



**Operational Program European Social Fund - Regione Liguria 2014-2020
ASSE 3 "Education and training"**



**UNIVERSITÀ DEGLI STUDI
DI GENOVA**

UNIVERSITÀ DEGLI STUDI DI GENOVA

EXCERPT OF INFORMATION SHEET CIVIL, CHEMICAL AND ENVIRONMENTAL ENGINEERING	
GENERAL INFORMATION STRUCTURE OF THE TRAINING PROJECT	
DURATION AND ORGANIZATION OF THE COURSE	<p>The course starts officially on 1 of November 2018 and lasts three years. 1. At the end of each year, doctoral students shall present the Teaching Body with a detailed written account of the activities carried out. The Teaching Body may ask for the account to be discussed according to procedures it has established.</p> <p>Coordinator of the course: Prof. Guido Busca; E-mail address: Guido.Busca@unige.it Department coordinating for research: Department of Civil, Chemical and Environmental Engineering (Dipartimento di Ingegneria civile, chimica e ambientale – DICCA).</p>
TRAINING PROJECT	<p>The following 2 projects/scholarships are activated:</p> <p>Curriculum WIND SCIENCE AND ENGINEERING (CODICE 7298)</p> <p><u>Progetto/borsa 1: The safe management of mooring systems for large ships under strong wind conditions.</u></p> <p><i>Months abroad:</i> 6</p> <p><i>In cooperation with:</i></p> <ul style="list-style-type: none">- Centro per gli Studi di Tecnica Navale CETENA S.p.A.- Gruppo Antichi Ormeggiatori del porto di Genova S.c.r.l.- Voltri Terminal Europa SpA- Distretto Ligure delle Tecnologie Marine (DLTM) <p><i>Project/scholarship details:</i> Because of the increasing dimensions of modern naval units, called naval gigantism, the wind actions on ships is becoming more and more important but, at the same time, difficult to quantify. Wind influences, on the one hand, the maneuvers of ships in port and, on the other hand, the design and management of mooring systems. The wind actions on the ship depend on the its dimensions as well as on the climatology of the area and the degree of exposure of the dock, and they may vary greatly from port to port, from one</p>

quay to another within the same port, or even from point to point along the quay. At present, the construction of the mooring and the management of the ship at the dock are mostly entrusted to the experience of operators and pilots. However, accidents frequently occur due to the breakage of mooring clamps, which can lead to risk situations, as well as to significant economic damage. Therefore, the port community really needs to define operational protocols by means of which evaluate the wind loading conditions on ships as well as to have practitioners able to perform such evaluations.

The main objective of the proposed project is the evaluation of the loading conditions that affect large ships at berth with respect to wind actions, in order to be able to define on a scientific basis the safer conditions for mooring and unmooring. The research program will focus on the interpretation and prediction of the wind evolution in an operational context, using both numerical prediction models to forecast strong wind events and their critical conditions, and aerodynamic and structural models to evaluate the effects of wind on ships and the loads on the mooring system due to the wind, finalised to carry out hazard analysis and risk assessment. An operative protocol will be proposed made up of codified and shared procedures based on advanced technologies that is able to guarantee the safe operational management of the moorings of the port terminals. The Port of Genoa will be the case study on which the operating protocol will be based on and exported to other port contexts. This protocol will be tested simultaneously at several port terminals related to the transport of goods, people and shipbuilding.

The PhD student will develop his research activities both at the University of Genoa (24 months), at the facilities of CETENA SpA in Genoa, (6 months), and through internships abroad (6 months). The terminals and port operators involved in the PhD programme will provide their equipment and their experience for the field experimentation of the aforementioned models and will support the research structures in the definition of procedural standards and management

Curriculum CHEMICAL ENGINEERING, MATERIALS AND PROCESSES (CODICE 7297):

Progetto/borsa 2: Novel products for multilayer coating cycles used as smart strategy to increase energy efficiency and environmental sustainability of buildings: formulation, development and simulation models.

Months abroad: 6

In cooperation with:

- Boero Bartolomeo SpA
- Polo Energia Ambiente e Sviluppo Sostenibile (EASS)

Project/scholarship details:

Aim of the project is to develop and optimise building products able to produce energy savings related to thermal insulation and improvement of protective action against water and degrading chemical agents.

The project is based on two main criteria: (1) energy savings can be obtained by isolating the building envelope, (2) energy savings can be obtained by using building materials characterised by high resistance to the degradation produced by physico-chemical action of water and pollutants. In this case, the increased durability of the materials produces the reduction of maintenance interventions and material replacement.

The general objective of the project is dual:

to develop several water borne coating products, clear or pigmented, using, in addition to standard coating components, new materials characterised by a particular porous structure and a very low thermal conductivity, as well as materials resistant to degradation; to optimise new coatings containing colouring pastes able to reflect the solar radiation, especially its infrared component, which is responsible for the heating of the underlying surface.

The driving force of this scientific theme is the fact that one of the best ways

	<p>to improve the energy performance of buildings is the use of insulating systems to apply on the areas of highest heat dispersion, like facades, covers, floors. The new coating products, characterised by easiness of application and very low thickness, should compete with the more complex systems on the market, which, in addition to their low mechanical resistance, have high thicknesses, implying the reduction of the cubage of internal and external spaces. Furthermore, the problem of obtaining superficial films with reflective and versatile properties is not yet solved, since the most used materials for coatings are generally transparent to infrared radiations.</p> <p>The student interested to the position has to have a master's degree, preferably in engineering, chemistry, industrial chemistry, materials science. However, good skills in chemical and physico-mathematical subjects are required.</p>
PHD FUNDING	<p>The annual gross amount of the grant, including social security expenses to be paid by the recipient, is € 16,500.00.</p> <p>The amount of the doctoral grant shall be increased by 50% for an overall period of not more than 18 months, if the graduate student is authorized to by the teaching body to carry out research abroad.</p> <p>Starting from the first year, each graduate student will have, besides the grant, a budget for research activities in Italy and abroad which will not be less than 10% of the grant.</p>
ADMISSION REQUIREMENTS	
COURSE ADMISSION	<p>Admission is subject to the passing of the selection tests and is conditioned by the positive outcome of the medical examinations, where required, that are carried out in health facilities and aimed at ascertaining the suitability for the specific task in accordance with D. Lgs. No. 81/08.</p>
REQUIRED QUALIFICATION	<p>Degree which has been conferred according to the rules and regulations in force prior to the reform of didactic freedom in universities, or a specialist/II level degree or an equivalent foreign academic qualification.</p>

SELECTION PROCESS	
SELECTION COMMITTEE	<p>The committees are made up of at least 3 university professors for each course; they may be integrated by not more than 2 experts, who may also be foreign nationals, from public and private research institutions and structures.</p>
ADMISSION TEST VENUE	<p>Department of Civil, Chemical and Environmental Engineering (Dipartimento di Ingegneria civile, chimica e ambientale – DICCA)</p>
TYPE OF ADMISSION TEST	<ul style="list-style-type: none"> • Comparative assessment of the qualifications/publications. • Written test (research project). • The interview consists in the discussion of the written test (research project) and the description of the candidate's research area of interest, also on the basis of previous activities stated in his/her scientific-professional curriculum <p>The tests are focused on confirming the candidates' aptitude for scientific research.</p>
METHODS FOR INVITING THE CANDIDATES AND COMMUNICATING THE OUTCOMES OF THE TESTS	<p>The examination schedule is as follows:</p> <ul style="list-style-type: none"> • Evaluation of qualifications, curriculum and written test (research project): 16.7.2018, 3.00 pm • Interview: 19.7.2018, 9.00 am at Department of Civil, Chemical and Environmental Engineering (Dipartimento di Ingegneria civile, chimica e ambientale – DICCA), room A11 <p>Candidates can use video conference mode; and, for identification purposes, the candidate must show the original document of which he</p>

	<p>has deposited a certified copy at the time of application.</p> <p>L The list of those admitted to the interview will be affixed at the Department of Civil, Chemical and Environmental Engineering (Dipartimento di Ingegneria civile, chimica e ambientale – DICCA).</p> <p>The final lists shall be announced on 10th August 2018, and will appear solely on:</p> <ul style="list-style-type: none"> • the noticeboard of the relevant research Departments/facilities for the research courses; • the noticeboard of the University; • on the Internet address https://unige.it/usg/it/dottorati-di-ricerca <p>No information whatsoever shall be posted to candidates' domicile.</p>
WRITTEN TEST	<p>The research project (10 pages maximum) has to be attached to the online application form, and it must concern one or more research Projects/grants highlighted in the section "TRAINING PROJECT".</p> <p>The research project will be evaluated as practical test for the selection, together with the evaluation of the qualifications and the scientific-professional curriculum, in order to identify the candidate's aptitude for scientific research in terms of originality, feasibility, clarity in the definition of objectives, methods and expected results.</p>
INTERVIEW	<p>The interview consists in the discussion of the written test (research project) and the description of the candidate's research area of interest, also on the basis of previous activities stated in his/her scientific-professional curriculum</p> <p>During the interview, the candidate shall also prove his/her proficiency in the following foreign language: English.</p> <p>Non-Italian candidates will also have to prove knowledge of the Italian language.</p>
PERCENTAGE VALUES OF TO EACH TEST	<p>To each candidate can be assigned a maximum of 150 points, divided as follows:</p> <ul style="list-style-type: none"> - comparative assessment of the qualifications/publications: max score 30/30, pass mark 20/30. - Written test (research project): max score 60/60, pass mark 40/60. - Interview: max score 60/60, pass mark 40/60. <p>The final ranking will be drawn up by adding the scores assigned in comparative assessment, written test and interview.</p> <p>Candidates will be selected in compliance with the principles of equal opportunities.</p>
ADDITIONAL CRITERIA FOR ADMISSION TO THE COURSE	<p>In the case of equal grades, the evaluation of candidates' incomes prevails for the assignation of grants, as per D.P.C.M. 9 April 2001.</p>

PROJECT CO-FINANCED BY THE EUROPEAN UNION
Regional Operational Program for Liguria - European Social Fund 2014-2020