



PHD COURSE IN	ARCHAEOLOGY, HISTORY AND HUMAN SCIENCES
SEAT OF ADMINISTRATION	University of Sassari
COORDINATOR	Raimondo Zucca - momoz1967@gmail.com/079229616
EDUCATIONAL OBJECTIVES	<p>The aim of the course is to train highly qualified PhDs able to meet the demand for research, particularly in the MIUR, MiBACT and C.N..R fields and its counterparts Institutes in EU and non-EU countries, with particular reference to the Maghreb, and technologies applied to cultural heritage, protection, conservation, enhancement, use and management in innovative forms, such as Virtual Archaeology, interactive 3D processing of cultural heritage in the national and international Archaeological field, within the central and peripheral organization of MiBACT, in cultural sites under public and private management (archaeological curriculum).</p> <p>The Historical-geographical Course also aims to train highly qualified PhDs in humanities, both in the historical-geographical and philological-literary fields, and in the human sciences (philosophical, social, pedagogical, etc.) in order to meet the needs of university research and research centres, both in public administration and in the private sector, in which a strong interest has been shown in the management groups, also in the scientific field, of a solid preparation in humanities. Over the three years, doctoral students acquire the scientific method and skills necessary for the public and private world of work in the field of pure research, university teaching, the application of new technologies to the various sectors of humanities, and finally the dissemination of research results according to international standards. The course pursues internationalization through the preparation of agreements with foreign universities and promotes the acquisition of qualifications recognized at European and international level.</p>
FIELDS OF INTEREST	<p>L-ANT/03 ROMAN HISTORY</p> <hr/> <p>L-ANT/01 PREHISTORY AND PROTOHISTORY</p> <hr/> <p>L-FIL-LET/04 LATIN LANGUAGE AND LITERATURE</p> <hr/> <p>M-PED/03 DIDACTICS, SPECIAL PEDAGOGY AND EDUCATIONAL RESEARCH</p> <hr/> <p>L-ANT/02 GREEK HISTORY</p> <hr/> <p>L-FIL-LET/12 ITALIAN LINGUISTICS AND PHILOLOGY</p>



	<p>L-ANT/10 METHODOLOGIES OF ARCHAEOLOGICAL RESEARCH.</p> <hr/> <p>L-ANT/07 CLASSICAL ARCHAEOLOGY</p> <hr/> <p>L-FIL- LET/05 CLASSICAL AND LATE-ANTIQUE PHILOLOGY</p> <hr/> <p>L-ANT/08 CHRISTIAN AND MEDIEVAL ARCHAEOLOGY</p> <hr/> <p>L-OR/06 CULTURES OF THE ANCIENT NEAR EAST, MIDDLE EAST AND AFRICA</p> <hr/> <p>MAT/05 MATHEMATICAL ANALYSIS, PROBABILITY AND MATHEMATICAL STATISTICS</p> <hr/> <p>M-STO/04 CONTEMPORARY HISTORY</p> <hr/> <p>L-FIL- LET/09 MEDIUM-LATIN AND ROMANCE PHILOLOGIES AND LITERATURES</p> <hr/> <p>FIS/07 APPLIED PHYSICS, DIDACTICS AND HISTORY OF PHYSICS</p>
CONTESTS	<p>n. 2 positions with University scholarship n. 1 position with scholarship reserved for graduate candidates from the University of Republic of Tunisia n. 1 position with scholarship from the University on the subject of tied research "<i>The social community from family to village. Archaeological and bio-archaeological analysis of the burials of Sardinia</i>" to be managed in collaboration with the PhD course in Life Sciences and Biotechnologies.</p>
METHOD OF EVALUATION	Titles, research project and interview
SCORING	30 points for the titles, 20 for the research project and 50 for the interview
VALID TOPICS FOR PROJECT AND INTERVIEW	<ul style="list-style-type: none">- Pandemics in history: Historical, social, literary, political, epidemiological aspects and the impact on people;- The identification of the areas of production and origin of the finds has long been an important topic for archaeological research. The Candidate discusses the methodological approach to the problem and the wide range of scientific techniques aimed at this type of investigation;- The Trojan War: the site, the myth, the sources, the reception;- From the archaeological context to the reconstruction of the processes of realization and use. Design, production, variability and use of ancient artefacts;- The constitutional, institutional and cultural crises in the different historical phases;



	<ul style="list-style-type: none">- Reflection on the effects that virtual socialization devices generate on the formation of contemporary subjectivity and possible forms of compensation/training/education to a conscious use: Analysis of ethical problems arising from technical evolution and its environmental impact in an increasingly interconnected world;- Digital humanities: methodological approaches to historical and archaeological research with innovative technologies. Surveys, discoveries, representations, data and bigdata between tradition and new applications;- Culture, institutions, society between Sardinia and continental areas in a long-term historical perspective;- The social community from family to village. Archaeological and bio-archaeological analysis of the burials in Sardinia;- City and territory of ancient Tunisia;
<p>INDICATIONS CONCERNING THE RESEARCH PROJECT</p>	<p>Each competitor must submit a research project according to Annex 2 or a Power Point.</p> <p>The Power Point must consist of a minimum of 10 slides and a maximum of 20, with images and text in each slide; the text (in Italian or English or French) must contain the title of the research theme included in one of the proposed thematic tracks, and must be divided into chapters, characterized by a progressive order number, relating to the sequence of arguments on the chosen theme, with bibliographical references in round brackets and a final general bibliography, ordered according to the Harvard (author-date) System (see e.g. https://intranet.birmingham.ac.uk/as/libraryservices/library/referencing/icit/e/harvard/referencelist.aspx) For quotations from ancient sources see the indexes of ThLL (Latin sources) and Liddel-Scott (Greek sources).</p> <p>Maximum number of characters: 10,000 (spaces excluded); minimum number of characters: 7,000 (spaces excluded); font: Times New Roman; single line spacing.</p> <p>The research project should demonstrate the knowledge and ability to apply the scientific method in relation to the themes of the call and the knowledge and understanding of the themes of the call and the motivation to research.</p>
<p>DIRECTIONS ON THE ORAL TEST</p>	



PHD COURSE IN	ARCHITECTURE AND ENVIRONMENT
SEAT OF ADMINISTRATION	University of Sassari - in agreement with the University of Karabuk (Turkey)
COORDINATOR	Vincenzo Pascucci - pascucci@uniss.it/079228685
EDUCATIONAL OBJECTIVES	<p>The environmental issue requires rethinking forms and ways of living around concepts of environmental sustainability at various scales, from spatial planning and transport systems, management of biotic and abiotic resources and ecosystems, energy, water and soil, resources, sustainable design, architectural philosophy and design methodology, recovery and urban regeneration to object design and communication.</p> <p>The PhD aims to train a researcher able to understand how building spaces and their relationship with the natural environment and landscape in order to design their management and transformation. This requires a systemic and multidisciplinary approach: the disciplinary fences with their exclusionary theories do not allow addressing the issue of sustainability in an integrated way.</p> <p>The doctorate is thematic and interdisciplinary, but consistent in content, objectives and methodological approach. It is focused on both Architecture and the Environment in all their fields and relationships: the space starts from an adequate naturalistic knowledge.</p> <p>The aim is to make sustainability concrete, dealing with material and immaterial objects in relation to the structures and functions of the ecosystem (both biotic and abiotic), but also to requalify, recover, restore, reuse, recycle, reduce, etc... Rethink and recapitulate history, rework it, relive it; redesign the city and its territory, the landscape and the environment in relation to each other, its form and its objects, with a sense of limit, saving, equity, solidarity.</p>
FIELDS OF INTEREST	<p>L-ANT/06 Archaeology</p> <hr/> <p>M-FIL/02 Logic, History and Philosophy of Science</p> <hr/> <p>BIO/02 Botany</p> <hr/> <p>BIO/07 Ecology</p> <hr/> <p>ING-INF/05 Information Processing Systems</p> <hr/> <p>GEO/02 Structural Geology, Stratigraphic Geology, Sedimentology and Paleontology</p>



	<p>GEO/03 Structural Geology, Stratigraphic Geology, Sedimentology and Paleontology</p> <hr/> <p>GEO/09 Geochemistry, Mineralogy, Petrology, Volcanology, Georesources and Applications</p> <hr/> <p>ICAR/12 Design and Technological Design of Architecture</p> <hr/> <p>ICAR/13 Design and Technological Design of Architecture</p> <hr/> <p>ICAR/14 Architectural Design</p> <hr/> <p>ICAR/19 Restoration and History of Architecture</p> <hr/> <p>ICAR/20 Urban and Territorial Planning and Design</p> <hr/> <p>AGR/14 Agricultural Chemistry, Agricultural Genetics and Pedology</p> <hr/> <p>ICAR/21 Urban and Territorial Planning and Design</p> <hr/> <p>ICAR/17 Drawing</p> <hr/> <p>AGR/08 Agricultural, Forestry and Biosystems Engineering</p> <hr/> <p>ICAR/08 Construction Science</p> <hr/> <p>ICAR/05 Infrastructure and Transport Systems, Estimation and Evaluation</p>
CONTESTS	<p>n. 2 positions with University fellowship n. 1 position with fellowship reserved to candidates graduated from foreign universities n. 2 reserved positions (following a special agreement stipulated with the University) for employees of companies engaged in highly qualified activities or employees of public research institutes and centres engaged in highly qualified activities (with maintenance of salary)</p>
METHOD OF EVALUATION	Titles and interview
SCORING	30 points for the titles and 70 for the interview
VALID TOPICS FOR PROJECT AND INTERVIEW	Theme 1: Living the Environment; Theme 2: Tourism and Cultural Heritage;



	<p>Theme 3: Aerospace and Remote Monitoring Systems;</p> <p>Theme 4: Smart networks and new technologies applied to good environmental management;</p> <p>Theme 5: Spatial planning, cities, natural resources and ecosystems;</p> <p>Theme 6: Sustainable design, regeneration and urban regeneration;</p> <p>Theme 7: Object and communication design;</p> <p>Theme 8: Ecology, Geology, Pedology, Botany: new techniques for a correct environmental management;</p> <p>Theme 9: Sedimentology, Stratigraphy, Geology and Marine Ecology as tools for monitoring climate change;</p> <p>Theme 10: Philosophy of Architecture and Project Methodology;</p>
<p>INDICATIONS CONCERNING THE RESEARCH PROJECT</p>	<p>For this course it is not required the presentation of a research project among the documentation attached to the application.</p>
<p>DIRECTIONS ON THE ORAL TEST</p>	<p>During the interview you will be able to present a possible research idea which should be developed according to the following guidelines:</p> <ol style="list-style-type: none">1. Theme of research and coherence with doctoral issues2. Objectives and feasibility3. Methodologies4. Expected results <p>You can present a short ppt (5 slides) to better illustrate the research</p>



PHD COURSE IN	CULTURES, LITERATURES, TOURISM AND TERRITORY
SEAT OF ADMINISTRATION	University of Sassari
COORDINATOR	Fiorenzo Toso - ftoso@uniss.it/079229610
EDUCATIONAL OBJECTIVES	<p>The Course has as its strengths on the one hand the adoption of an interdisciplinary perspective based on international comparison, on the other hand the search for harmonisation between the local and global dimensions. As for the training activity, the linguistic, literary, arts and visual aspects will connect the study of the territory and the landscape in an anthropic and historical-geographical sense. The objective will be to develop the skills and methodologies of research in function of tourism and landscape science.</p> <p>The doctoral candidates will have to:</p> <ul style="list-style-type: none">- develop a theoretical-critical instrumentation suitable for the complex cultural and social scenario generated by the globalization, going back to its social and linguistic cultural roots- critically examine the transnational dynamics of today's knowledge society and at the same time to contrast the uncritical homologation of contemporary reality, drawing on the cultural richness of the territory and to the memory of the past, also in function of a collaboration with companies, local authorities and the community- increase their linguistic, anthropological, sociological and literary knowledge with a view to a broadening research horizon and international mobility- address the linguistic, literary, artistic, geographical and socio-cultural fields with a comparative approach and interdisciplinary, in an international and trans-media sense- to extend the knowledge of the territory in its local specificities
FIELDS OF INTEREST	<p>L-FIL- CONTEMPORARY ITALIAN LITERATURE LET/11</p> <hr/> <p>L-FIL- ITALIAN LITERATURE LET/10</p> <hr/> <p>M- GEOGRAPHY GGR/02</p> <hr/> <p>L-LIN/10 ENGLISH AND ANGLO-AMERICAN LANGUAGES, LITERATURES AND CULTURES</p> <hr/> <p>L- THEATRE, MUSIC, CINEMA, TELEVISION AND ART/06 AUDIOVISUAL MEDIA</p>



	<p>L- ART HISTORY ART/03</p> <hr/> <p>L-LIN/01 GLOTTOLOGY AND LINGUISTICS</p> <hr/> <p>IUS/21 COMPARATIVE LAW</p> <hr/> <p>L-LIN/04 FRENCH LANGUAGE, LITERATURE AND CULTURE</p> <hr/> <p>L- THEATRE, MUSIC, CINEMA, TELEVISION AND ART/07 AUDIOVISUAL MEDIA</p> <hr/> <p>M- PEDAGOGY AND HISTORY OF PEDAGOGY PED/02</p> <hr/> <p>M- DEMOETHNOANTHROPOLOGICAL SCIENCES DEA/01</p> <hr/> <p>L-FIL- ITALIAN LINGUISTICS AND PHILOLOGY LET/13</p> <hr/> <p>L-LIN/14 GERMANIC LANGUAGES, LITERATURES AND CULTURES</p> <hr/> <p>M-FIL/05 AESTHETICS AND PHILOSOPHY OF LANGUAGES</p> <hr/> <p>SPS/07 GENERAL SOCIOLOGY</p> <hr/> <p>M- GEOGRAPHY GGR/01</p>
<p>CONTESTS</p>	<p>n. 2 positions with University scholarship</p> <p>n. 1 position with a University scholarship on the subject of tied research "<i>Health emergency and sustainable tourism: study of the regional territorial context and tourism sector for the reorganization of health services, in order to maximize the impact on the territory in terms of sustainability and safety</i>" to be managed in collaboration with the PhD course in Biomedical Science</p> <p>n. 1 position with scholarship reserved for candidates who have graduated from foreign universities</p> <p>n. 1 position with a scholarship funded by INPS on the subject of restricted research '<i>E-Learning on administration public and private company network</i>'.</p> <p>n. 1 position with a scholarship funded by the Department of Humanities and Social Sciences</p> <p>n. 4 reserved positions reserved (following a special agreement stipulated with the University) for employees of companies engaged in highly qualified activities or employees of public research institutes and centres engaged in highly qualified activities (with maintenance of salary)</p>
<p>METHOD OF EVALUATION</p>	<p>Titles, research project and interview</p>



SCORING	30 points for the titles, 20 for the research project and 50 for the interview
VALID TOPICS FOR PROJECT AND INTERVIEW	Theme 1: Territory, jurisdictions and landscape science; Theme 2: Philology, Linguistics, languages and literatures; Theme 3: Cultures and visual sciences; Theme 4: Literature, ecology and geography; Theme 5: E-Learning on administration public and private company network;
INDICATIONS CONCERNING THE RESEARCH PROJECT	A maximum of 4500 characters, including and excluding the bibliography, are available for the research project.
DIRECTIONS ON THE ORAL TEST	See the indications in the notice



PHD COURSE IN	ECONOMICS, MANAGEMENT, AND QUANTITATIVE METHODS
SEAT OF ADMINISTRATION	University of Sassari - in agreement with the University of Bordeaux (France)
COORDINATOR	Dimitri Paolini - dpaolini@uniss.it/079213510
EDUCATIONAL OBJECTIVES	<p>The Doctorate in Economics, Management, and Quantitative Methods (EMQM) of the University of Sassari proposes a training course that integrates the analytical and theoretical training proper to the economic and business sciences, supporting both with a solid quantitative background. The PhD program includes three research paths: a path in "Economics", a path in "Management" and a path in "Quantitative Methods". The three pathways share a series of common courses, in addition to specialized courses for each subject. Thanks to this particular attention to interdisciplinary aspects, to the variety of courses offered and to the structure of the curricular path, the Doctorate allows both the training of original and innovative intellectual figures, characterized by transversal skills in the analysis of business and market dynamics, and a more specialized higher education on economic issues, management issues, as well as on mathematical and statistical methods and models of these disciplines.</p>
FIELDS OF INTEREST	<p>M-GGR/02 GEOGRAPHY</p> <hr/> <p>MAT/05 MATHEMATICAL ANALYSIS, PROBABILITY AND MATHEMATICAL STATISTICS</p> <hr/> <p>SECS-P/01 POLITICAL ECONOMY</p> <hr/> <p>SECS-P/09 ECONOMICS OF FINANCIAL INTERMEDIARIES AND CORPORATE FINANCE</p> <hr/> <p>SECS-P/07 BUSINESS ADMINISTRATION</p> <hr/> <p>SECS-P/08 ECONOMICS AND BUSINESS MANAGEMENT</p> <hr/> <p>SPS/08 SOCIOLOGY OF CULTURAL AND COMMUNICATIVE PROCESSES</p> <hr/> <p>SECS-P/02 ECONOMIC POLICY</p> <hr/> <p>SECS-P/05 ECONOMETRY</p> <hr/> <p>SECS-S/06 MATHEMATICAL METHODS OF ECONOMICS AND THE ACTUARIAL AND FINANCIAL SCIENCES</p>



	<p>SECS-S/04 DEMOGRAPHY AND SOCIAL STATISTICS</p> <hr/> <p>SECS-S/05 DEMOGRAPHY AND SOCIAL STATISTICS</p> <hr/> <p>SECS-S/01 STATISTICS</p> <hr/> <p>SECS-P/11 ECONOMICS OF FINANCIAL INTERMEDIARIES AND CORPORATE FINANCE</p> <hr/> <p>SECS-P/06 APPLIED ECONOMY</p>
CONTESTS	<p>n. 3 positions with University scholarship</p> <p>n. 1 position with a scholarship financed by the Department of Economic and Business Sciences on funds from the Department of Excellence on a tied theme concerning "Fair and Sustainable Welfare (BES)"</p> <p>n. 1 position with a scholarship financed by the Banco di Sardegna on a tied theme concerning " Economic, financial, managerial and quantitative aspects relating to the financial sector and its interaction with the real economy "</p> <p>n. 1 position with a scholarship financed by Sardaleasing s.p.a.</p>
METHOD OF EVALUATION	Titles and interview
SCORING	30 points for the titles and 70 for the interview
VALID TOPICS FOR PROJECT AND INTERVIEW	<p>Theme 1: Economics (microeconomics, macroeconomics, and econometrics)</p> <p>Tematica 2: Management (Financial Accounting, Business Administration, Public Management, Corporate Finance, Banking, and Marketing)</p> <p>Tematica 3: Quantitative Methods (Complex Dynamics for Social - Economics System, Applications of Optimal Control Theory to Climate Change Economics, Agent Based Models, Statistics and Demography)</p> <p>Tematica 4: Equitable and sustainable well-being - BES (economics, management and quantitative methods)</p>
INDICATIONS CONCERNING THE RESEARCH PROJECT	For this course it is not required the presentation of a research project among the documentation attached to the application.
DIRECTIONS ON THE ORAL TEST	



PHD COURSE IN	LIFE SCIENCES AND BIOTECHNOLOGIES														
SEAT OF ADMINISTRATION	University of Sassari - in agreement with Shiraz University (Iran)														
COORDINATOR	Leonardo Antonio Sechi - sechila@uniss.it/079228462														
EDUCATIONAL OBJECTIVES	<p>The PhD Course in Life Sciences and Biotechnologies - Life Sciences and Biotechnologies aims to be an advanced training centre, open to young Italian and foreign graduates, with the following objectives: to offer high scientific qualification in both basic and applied research; to develop aptitude for national and international scientific cooperation; to stimulate the capacity for autonomous research both in terms of scientific understanding and technological spin-offs of the research topics studied. The training course covers a three-year period and is characterized by structured training activities and widely interdisciplinary research projects, in order to foster interactions and exchanges of knowledge between rapidly growing sectors such as modern biological and biomedical sciences. The Doctorate promotes theoretical and experimental cultural training and multiple interactions with national and international laboratories. The main areas of research are: animal biology, molecular bases of physiological and pathological processes, human and veterinary medicine, microbial pathogenicity, infections and autoimmunity, food and drug production, development of agriculture and animal husbandry, environmental protection, bioarchaeology. The multidisciplinary preparation in the fields of reference of the PhD course and the acquisition of a solid preparation in the field of molecular and evolutionary biology provides PhDs with a high degree of flexibility to ensure a successful integration in different working environments.</p>														
FIELDS OF INTEREST	<table><tr><td>BIO/05</td><td>ZOOLOGY AND ANTHROPOLOGY</td></tr><tr><td>BIO/10</td><td>GENERAL BIOCHEMISTRY</td></tr><tr><td>MED/33</td><td>LOCOMOTOR SYSTEM DISEASES AND PHYSICAL AND REHABILITATIVE MEDICINE</td></tr><tr><td>BIO/12</td><td>CLINICAL BIOCHEMISTRY AND CLINICAL MOLECULAR BIOLOGY</td></tr><tr><td>BIO/18</td><td>GENETICS</td></tr><tr><td>MED/07</td><td>MICROBIOLOGY AND CLINICAL MICROBIOLOGY</td></tr><tr><td>VET/05</td><td>INFECTIOUS AND PARASITIC DISEASES OF ANIMALS</td></tr></table>	BIO/05	ZOOLOGY AND ANTHROPOLOGY	BIO/10	GENERAL BIOCHEMISTRY	MED/33	LOCOMOTOR SYSTEM DISEASES AND PHYSICAL AND REHABILITATIVE MEDICINE	BIO/12	CLINICAL BIOCHEMISTRY AND CLINICAL MOLECULAR BIOLOGY	BIO/18	GENETICS	MED/07	MICROBIOLOGY AND CLINICAL MICROBIOLOGY	VET/05	INFECTIOUS AND PARASITIC DISEASES OF ANIMALS
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	<p>BIO/16 HUMAN ANATOMY</p> <hr/> <p>MED/09 INTERNAL MEDICINE</p> <hr/> <p>MED/04 GENERAL PATHOLOGY AND CLINICAL PATHOLOGY</p> <hr/> <p>MED/16 BLOOD DISEASES, ONCOLOGY AND RHEUMATOLOGY</p>
CONTESTS	<p>n. 4 positions with University scholarship</p> <p>n. 1 position INPS-funded fellowship on the thematic research topic '<i>Human endogenous retroviruses (HERV) in ALS, new therapeutic targets and biomarkers of the disease</i>'.</p> <p>n. 2 positions financed on the Horizon 2020 Call: H2020-MSCA-ITN-2020 (Marie Skłodowska-Curie Innovative Training Networks) for which reference is made to Article 6 of the call for proposals</p>
METHOD OF EVALUATION	Titles and interview
SCORING	30 points for the titles and 70 for the interview
VALID TOPICS FOR PROJECT AND INTERVIEW	<ul style="list-style-type: none">- Theme 1: Molecular markers as tools for the analysis of genetic variation in aquatic animals;- Theme 2: The antimicrobial role of silver in the coating of prosthetic implants and synthetic means in orthopaedic surgery;- Theme 3: Identification and use of Biomarkers in different pathologies;- Topic 4: Human endogenous retroviruses (HERV) in ALS, new therapeutic targets and biomarkers of the disease;
INDICATIONS CONCERNING THE RESEARCH PROJECT	For this course it is not required the presentation of a research project among the documentation attached to the application.
DIRECTIONS ON THE ORAL TEST	Oral candidates will be able to present research projects within the above mentioned themes also using a Power Point presentation (max 10 min.).



PHD COURSE IN	AGRICULTURAL SCIENCES
SEAT OF ADMINISTRATION	University of Sassari
COORDINATOR	Ignazio Floris - ifloris@uniss.it/079229360
EDUCATIONAL OBJECTIVES	<p>The course aims to train highly qualified PhDs able to meet the demand for research and development and high professional qualifications in the fields of agro-meteorology and plant ecophysiology; productivity of agricultural crops; management and protection of agricultural and forestry systems; conservation, protection and enhancement of natural resources; biotechnologies aimed at regional, national and international production needs; breeding techniques, nutrition and feeding, applied genetics and selection of livestock also with the use of molecular biology techniques, quality and safety of food products of animal origin.</p> <p>During the three years, PhD students acquire the scientific method and skills necessary to prepare experimental projects, conduct experimental plans and laboratory activities, data processing and evaluation of statistical-experimental inferences, dissemination of research results according to international standards. The course pursues internationalization through the preparation of agreements with foreign universities and promotes the acquisition of qualifications recognized at European and international level.</p>
FIELDS OF INTEREST	<p>AGR/01 AGRARIAN ECONOMY AND ESTIMATION</p> <hr/> <p>AGR/02 AGRONOMY AND HERBACEOUS AND HORTICULTURE SYSTEMS</p> <hr/> <p>AGR/03 TREE AND FOREST SYSTEMS SCIENCE AND TECHNOLOGY</p> <hr/> <p>AGR/07 AGRICULTURAL CHEMISTRY, AGRICULTURAL GENETICS AND PEDOLOGY</p> <hr/> <p>AGR/08 AGRICULTURAL, FORESTRY AND BIOSYSTEM ENGINEERING</p> <hr/> <p>AGR/09 AGRICULTURAL, FORESTRY AND BIOSYSTEM ENGINEERING</p> <hr/> <p>AGR/11 GENERAL AND APPLIED ENTOMOLOGY</p> <hr/> <p>AGR/12 PLANT PATHOLOGY</p> <hr/> <p>AGR/13 AGRICULTURAL CHEMISTRY, AGRICULTURAL GENETICS AND PEDOLOGY</p> <hr/> <p>AGR/15 FOOD SCIENCE AND TECHNOLOGY</p> <hr/> <p>AGR/16 AGRICULTURAL MICROBIOLOGY</p>



	<p>AGR/17 ANIMAL SCIENCES AND TECHNOLOGIES</p> <hr/> <p>AGR/18 ANIMAL SCIENCES AND TECHNOLOGIES</p> <hr/> <p>AGR/19 ANIMAL SCIENCES AND TECHNOLOGIES</p> <hr/> <p>AGR/20 ANIMAL SCIENCES AND TECHNOLOGIES</p> <hr/> <p>AGR/10 AGRICULTURAL, FORESTRY AND BIOSYSTEM ENGINEERING</p> <hr/> <p>AGR/04 AGRONOMY AND HERBACEOUS AND HORTICULTURE SYSTEMS</p> <hr/> <p>BIO/02 SYSTEMATIC BOTANICS</p> <hr/> <p>BIO/03 ENVIRONMENTAL AND APPLIED BOTANICS</p> <hr/> <p>GEO/05 APPLIED GEOLOGY, PHYSICAL GEOGRAPHY AND GEOMORPHOLOGY</p>
<p>CONTESTS</p>	<p>Curriculum in Agrometeorology and Ecophysiology of Agricultural and Forestry Systems n. 1 position with University scholarship n. 1 position with a scholarship financed by the Euro-Mediterranean Centre on Climate Change n. 1 reserved position for scholarship holders from foreign countries from the Université Libanaise</p> <p>Curriculum in Microbial Biotechnology in Agro-foodstuffs n. 1 position with University scholarship n. 1 reserved position for scholarship holders from foreign countries from the Université Libanaise</p> <p>Curriculum in Monitoring and control of agricultural and forest ecosystems in Mediterranean environment n. 1 position with University scholarship n. 2 reserved positions for scholarship holders from foreign states from the Université Libanaise</p> <p>Curriculum in Productivity of cultivated plants n. 1 position with University scholarship n. 1 position financed by INPS on the thematic research topic 'Digital tools and technologies for the sustainable intensification of Mediterranean pastoral systems'. n. 1 position financed by H2020-SFS-2018-2020 within the project EWA-BELT (GA n. 862848). n. 1 reserved position for scholarship holders from foreign countries from the Université Libanaise</p> <p>Curriculum in Zootechnical Sciences and Technologies n. 1 position with University scholarship n. 1 position with a scholarship financed by the Department of Agriculture n. 1 reserved position for scholarship holders from foreign countries from the Université Libanaise</p>
<p>METHOD OF EVALUATION</p>	<p>Titles, research project and interview</p>



SCORING	30 points for the titles, 20 for the research project and 50 for the interview
VALID TOPICS FOR PROJECT AND INTERVIEW	<p>Curriculum in Agrometeorology and Ecophysiology of Agricultural and Forestry Systems</p> <ul style="list-style-type: none">- Development of methodologies and approaches for the assessment and valorisation of multiple ecosystem services within tree systems along climate gradients;- Development and application of crop modelling for climate impact assessment and different crop management practices on productivity, resilience and sustainability of agricultural systems and implications for food security; <p><i>Reserved positions for scholarship holders from foreign states from the Université Libanaise</i></p> <ul style="list-style-type: none">- Mechanisms of resistance to water stress in traditional varieties of Mediterranean olive trees; <p>Curriculum in Microbial Biotechnology in Agro-foodstuffs</p> <p>Natural compounds used as antimicrobials against pathogenic microorganisms: mode of action and molecular targets;</p> <p><i>Reserved positions for scholarship holders from foreign states from the Université Libanaise</i></p> <ul style="list-style-type: none">- Exploiting the biotechnological potential of <i>Bacillus velezensis</i> for application in forestry and agriculture; <p>Curriculum in Monitoring and control of agricultural and forest ecosystems in Mediterranean environment</p> <ul style="list-style-type: none">- Analysis of ecosystem services in agricultural and natural environments of Sardinia; <p><i>Reserved positions for scholarship holders from foreign states from the Université Libanaise</i></p> <ul style="list-style-type: none">- Evaluation of the effectiveness of controlled aquifer recharge techniques to combat the degradation of groundwater resources in the Mediterranean;- Plant diversity in Mediterranean ecosystems; <p>Curriculum in Productivity of cultivated plants</p> <ul style="list-style-type: none">- Digital tools and technologies for the sustainable intensification of Mediterranean pastoral systems;- Productivity of Mediterranean crops;- Sustainable intensification of African cropping systems; <p><i>Reserved positions for scholarship holders from foreign states from the Université Libanaise</i></p> <ul style="list-style-type: none">- Farmers' behaviour, farm enterprise and impact of climate change;



	<p>Curriculum in Zootechnical Sciences and Technologies</p> <ul style="list-style-type: none">- Analysis of phenotypic, genetic and genomic aspects of biodiversity of species of zootechnical interest;- Sustainability and circularity of agro-zootechnical production systems: design, management and evaluation criteria;- Study of the relationship between feeding and production performance of animal species of zootechnical interest;- Study of Mediterranean agro-sylvo-pastoral systems;
<p>INDICATIONS CONCERNING THE RESEARCH PROJECT</p>	<p>For the drafting of the research project use Annex 2</p>
<p>DIRECTIONS ON THE ORAL TEST</p>	



PHD COURSE IN	BIOMEDICAL SCIENCES																				
SEAT OF ADMINISTRATION	University of Sassari																				
COORDINATOR	Andrea Fausto Piana - piana@uniss.it /079229091																				
EDUCATIONAL OBJECTIVES	<p>The PhD Course in Biomedical Sciences has the general objective of training highly qualified researchers in extensive scientific and methodological areas of great relevance for basic and applied research in the field of biomedical sciences. The training and research activity is characterized by a multidisciplinary approach that allows the development of topics proposed in the following curricula:</p> <ul style="list-style-type: none">- Medical pathophysiology- Medical genetics- Gender medicine for man, woman and child- Neuroscience- Molecular Oncology- Public Health <p>The training objective will be pursued, also in collaboration with other Italian or foreign universities or as a result of agreements with public and private entities possessing high cultural and scientific qualifications, as well as suitable personnel, facilities and equipment.</p>																				
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MED/15	BLOOD DISEASES, ONCOLOGY AND RHEUMATOLOGY
MED/18	GENERAL SURGERY
MED/28	ODONTOSTOMATOLOGICAL DISEASES
MED/30	VISUAL APPARATUS DISEASES
MED/35	SKIN DISEASES, INFECTIOUS DISEASES AND DISEASES OF THE DIGESTIVE SYSTEM
MED/40	GYNAECOLOGY AND OBSTETRICS
MED/42	GENERAL AND APPLIED HYGIENE, NURSING SCIENCES AND MEDICAL STATISTICS
MED/17	SKIN DISEASES, INFECTIOUS DISEASES AND DISEASES OF THE DIGESTIVE SYSTEM
MED/07	MICROBIOLOGY AND CLINICAL MICROBIOLOGY
MED/10	CARDIOVASCULAR AND RESPIRATORY DISEASES
ING-INF/06	BIOINGNERY
MED/36	DIAGNOSTIC IMAGING, RADIOTHERAPY AND NEURORADIOLOGY
BIO/13	APPLIED BIOLOGY
MED/49	ENDOCRINOLOGY, NEPHROLOGY AND FOOD AND WELLNESS SCIENCES
MED/08	PATHOLOGICAL ANATOMY
MED/29	NEUROSURGERY AND MAXILLOFACIAL SURGERY
MED/31	OTOLARYNGOLOGY AND AUDIOLOGY
MED/41	ANESTHESIOLOGY

CONTESTS

Curriculum in Medical Genetics

n. 1 position with scholarship reserved for candidates who have graduated from foreign universities

n. 1 reserved position (following a special agreement stipulated with the University) for employees of companies engaged in highly qualified activities or employees of public research institutes and centres engaged in highly qualified activities



	<p>(with maintenance of salary)</p> <p>Curriculum in Neuroscience n. 1 position with University scholarship n. 1 position with scholarship financed by INPS on the subject of restricted research '<i>Study of miRNA of healthy, pathological and serum human tissues in the diagnosis and therapeutic prediction of oncological diseases</i>'.</p> <p>Curriculum in Molecular Oncology n. 1 position with University scholarship</p> <p>Curriculum in Public Health n. 1 position with University scholarship n. 3 reserved positions (following a special agreement stipulated with the University) for employees of companies engaged in highly qualified activities or employees of public research institutes and centres engaged in highly qualified activities (with maintenance of salary)</p>
METHOD OF EVALUATION	Titles and interview
SCORING	30 points for the titles and 70 for the interview
VALID TOPICS FOR PROJECT AND INTERVIEW	<p>Curriculum in Medical Genetics - New biotechnological approaches in regenerative medicine; - Epigenetics and Behavioral Biology;</p> <p>Curriculum in Neuroscience - Systematic neuroscience, cognitive and behavioral sensory-motor; - Innovative techniques applied to the study of tumor stem cells;</p> <p>Curriculum in Molecular Oncology - Functional evaluation of miRNAs involved in carcinogenesis;</p> <p>Curriculum in Public Health - Public health and clinical governance; - Telemedicine and evaluation of the patient's health status: monitoring of vital parameters through integrated and non-invasive diagnostic methods; - Epidemiology, prevention and management of infectious diseases related to neoplasia; - Surveillance and control of environmental contamination from urban and industrial wastewater;</p>
INDICATIONS	For this course it is not required the presentation of a research project among the documentation attached to the application.



CONCERNING THE RESEARCH PROJECT	
DIRECTIONS ON THE ORAL TEST	<p>The oral test will focus on candidates' motivational issues and on ascertaining their knowledge and interests in the areas of the above subjects, specific to the different curricula. Candidates may use a Power Point presentation (10/15 DIA max) for the exhibition. During the interview the knowledge of the English language will be verified.</p>



PHD COURSE IN	CHEMICAL SCIENCE AND TECHNOLOGY
SEAT OF ADMINISTRATION	University of Sassari - in agreement with the University of Cagliari
COORDINATOR	Stefano Enzo - enzo@uniss.it/079229557
EDUCATIONAL OBJECTIVES	<p>To train through research highly qualified doctors in the chemical field, offering young Italian and foreign graduates the opportunity to set up and carry out independently an original research project in the most advanced sectors of chemical science and technology. To this end, doctoral students are trained, within the different themes, through a constant activity of experimental research and an appropriate didactic path.</p> <p>This training path will allow the PhD to achieve a deep specialist preparation, combined with the cultural preparation necessary to be able to contribute positively to the progress of chemical sciences and research both in the industrial world, with the assumption of highly professional positions, and in the academic one, in a context of global international competition. In order to achieve this objective, the PhD student is offered the opportunity to come into contact with researchers and research institutions both at home and abroad and to carry out a period of research activity in foreign research institutions.</p>
FIELDS OF INTEREST	<p>CHIM/01 ANALYTICAL CHEMISTRY</p> <hr/> <p>CHIM/02 MODELS AND METHODOLOGIES FOR THE CHEMICAL SCIENCES</p> <hr/> <p>CHIM/03 FUNDAMENTALS OF CHEMICAL SCIENCES AND INORGANIC SYSTEMS</p> <hr/> <p>CHIM/04 INDUSTRIAL CHEMISTRY</p> <hr/> <p>CHIM/06 ORGANIC CHEMISTRY</p> <hr/> <p>CHIM/08 CHEMISTRY AND PHARMACEUTICAL, TOXICOLOGICAL AND NUTRACEUTICAL-FOOD TECHNOLOGIES</p> <hr/> <p>CHIM/09 TECHNOLOGY, SOCIOECONOMIC AND REGULATORY ASPECTS OF MEDICINAL PRODUCTS</p> <hr/> <p>ING-IND/22 MATERIALS SCIENCE AND TECHNOLOGY</p> <hr/> <p>FIS/07 APPLIED PHYSICS, DIDACTICS AND HISTORY OF PHYSICS</p>
CONTESTS	<p>n. 2 positions with University scholarship</p> <p>n. 3 positions with scholarship financed by the University of Cagliari</p> <p>n. 1 position with a University grant on the subject of restricted</p>



	<p>research "<i>Innovative nanostructured materials for the post-Covid-19 era</i>" to be managed in collaboration with the PhD course in Architecture and Environment</p> <p>n. 1 position with scholarship reserved for candidates who have graduated from foreign universities</p>
METHOD OF EVALUATION	Titles and interview
SCORING	30 points for the titles and 70 for the interview
VALID TOPICS FOR PROJECT AND INTERVIEW	<ol style="list-style-type: none">1. <i>Innovative nanostructured materials</i>. Synthesis and characterization of new materials for applications (e.g. catalytic, magnetic, optical, electrical and biological).2. <i>Physical chemistry of biological systems</i>. Experimental and theoretical study of complex biological systems and use of specialized techniques (NMR, diffraction, environmental microscopy).3. <i>Modeling and computational chemistry</i>: Development of simulation techniques, computational studies of complex systems of chemical interest.4. <i>Industrial catalytic processes</i>. Chemical process technologies. Study of catalytic processes (preparation, stability, regeneration).5. <i>Industrial biotechnology</i>. Processes based on enzymatic catalysis; physical and chemical immobilization methodologies; industrial applications.6. <i>Analytical chemistry and surface technology</i> Study of the reactivity of thin oxide layers on metallic materials with technological applications (e.g. corrosion, heterogeneous catalysis, tribology and biocompatible materials); Reactivity of mineral, asbestos and atmospheric particulate surfaces in biotic and abiotic environments.7. <i>Surfactants and nanotechnology applications</i>. Systems based on nanostructured surfactants; applications in preformulations. (NMR studies of local structure, SAXS morphological properties)8. <i>Conventional and supercritical fluid extraction technologies</i>. Technologies based on the use of fluids under supercritical conditions; extraction and separation of plant active ingredients and in technological treatments.9. <i>Synthesis and reactivity of organic molecules</i>. Study of reactions promoted by metals for the enantium, diastereo- and regioselective synthesis of molecules with biological activity and natural products.10. <i>New methods of organic synthesis</i>: development of new cross coupling reactions for the preparation of classic functional groups from non-conventional reagents11. <i>Synthesis, characterization, properties and reactivity of new inorganic or organometallic compounds</i>. Structural, spectroscopic, computational characterization and catalytic, biological and pharmacological properties of compounds of application interest12. <i>Precursors and molecular materials</i>. Organic and inorganic synthesis of molecules rich in sulphur and/or selenium of intrinsic and applicative interest (extraction of noble metals, anti-carcinogenic) and as precursors of materials of interest in optics and electronics. Synthesis and development of fluorescence and redox molecular sensors for metal ions and inorganic anions. Reactivity studies, molecular spectroscopy, solution balances and calculation methods, solid state.



	<ol style="list-style-type: none">13. <i>Analytical methodologies and applications.</i> Synthesis and characterization of organic and metallorganic based materials for technological applications (sensors, luminescence, photovoltaic devices). Methods for the determination of analytes of food, environmental, biomedical interest Design, synthesis and characterization of complex-forming balances of binders for toxic metals in human pathologies. Study of balances in solution: experimental techniques and calculation methods.14. <i>Design, synthesis and biological evaluation of small molecules.</i> Synthesis, characterization and biological evaluation of new chemical structures with potential pharmacological activity.15. <i>Chemistry and pharmaceutical technology.</i> Design and development of nanosystems for site-specific delivery of bioactive molecules and for diagnostics/theranostics. Design and testing of innovative platforms for the delivery of drugs through different delivery routes.16. <i>Pharmaceutical and toxicological chemical analysis.</i> Validation of analytical methodologies for the determination of drugs, designer drugs and metabolites in biological matrices.17. <i>Cultural heritage and conservation techniques:</i> innovative strategies for conservation through kinetic control of mineralogical and inhibitive processes. Application of modern <i>in-situ</i> portable diagnostics
<p>INDICATIONS CONCERNING THE RESEARCH PROJECT</p>	<p>For this course it is not required the presentation of a research project among the documentation attached to the application.</p>
<p>DIRECTIONS ON THE ORAL TEST</p>	<p>Oral candidates will be able to present research projects within the above mentioned themes also using a Power Point presentation.</p>



PHD COURSE IN	LEGAL SCIENCE																																														
SEAT OF ADMINISTRATION	University of Sassari																																														
COORDINATOR	Michele Maria Comenale Pinto - comenale@uniss.it/079228933																																														
EDUCATIONAL GOALS	<p>The objective pursued by the PhD course is advanced training in the field of law, with specific attention to the two curricula considered, which respond to needs especially felt in the territory where the doctorate operates, but with the intention of being a pole of attraction for nationwide and international candidates in continuity with the successful experience of the previous Doctoral School in Law and Economics of Production Systems of the University of Sassari. The latter is the paradigm from which the current Doctoral Program (as well as its previous editions) derives the main part of its didactic and scientific project. Strong attention to interrelationships between law and the economics and overcoming individualism in research (besides the traditional approach in legal studies) is also part of the legacy of that experience. The PhD aims to provide the necessary tools for learning suitable research methodologies through the organization of in-depth seminars, conferences and external collaborations. This activity is aimed at training scholars who demonstrate their maturity writing an original monographic study that provides an adequate scientific contribution to legal research in the areas of the active curricula: Law of Transport and Navigation, Business and Production Systems and Law of Culture.</p>																																														
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	IUS/09 CONSTITUTIONAL LAW <hr/> IUS/15 CIVIL PROCEDURAL LAW
CONTESTS	<p>n. 2 positions with University scholarship</p> <p>n. 1 position with University scholarship on the research topic "<i>Sanitary crises and control measures: legal and economic profiles</i>", in collaboration with the PhD course in Economics, Management, and Quantitative Methods</p> <p>n. 1 position with scholarship reserved for candidates who have graduated from foreign universities</p> <p>n. 6 reserved positions (following a special agreement stipulated with the University) for employees of companies engaged in highly qualified activities or employees of public research institutes and centres engaged in highly qualified activities (with maintenance of salary)</p>
METHOD OF EVALUATION	Titles, research project and interview
SCORING	30 points for the titles, 20 for the research project and 50 for the interview
VALID TOPICS FOR PROJECT AND INTERVIEW	Theme 1: Transport and shipping law, business law and production systems; Theme 2: Law and Culture; Theme 3: Sanitary crises and control measures: legal and economic profiles;
INDICATIONS CONCERNING THE RESEARCH PROJECT	The project may be prepared in Italian or English, contain a hypothesis of research articulation and be accompanied by adequate references to legal sources, judicial cases and literature.
DIRECTIONS ON THE ORAL TEST	During the interview the knowledge of the foreign language at option of the candidate will be verified, among those indicated below, for this PhD course: English, French, Spanish, German, Portuguese. During the test, reading and comprehension of a technical text and conversation skills will be ascertained.



PHD COURSE IN	VETERINARY SCIENCES
SEAT OF ADMINISTRATION	University of Sassari - in agreement with the Chungnam National University (South Korea) and the Universidad Autonoma de Barcelona (Spain)
COORDINATOR	Fiammetta Berlinguer - berling@uniss.it/079229904
EDUCATIONAL OBJECTIVES	<p>The aim of the PhD course is to train qualified researchers in the disciplines of Veterinary Science through a multidisciplinary scientific and cultural training, transferred also through the provision of highly qualified specialist teaching. In line with the two curricula in Reproduction, Pathology, Breeding and Animal Welfare and in Production, Quality and Food Safety, the specific training objectives of the course are:</p> <ul style="list-style-type: none">- have an in-depth and updated knowledge of the mechanisms underlying the processes inherent in reproductive and productive biology and animal welfare conditions, with the aim of developing specific knowledge for the development and application of biotechnology in animal reproduction and to improve the reproductive performance and profitability of livestock farms;- acquire knowledge and technical experience regarding animal production, in order to improve its quality through the careful management of resources and production processes;- develop specific knowledge for the study of animal diseases and parasitosis, also in order to develop all those control measures that through the reduction of pharmacological interventions can allow the quanti-qualitative improvement of production;- to deepen the latest surgical, obstetric and internal medicine techniques in order to improve and update veterinary clinical practice;- to develop specific skills in the fields of pharmacology and toxicology, microbiology of food, control of abiotic contamination, methodologies necessary to achieve quality certification of the company system and policies of quality labels recognized in the EU in order to enhance the value of animal products and develop innovative processing techniques.
FIELDS OF INTEREST	<p>VET/02 VETERINARY ANATOMY AND PHYSIOLOGY</p> <hr/> <p>VET/03 VETERINARY DISEASE AND INSPECTION OF FOOD OF ANIMAL ORIGIN</p> <hr/> <p>VET/04 VETERINARY DISEASE AND INSPECTION OF FOOD OF ANIMAL ORIGIN</p> <hr/> <p>VET/06 INFECTIOUS AND PARASITIC DISEASES OF ANIMALS</p> <hr/> <p>VET/07 MEDICAL CLINIC AND VETERINARY PHARMACOLOGY</p> <hr/> <p>VET/09 VETERINARY SURGERY AND OBSTETRICS CLINICS</p>



	<p>VET/10 VETERINARY SURGERY AND OBSTETRICS CLINICS</p> <hr/> <p>AGR/18 ANIMAL SCIENCES AND TECHNOLOGIES</p> <hr/> <p>AGR/19 ANIMAL SCIENCES AND TECHNOLOGIES</p> <hr/> <p>VET/08 MEDICAL CLINIC AND VETERINARY PHARMACOLOGY</p> <hr/> <p>AGR/17 ANIMAL SCIENCES AND TECHNOLOGIES</p>
CONTESTS	<p>Curriculum in Production, Quality and Food Safety n. 2 positions with University scholarship n. 1 position with a University scholarship on a specific research topic "<i>Real-time and non-invasive monitoring of indicators based on IoT 4.0 for livestock management in relation to different physiological and productive stages</i>" to be managed in collaboration with the PhD course in Agricultural Science n. 1 reserved position for scholarship holders from foreign countries from the Université Libanaise</p> <p>Curriculum in Reproduction Pathology, Breeding and Animal Welfare n. 3 positions with University scholarship n. 1 position with a scholarship funded by INPS on the research topic "<i>The use of slaughter by-products for the production of functional food and BARF for pets</i>". n. 1 position with a grant financed by the Istituto Zooprofilattico Sperimentale della Sardegna reserved for candidates of Tunisian nationality n. 1 reserved position for scholarship holders from foreign countries from the Université Libanaise</p>
METHOD OF EVALUATION	Titles and interview
SCORING	30 scores for the titles and 70 for the interview
TOPICS VALID FOR THE INTERVIEW	<p>Curriculum in Production, Quality and Food Safety</p> <ul style="list-style-type: none"> - Xenobiotic residues: food safety risks; - Innovation of food safety research through the One Health approach; - New technologies for smart farming innovations; - Drug use in food producing animals: the thorny issue of residues; <p>Curriculum in Reproduction Pathology, Breeding and Animal Welfare</p> <ul style="list-style-type: none"> - Nutrient sensing mechanisms in the ovary: how to fully exploit the potential of nutritionally manipulated reproduction;



	<ul style="list-style-type: none">- Nervous system pathologies in pets: innovative diagnostic and therapeutic approaches;- Reproductive biotechnology for the study of the effects of environmental contaminants on early reproductive stages in animal models;- Application of ultrasonography in veterinary internal medicine;- Main parasites transmissible to susceptible animals through BARF food and zoonotic risk;- Control of the reproductive seasonality and management of the diseases in dromedaries;
<p>INDICATIONS CONCERNING THE RESEARCH PROJECT</p>	<p>For this course the presentation of a research project among the documentation attached to the application is not required.</p>
<p>DIRECTIONS ON THE ORAL TEST</p>	<p>The interview will assess the candidate's knowledge of the English language, motivation and aptitude for research, as well as the possession of specific knowledge related to the topics of the call. In particular, during the interview the candidate must present, also through the use of a Power Point presentation, the application of the scientific method on concrete examples related to one of the topics of the call (research objective, experimental design and methods used, expected results and their implications). The presentation should be no longer than 10 minutes.</p>