



UNIVERSITÀ  
DEGLI STUDI  
FIRENZE

## DOCTORAL PROGRAMME IN INDUSTRIAL ENGINEERING

Coordinator prof. Giampaolo Manfrida

<b>TECHNOLOGICAL AREA</b>	
<b>ADMINISTRATIVE OFFICE</b>	Department of Industrial Engineering Florence (DIEF)
<b>CURRICULA</b>	<ol style="list-style-type: none"><li>1. Energy and Innovative Industrial&amp;Environmental Technologies</li><li>2. Design and development of Industrial Products and Processes</li><li>3. Industrial Engineering and Reliability</li><li>4. Science and Engineering of Materials</li></ol>
<b>POSITIONS AVAILABLE: 18</b> Positions with scholarship: 14 Positions without Scholarship: 4	
<b>Scholarships: 14</b>	<p>5 – University of Florence 7 – Department of Industrial Engineering Florence (DIEF) 1 – co-financed University of Florence and Department of Industrial Engineering Florence (DIEF) 1 – co-financed Consorzio Interuniversitario Nazionale per la Scienza e Tecnologia dei Materiali (INSTM) and Department of Industrial Engineering Florence (DIEF) – Subject: “Nano-structured magnetic materials: development and applications”</p>
<b>RESERVED POSITIONS</b>	NO
<b>STUDY/RESEARCH PERIODS ABROAD</b>	YES – only positions with scholarship
<b>MANDATORY PERIOD REQUIRED</b>	3 months
<b>DOCUMENTS TO BE ENCLOSED WITH THE APPLICATION</b>	<p><b>MANDATORY DOCUMENTS</b></p> <ul style="list-style-type: none"><li>• Copy of Identification Document (Passport, valid international ID card)</li><li>• Title of the MSc degree Thesis subscribed with the <a href="#">Replacement Declaration Form</a></li><li>• Curriculum Vitae</li><li>• Research project</li></ul> <p><b>OPTIONAL DOCUMENTS</b></p> <ul style="list-style-type: none"><li>• any additional qualification documents, scientific publications, Abstract of the MSc degree Thesis</li></ul>
<b>REFERENCE LETTERS</b>	A section is provided in the online application to specify the e-mail addresses of two professors/researchers willing to provide information about candidates training path and activities performed within a scientific field related to the Ph.D. course.

<b>RESEARCH PROJECT</b>	The <b>research project</b> must be written in Italian or English in NO MORE than 12,000 characters including spacing, abstract, introduction and references The project must be related, and should make specific reference, to one of the proposed work subjects listed in the below section <b>“Thematics”</b> .																		
<b>MODALTY OF EVALUATION</b>	<ul style="list-style-type: none"> <li>• <b>Evaluation of curriculum vitae</b>, research project, publications and /or other qualification documents</li> <li>• <b>Interview</b> as detailed in the section below <b>“Evaluation Marks”</b></li> </ul>																		
<b>OTHER LANGUAGES FOR THE INTERVIEW</b>	English																		
<b>SKYPE INTERVIEW</b>	<b>YES</b> – Possible for foreign residents only																		
<b>EVALUATION MARKS</b>	<table border="1" data-bbox="483 772 1437 1160"> <thead> <tr> <th data-bbox="483 772 1094 862">parameter</th> <th data-bbox="1094 772 1265 862">minimum score</th> <th data-bbox="1265 772 1437 862">maximum score</th> </tr> </thead> <tbody> <tr> <td data-bbox="483 862 1094 936">Curriculum vitae; publications, other qualification documents</td> <td data-bbox="1094 862 1265 936">12/120</td> <td data-bbox="1265 862 1437 936">18/120</td> </tr> <tr> <td data-bbox="483 936 1094 972">Evaluation of the research project</td> <td data-bbox="1094 936 1265 972">28/120</td> <td data-bbox="1265 936 1437 972">42/120</td> </tr> <tr> <td colspan="3" data-bbox="483 972 1437 1046"><b>Applicants who obtain at least 40/120 marks in the evaluation of the above parameters will be admitted to the interview.</b></td> </tr> <tr> <td data-bbox="483 1046 1094 1120">Interview: discussion of the project and publications (if any)</td> <td data-bbox="1094 1046 1265 1120">40/120</td> <td data-bbox="1265 1046 1437 1120">60/120</td> </tr> <tr> <td colspan="3" data-bbox="483 1120 1437 1160"><b>Eligibility is achieved with a minimum score of 80/120</b></td> </tr> </tbody> </table>	parameter	minimum score	maximum score	Curriculum vitae; publications, other qualification documents	12/120	18/120	Evaluation of the research project	28/120	42/120	<b>Applicants who obtain at least 40/120 marks in the evaluation of the above parameters will be admitted to the interview.</b>			Interview: discussion of the project and publications (if any)	40/120	60/120	<b>Eligibility is achieved with a minimum score of 80/120</b>		
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<b>FURTHER INFORMATION ON THE EVALUATION PROCESS</b>	If the minimum score is not reached for either CV or research project (see box above), the candidate will not be admitted to interview.																		
<b>THEMATICS</b>	<ul style="list-style-type: none"> <li>- Development and integration of multidisciplinary numerical methodologies for the aero-thermal and mechanical design of aero-engine combustors</li> <li>- Numerical modeling of the combustion process in industrial and aeronautical gas turbines to develop combustor innovative concepts to limit polluting emissions, with particular reference to the problems affecting lean flame based systems such as thermo-acoustic instability and the Lean Blow Out</li> <li>- Fluid dynamics analysis and advanced design of cryogenic turbine and pump components for rocket engine applications</li> <li>- Fluid dynamics analysis and performance prediction in cryogenic turbopumps for space applications with particular emphasis on cavitating flows</li> <li>- Fluid Dynamics Analysis of natural gas distribution networks</li> <li>- Innovative solutions for Energy storage for conversion and direct use, including smart integration in energy distribution grids</li> <li>- RAMS models and experimental analysis for complex systems</li> <li>- Development of decision-making algorithms for self-driving vehicles</li> <li>- Development of systems and methods based on Reverse Engineering and Additive - Manufacturing for personalized medicine</li> <li>- Creation of a perfusion system to maintain the life of organs</li> <li>- Modeling and optimization of machining processes</li> </ul>																		

	<ul style="list-style-type: none"> <li>- Development of passive safety solutions for motorcyclists</li> <li>GNC (Guidance, Navigation and Control) systems for mobile robotics</li> <li>- Study of the interaction among motorcycles and autonomous vehicles</li> <li>- Nano-structured magnetic materials: development and applications</li> <li>- Development and integration of advanced numerical models for the study of heat transfer and cooling in high-temperature turbomachinery components</li> <li>- Development of diagnostic systems for the study of fuel spray processes in high efficiency, low polluting combustors</li> <li>- Experimental survey on high temperature components of thermal engines: innovative measuring systems and applications linked to the introduction of new additive manufacturing techniques</li> <li>- Reliability analysis, availability and maintainability optimization for railway applications</li> <li>- Methods and tools to support the implementation of lean projects in healthcare</li> <li>Servitization of manufacturing companies: the role of digital twins of products and processes</li> <li>- The role of digital twins of logistic plants. Use of simulation models for "plug and produce"</li> <li>- Development of test-rigs for turbomachinery applications</li> <li>- Development of thermo-elastic models for turbomachinery components</li> <li>- Integration of solutions for electricity networks with intermittent, variable and non-programmable renewable sources, in order to improve production/load balance and store energy ; specific reference to hybrid systems with biomass</li> <li>- Innovative working fluids having good environmental compatibility; property modeling and effects on performance (direct and inverse cycles) considering also lubricating oil effects.</li> <li>- Development of energy systems and components exploiting concentrated solar energy</li> <li>- Analysis, design and verification of Electromagnetic Compatibility (EMC) test methods for automotive industry subject to metrological control and quality assurance of test results</li> <li>- Overview, analysis and design of Signal-Power Integrity (SIPI) and Electromagnetic - Compatibility (EMC) methodologies for Advanced Driver Assistance Systems (ADAS) technologies in the automotive industry</li> </ul>
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Further information available at the following web page:

<https://www.dief.unifi.it/vp-344-dottorato.html>

### EXAMINATIONS SCHEDULE

	DATE	TIME	PLACE
<b>INTERVIEW</b>	24 September 2018	9:00 a.m.	Department of Information Engineering (DINFO) Via Santa Marta,3 - Florence Meeting Room

The list of candidates admitted to the interview and the final ranking will be published at the following webpage: <https://www.unifi.it/p11361.html>