

PHD PROGRAMME TABLE 37TH CYCLE

Section "Available Positions and Scholarship" integrated on 29/04/2021

Section "Available Positions and Scholarship" integrated on 13/05/2021

Section "Available Positions and Scholarship" integrated on 20/05/2021

Section "Available Positions and Scholarship" integrated on 21/05/2021

Section "Available Positions and Scholarship" integrated on 01/06/2021

Section "Admission Exams" modified on 18/06/2021

PROGRAMME'S NAME	ELECTRONICS, TELECOMMUNICATIONS AND INFORMATION TECHNOLOGIES ENGINEERING
DURATION	3 years
PROGRAMME START DATE	01/11/2021
LANGUAGE	English
MANDATORY STAY ABROAD	no
COORDINATOR	Prof. Alessandra Costanzo (alessandra.costanzo@unibo.it)
CURRICULA	N/A
RESEARCH TOPICS	Detailed list at the bottom of the present document
PhD POSITIONS	29
ADMISSION PROCEDURE	Qualifications and research proposal evaluation Oral examination

Available Positions and Scholarships

Pos. n.	Financial Support	Description	Positions linked to specific research topics
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	Co-funded by the University of Bologna general budget and the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi"	
5	PhD Scholarship	Funded by the the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi"	
6	PhD Scholarship	Funded by the the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi"	
7	PhD Scholarship	Funded by EbWorld S.r.l.	Localization and management of georeferenced information for IoT scenarios
8	Research Grant	Provided by the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" with funds made available by the EU project H2020 – The European PILOT, Regale (GA 956560); EPI (CUP J56C18001890006; GA 826647) P.I. Prof. Luca Benini. The research grant will have a duration of 12 months, renewable up to 36 months, and gross percipient amount of € 19,367.00.	HW/SW Codesign of Power Management Units for high-performance processors and system

9	Research Grant	Provided by the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" with funds made available by the EU project H2020 BonsAPPs "AI-as-a-Service for the Deep Edge" – (CUP J55F21000570006; G.A. 101015848). The research grant will have a duration of 12 months, renewable up to 36 months, and gross percipient amount of € 19,367.00.	Hardware/Software codesign and optimization for control algorithms on edge low-power platforms
10	Research Grant	Provided by the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" with funds made available by the EU project H2020 – NANO-EH (CUP J59C20000720006, GA 951761). The research grant will have a duration of 12 months, renewable up to 36 months, and gross percipient amount of € 19,367.00.	Millimeter-wave reconfigurable metasurfaces by functionalized nano-materials
11	Research Grant	Provided by "Ercole De Castro" Advanced Research Center on Electronic System- ARCES with funds made available by the EU project H2020 – Energy ECS, P.I. Prof. Aldo Romani, guaranteed by funds ECO_RIC_TER_Romani. The research grant will have a duration of 12 months, renewable up to 36 months, and gross percipient amount of € 19,367.00. Main place of work: Cesena	Energy harvesting and micropower management for Internet of Things, energy efficiency and future mobility" within the project H2020-ECSEL named Energy ECS "Smart and secure energy solutions for future mobility
12	Research Grant	Provided by the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" with funds made available by the EU project H2020 – EPI (CUP J56C18001890006, GA 826647) P.I. Prof. Luca Benini; TEP (GA 101034126) P.I. Davide Rossi. The research grant will have a duration of 12 months, renewable up to 36 months, and gross percipient amount of € 19,367.00.	Heterogeneous architectures for machine learning and predictive model based control systems
13	Research Grant	Provided by the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" with funds made available by the EU project H2020 – EPI (CUP J56C18001890006, GA 826647) P.I. Prof. Luca Benini; TEP (GA 101034126) P.I. Davide Rossi. The research grant will have a duration of 12 months, renewable up to 36 months, and gross percipient amount of € 19,367.00.	Extending high-performance RISC-V cores for data-intensive acceleration
14	Research Grant	Provided by the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" with funds made available by the EU project H2020 – EPI (CUP J56C18001890006, GA 826647) P.I. Prof. Luca Benini; TEP (GA 101034126) P.I. Davide Rossi. The research grant will have a duration of 12 months, renewable up to 36 months, and gross percipient amount of € 19,367.00.	Overcoming the software challenges for modern multi- and many-core accelerators
15	Industrial PhD	Position reserved for employees of FEV Italia S.r.l.	
16	PhD Scholarship	Funded by TIM S.p.a.	IoT sensor nodes with AI and Blockchain for SHM and biomedical applications
17	PhD Scholarship	Funded by TIM S.p.a.	5G solutions and constraints for the Industry 4.0
18	PhD Scholarship	Funded by Fondazione Bruno Kessler	Distributed embedded AI for energy-efficient smart sensing in IoT

19	PhD Scholarship	Funded by Fondazione Bruno Kessler	AI at the edge: end-to-end neural networks for audio processing on IoT devices
20	PhD Scholarship	Funded by CNIT National Inter-University Consortium for Telecommunications	Smart Radio Environments
21	PhD Scholarship	Funded by CNIT National Inter-University Consortium for Telecommunications	Industrial Internet of Things
22	PhD Scholarship	Funded by CNIT National Inter-University Consortium for Telecommunications	6G Radio Networks
23	PhD Scholarship	Funded by CNIT National Inter-University Consortium for Telecommunications	6G Wireless Systems
24	Industrial PhD	Position reserved for employees of HENSOLDT Cyber GmbH	
25	Research Grant	Provided by the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" with funds made available by the EU project H2020 – EPI (CUP J56C18001890006, GA 826647) P.I. Prof. Luca Benini; TEP (GA 101034126) P.I. Dott. Davide Rossi. The research grant will have a duration of 12 months, renewable up to 36 months, and gross percipient amount of € 19.540,79	RISC-V Based Computing Architectures for Satellite Applications
26	Research Grant	Provided by the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" with funds made available by the project PRIN2017: WPT4WID: Wireless Power Transfer for Wearable and Implantable Devices, Progetto 2017YJE9XK, CUP J54I19003220005 (P.I. prof. Alessandra Costanzo). The research grant will have a duration of 12 months, renewable up to 36 months, and gross percipient amount of € 19.540,79	WPT4WID: Wireless Power Transfer for Wearable and Implantable Devices: Electro-magnetic/nonlinear co-design of millimeter-wave transmitters for energy focusing to wearable devices
27	PhD Scholarship	Funded by Arca Technologie	Power electronic converters and systems
28	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 gross percipient amount of € 19.367,00	Porting of data processing applications to low power embedded Università - DEI Committente - Leonardo 4 architectures
29	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 gross percipient amount of € 19.367,00	Green Computing application to monitor complex infrastructure with analytics and AI capability

Admission Exams

	DATE AND TIME	RESULTS
Qualifications and research proposal evaluation	Applicants' participation is not required	Available from 20/06/2021**
Oral examination	Date: starting from 28/06/2021 – 9 am CEST* Place: Remotely, using Microsoft Teams	Available from 12/07/2021**

* 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 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

(only documents in Italian, English, French, German and Spanish shall be considered as valid and be assessed by the Admission Board)

Only qualifications obtained during the last 5 years before the expiration date present Call for applications 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)
SUPPORTING DOCUMENTS	
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: <ul style="list-style-type: none"> - it must mention on the first page the research topic of the PhD Programme associated to the research proposal; - it cannot exceed 20.000 characters, including spaces and formulas, if present. This figure does not include: the title, the outline, references and images (such as graphs, diagrams, tables etc. - where present); - it must include: state of the art; project’s description; expected results; timeline of the proposed research activities; outline of the proposed findings assessment criteria; references. The research projects that successful applicants shall carry out during their doctoral career may possibly differ from the project proposed at the application stage. This shall be defined together with the supervisor and approved by the Academic Board.
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/or 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 for the scientific research. Letters shall be uploaded following the procedure on Studenti Online , detailed in the Call for Applications (Art. 3.2).
Publications	List of publications (i.e. monographs, articles on scientific journals, volume chapters), minor publications (conference papers, etc.) and abstracts and posters presented during academic conferences
Other documents	<ul style="list-style-type: none"> - University Master Courses (Master Universitari di I e II livello), Postgraduate vocational training programmes and/or specialisation programmes relevant to the PhD Programme - Research activity - whether basic, applied, translational, etc. - carried out in any capacity, including when covered by research grants, and as a staff member of research units - Working activity - Professional and/or training internships - Language proficiency certificates - Periods of study abroad, outside the country 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	University degree final mark. Graduands shall be evaluated according to the Weighted Average Mark (WAM)	12 points max
	Publications	5 points max
	Other documents	12 points max
Research proposal evaluation	Scientific value and innovative nature of the proposal	7 points max
	Description and 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 proficiency	5 points max
Research proposal presentation	35 points max
General knowledge of issues encompassed by the PhD Programme	10 points max

Oral examination includes the presentation of the research proposal and 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”.

Final Ranking List and Enrollment

Considering the expressions of interest for **topic-specific positions**, the Admission Board will establish if the applicants can be considered eligible for the allocation of the positions linked to specific research topics, taking into account their skills, experience and aptitude. A sub-ranking list for each topic-specific position shall be drawn up.

After the publication of the results of the oral examination, the **final ranking list** will be available on the [University website](#), selecting the relevant PhD Programme > “More information”, section “Notices” at the bottom of the page.

Following the publication of the final ranking list, successful applicants shall **enroll** on [Studenti Online](#) by the deadline indicated on the [University website](#), selecting the relevant PhD Programme > “More information”.

If a successful applicant withdraws from a position, the following applicant in the ranking list, who is also eligible for the specific position, will be contacted. During the replacement procedure, the new terms of enrollment shall be communicated via e-mail to the chosen applicant.

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
- Communications architectures, systems, and networks: wireless, cellular, fixed / mobile terrestrial / satellite, wired and optical
- Electromagnetic theory, antennas, antenna systems and active antennas at microwave and millimeter waves, IoT applications, smart beamforming, channel propagation models
- Electronic devices
- Electronics for telecommunications
- 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 agriculture and IoT circuits, systems for pervasive monitoring
- Energy harvesting