



UNIVERSITÀ DEGLI STUDI DI TRIESTE

Rettorato e Direzione Generale
Sezione Ricerca e Dottorati
Ripartizione Dottorati

LAST REVISED 23 gennaio 2014

DOCTORAL PROGRAMME IN ENGINEERING AND ARCHITECTURE

NOTE: This attachment provides only partial information. Exhaustive information, including how to register for the selection, is published in the Admission Announcement posted in the web page <http://www2.units.it/dottorati/> >> Admission Announcement.

Deadline for online application

16th September 2013 h.11:30 a.m. CET

GENERAL DESCRIPTION

SUBJECT AREA:

- main area: 09
- other areas: 08

MACRO RESEARCH FIELDS:

- main area: 09/A
- other areas: 08/A; 08/B; 08/D; 08/E; 08/F; 09/B; 09/C; 09/D; 09/E; 09/F; 09/G; 09/H; 07/A; 08/C

SCIENTIFIC DISCIPLINARY SECTOR:

- main area: ING-IND/08
- other areas: AGR/01; GEO/10; GEO/11; ICAR/01; ICAR/02; ICAR/04; ICAR/05; ICAR/06; ICAR/07; ICAR/08; ICAR/09; ICAR/10; ICAR/14; ICAR/17; ICAR/19; ICAR/21; ICAR/22; MAT/09; ING-INF/05; ING-INF/03; ING-INF/01; ING-INF/06; ING-INF/07; ING-INF/04; ING-INF/02; ING-IND/02; ING-IND/14; ING-IND/15; ING-IND/17; ING-IND/13; ING-IND/16; ING-IND/09; ING-IND/01; ING-IND/11; ING-IND/10; ING-IND/32

DOMAIN EUROPEAN RESEARCH COUNCIL:

- PE

ERC PANELS:

- main area: PE7
- PE6; PE8; PE10; PE1

Information on the codes can be found online at the address: <http://www.units.it> >> Research >> Doctorates >> Admission >> Admission Announcement and relative attachments - Board of Examiners - Eligible Candidates/Merit list

CURRICULUM: Architecture

Research fields:

1. study and design of the city, territory and landscape
2. methods and forms of architectural and spatial, landscape planning and design
3. forms and techniques of architectural restoration project
4. representation and communication of project
5. enhancement of the environment and its resources,

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6. history and theory of architecture, urban and territory

CURRICULUM: Civil engineering

Research fields:

1. structural design
2. functional and architectonic design
3. design and management of infrastructure and transport systems
4. environmental engineering and earth resources
5. geomatics

CURRICULUM: Information engineering

Research fields:

1. automation
2. electronic bioengineering and Informatics
3. electromagnetic fields
4. signal and image processing
5. informatics
6. measures and electronic instruments
7. operational research
8. telecommunication
9. converters, machines and electric drives

CURRICULUM: Mechanical engineering, naval architecture, energy and production

Research fields:

1. design and optimization of fluid machines and power plants
2. rational use of energy in civil and industrial fields
3. inverse problems and functional and shape optimization in heat transfer
4. design, synthesis and mechanical construction
5. theoretical and experimental methodologies for the analysis and design of ships and ocean structures
6. product development, process modeling and optimization, design, management and logistics of industrial plants

LOCATION: Trieste

- ORGANIZING DEPARTMENT: Dip. di Ingegneria e Architettura

NON-ACCREDITED PARTICIPATING INSTITUTIONS:

- Hochschule Ostwestfalen-Lippe – University of Applied Sciences (Germania)
- Universidad Católica Santo Toribio De Mogrovejo (Perù)
- Osaka University – Department of Naval Architecture and Ocean Engineering (Giappone)

DURATION: 3 years

MAXIMUM NUMBER OF MONTHS TO BE SPENT ABROAD IN THREE YEARS: 6

OFFICIAL LANGUAGE: italian

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ADMISSION INFORMATION

TOTAL NUMBER OF PLACES AVAILABLE: 37

Amended on 11/11/2013: number of places available has been raised from 24 to 37

- RESERVED PLACES 2

- [cod R/2] scholarships funded by foreign Countries 1

- [cod R/3] scholarships funded by international mobility programmes 1

SCHOLARSHIPS AVAILABLE WITH INDICATION OF FUNDING BODY:

- [cod GD/1] Dipartimento di Ingegneria e Architettura funded by Electrolux + MIUR
"Progetto Giovani Ricercatori" (Project title "*Multidisciplinary research and development on new measurement methods, devices and instrumentations devoted to sensors network able to infer the heterogeneous and polydisperse systems status*").....1

- [cod GD/2] Dipartimento di Ingegneria e Architettura funded by Electrolux + MIUR
"Progetto Giovani Ricercatori" (Project title "*Development of wireless networks adopting high capacity multi-packet protocols and multiple antenna systems, for heterogeneous, asynchronous, redundant systems, such as the autonomous sensor platforms (Internet of Things)*")1

- [cod D/3] Dipartimento di Ingegneria e Architettura funded by NAVALPROGETTI srl
(Project title "*Propulsion systems with low environmental impact*").....1

- [cod D/4] Dipartimento di Ingegneria e Architettura funded by CNR - INSEAN
(Project title "*Intermediate and long term wave and ship motion prediction in complex sea-states*" in the framework of research activities at CNR-INSEAN in the field of numerical and experimental methods for propagation of water waves and for short, medium and long term prediction of ship motions)1

- [cod MD/5] Università degli Studi di Trieste + Dipartimento di Ingegneria e Architettura (Project title "*Study of the Health Technology Assessment and Risk Management procedures*").....1

- [cod D/6] Dipartimento di Ingegneria e Architettura (Project title "*Clinical Engineering: integration tools between Medical Devices and ICT*").....1

- [cod FSE/D/7] Università degli Studi di Trieste funded by the Region Friuli Venezia Giulia, with resources provided by the European Social Fund, Operational Programme 2007/13, Axis 5 Transnational and Interregional Cooperation+ Dipartimento di Ingegneria e Architettura (Project title "*Seismic design of timber constructions*")1

- [cod G/8] MIUR "Progetto Giovani Ricercatori" (Project title "*Ship and aircraft design and building with high ability to penetrate foreign markets*")1

- [cod G/9] MIUR "Progetto Giovani Ricercatori" (Project title "*Energy saving and distributed generation*")1

- [cod D/10] Dipartimento di Ingegneria e Architettura funded by INFN (Project title "*Innovative solutions for silicon drift detectors for third and fourth generation synchrotron light source*")1

- [cod D/11] Dipartimento di Ingegneria e Architettura funded by Elettra Sincrotrone Trieste S.C.p.A. (Project title "*Optimization of the features of the free electrons*")

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- laser FERMI @Elettra by means of advanced algorithms*).....1
- [cod D/12] Dipartimento di Ingegneria e Architettura funded by Elettra Sincrotrone Trieste S.C.p.A. (Project title “*Search of an innovative system for detecting the position of the beam of charges in light sources of third and fourth generation*”).....1
 - [cod D/13] Dipartimento di Ingegneria e Architettura (Project title “*Advanced engineering and seismological analysis for the evaluation of seismic vulnerability*”)1
 - [cod D/14] Dipartimento di Ingegneria e Architettura (Project title “*Techniques for Automatic Generation of Text Extraction Patterns from Examples*”).....1
ADDED on 12/12/2013: scholarship [cod D/14]
 - [cod D/15] Dipartimento di Ingegneria e Architettura (Project title: “*Analysis and development of models and methods for the management of complex systems in the fields of logistics, transportation and health, with special reference to: Pilot Applications post Directive 2010/65 in Italian port realities of the Suite MIELE to support the Authority to optimize the interoperability in the intermodality of city-port flows (ASMARA), Smart Cities and Communities and Social Innovation, Decreto Direttoriale 5 luglio 2012 n. 391/Ric., Ministero dell’Istruzione, Università e Ricerca, and “COoperative loGISTICS for Sustainable Mobility of Goods (CO-GISTICS)” 7th FP European Union*”).....1
ADDED on 14/01/2014: scholarship [cod D/15]

Candidates who accept an earmarked scholarship are committed to the pre-assigned topic.

PLACES WITH JOINT SUPERVISION OF THESIS: students from foreign universities may be admitted to the Ph.D. programme with a joint supervision of their thesis

ACADEMIC QUALIFICATION REQUIRED: see Announcement (art. 2 - Requirements)

1. Italian Master’s Degree “Laurea Specialistica/Magistrale” or Degree awarded prior to approval of Ministerial Decree D.M. n. 509 of 3 Novembre 1999, updated with D.M. n. 270 of 22 October 2004, n. 270, (or a qualification corresponding to a Master’s -second level- degree);
2. an equivalent foreign academic qualification awarded abroad
3. an academic qualification awarded abroad which is considered to be equivalent to the Italian degree that allows the holder to undertake Ph.D. studies for duration, level and area of study

DEADLINE FOR COMPLETION OF DEGREE: **31.10.2013**

ASSESSMENT CRITERIA: qualifications + interview (upon request from the candidate, the interview may be carried out through videoconference – art. 6.1 bis of Announcement) **LAST UPDATED ON 20.08.2013!**

-- MAXIMUM FINAL SCORE (the final score is based on the sum total of marks obtained in the interview plus the points given for qualifications and publications): 100/100

MINIMUM FINAL SCORE REQUIRED:.....70/100

- MAXIMUM NUMBER OF POINTS AWARDED FOR QUALIFICATIONS+PUBLICATIONS:30/30

WEIGHTING OF THE QUALIFICATIONS:

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- "Integration to application" (unless this form is presented, qualifications and publications CANNOT be assessed by the Examining Board):

a detailed curriculum vitae et studiorum: 10/30

b. full copy or abstract of the MA thesis in Italian or English (Italian MA theses may be from "Laurea vecchio ordinamento" or "Laurea specialistica/magistrale")::
12/30

c. publications (if foreseen): 8/30

MINIMUM SCORE REQUIRED FOR QUALIFICATIONS/PUBLICATIONS:no

- ORAL EXAMINATION MARK OUT OF:70/70

MINIMUM SCORE REQUIRED FOR INTERVIEW:49/70

EUROPEAN SOCIAL FUND SCHOLARSHIPS:

For successful candidates who scored a minimum of 70/100 at the admission examination a separate list will be created only for ESF scholarship allocation

- MAXIMUM NUMBER OF POINTS AWARDED FOR PROJECT40/40

The evaluation of the project takes into account:

1.consistency with the PhD topics;

2.originality and scientific value;

3.clarity of the objectives;

4.reachability of the objectives in the three-year doctoral program;

5 labour market relevance of the skills acquired by the candidate in the development of the project.

DEADLINE FOR SUBMITTING QUALIFICATIONS AND PUBLICATIONS AND PROJECT (IF FORESEEN):

**NEW DEADLINE 14.10.2013
(UPDATED ON 20.09.2013)**

QUALIFICATIONS AND PUBLICATIONS MAY BE SUBMITTED (art. 5.1.4 of the Ph.D. Announcement):

- as an attachment to the online admission application (upload)

- only for publications that are voluminous or not available in electronic format, as long as they are listed in the form "Integration to application" (digital format preferable):

- by email to: segreteria@dicar.units.it

or

- by mail or by hand to the Administrative Office del Dipartimento di Ingegneria e Architettura, Università di Trieste, building C8, via A.Valerio 6/1- 34127 TRIESTE.

EXAMINATION SCHEDULE:

- INTERVIEW: **23.10.2013 from 10.00 am (CET)**, at the library of "ex Istituto Strade e Trasporti" – Building C8 – via A. Valerio 6/1 – TRIESTE **from 9 am to 1 pm**

Office Hours UPDATED ON 20.09.2013

Upon request from the candidate, the interview may be carried out through videoconference, with the same schedule

ALTERNATIVE LANGUAGE TO ITALIAN FOR THE INTERVIEW: english (CEFR

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LEVEL B2)

GENERAL INFORMATION

LAST UPDATED ON 23.09.2013!

CHAIR: Prof. Diego Micheli - Dipartimento di Ingegneria e Architettura - Università degli Studi di Trieste - tel. 040/5583809, e-mail: micheli@units.it
VICE: Prof. Claudio AMADIO – Dipartimento di Ingegneria e Architettura - Università degli Studi di Trieste - tel. 040/558.3833 e-mail amadio@univ.trieste.it

WEB SITE: <http://www.dicar.units.it/dottingarc/>

EDUCATIONAL AIMS: The PhD course in Engineering and Architecture is finalized to the formation of researchers with a high scientific preparation and a culture oriented towards the engineering and architecture applications in the sectors of competence, able to conceive and to develop knowledge and innovative methodologies of investigation and design and to develop, with technical-scientific and managerial competences, a highly qualified research activity in public or private bodies.

The Doctors formed by the course will develop their professional activity in the sectors defined by the official research themes of the curricula in which it is organized.

With reference to the curriculum in Architecture, the activities of the students will be devoted to the study and design of the contemporary city and territory, pursuing a multidisciplinary and integrated approach in a substantial framework of verifying the environmental sustainability of the interventions of transformation. Specifically, the research topics will be related to:

- the existing city and architecture: approaches, tools, processes that planning and architectural design can adopt to face, in an innovative way, the renewal of the assets of single parts composing urban territories (social housing districts, open spaces and terrains vagues, disused areas, rural areas and unbuilt spaces that spread in-between settlements);
- theories, techniques, technologies, tools and procedures that can direct the renewal, reuse and “recycling” of buildings for living and producing towards new assets, ecological and environmental performances;
- the re-signification of contemporary landscapes: ways to interpret and enhance landscape areas and resources that elude criteria of exceptionality; places that, being near to dispersed living spaces and able to activate new – slow and local development processes, spur the project to draw innovative tools for the interpretation and design of transformations;
- the adjustment of infrastructural framework: sustainable accessibility and mobility can be interpreted as generators of projects aimed to reorganize into a hierarchy, redesign, complete infrastructural texture and to interact, in a fertile and innovative way, both with the rearrangement of existing settlement situations, and with the enhancement of crossed landscapes.

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With reference to the curriculum in Civil Engineering, the activities of the students will cover different research themes. In particular, in the field of structural engineering, researches are developed on calculation of steel, reinforced concrete and wood structures both in static and dynamic conditions. Particular attention is paid to the study of seismic vulnerability and mitigation of existing structures, in addition to the advanced seismic design of new structures. In the design and management of infrastructure and transportation systems are addressed first the issues of geometric and physical characteristics, with particular reference to the effects on road safety. Furthermore are deepened methods for planning the transportation systems, with particular reference to road and rail, and for their technical and economic evaluation. Within the environment and earth resources engineering, researches are detailed on methods and techniques for subsoil characterization, new raw materials and energy sources research and exploitation and their sustainable management in different geological and environmental contexts. Particular attention is devoted to surface and ground water resources management, vulnerability and rehabilitation of polluted water bodies from urban and industrial activities. Finally, specific aspects are examined, such as natural risk prevention and protection (hydrological, geological, seismological and volcanic) and security for large civil settlements. In the geomatics field the research activities are relative to GNSS surveying technologies applications to environmental monitoring, terrestrial and aerial real time navigation and integrated GIS (Geographic Information Systems). These research topics are addressed in an integrated approach, with particular emphasis on user safety, operational efficiency and economic and environmental sustainability.

With reference to the curriculum in Information Engineering, the cultural area includes the following typical sectors: electromagnetic fields, telecommunications, information processing systems, automation, electronics, bioengineering, operational research, electrical and electronic measurements, and finally converters, machines and electric drives. Each of these cultural sectors presents not only purely methodological aspects, but also particular characteristics and various applications, and offers very wide formative approaches, from the scientific point of view. Indeed, the related research themes cover, in an interaction perspective, the most important and investigated subjects of interest for the above mentioned scientific sectors, going from the automatic controls to the modern problems of bio-engineering, such as, for example, the (possibly remote) managing of the data of the patients of an hospital, to the advanced applications of the informatics, for example that of security in the internet network, to the electronics, signal and image processing, to the modern applications of the operational research, to the design of electric machines, to the development of sophisticated electrical and electronic measurement techniques, to the study of telecommunication networks, and to the electromagnetic design of antennas, to the electromagnetic scattering, to the microwave measurements,

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and finally to the analysis of the interaction between electromagnetic fields and relativistic electrons.

With reference to the curriculum in Mechanical Engineering, Naval Architecture, Energy and Production Engineering, the activity of the PhD students will concern the fields of the thermo and fluid dynamics of machines, of the transmission of heat, of the advanced systems for energy, energy savings in buildings, of the design, construction and control of mechanical systems (with particular reference to the structural and dynamic aspects and to the fatigue damage of materials and biomaterials), of naval architecture and ocean engineering, of the mechanical plants (with particular reference to concurrent and reverse engineering, lean manufacturing and the environmental impact of the industrial plants).

The research activity "at home" will be developed in dedicated laboratories which have consolidated scientific collaborations with universities and research bodies at national and international level. At the same time they have agreements for industrial research and regulations development with regional, national and European industries operating in advanced technology sectors. The following collaborations can be quoted as an example: Area Science Park, SISSA, INSEAN, CETENA, SAIPEM, Fincantieri, Dassault and INRIA Sophia Antipolis, EADS, Penn University & Virginia Tech, Sendai & Osaka Universities, Chalmers University of Technology. The PhD students can avail themselves of a period of formation in a foreign country in centers of excellence like the VKI of Bruxelles or the EPFL in Lausanne.

Important peculiarities of the proposed curriculum is the offer of third level formation in the sectors of naval architecture, ship construction and plants and the wide offer of themes on energy, close to the environmental thematic treated in another curriculum of the course. Another specificity of the proposed curriculum will be the collaboration with the Doctorate in Science of Environmental and Energy Engineering of the University of Udine. This collaboration derives from previous participation of some professors of mechanical engineering of the University of Trieste, as coordinated University, uninterruptedly since the XII cycle.

As a whole, the activities of the PhD students will be oriented to the advanced design, theoretical analysis, soft-computing and experimentation. The first year of the formative project includes the participation to courses or lectures on basic scientific subjects and organizational aspects of the scientific search. These courses will be integrated by other courses belonging to postgraduate (Laurea Magistrale) studies, selected in base to the needs and weaknesses identified in the individual initial preparation, also taking into account the specificities of the selected research themes.

During the first year an analysis of the state of the art will be carried out in the discipline of interest, and the main theme of study will be identified. The second and third year will be devoted to the development of the individual themes of

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research, and in this frame it will be proposed to the student, preferably during the second year, a period of permanence in a research body of international relevance specialized in the selected sector.

Important common features to the scientific formation that the course intends to transmit to the PhD students are an open and multidisciplinary approach to the problems of engineering and architecture. Particular attention will also be devoted to the interaction with the territory, industrial and professional productive world and the theoretical-experimental approach as qualifying aspects of the advanced research.

The whole scientific project will be therefore oriented to the valorization of the abilities and individual professionalism of the PhD students, with whom the School assumes a precise responsibility of addressing and collocation of the given formation in the international job market. The correspondence of the planned activities to the obtainment of such objective will be carefully evaluated during the planned meetings of the body of teachers.

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