PHD PROGRAMME TABLE 38TH CYCLE

Section “Available Positions and Scholarships” integrated on 23/05/2022

Section “Available Positions and Scholarships” modified on 27/05/2022

Section “Available Positions and Scholarships” modified on 09/06/2022

Section “Available Positions and Scholarships” modified on 23/06/2022

PROGRAMME’S NAME	ELECTRONICS, TELECOMMUNICATIONS AND INFORMATION TECHNOLOGIES ENGINEERING
DURATION	3 years
PROGRAMME START DATE	01/11/2022 (DD/MM/YYYY)
LANGUAGES	English
MANDATORY STAY ABROAD	No
COORDINATOR	Prof. Aldo Romani (aldo.romani@unibo.it)
CURRICULA	N/A
RESEARCH TOPICS	Detailed list at the bottom of the present document
PhD POSITIONS	16
ADMISSION PROCEDURE	Qualifications and Research proposal evaluation Oral examination

Available Positions and Scholarships

Pos. n.	Financial Support	Description	Position linked to a specific research topic
1	PhD Scholarship	Totally funded by the University of Bologna general budget	
2	PhD Scholarship	Totally funded by the University of Bologna general budget	
3	PhD Scholarship	Totally funded by the University of Bologna general budget	
4	PhD Scholarship	Funded by the Department of Electrical, Electronic, and Information Engineering “Guglielmo Marconi”	
5	Research Grant	Provided by the Department of Electrical, Electronic, and Information Engineering “Guglielmo Marconi”. The research grant will have a duration of 12 months, renewable up to 36 months, and a gross percipient amount of €19367.	Design of wireless sensing devices based on resonance techniques
6	PhD Scholarship	Totally funded by the University of Bologna general budget	
7	PhD Scholarship	Co-funded by the University of Bologna general budget and by the Department of Electrical, Electronic, and Information Engineering “Guglielmo Marconi”	
8	PhD Scholarship	Funded by Consorzio nazionale interuniversitario per le telecomunicazioni – CNIT	Intelligent IoT for 6G
9	PhD Scholarship	Funded by Consorzio nazionale interuniversitario per le telecomunicazioni – CNIT	Intelligent IoT for 6G

10	Research Grant	Provided by the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" with funds made available by the projects H2020 BONSAPPS (GA 101015848) and EPI SGA1 (GA 826647) – ref. Prof. Luca Benini. The research grant will have a duration of 12 months, renewable up to 36 months, and a gross percipient amount of € 19,367	Energy-efficient Machine Learning on Resource-Constrained Parallel Processors for Nano-robotics applications
11	Research Grant	Provided by the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" with funds made available by the projects H2020 EPI-SGA1 (GA 826647) e EPI SGA2 (GA 101036168) - ref. Prof. Luca Benini. The research grant will have a duration of 12 months, renewable up to 36 months, and a gross percipient amount of € 19,367	RISC-V based edge-computing architectures for training and inference of brain-inspired networks
12	Research Grant	Provided by the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" ~~with funds made available by the projects ROADSTER (ref. Dott. Francesco Conti), NeuroSOC (ref. Dott. Francesco Conti), H2020 EPI SGA1 (ref. Prof. Luca Benini)~~ with funds made available by the project ROADSTER (CUP E95F21003290007) ref. dott. Francesco Conti, by the project HORIZON EUROPE NeuroSOC (project n. 101070634) ref. prof. Eleonora Franchi Scarselli and on funds ECO_RIC_TER ref. prof. Luca Benini. The research grant will have a duration of 12 months, renewable up to 36 months, and a gross percipient amount of € 19,367	Hardware/Software Design of Acceleration Techniques for Deep Neural Network Inference and Training
13	Research Grant	Provided by the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi". The research grant will have a duration of 12 months, renewable up to 36 months, and a gross percipient amount of € 19,367.	Programming models and tools for secure and efficient cyber-physical systems
14	Research Grant	Provided by the "Ercole De Castro" Advanced Research Center on Electonic System- ARCES with funds made available by the project H2020-ECSEL StorAIge - STORAIGE_TP (ref. prof. Eleonora Franchi Scarselli) GA 101007321. The research grant will have a duration of 12 months, renewable up to 36 months, and a gross percipient amount of € 19,367.	Circuits and programming algorithms for PCM-based analog-in-memory computing
15	Research Grant	Provided by the "Ercole De Castro" Advanced Research Center on Electonic System- ARCES with funds made available by the project H2020-ECSEL GaN4AP - GAN4AP_TP (ref. prof. Susanna Reggiani) GA 101007310. The research grant will have a duration of 12 months, renewable up to 36 months, and a gross percipient amount of € 19,367.	Study of transport properties and reliability of novel GaN-based HFETs for high-voltage and high-frequency applications

16	Research Grant	Provided by the "Ercole De Castro" Advanced Research Center on Electonic System- ARCES with funds made available by the project PRIN 2017SRYEJH - PRIN2017GNUDI (ref. prof. Antonio Gnudi). The research grant will have a duration of 12 months, renewable up to 36 months, and a gross percipient amount of € 19,367.	Quantum modeling of 2D-semiconductor based electronic devices

Admission Exams

	DATE AND TIME	**RESULTS**
Qualifications and research proposal evaluation	Applicants' participation is not required	Available from **29/06/2022****
Oral examination	**Date**: starting from **06/07/2022 – 9.00 a.m. CEST*** **Place**: In presence, Sala Giunta, Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi", Via Risorgimento 2, Bologna. Remotely, using Microsoft Teams	Available from **15/07/2022****

* In case that the oral examination cannot be completed in one day due to the large number of applicants, the oral examination detailed schedule shall be made available on the webpage Studenti Online together with the results of the qualifications and research proposal evaluation. **During the oral examination, applicants may express their interest in one or more positions linked to specific research topics.**

** The **results of the admission exams** will be available on the webpage Studenti Online (select "summary of the requests in progress" > "see detail" and open the .pdf file at the bottom of the page). **No personal written communication will be sent to applicants concerning the examinations results**.

Required and Supporting Documents to be attached to the application

All the documents listed below **shall be drawn up in English or in Italian**. In case of documents originally issued in any other language (e.g. identity document, qualifications), an official translation is required.
Only qualifications obtained **during the last 5 calendar years** shall be taken into consideration, except for the University Degree. The Admission Board will assess the relevance of the supporting documents to the PhD Programme.

REQUIRED DOCUMENTS	
Identity document	Valid identity document with photo (i.e. identity card, passport)
Curriculum Vitae	No specific CV format is required
Degrees	Documents attesting the awarding of the first and second cycle degrees, the exams taken and the marks obtained (see Art. 3 of the Call for Applications)
Research Proposal	Multi-annual research proposal, with special emphasis on the activities to be completed during the first-year course. The proposal must meet the following requirements: - it must **mention on the cover page the main research topic/s** the applicant is interested to and the proposal is about; - **it cannot exceed 20,000 characters**, including spaces and formula possibly used. This figure does not include: the title of proposal, the outline, references and images (such as graphs, diagrams, tables, etc. - if present); - **it must include**: the state of the art; description of the proposal; expected results; articulation of the proposal and implementation times; outline of the proposed findings assessment criteria; references. The research proposal that successful applicants shall carry out during their PhD career may possibly differ from the one proposed at the application stage. This shall be defined together with the supervisor and approved by the Academic Board.

SUPPORTING DOCUMENTS	
Personal Statement	The statement shall include the reasons prompting the applicant to attend the PhD Programme and **those relevant experiences and research interests**, that make the applicant suitable for the specific PhD Programme (3000 characters maximum, including spaces).
Reference letter/s	**No more than 2 reference letters** signed by Italian and international academics and professionals in the research field, which do not form part of the Admission Board, attesting the suitability of the applicant and his/her interest in the scientific research. Letters shall be uploaded following the procedure detailed in the Call for Applications (Art. 3.2).
Publications	Lists of publications (i.e. monographs, articles on scientific journals), minor publications (conference papers, etc.), abstracts and posters presented during national and international conferences, etc.
Other documents	- Postgraduate vocational programmes and/or specialisation programmes relevant to the PhD Programme - Research activity of any kind - whether basic, applied, translational, etc. - carried out in any capacity, including when covered by research grants, and as a staff member of research projects - Work activity - Curricular and non-curricular training internships - Documents attesting the applicant's foreign languages proficiency - Periods of study abroad, completed by applicants outside their countries of origin (e.g. Erasmus programme or other similar mobility programmes) - Other qualifications attesting the suitability of the applicants (scholarships, prizes, etc.)

Evaluation criteria*

Scores will be expressed in points out of 100, as follows.

1. Qualifications and research proposal evaluation

Minimum score for admission to the oral examination: 30 points, Maximum score: 50 points

Qualifications evaluation	Second cycle degree (Master's) final mark. Graduands shall be evaluated according to the Weighted Average Mark (WAM)	12 points max
	Publications	5 points max
	Other evaluable documents	12 points max
Research proposal evaluation	Scientific value and ground-breaking nature of the proposal	7 points max
	Structure of the proposal	7 points max
	Proposal feasibility	7 points max

2. Oral examination

Minimum score for eligibility: 30 points, Maximum score 50 points

English language proficiency	5 points max
Research proposal presentation	35 points max
General knowledge of issues encompassed by the PhD Programme	10 points max

Oral examination aims to assess the suitability of the applicant for scientific research as well as the general knowledge of issues encompassed by the PhD Programme (see the list of research topics at the bottom of the present document). **The oral examination is carried out in English**.

* Possible further evaluation criteria will be available on the University website, selecting the relevant PhD Programme > "More information", at the bottom of the page in the section "Notices".

Research Topics

- Analog and digital circuits and electronic systems
- Analysis and simulation of semiconductor devices
- Applications of Information technologies: smart cities, smart grid, etc.
- Cyber-physical systems
- Communication theory and its applications
- Telecommunications architectures, systems, and networks: wireless, cellular, fixed / mobile terrestrial / satellite, wired and optical

- Electromagnetic theory, antennas, antenna systems, beamforming, electromagnetic characterization of materials, channel propagation models
- Near- and Far- field wireless power and information transmission
- Internet-of-Things and applications
- Electronic devices
- Electronics for telecommunications
- Power electronics, power converters and semiconductor devices
- Embedded systems
- Energy harvesting
- Information theory and its applications
- Intelligent sensors
- Micro and nano-technologies
- Microwave Photonics
- Microwave and millimetre wave circuits and systems
- Navigation and positioning systems and applications
- Network control and management: software defined networks
- Performance evaluation of communication networks
- Statistical signal processing and its applications
- Ultrasonics
- Wireless power and data transfer
- Science of Creative Thinking with Applications in the ICT Domain
- Precision agricolture and IoT circuits, systems for pervasive monitoring
- Reconfigurable intelligent surfaces