree awarded by an accredited foreign university.

**Admission procedures**
Qualification assessment and oral examination. The knowledge of the english language will be assessed during the oral examination.

**Assessable qualification**
- Research project;
- Curriculum vitae, including a copy of Bachelor's and Master's Degree (in Italian or English), and the list of examinations taken with grades and final mark.

**Assessment criteria**

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<tr>
<th>Qualification assessment</th>
<th>Maximum score 30</th>
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<tr>
<td>Research project</td>
<td>Maximum score 10</td>
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<tr>
<td>Curriculum vitae</td>
<td>Maximum score 20</td>
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**Oral examination**
Discussion on the proposed research project and on the disciplines of interest for the

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<th>Total maximum score 60</th>
<th>Maximum score 30 punti</th>
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doctorate. Foreign candidates can take the exam via skype.

Minimum score required for the admission to the oral admission and for the oral examination: 21 pt

### Positions and scholarships

7 (seven) positions with scholarship of which:
- 5 granted by University of Calabria one of which reserved to candidate with an academic qualification obtained abroad;
- 2 granted by DIMES as part of the "Departments of Excellence" project on the topic "Design of Internet of Things Systems".

### Agenda

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<th>Description</th>
<th>Date</th>
<th>Time</th>
<th>Room</th>
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<tr>
<td>Qualification assessment (presence of candidates not requested)</td>
<td>September, 27 2021</td>
<td>9.00 am CEST</td>
<td>Seminar room of DIMES – University of Calabria – Arcavacata di Rende (Cosenza) Italy</td>
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<tr>
<td>Oral examination</td>
<td>September, 27 2021</td>
<td>9.00 am CEST</td>
<td>Seminar room of DIMES – University of Calabria – Arcavacata di Rende (Cosenza) Italy</td>
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The results of the exam will be posted on the PhD website: [http://dottorato.dimes.unical.it/](http://dottorato.dimes.unical.it/)

### Information

- g.fortino@unical.it

### PhD website

[http://dottorato.dimes.unical.it/](http://dottorato.dimes.unical.it/)