INFORMATION TECHNOLOGIES

CYCLE	XL
COORDINATOR	Prof. Marco LOCATELLI email: marco.locatelli@unipr.it Department of Engineering and Architecture
DURATION	3 years
STARTING DATE OF THE PHD PROGRAM	01/11/2024
POSITIONS PUT OUT TO COMPETITION	**17**
ADMISSION PROCEDURES	Assessment of QUALIFICATIONS and Research Project Oral Exam in PRESENCE or REMOTELY
ADMISSION REQUIREMENTS	Regardless of age and citizenship, applicants holding at least one of the following academic qualifications can apply for admission: − Laurea specialistica or Laurea magistrale (second cycle master's degree) − Laurea Vecchio Ordinamento (degree obtained under the previous Italian regulations); − Second cycle Master's degree obtained abroad, equivalent to the above mentioned Italian degrees and recognized as suitable for the admission to doctoral program Undergraduates can also apply for admission to the selection, with the obligation to obtain the degree **by 31.10.2024**

TRAINING OBJECTIVES

The course aims at educating the future Ph.D.'s so that they will enter the research world with an active role, within both universities and industries

RESEARCH AREAS

- Electronics instrumentation and electrical drives
- Computer systems and automatic control
- Telecommunications and electromagnetic fields

Position with Scholarship		
N°	*Funding entity*	*Research Topic, if any*
3	Scholarship funded by University of Parma (Ministerial funds)	

Position with Scholarship LINKED TO SPECIFIC TOPICS (art. 6 of the Competition notice)		
N°	*Funding entity*	*BOUND RESEARCH TOPIC*
1	Scholarship funded by Department of Engineering and Architecture (funds Project EmilAmbiente)	Study and development of data collection and analysis models for optimized management of water distribution networks
1	Scholarship funded by Department of Engineering and Architecture (funds Project KOSME)	Study and development of simulation methods for complex systems based on Artificial Intelligence (AI) techniques

1	Scholarship funded by Department of Engineering and Architecture	Study of path planning strategies for Autonomous Vechicles by means of imitation or reinforcement learning techniques
1	Scholarship partly financed with UNIVERSITY funds and co-financed by the Department of Engineering and Architecture	Study and development of IoT systems for data collection and analysis in smart agriculture applications
1	Scholarship partly financed with UNIVERSITY funds and co-financed by the Department of Engineering and Architecture	Artificial intelligence algorithms for optimal efficiency control of electric machines.
1	Scholaship funded by EMILIA ROMAGNA REGION (PR.FSE + 2021/2027 – DGR n. 2111 del 04/12/2023) - CUP D92J24000010002	Methods for knowledge verification and update in Large Language Models: towards a reliable and adaptable artificial intelligence
1	Scholarship co-financed with funds under the PNRR - Mission 4 component 2 (**Ministerial Decree 630/2024**) and co-financed by the Company Sygest S.r.l. CUP D92J24000370004	(Study of) innovative methodologies and experimental evaluation for efficient and robust recommender systems based on Machine Learning techniques. Main application will be to B2B after-sales services.
1	Scholarship co-financed with funds under the PNRR - Mission 4 component 2 (**Ministerial Decree 630/2024**) and co-financed by the Company things2i S.r.l. CUP D92J24000370004	Design and implementation of multi-interface IoT gateways with embedded intelligence
1	Scholarship co-financed with funds under the PNRR - Mission 4 component 2 (**Ministerial Decree 630/2024**) and co-financed by the Company Vislab S.r.l. CUP D92J24000370004	Study of techniques for sensor fusion using cameras, radars, or lidars exploiting AI for ADAS and Autonomous driving systems
1	Scholarship co-financed with funds under the PNRR - Mission 4 component 2 (**Ministerial Decree 630/2024**) and co-financed by the Company OCME S.r.l. CUP D92J24000370004	Development of algorithms for motion planning and coordination of a fleet of autonomous vehicles

POSITION RESERVED	
Reserved for **EMPLOYEES of Company "Crédit Agricole Group Solutions Scpa"** (with salary maintenance)	2
Reserved to **Holders of RESEARCH GRANT** within the Project MARIE SKLODOWSKA-CURIE ACTIONS – COFUND "Training Future Big Data Experts for Europe (**FutureData4EU**)"	2

ADMISSION PROCEDURES
Assessment of QUALIFICATIONS: up to 70 points (a minimum score of 40 points shall be required to be admitted to the Oral Exam) **ORAL EXAM:** up to 50 points **Minimum score for ELIGIBILITY**: 70/120

ORAL EXAM PROGRAM
THE ORAL EXAM TAKES IN THE PRESENCE and with the possibility of carrying out the interview **REMOTELY** for candidates residing abroad or temporarily abroad for study / work reasons. To this end, candidates must submit **a motivated REQUEST** as per the model attached to the competition announcement)
The ORAL test involves the presentation and discussion of the research project by the candidate and is aimed at verifying the candidate's aptitude for scientific research and his general preparation on topics related to the research topics of the doctoral course

Foreign Language the fluency of which shall be assessed during the Oral Exam	**ENGLISH**	The evaluation of the knowledge of this language will be oral and will consist of a brief interview on a technical topic (for example a translation of a scientific text).

SCHEDULE OF THE ADMISSION EXAMS		
ASSESSMENT OF QUALIFICATIONS		It is the candidate's responsibility to verify the outcome of the evaluation of qualifications, which can be consulted in their reserved area by connecting to the page http://unipr.esse3.cineca.it/Home.do in the days preceding the date of the Oral Exam
ORAL EXAM	**DATE**	4th September 2024 (with possible extension in the following days)
	TIME	10:00 am (Italian Time)
	PLACE	Department of Engineering and Architecture Scientific Engineering Headquarters Parco Area delle Scienze, 181/A – Campus Universitario 43124 PARMA - ITALY
FURTHER INFORMATION		**The choice of the Research Topic to be expressed in Annex A is not binding on the assignment of the research project, and it is intended to assess candidates skills during the admission exam.** The PhD research topic will be assigned by the Academic Board. **For foreign candidates all documents written in a language other than Italian will have to be translated into English, otherwise they will not be evaluated**
	THE INTERVIEW MAY BE HELD ALSO IN ENGLISH	For foreign candidates, the admission examinations may be held in English at the candidate's choice.

LIST OF QUALIFICATIONS TO BE SUBMITTED AND THEIR ASSESSMENT	
MANDATORY DOCUMENTS TO BE ATTACHED TO THE ON-LINE APPLICATION	
ANNEX A	(art. 3.2 of the Competition notice)
Identification Document	Scanned Copy of a valid identity document with photo (i.e. identity card, passport)
Curriculum Vitae et studiorum	No specific CV format is required (see art. 3.2 of the Competition notice)
Abstract of degree thesis	**Abstract of the second cycle master's degree thesis**. Undergraduate applicants must submit the draft of the thesis approved by their supervisor (abstract/draft of the thesis: 10.000 characters including spaces)

Academic Qualifications	**Certificates and academic transcript of records for both Bachelor' and Master' degrees** containing the following details for each degree held: (art. 3.2 of the Competition notice): University that granted the degree - Type of degree (first cycle/second cycle/single cycle) Name of the degree program - Date of graduation - Final mark - List of exams and corresponding scores (academic transcript of records) - Translation into Italian or English (only for degrees issued in languages other than Italian or English).
Research Project	Max 10.000 characters, written in English, it will have to focus on an original research topic and structured as follows: introduction of the problem in the scientific context, significance of the problem, expected results, argumentation. It does not represent a constraint with respect to the following choice of the doctoral thesis, that shall be defined together with the supervisor and approved by the Academic Board. However, this project must be prepared after having contacted and consulted one of the research groups related to the PhD course in Information Technologies (information on the research groups and their contacts can be found at https://dia.unipr.it/en/node/3080). **Failure to submit the project will result in exclusion from procedure for admission to the course.**

LIST OF EVALUABLE QUALIFICATIONS		
(only qualifications attested by a document drawn up in Italian or in English)		
Curriculum Vitae et studiorum	Evaluation of the marks of the exams and of the master's degree mark (if available). The candidate is required to provide the average of the marks of all the exams of the master's degree, in addition to the details of the same It will also be evaluated the congruence of the degree obtained with the PhD themes.	**Up to 25 points**
Graduation thesis	It will be evaluated the congruence of the Master's Degree thesis with the doctoral program research topics	**Up to 5 points**
Research Project	Points relating to the research project shall be allocated on the basis of the following criteria: o Scientific value and originality of the proposal: max 10 points o description and structure of the proposal: max 10 points o proposal feasibility: max 10 points	**Up to 30 points**
Scientific Publications	Articles on national and international journals, papers presented at conferences or symposia, book chapters etc. Evaluation of the editorial position of the publication and its impact on the scientific community on the basis of the available indicators. It will be evaluated only publications from the past five years.	**Up to 5 points**
Reference Letters	Maximum 1 letter from professors or researchers belonging to the Collegio Docenti (PhD board) of the PhD in Information Technologies, after a preliminary interview with them. It must be sent directly by the signer to the address e-mail: marco.locatelli@unipr.it (The candidate, therefore, must not upload them through the procedure of the competition online registration). Evaluation of the judgments reported in the reference letters.	**Up to 2 points**
Other experiences (training, work, research, teaching, etc.)	Duration evaluation (for scholarships and internships), score (for the GRE test), prestige (for awards)	**Up to 3 points**

EVALUATION ORAL EXAM		
Interview Program	**Evaluation CRITERIA**	**POINTS**
The ORAL EXAM includes the presentation of the research project and is intended to assess the suitability of the applicant to pursue scientific research as well as the general knowledge of issues connected to the PhD course	o knowledge of the foreign language: max 5 points o research project presentation: max 25 points o general knowledge of issues connected to the PhD course: max 20 points	**Up to 50 points**