

SCIENZE AGRARIE

AGRICULTURAL SCIENCES

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Area disciplinare: Scienza Agrarie e Veterinarie

Dipartimenti interessati: Agraria

Costo: rata unica annuale di 354,23 euro (per ogni anno di iscrizione)

Scadenza bando: 13/09/2018

Breve descrizione: Il Corso ha l'obiettivo di formare dottori di ricerca altamente qualificati e in grado di rispondere alla domanda di ricerca e sviluppo e di alta qualificazione professionale nei campi dell'agrometeorologia e ecofisiologia vegetale; della produttività delle colture agrarie; della gestione e protezione dei sistemi produttivi agrari e forestali; della conservazione, tutela e valorizzazione delle risorse naturali; delle biotecnologie mirate alle esigenze produttive di ambito regionale, nazionale e internazionale; delle tecniche di allevamento e di riproduzione, nutrizione e alimentazione, genetica applicata e selezione degli animali zootecnici anche con l'uso di tecniche di biologia molecolare, qualità e sicurezza dei prodotti alimentari di origine animale.

Nei tre anni i dottorandi acquisiscono il metodo scientifico e le competenze necessarie per la predisposizione di progetti sperimentali, la conduzione di piani sperimentali e di attività di laboratorio, l'elaborazione dei dati e la valutazione delle inferenze statistico-sperimentali, la divulgazione dei risultati della ricerca secondo standard internazionali.

Il Corso persegue l'internazionalizzazione attraverso la predisposizione di convenzioni con università straniere e promuove l'acquisizione di titoli riconosciuti a livello europeo e internazionale.

Disciplinary area: Agricultural and Veterinary Sciences

Departments involved: Agricultural Sciences

Cost: annual fee of € 354,23

Deadline for applicants: 13/09/2018

Brief description: The course aims to train highly qualified Phd able to respond to the demand for research and development and high professional qualifications in the fields of agrometeorology and plant ecophysiology; productivity of agricultural crops; management and protection of agricultural and forest production systems; conservation, protection and enhancement of natural resources; biotechnologies aimed at regional, national and international production needs; techniques of breeding and reproduction, nutrition and nutrition, applied genetics and selection of livestock animals, also with the use of molecular biology techniques, quality and safety of food products of animal origin.

During the three years of the course, the PhD students will acquire the scientific method and the skills necessary for the experimental plane definition and laboratory activities, the processing of data and the evaluation of statistical-experimental inferences, the dissemination of the scientific results of the research according to international standards.

The course pursues internationalization through the establishment of agreements with foreign universities and promotes the acquisition of titles recognized at European and international level.

INFORMAZIONI SUL DOTTORATO

INFORMATION ON THE PH.D. COURSE

KEY INFORMATION

- **Disciplinary area:** Agricultural and Veterinary Sciences
- **Department:** Agricultural Sciences
- **Cost:** annual fee of € 354,23
- **Deadline for applicants:** 13/09/2018
- **Coordinator:** Prof. Ignazio Floris
- **Venue:** Department of Agricultural Sciences
- **Type of lessons:** frontal and practical lessons
- **Language:** Italian - English
- **Positions open:** 11
- **ECTS:** 180
- **Deadline for applicants:** from 03/08/2018 to 13/09/2018

OVERVIEW

Brief description: The PhD program develops research training activities in a field that is extended to many scientific sectors of agricultural sciences.

The course is divided into five Curricula, which operate within a common teaching plan to organize and promote study and research activities.

1) Curriculum Agrometeorology and ecophysiology of agricultural and forest ecosystems (Referents: Prof. Donatella Spano and Maurizio Mulas).

The lines of research mostly concern:

Analysis of the impact of the climate on agriculture and forest and natural ecosystems, with particular attention to the dynamics and adaptation and mitigation techniques.

Study of micrometeorological processes in agrarian, forest and natural systems and of the dynamics that regulate carbon balance.

Analysis of ecophysiological processes in Mediterranean environments with particular reference to water stress conditions.

Analysis of the territorial vocation, with particular reference to the identification of bioclimatic indexes, to the studies of agricultural and forest vocationality, to the management of the green areas.

Modeling and simulation of crop water requirements and estimation of irrigation efficiency, in consideration of climate change in progress.

Analysis of the interactions between climate change and forest fire risk.

Development and validation of modeling for the study of the functionality and productivity of forest and agricultural systems.

Management and use of biodiversity and agro-biodiversity for the sustainability of crop systems.

2) *Curriculum Agricultural and food microbial biotechnology* (Referents: Prof. Severino Zara and Costantino Fadda).

The most characteristic lines of research concern:

Study of the physiology and of the classical and molecular genetics of bacteria, yeasts and fungi also according to their use in the biotechnological industry.

Chemical-physical and sensory characterization of food products and impact of transformation / conservation operations on the evolution of the main biochemical parameters.

Impact of transformation / conservation operations on the content and activity of biological components present in food.

Determinants of pathogenicity in mycotoxigenic fungi and development of alternative containment strategies.

Metabolomics as a new approach to nutritional research and its utility in the study of food and gut microbiota.

Study of the biosynthesis of carotenoids in yeast.

Study and development of biosensors for the detection of microbial metabolites of agri-food relevance.

3) *Curriculum Monitoring and control of forest ecosystems in mediterranean environments* (Referents: Prof. Alberto Satta and Lucia Maddau).

The most characteristic lines of research are:

Biodiversity study of the Mediterranean forest.

Climate-soil-biocenosis relations and influence of anthropic factors on the forest ecosystem.

Indicator species for monitoring the degradation status of forest ecosystems.

Identification of qualitative models for the different forest and mountain ecosystems through the monitoring of the main biological, geochemical and environmental indicators.

Definition of sustainable strategies aimed at the recovery and rehabilitation of degraded areas, as well as the improvement of the physical-chemical characteristics of soil and crop production.

Development of sustainable silvo-culture systems and re-naturalization models of areas subject to reforestation with exotic species.

Evaluation of the state of natural equilibrium with the study of the composition of the biocenoses and identification of the taxonomic groups most sensitive to environmental pollution factors and their use as indicators of the same.

Studies on the bio-ecology of the main pathogens and phytophages in forest populations, and on the relative means of struggle.

Genetic biotechnologies applied to taxonomic phylogeny and environmental diagnostics.

Territorial information systems for monitoring and multi-dimensional representation of the elements studied, useful for the definition of models functional to the management of forest ecosystems.

4) *Curriculum* Productivity of cultivated Plants (Referents: Prof. Giovanna Attene and Giovanna Seddaiu).

The most characteristic lines of research are:

Study of biological and agronomic factors that influence the production of vegetable and / or floricultural species in protected cultivation;

Influence of biotic and agronomic factors on the accumulation of functional and nutraceutical compounds;

Approaches of structural genomics for the optimization of the expression of transgenes in plants;

Study of the physiology of cereal production and grain legumes for the purposes of modeling the interaction between the genotype x environment and the agronomic technique;

Mediterranean farming systems: adaptation to climate change;

Development of forecasting models of growth, phenology and production of the main herbaceous and vegetable crops.

5) *Curriculum* Livestock sciences and technologies (Referents: Prof. Gianni Battacone and Corrado Dimauro).

The most characteristic lines of research are:

The study of the nutrition of animals of zootechnical interest, feeding techniques and methods of evaluation of livestock food.

Mathematical-statistical modeling applied to biological processes of zootechnical interest, to production systems, to the environmental impact of farms.

Studies on the relationship between feeding of the main species of zootechnical interest, quality and safety of food products of animal origin.

Studies on genetic improvement and enhancement of biodiversity in species of zootechnical interest with quantitative and biotechnological genetic tools.

Studies on breeding techniques of both terrestrial and aquatic species of zootechnical interest.

Studies on the optimization of zootechnical systems, on the efficiency of machines and plants of livestock farms, on the relationship between animal management techniques and their well-being.

The common objective is that the training of the PhD student is not limited to the deepening of the fields closely related to his research field, but aims at a common interdisciplinary competence base of the Agricultural Sciences, acquired in specific laboratories and in the open field (experimental companies) as well as in liaison with affiliated agencies and research agencies, under the supervision of a guide teacher.

The PhD program in Agricultural Sciences also promotes internationalization through the carrying out of research periods abroad, the preparation of co-tutoring agreements with foreign researchers, the stipulation of agreements with foreign universities and research institutions and the presence in the board of professors of researchers from universities and research institutions located outside the national territory.

Teaching goals:

The course aims to train experts in research and high professional qualifications in the fields of agrometeorology and plant ecophysiology; the competence of agricultural crops; management and protection of agricultural and forest production systems; conservation, protection and enhancement of natural resources; biotechnologies aimed at regional, national and international production needs; breeding and breeding techniques, feeding and feeding, selection and selection of zootechnical animals also with the use of molecular biology techniques, quality and safety of food products of animal origin.

In the three years the PhD students acquire the scientific method and the skills for the preparation of experimental projects, the conduct of experimental plans and laboratory activities, the processing of data and the evaluation of statistical-experimental inferences, the disclosure of the facts of the research according to international standards. The course pursues internationalization through the establishment of agreements with foreign universities and promotes the acquisition of titles at European and international level.

Expected employment and professional opportunities

PhDs have specific training for conducting scientific and technological research activities in public and private research institutions. Through specific paths, in connection with industries and companies, they can acquire high professional skills, develop and apply research results as well as start up business activities and technology transfer.

Expected professional outlets are:

the research career in universities and public bodies or in private research facilities, in the areas of land use planning, environmental monitoring of resources, innovative technologies and processes related to the activities of the agro-food industry, where skills are required specifications, as well as agro-meteorological services and environmental agencies;

the establishment of research spin-offs for technology transfer to companies;

the scientific qualification of the professional activities of the degrees of access to the school (agronomist and forestry, veterinary, engineer, architect, biologist, naturalist, chemist, etc.). They can practice freelance with specialization in the field of studies and research or enhance their skills as entrepreneurs in the

agricultural, agroforestry and livestock, food processing and territorial governance, scientific dissemination and technology transfer of innovation.

Furthermore, the uses in the primary production and food processing industries and in consultancy and services in the fields of interest are to be considered.

Language

The knowledge of English is required for admission to the course.

This includes 3 compulsory common courses taught entirely in English to improve communication and oral comprehension and use of scientific English in terms of: i) reading and understanding of scientific texts; ii) writing of scientific texts; iii) oral communication in scientific forums.

All courses are taught with bilingual material - Italian / English - and teachers use both languages during lessons.

PhD students can attend the University Linguistic Center for a linguistic study.

Laboratories, facilities, libraries, and databases

The Department of Agriculture is fully applied in line with the strategies defined by the University Doctorate School - it has laboratories for measuring in the open field and in a controlled environment and handling of environmental conditions. Laboratories are available for the implementation of biotechnological processes, chemical, biological and microbiological analyzes and for all support analyzes. Furthermore, IT laboratories are present.

The books and databanks available to the PhD students ensure complete coverage of the course topics and consist of 52,700 monographs; 80 magazine subscriptions; 19,307 years; 535 CD-DVD; The PhD students also have free access to the University Library System <http://sba.uniss.it/>, with 40,500 electronic journals in subscription; 10,000 free on the Web; 52 databases and other electronic publications on subscription; 600 free on the Web; 14,500 e-books; 10,500 publications including PhD theses among the digital products of the University's scientific research available in the UnissResearch institutional archive.

REQUIREMENTS

Education: master's degree

Selection process: Public call with evaluation of qualifications, research project and interview

Language: all applicants will have to demonstrate competence in the English language

TEACHING

Teaching schedule

The training course of the Course is divided into three years and aims to train figures able to contribute to innovation and to the scientific and technological development of society.

Every year for the new Doctoral Cycle activated, the Teaching Plan is formulated for a period of three years.

The preparation of the PhD students is aimed at research oriented both towards university teaching and for inclusion in public and private research institutions, both in the industrial and service world.

The total teaching commitment is 180 Research Training Credits (CFR). For admission to the second year, 42 CFR are required and admission to the third 102 CFR. All CFR must be achieved within the third year of the course.

For courses which are common to the addresses and specific to the 1CFR address = 8 hours of teaching and 25 hours of the doctoral candidate's total commitment.

Attendance is mandatory. A maximum of 25% is allowed on the total time of the scheduled lessons, with attendance of at least 75% for each course.

For PhD students without scholarship, the compulsory attendance is at least 30% of each course.

In order to encourage stays abroad and internships, doctoral students who do not attend scheduled classes as they are engaged in research activities elsewhere are admitted and must still take the final exams. In addition, the PhD student who has attended courses similar to those of the Course, arranged by the host institution, can request the evaluation of the accrued CFR. The decision on the evaluation will be taken by the Board of the Course.

They can be evaluated among the CFRs at the choice of the PhD student courses used outside the Course. Courses that require access to the master's degree and which include a final exam are eligible. The recognition of the number of CFR is delegated to the Board of the Course.

At the end of each academic year the student must produce a report of the activities carried out during the year. The report is evaluated by the Board for admission to the following year and the recognition of the CFR for the research activity.

At the end of the three-year course, the PhD students must have acquired 180 CFR for the acquisition of the PhD in Veterinary Sciences, divided according to the following breakdown:

Scanning of the total 180 CFR three-year PhD program

		I YEAR	II YEAR	III YEAR	TOTAL
Project work		33	40	49	122
Frontal lessons organized by the PhD course		15	8	3	26
Frontal lessons organized by the Central University PhD School		6	2	-	8
Lectures, congress, courses, student tutoring, teaching assistance etc..	Obligatory and specific to each curricula	3	5÷3	4	10÷12
	Free choice	3	4÷6	4	11÷13
TOTAL CFR		60	60	60	180

PLAN OF MANDATORY TEACHING

common to all Curricula

I YEAR

COURSE	PROFESSOR	HOURS	CFR	FINAL EXAM
SICUREZZA IN LABORATORIO	Prof. ANTONELLO PAZZONA	8	1	NO
APPLICAZIONI DI SOFTWARE	Dr. MASSIMO CELLESI	8	1	SI

Software "R" (Preparatory for the statistics course)				
STATISTICA	Prof. NICOLO' P.P. MACCIOTTA	32	4	SI
ETICA DELLA SCIENZA	Prof. GIUSEPPE PULINA	8	1	SI
COMUNICAZIONE SCIENTIFICA (atelier)	Prof. QUIRICO MIGHELI	24	3	SI
LABORATORIO DI STATISTICA E DISEGNO SPERIMENTALE	Prof. PIER PAOLO ROGGERO	24	3	SI
POLITICA E PROGETTAZIONE DELLA RICERCA	Dr. COSTANTINO SIRCA	16	2	SI

II ANNO

COURSE	PROFESSOR	HOURS	CFR	FINAL EXAM
MODELLISTICA	Dr. ALBERTO S. ATZORI	24	3	SI
ANALISI MULTIVARIATA	Dr. CORRADO DIMAURO	24	3	SI
SCIENTIFIC WRITING (atelier)	Dr.ssa ANA D. FRANCESCONI	16	2	SI

III ANNO

COURSE	PROFESSOR	HOURS	CFR	FINAL EXAM
SCIENTIFIC COMMUNICATION (atelier)	Dr. ssa ANA D. FRANCESCONI	24	3	SI

CONTACTS

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