

ANNEX "A"

PhD Programme in '*Methods, models and technologies for engineering*'

Department	'Maurizio Scarano' Department of Electrical and Information Engineering	
Coordinator:	Prof. Fabrizio Marignetti Tel. 0776-2993716 e-mail: marignetti@unicas.it	
Total number of positions available:	1	
Positions with scholarships	1	scholarship co-funded by the University and San Raffaele S.p.A. on the topic: " <i>Methodologies of postural control assessment through fine motor skill analysis in neurodegenerative diseases</i> ", curriculum C2: Information Engineering
Duration of the course:	3 years	

Curriculum	Research topics
Information Engineering	The Information Engineering curriculum aims to provide highly specialised training in Information and Communication Technology, enabling PhDs to operate in various application sectors and to manage and promote scientific and technological innovation. In particular, the curriculum provides specific skills in the different fields of information engineering aimed, for example, at the development of artificial intelligence techniques, machine learning and IoT, the design and development of telecommunications networks and radar systems, the control of industrial automation systems, industrial and service robots, the analysis of electromagnetic fields for the design of antennas, electromagnetic protection and characterisation, the design of sensor networks and the development of embedded systems.

Scholarship type	Research activities
Borsa finanziata da Ateneo e San Raffaele S.p.a. sulla tematica " <i>Methodologies of postural control assessment through fine motor skill analysis, in neurodegenerative diseases</i> "	<p>The proposed research activity aims to develop novel tools, based on Machine Learning and Deep Learning techniques, capable of supporting the early diagnosis of neurodegenerative diseases (NDs), such as Alzheimer's disease (AD) and Parkinson's disease (PD), and of predicting the progression of the clinical condition of patients affected by these diseases.</p> <p>The objective of the project is to test the hypothesis that the combined analysis of multiple biometric parameters, derived from heterogeneous data sources—ranging from speech and handwriting data to MRI imaging and movement analysis—may provide highly relevant diagnostic information prior to the onset of more evident symptoms.</p> <p>During the project, innovative Explainable Artificial Intelligence (XAI) procedures will be developed in order to identify the most relevant biometric markers for predicting the onset and progression of AD. Existing XAI approaches described in the literature will be used as a benchmark to evaluate the effectiveness of the newly proposed methodologies.</p>

Admission requirements:

The following master's/specialist degrees (in the case of foreign degrees, they must be equivalent to the degree classes listed)

LM-3 Landscape architecture

LM-4 Architecture and building-architecture engineering

LM-4 c.u. Architecture and building engineering-architecture (five-year)

LM-6 Biology

LM-7 Agricultural biotechnology

LM-8 Industrial biotechnology

LM-9 Medical, veterinary and pharmaceutical biotechnology

LM-10 Conservation of architectural and environmental heritage

LM-11 Conservation of cultural heritage

LM-12 Design

LM-13 Pharmacy and industrial pharmacy

LM-16 Finance

LM-17 Physics

LM-18 Computer science

LM-20 Aerospace and astronautical engineering

LM-21 Biomedical engineering

LM-22 Chemical engineering

LM-23 Civil engineering

LM-24 Building systems engineering

LM-25 Automation engineering

LM-26 Security engineering

LM-27 Telecommunications engineering

LM-28 Electrical engineering

LM-29 Electrical engineering

LM-30 Energy and nuclear engineering

LM-31 Management engineering

LM-32 Computer engineering

LM-33 Mechanical engineering

LM-34 Marine engineering

LM-35 Environmental and territorial engineering

LM-40 Mathematics

LM-41 Medicine and surgery

LM-42 Veterinary medicine

LM-43 Computer methodologies for the humanities

LM-44 Mathematical and physical modelling for engineering

LM-46 Dentistry and dental prosthetics

LM-47 Organisation and management of services for sport and motor activities

LM-48 Urban and environmental spatial planning

LM-51 Psychology

LM-53 Materials science and engineering

LM-54 Chemical sciences

LM-55 Cognitive sciences

LM-56 Economic sciences

LM-56 Economics

LM-57 Adult and continuing education sciences

LM-58 Sciences of the universe

LM-61 Human nutrition sciences

LM-63 Public administration sciences

LM-66 Computer security

LM-67 Sciences and techniques of preventive and adapted motor activities

LM-68 Sports sciences and techniques

LM-69 Agricultural sciences and technologies

LM-70 Food science and technology

LM-71 Industrial chemistry science and technology

LM-72 Navigation sciences and technologies

LM-73 Forest and environmental sciences and technologies

LM-74 Geological sciences and technologies
LM-75 Environmental and territorial sciences and technologies
LM-76 Economic sciences for the environment and culture
LM-77 Economic and business sciences
LM-79 Geophysical sciences
LM-80 Geographical sciences
LM-81 Development cooperation sciences
LM-82 Statistics
LM-83 Actuarial and financial statistics
LM-91 Techniques and methods for the information society
LM-93 Theories and methodologies of e-learning and media education
20/S (specialisation in physics)
23/S (specialisation in computer science)
25/S (specialisation in aerospace and astronautical engineering)
26/S (specialisation in biomedical engineering)
27/S (specialisation in chemical engineering)
28/S (specialisation in civil engineering)
29/S (specialisation in automation engineering)
30/S (specialisation in telecommunications engineering)
31/S (specialisation in electrical engineering)
32/S (specialisation in electrical engineering)
33/S (specialisation in energy and nuclear engineering)
34/S (specialisation in management engineering)
35/S (specialisation in computer engineering)
36/S (specialisation in mechanical engineering) 37/S (specialisation in naval engineering)
38/S (specialisation in environmental and territorial engineering)
45/S (specialisation in mathematics)
76/S (specialisation in science and techniques of preventive and adaptive motor activities)
The following degrees are only eligible for access to curriculum 5) Environments and technologies for motor activity and health:
LM-51-Psychology
LM-55-Cognitive sciences
LM-67-Sciences and techniques of motor and adapted activities
LM-68-Sports sciences and techniques
76/S (specialisation in motor and adaptive activity sciences and techniques)

Mandatory documentation to be attached to the application

The candidate must submit the following documents electronically

- curriculum vitae (to be drawn up according to the format attached to the competition notice and available on the University website: Annex "B")
- appropriate certification or self-certification of the marks obtained in the profit examinations throughout the university course of study, including the marks obtained in the first and second degree examinations or in the old degree examination or equivalent qualifications for foreign candidates;
- research project (to be drawn up according to the outline attached to the competition notice and available on the University website: Annex "C")
- reference letters (no fewer than 2 and no more than 4).

Further assessable qualifications

Further evaluable titles are:

any publications (maximum number of 5).

Selection procedure

The admission examination consists of a pre-selection and an oral test.

The pre-selection consists of the evaluation of the following elements:

- curriculum vitae;
- any publications (maximum number of five);
- any other scientific titles (titles considered helpful for the evaluation of the curriculum including, obligatorily, adequate certification of the marks obtained in the profit examinations throughout the university course of study, including the marks obtained in the first and second level degree examinations or the old degree examination or equivalent titles for foreign candidates);
- research project;
- cover letters (no fewer than two and no more than 4).

The oral test aims to ascertain the candidate's propensity to conduct research in one of the disciplinary fields of reference of the PhD course and knowledge of the English language. The oral test may be conducted electronically, at the candidate's request, in the presence of adequate justification, including the candidate's residence in a foreign country. The applicant must indicate the chosen mode in the application for the competition.

It is also possible to take the test in English, provided that you explicitly request this when submitting your application. Candidates must indicate in their application an e-mail address to which they want to be notified of the outcome of the assessment of their qualifications and, for those who have opted for the oral test by telematic means, the information on how the test will be conducted.

Scholars from foreign countries or specific international mobility programmes, including holders of research grants financed by the European Union or other European or international scientific institutions, are admitted to the doctorate after an evaluation of the qualifications submitted and an interview aimed at ascertaining the candidate's preparation, ability and aptitude for research, as well as their knowledge of Italian and/or English. The selection board will draw the appropriate minutes and a separate merit list.

Evaluation criteria:

The pre-selection score from 0 to 60 points will be awarded by taking into account the following aspects:

1. Curriculum, marks obtained in university studies and any other scientific qualifications (0 to 25 points);
2. Publications, a maximum number of 5 (0 to 5 points);
3. Research project (0 to 25 points);
4. Letters of presentation (0 to 5 points).

For admission to the oral test, the candidate must have passed the pre-selection test with a score of no less than 40/60.

The oral examination will be marked out of 60 points, obtained by taking into consideration the following aspects

1. The candidate's aptitude for carrying out research activities, including independently (0 to 20 points);
2. Propriety of language (0 to 20 points);
3. Ability to analyse and synthesise (0 to 20 points).

Knowledge of the English language is required and will be subject to verification. The minimum mark for passing the oral test is 40/60.

The merit ranking is determined by the sum of the marks obtained during the pre-selection and the oral test.

Examination topics

The subjects of the examination belong to the degrees that constitute entry qualifications and to the research activities planned within the scholarship.

Examination location

Engineering Education Area - Sala del Consiglio (Board Room) – Via G. Di Biasio, 43 – Cassino, 2nd floor

Examination schedule

Publication date of pre-selection result	7 May 2026
Oral examination date	13 May 2026
Publication of ranking lists	18 May 2026

The results of the tests and the ranking list will be published on:

<https://www.unicas.it/ateneo/bandi-di-concorso/bando-aggiuntivo-dottorato-di-ricerca-aa-20252026-xli-ciclo/>

Information about didactic activities

<https://www.unicas.it/dottorato/elenco-dottorati-di-ricerca/corso-di-dottorato-in-metodi-modelli-e-tecnologie-per-l-ingegneria/>