



LIST OF DOCTORAL COURSES – 32nd SERIES Academic Year 2016/2017

Please note that, at the time of the publication of the call, the list of the Doctoral Courses has not been definitely confirmed by the Ministry yet (DM 45/13)

DOCTORAL COURSES

1. ANIMAL AND FOOD SCIENCE
2. ARTERIAL HYPERTENSION AND VASCULAR BIOLOGY
3. ASTRONOMY
4. BIOMEDICAL SCIENCES
5. BIOSCIENCES
I. Curriculum: BIOCHEMISTRY AND BIOTECHNOLOGY
II. Curriculum: CELL BIOLOGY AND PHYSIOLOGY
III. Curriculum: EVOLUTION, ECOLOGY AND CONSERVATION
IV. Curriculum: GENETICS, GENOMICS AND BIOINFORMATICS
6. BRAIN, MIND AND COMPUTER SCIENCE
I. Curriculum: NEUROSCIENCE, TECHNOLOGY, AND SOCIETY
II. Curriculum: COMPUTER SCIENCE FOR SOCIETAL CHALLENGES AND INNOVATION
7. CIVIL AND ENVIRONMENTAL ENGINEERING SCIENCES
8. CLINICAL AND EXPERIMENTAL ONCOLOGY AND IMMUNOLOGY
9. CLINICAL AND EXPERIMENTAL SCIENCES
I. Curriculum: CLINICAL METHODOLOGY, METABOLISM, ENDOCRINOLOGY, NEPHROLOGY AND EXERCISE
II. Curriculum: HEMATOLOGICAL AND GERIATRIC SCIENCES
III. Curriculum: HEPATOLOGY AND TRANSPLANTATION SCIENCES
IV. Curriculum: RHEUMATOLOGICAL AND LABORATORY SCIENCES
10. CROP SCIENCE
11. DEVELOPMENTAL MEDICINE AND HEALTH PLANNING SCIENCES
I. Curriculum: ONCOHEMATOLOGY AND HUMAN GENETICS, RARE DISEASES AND PREDICTIVE MEDICINE
II. Curriculum: HEALTH PLANNING MODELS/ SYSTEM PLANNING

12. EARTH SCIENCES
13. ECONOMICS AND MANAGEMENT
I. Curriculum: ECONOMICS
II. Curriculum: MANAGEMENT
14. FUSION SCIENCE AND ENGINEERING
15. HISTORICAL, GEOGRAPHICAL AND ANTHROPOLOGICAL STUDIES (UNIVERSITY OF PADUA, CA' FOSCARI VENICE, UNIVERSITY OF VERONA)
I. Curriculum: GEOGRAPHICAL STUDIES
II. Curriculum: HISTORIC-RELIGIOUS AND ANTHROPOLOGICAL STUDIES
III. Curriculum: HISTORICAL STUDIES (FROM ANCIENT TO CONTEMPORARY HISTORY)
16. HISTORY, CRITICISM AND PRESERVATION OF CULTURAL HERITAGE
17. HUMAN RIGHTS, SOCIETY, AND MULTI-LEVEL GOVERNANCE
18. INDUSTRIAL ENGINEERING
I. Curriculum: CHEMICAL AND ENVIRONMENTAL ENGINEERING
II. Curriculum: ELECTRICAL ENERGY ENGINEERING
III. Curriculum: ENERGY ENGINEERING
IV. Curriculum: MATERIALS ENGINEERING
V. Curriculum: MECHANICAL ENGINEERING
19. INFORMATION ENGINEERING
I. Curriculum: BIOENGINEERING
II. Curriculum: INFORMATION SCIENCE AND TECHNOLOGY
20. INTERNATIONAL LAW AND PRIVATE AND LABOUR LAW
21. LAND, ENVIRONMENT, RESOURCES AND HEALTH (L.E.R.H.)
22. LINGUISTIC, PHILOLOGICAL AND LITERARY SCIENCES
23. MANAGEMENT ENGINEERING AND REAL ESTATE ECONOMICS
24. MATHEMATICAL SCIENCES
I. Curriculum: MATHEMATICS
II. Curriculum: COMPUTATIONAL MATHEMATICS
25. MECHATRONICS AND PRODUCT INNOVATION ENGINEERING
26. MOLECULAR MEDICINE
I. Curriculum: BIOMEDICINE
II. Curriculum: REGENERATIVE MEDICINE
27. MOLECULAR SCIENCES

I. <i>Curriculum:</i> CHEMICAL SCIENCES
II. <i>Curriculum:</i> PHARMACEUTICAL SCIENCES
28. PEDAGOGICAL, EDUCATIONAL AND INSTRUCTIONAL SCIENCES
29. PHARMACOLOGICAL SCIENCES
I. <i>Curriculum:</i> MOLECULAR AND CELLULAR PHARMACOLOGY
II. <i>Curriculum:</i> PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS
30. PHILOSOPHY
31. PHYSICS
32. PSYCHOLOGICAL SCIENCES
33. SCIENCE AND ENGINEERING OF MATERIALS AND NANOSTRUCTURES
34. SOCIAL SCIENCES: INTERACTIONS, COMMUNICATION, CULTURAL CONSTRUCTIONS
35. SPACE SCIENCES, TECHNOLOGIES AND MEASUREMENTS
I. <i>Curriculum:</i> SCIENCES AND TECHNOLOGIES FOR AERONAUTICS AND SATELLITE APPLICATIONS (STASA)
II. <i>Curriculum:</i> MECHANICAL MEASUREMENTS FOR ENGINEERING AND SPACE (MMIS)
36. STATISTICAL SCIENCES
37. TRANSLATIONAL SPECIALISTIC MEDICINE G.B. MORGAGNI
I. <i>Curriculum:</i> CARDIOTHORACIC AND VASCULAR SCIENCES
II. <i>Curriculum:</i> ENDOCRINE AND METABOLIC SCIENCES
III. <i>Curriculum:</i> NEUROSCIENCES
38. VETERINARY SCIENCES

GUIDELINES 32nd SERIES - ACADEMIC YEAR 2016/2017

ANIMAL AND FOOD SCIENCE

website: http://webservice.dafnae.unipd.it/phdanim_food/en/

contact person: stefano.schiavon@unidpd.it

language/s: English/ Italian

Within a geographical context characterized by highly intensive farming and high quality and high priced foods and wines, the University of Padua offers a PhD course in Animal and Food Science. The University of Padua was ranked first in Italy for the research quality in agriculture and animal rearing. The PhD course covers two main fields of interest: Animal Science and Food Science. Strong connections between these fields of research are assured by common education activities and integrated research projects. Consolidated cooperation with a number of other universities across the world, with Italian and European organizations of producers, private companies, and public institutions allow jointed research activities, seminars and periods of stage. Attendance to stages abroad for some months, International meetings and conferences is strongly recommended for our students. The final thesis consists in a collection of peer reviewed papers published in top ranking scientific journals. The mission of the course is to form PhD doctors with excellent preparation in the field of animal and food science and practice. The development of an international education environment is considered a basic tool to achieve this goal, as new ideas and synergies, new contacts and cooperation can be achieved from the contextual presence of Italian and foreign students. The international visibility of the course is assured by the web site with pages dedicated to the mission of the course, the research lines, the teaching activity, links to the publications of each member of teaching board, information about “how to apply” and acknowledgements to financial supporters (http://webservice.dafnae.unipd.it/phdanim_food/en/). In addition, every year the course guest a number of foreign PhD students (4-5/year) for stages of some months (3 to 12 months). An English training course level B2 proficiency is offered for student not familiar with the English language, and B1 is the minimum level to apply this course.

The course cover different research topics. The main are listed below.

- Animal feeding and nutrition, economic and environmental sustainability of production systems;
- Milk quality, cheese-making and cheese quality;
- Meat quality and nutritional value, high quality and high price processed meat and sausage
- Ethology, animal welfare, biodiversity and traceability, livestock and pet-animals;
- Management of wild animal populations in mountainous areas
- Food and food industry byproducts quality and technology;
- Novel, functional and health foods;
- Food enzymology;

- Food sensory quality;
- Wine, alcoholic beverages and distillates technology and quality;

More detail about research projects for applying students are prepared by the various research teams and provided in the web site before the call. This to help the candidates to apply for research topics consistent with those currently under investigation. See as examples the page http://webservice.dafnae.unipd.it/phdanim_food-china/researchproposals.html

ARTERIAL HYPERTENSION AND VASCULAR BIOLOGY

website:

<http://www.medicinadimed.unipd.it/corsi/dottorati-di-ricerca/dottorati-internazionali>

contact person: teresamaria.seccia@unipd.it

language: English

The International PhD program in Arterial Hypertension and Vascular Biology is based on the Department of Medicine -DIMED, Clinic of Hypertension, University of Padova. This is a referral centre for Arterial Hypertension and cardiovascular diseases in Italy and a Centre of Excellence for Hypertension Research of the European Society of Hypertension. This programme is the first in Europe devoted to Hypertension research and was established in conjunction with the Cardiovascular Research Institute Maastricht (CARIM) and the University of Rome.

The PhD Course entails specific commitment and training in the following areas:

1. Experimental research.

- Vascular biology with emphasis on the role of the endothelium and endothelial dysfunction and on its role in the control of vascular tone.
- Pathophysiology of salt and water homeostasis.
- Endocrine control of blood pressure.
- Methodologies of molecular analysis.
- Experimental atherogenesis.
- Analysis of the model of arterial hypertension.
- Experimental and molecular pharmacology.

2. Clinical research.

- Epidemiology and statistics applied to hypertension.
- Principles of pharmacoconomics applied to hypertension.
- Methodologies for assessment of target organ damage in hypertension.
- Pathophysiology of the secondary forms of hypertension.
- Guidelines for risk stratification and treatment.
- Design and planning of clinical trials in hypertension.

ASTRONOMY

website: <http://www.dfa.unipd.it/index.php?id=403>

contact person: giampaolo.piotto@unipd.it

language/s: English

Padova hosts Italy's largest Astronomical research community. Between the Department of Physics and Astronomy "Galileo Galilei" and the nearby Astronomical Observatory there are more than 60 staff astronomers, well known at an international level, and about 40 postdocs. In Padova there are research groups actively working on observational and theoretical astrophysics, on topics ranging from:

Solar System Bodies;

Extrasolar Planets;

Stellar Evolution;

Star Clusters and Stellar Populations;

Galaxies, Galactic Nuclei (active and not);

Observational and Theoretical cosmology;

Technology.

Research groups develop advanced astronomical instruments, and are involved in international collaborations for new instruments, both ground-based and in space.

The doctoral course in Astronomy pays particular attention to education and training to research, with 30 doctoral students/year typically presently enrolled in our Course. We have an high percentage (75%) of researchers who hold a permanent position at universities or research institutes in astronomy, in Italy or abroad, among those who obtained their doctoral (PhD) degree in Padova before 2003. More than 80% of our younger former students are working as astronomers.

All activities in the school are in English.

BIOMEDICAL SCIENCES

website: <http://doctorate.biomed.unipd.it>

contact person: [Marta Martini \(marta.martini@unipd.it\)](mailto:marta.martini@unipd.it) - Secretary

coordinator: **Paolo Bernardi**

language: English

Research lines:

- **Signal Transduction**

- cAMP and Ca²⁺ Signalling
- Oxidative Stress and Thiol Redox Regulation
- Phosphorylation Signalling in Health and Disease
- Signalling in Macrophage-Lymphocyte Interactions
- Inflammation and Immunity

- **Mitochondrial Pathophysiology**

- Molecular Mechanisms of Ca²⁺ Transport
- Mitochondrial Ca²⁺ Signalling
- Molecular Nature of the Permeability Transition Pore
- Metabolic Changes in Cancer
- Diabetes and Obesity
- Mitochondriotropic Drugs
- Oxidative Stress
- Mitochondria in Cell Death and Cancer
- Regulation of the Mitochondrial Proteome

- **Heart and Skeletal Muscle Pathophysiology**

- Heart Failure and Ischemia-Reperfusion Injury
- Autonomic Control of Cardiac Function
- Oxidative Metabolism in Cardiac Disease
- Molecular Mechanisms of Autophagy in Muscle
- Signaling Pathways that Control Protein Homeostasis in Muscles
- Pathogenesis of Muscular Dystrophies
- Chaperones in Muscle Differentiation and Disease
- Muscle Contractility and Plasticity
- Pathophysiology of Striated Muscles

- **Pathophysiology of the Nervous System**

- Mechanisms of Neurodegeneration: Focus on Prion Disorders, AD, PD and ALS
- Migraine Pathophysiology
- Neuron-glia Interaction and Epilepsy
- Neurotoxins, Neuroparalysis and Regeneration

- **Structural Biology, Bioinformatics, New Materials**
 - Computational and Molecular Interactomics
 - Protein Crystallography and Protein Engineering
 - Nanoparticles and Peptides in Biomedicine
 - Extracellular matrix (ECM) Pathobiology and Tissue Engineering
 - Pharmacobiology of Natural Compounds
- **Health, Sport and Exercise Sciences**

BIOSCIENCES

website : <http://dottorato.biologia.unipd.it/>

contact person: Andrea Pilaastro (andrea.pilaastro@unipd.it)

language/s: English

The PhD Course in “Biosciences” is organized in four curricula: 1) Biochemistry and Biotechnology (BB); 2) Cell Biology and Physiology (CBP); 3) Evolution, Ecology and Conservation (EEC); 4) Genetics, Genomics and Bioinformatics (GGB).

- The curriculum in Biochemistry and Biotechnology focuses on: Ca²⁺ homeostasis; structural biology; biochemistry and biophysics of energy transducing membranes, mitochondrial physiopathology, biochemistry of apoptosis and autophagy. Reflecting its interdisciplinary character, it includes animal, plant, microbial and agro-alimentary biotechnologies, pharmaceutical and protein biotechnology, and computational biology.
- Main topics of the Cell Biology and Physiology curriculum are: regulation of DNA precursors, modulation of gene expression and function; cell differentiation; mechanisms of signal transduction; membrane trafficking; structure and function of intracellular organelles; apoptosis and autophagy; molecular physiology; host-pathogen interactions; cell interactions with nanomaterials and nanodelivery of drugs.
- The curriculum Evolution, Ecology and Conservation includes evolutionary ecology (including animal behavior); plant and animal functional ecology; evo-devo, molecular evolution, sexual selection and sperm competition, population genetics and molecular systematics and phylogeny. Evolutionary approaches to conservation biology, ranging from genetic-planned breeding plans for endangered species to biomonitoring of protected areas, fish-stock management and marine ecology and ecotoxicology.
- The curriculum Genetics, Genomics and Bioinformatics focuses on the study of the genetic and molecular mechanisms of embryonic development and cell differentiation in normal and pathological conditions; genetic human diseases; circadian biological clocks. The studies employ different in vitro and in vivo systems, including *Drosophila*, zebrafish and mouse.

Transcriptomic and genomic analyses of both model and non model species, ranging from crop plants to humans are also performed.

A complete list of the potential supervisors and their research projects is available at the course website (<http://dottorato.biologia.unipd.it/>) or from the course director (andrea.pilastro@unipd.it).

Our PhD students have access to first-class facilities (see also below) at the Biology Department (<http://www.biologia.unipd.it/>) and work within a friendly and vibrant international research community under the supervision of experts of the field. Research opportunities are multi-disciplinary, spanning the whole range of biological research, from the protein, cellular and molecular level to organisms and populations. Interdisciplinary approaches are encouraged as well as the interaction among PhD students (approx. PhD 60 students are enrolled at the Biology department), post-docs and the approx. 70 faculty members of the Department. Students have access to the funds of the PhD Course and to internal research grants to cover travel and other research expenses (e.g. conferences, consumables, microscopy and DNA sequencing services).

Certain lines of research will be carried out at the Centre for Innovative Biotechnologies (CRIBI, <http://www.cribi.unipd.it>), the Botanical Garden of the University of Padua (<http://www.ortobotanico.unipd.it/en/>), the Venetian Institute of Molecular Medicine in Padua (www.vimm.it) the Marine Station of the Department of Biology, Chioggia, Italy (<http://chioggia.scienze.unipd.it/Inglese/indexEnglish.html>).

Facilities at the Department of Biology include: Electron and confocal microscopy; Electron Magnetic Resonance Spectroscopy; Ultracentrifuges; Cell culture facilities; the Unipd Zebrafish Facility (Zebrafish line maintenance and acquisition, transient lines from DNA injection, mutant, stable transgenes, whole mount in situ hybridization, morpholino technology, microinjection, germ line transformation, mRNA injection); aquaria facilities for breeding tropical fish and Xenopus; plant growth facilities (including a T/Light-controlled greenhouse); barrier and conventional mouse facility (with more than 2000 cages); flow cytometry facility (FacsCanto and FacsCalibur); P2 viral and bacterial vector facility; Next Generation High Throughput DNA Sequencing, Gene Expression Analysis, Peptide Facility; Cluster of High Performance Computers for scientific calculus and bioinformatic analysis of Next Generation Sequencing and protein analyses and dedicated software (<http://genomics.cribi.unipd.it/main/category/bioinformatics/>). A library with more than 40,000 volumes is permanently (24h) accessible to PhD students and provide online access to scientific bibliographic databases (WoS, Scopus) and thousands of scientific journals.

BRAIN, MIND AND COMPUTER SCIENCE

website: <http://hit.unipd.it/phd-bmcs>

contact person: luciano.gamberini@unipd.it, anna.spagnolli@unipd.it, mauro.conti@unipd.it

language/s: English

Research Lines

- Abstract interpretation and program analysis
- Advanced Data Analysis and Big Data
- Ambient Assisted Living and Domotics
- Applied Cognitive Sciences
- Artificial Intelligence & Machine Learning
- Cloud Computing
- Cognitive Ergonomics and Human Factors
- Cognitive Systems and Robotics
- Constraint reasoning
- Embedded and Distributed Systems
- Formal Methods
- Future Internet and Internet of Things
- Human Computer Interaction
- ICT Security
- Multi-agent systems
- Multimedia and 3D Data Processing
- Neuroscience and Neuropsychology
- Persuasive Technologies
- Qualitative Methods for User Studies
- Sensory and Perceptual Processing
- Smart City and Smart Communities
- Social Ergonomics
- Symbiotic Interaction
- Videogames Usability and User Experience (including serious games, edugames, advergames)
- Virtual, Mixed and Augmented Reality
- Sensors and Wireless networks

CIVIL AND ENVIRONMENTAL ENGINEERING SCIENCES

website: <http://www.dicea.unipd.it/ricerca/scuola-di-dottorato>

contact person: stefano.lanzoni@unipd.it

language/s: English

The research topics active within the framework of the PhD School are reported below. Between round bracket the names of the *professors that can be referred to for information of the research topic*:

- Fluid Mechanics and Hydrodynamics (Proff. Lanzoni, Defina)
- Fluvial and Lagoonal Morphodynamics (Proff. Lanzoni, Defina, Carniello)
- Ecogeomorphology (Proff. Marani, Lanzoni, Defina,)
- Dynamics of water-limited vegetation (Proff. Marani, Botter, Ursino)
- Limnology (Prof. Lanzoni)
- Biofluidodynamics (Prof. Susin)
- Geophysical fluid dynamics (Prof. Lanzoni)
- Surface hydrology (Proff. Rinaldo, Marani, Botter)
- Subsurface hydrology (Proff. Salandin, Camporese, Putti)
- Statistical hydrology and mechanics (Prof. Rinaldo, Maritan, Botter)
- Transport of pollutants within surface and subsurface water bodies (Prof. Lanzoni, Putti, Salandin, Camporese)
- Reclamation of contaminated sites. Solid waste management (Proff. Cossu, Lavagnolo, Raga)
- Slope stability (Proff. Simonini, Cola, Carrubba)
- Environmental geomechanics (Proff. Simonini, Cola, Carrubba)
- Structural mechanics and engineering (Proff. Maiorana, Schrefler, Boso, Pesavento, Sanavia, Salomoni, Modena, Vitaliani, Pellegrino, Scotta)
- Computational mechanics (Proff. Gambolati, Maiorana, Schrefler)
- Self-organizatrion and networks in nature (Proff. Rinaldo, Maritan)
- Advanced numerical methods (Proff. Gambolati, Putti)
- Theory and applications of finite-element methods (Proff. Gambolati, Putti)

CLINICAL AND EXPERIMENTAL ONCOLOGY AND IMMUNOLOGY

website: <http://www.discog.unipd.it/doctorate/mission>

contact person: paola.zanovello@unipd.it
dm.dagostino@unipd.it

language/s: English/Italian

Research lines:

- Innovative therapeutic approaches in solid tumors
- Application of biotechnology and nanotechnology to the study of tumors
- Application of bioinformatics to the study of tumors
- Molecular markers that predict therapeutic response in patients with solid tumors
- Tumor immunology and Study in animal models
- Hematological tumors
- Cyto-Histopathology and molecular pathology in oncology
- Genetic predisposition to cancer
- Locoregional treatment of tumors
- Tumors of the urogenital tract
- Viral oncology

CLINICAL AND EXPERIMENTAL SCIENCES

Website : <http://www.medicinadimed.unipd.it/corsi/dottorati-di-ricerca>

contact person: amelia.ruffatti@unipd.it

language/s: English/ Italian

Research lines:

The Clinical and Experimental Sciences Doctoral Course aims to train Research Doctors in the biomedical field. The doctoral students are required to possess knowledge concerning basic sciences and molecular medicine, to accrue technical laboratory skills, and to acquire a research method in Medicine and in the different subspecialties to be applied in the prevention, diagnosis and therapy of human diseases. Using a multidisciplinary approach to biomedical sciences, competences in epidemiology, genetics, biology and molecular pathology, regenerative medicine, physiopathology, diagnostics and therapy are integrated.

At the end of their research program the Ph. Doctors will gain skills for designing experimental protocols, for directing research projects and for managing patients.

The Ph.D. Course in Clinical and Experimental Sciences is organized in 4 curricula:

§ Clinical Methodology, Metabolism, Endocrinology, Nephrology and Exercise.

§ Hematological and Geriatric Sciences;

§ Hepatology and Transplantation Sciences;

§ Rheumatological and Laboratory Sciences.

CROP SCIENCE

website: <http://www.sciproveg.com/eng/>

contact person: antonio.berti@unipd.it

language/s: English

The unifying element of the Course is the cultivated plant, for both agricultural and forestry aims.

The scale of the research goes from the cell to the ecosystem, following three main approaches:

1. Agrobiotechnologies: Plant genetics and breeding, genomics and proteomics of processes involved in the regulation of cell cycle, reproductive systems, seed development and fruit maturation.
2. Plant-environment interaction: plant-soil and plant-climate relationships, soil C dynamics, role of micro-organisms in symbiotic associations with plants, anti-oxidation systems and environmental stress, ecophysiology, plant-insect and plant-pathogen interactions.
3. Ecosystem management: Human impact on ecological equilibrium, control of non-point pollution processes, Integrated Pest Management, use of micro-organisms in ecosystem processes, including removal of pollutants, post-harvest management

Research topics:

- Plant genetics, genomics and proteomics
- Dynamics of epigenetic states
- Genetic improvement of traits influencing yield
- Resistance to biotic and abiotic stress
- Alteration of plant architecture and control of flowering
- Genetic determinants of apomixis
- Genetic control of fruit development and ripening
- Fruit postharvest management and physiology
- Fruit allergenicity
- Plant hormone physiology and molecular biology
- Plant-environment interactions and ecophysiology
- Interactions between crop production and agronomic techniques
- Crop rotation

- Potential productivity and soil fertility
- Soil C and P dynamic
- Root systems and microbial symbionts
- Ecophysiology and productivity of agricultural and forest plants
- Biochemical, physiological and molecular responses of plants to pathogens
- Insect-plant relationships in agricultural and forest ecosystems
- Biological and Integrated control of pests and diseases
- Ecological and molecular analysis of pests and pathogens
- Regulation of fruit development and ripening

DEVELOPMENTAL MEDICINE AND HEALTH PLANNING SCIENCES

website: <http://www.sdb.unipd.it>

contact person: carlo.giaquinto@unipd.it Coordinator
giovanni.dagata@unipd.it Administrative Contact

language/s: English/ Italian

Curriculum: ONCOHEMATOLOGY AND HUMAN GENETICS, RARE DISEASES AND PREDICTIVE MEDICINE

Research lines:

- Oncohematology and Human Genetics

The main focus and research themes in the areas of Oncohematology, Immunology and Genetics presently include:

Morphological, immunological, histochemical and molecular evaluations for the diagnoses of oncohematological, and genetically based diseases. Characterization and manipulation of stem cells and modification of cell lines for in vivo and in vitro research purposes.

Clinical trials and epidemiological studies in the areas of oncohematological and genetic diseases, of congenital and acquired immune deficits, and of pediatric autoimmune diseases.

Epidemiological studies of infantile tumours.

Support therapy

- Rare Diseases: Epidemiology and Genetics

The research focus in this sector is on rare diseases. Rare diseases are of particular interest in the medical scientific field since these disease, although little known and often of less interest due to the few number of cases, are often unique scientific “models” to study biological phenomenon of interest to healthy individuals as well. More specifically both basic and clinical research are carried out to understand and outline the specific genetic, biochemical and biological aspects of rare pediatric diseases. The valorization of basic research is needed to increase the underlying knowledge of the biological basis for conditions that can contribute to the discovery of the fundamentally important molecular mechanisms involved and at the same time gain new tools to allow for precocious eziological diagnosis and for specific genetic counseling as well as for development of new therapeutic strategies.

- Prenatal diagnosis of fetal abnormalities and high risk pregnancies as well as neonatology follow up.

***Curriculum:* HEALTH PLANNING MODELS/ SYSTEM PLANNING**

As a priority this area develops applied research themes in the areas of environmental and psychosocial factors concerned with family and community health, with the evaluation of actions to promote health and planning of interventions in favour of the weak, segregated, disadvantaged and/or special needs individuals. Additionally, sanitary programming and planning is carried out with local and national institutions and programmes of international cooperation are developed as well. Studies are also carried out in the areas of analytical and evacutive epidemiology, operational research using stochastic and linear methods as well as graphing and simulation.

EARTH SCIENCES

website: <http://www.geoscienze.unipd.it/corsi/scuola-dottorato>

contact person: fabrizio.nestola@unipd.it

language/s: English

The School focuses on the following fields of research:

- Programme 1: Deep Earth
- Programme 2: Sediment systems, past life and deep time
- Programme 3: Mineralogy, petrography and geophysics applied to cultural heritage
- Programme 4: Geological and hydrogeological hazards

Applicants are advised to consult the web pages of the different research teams of the Department of Geosciences in order to find the contact person of each group (<http://www.geoscienze.unipd.it/ricerca/programmi>).

Moreover, applicants should make preliminary contacts with possible Tutors or with the Director of the School (Prof. Fabrizio Nestola), in order to check interest on specific topics and discuss the details of application and research project.

ECONOMICS AND MANAGEMENT

website: <http://www.economia.unipd.it/corsi/ph-d-economics-and-management>

contacts antonio.nicolo@unipd.it (Prof. Antonio Nicolò Head of the program - Economics)

federica.ricceri@unipd.it (Prof. Federica Ricceri, Deputy Head - Management)

sdem@unipd.it (Mrs. Paola Zanin - Secretary)

language/s: English

Our PhD is a 3-year full-time program for students who want to achieve an outstanding training in advanced research in Economics or Management. Our faculty has a proved record of international research and teaching experience. Over the years our students have been hired by prestigious organizations such as the OECD, the World Bank, the University of Copenhagen, University of Exeter Business School, Tuck School of Business, University of New South Wales, University of Groningen, University of Lund, Bank of Italy, and several Italian and European Universities.

The areas of research in economics include microeconomic theory, macroeconomics and finance, applied econometrics, public economics, applied economics, political economy, industrial economics, behavioural economics and labour economics

The areas of research in management include strategic management, organization behavior, supply chain management, knowledge and innovation management, financial accounting, marketing and capital markets

These topics are covered in several courses held during the first academic year. Students research in any of these areas under the guidance of a local supervisor.

FUSION SCIENCE AND ENGINEERING

website: <http://www.unipd.it/en/fusion-science-and-engineering>

website <https://www.igi.cnr.it/education/>

contact person: paolo.bettini@unipd.it
fiorella.colautti@igi.cnr.it

language: English

Background and aims of the Ph.D. course

Europe has a strong need to attract and educate young people in fusion science and engineering. With the start of ITER construction the field of magnetically confined fusion is undergoing an impressive acceleration. ITER will be the largest magnetic fusion device ever built ITER is a 17 meters high, 1000 cubic meter plasma volume device, which is under construction in France as a result of a joint project between China, India, Korea, Japan, European Union, Russia and USA. Its goal is to demonstrate the scientific and technological feasibility of fusion by producing 500 MW of fusion power.

Due also to the growing energy demand, and to the consequent big environmental, ethical and political issues, there is a strong and growing expectation on fusion as a sustainable energy source. Fusion needs therefore to be a success, and Europe has a key role in this challenge. Europe has in fact the largest share (40%) in the ITER project, and therefore the main responsibility to make it a success and to develop in parallel credible plans for proto-reactors (the so called DEMO devices).

As the start of the ITER operation is approaching, and fusion is expected to be a growing field, an increasing number of fusion scientists will be needed, both physicists and engineers.

For this reason we have set up a Doctoral Network, among a group of European Universities. They are all already actively and officially linked with their respective national EURATOM Fusion Laboratories and have a solid scientific and research background in the field of fusion science and engineering. In this way we exploit both the best scientific competences and skills from the university side and the best and more effective support from EURATOM Institutions, in particular as far as the availability of state-of-the-art experimental tools and devices is concerned.

The main goal of this doctoral project is to improve the present educational system in the area of fusion. The present education system does not seem adequate to provide the necessary number

of graduates nor to provide them with the proper preparation. With this doctoral course we aim at providing the European community with new young scientists, capable to cope with the activities on physics and engineering necessary to realize ITER, the subsequent demonstrative reactor(s), DEMO(S), and, at the end, the commercial thermonuclear reactors. This scientist should also have a background broad enough to be able to interact with companies and energy utility sector. High-tech companies will be in fact deeply involved in ITER construction and in subsequent fusion development. It is therefore extremely important that young researcher are trained on technological and industrial matters.

In this context the programme aims at preparing doctoral graduates, able to give an original contribution to the development of thermonuclear fusion research in a highly interdisciplinary context, where the needed engineering and physics competences complement each other. The availability of the Fusion Laboratories in the network, which offer a wide range of specializations, will allow the candidates, together with the Academic Council, to tailor their own educational path and research activity, balancing competences both in engineering and in physics.

On the basis of this deep culture in the subject, of the proactive environment and of the daily research work in interdisciplinary teams, the graduates should be able to plan new experiments and design and implement the corresponding hardware. Moreover they should be prepared to interact with industry to design and realize key ITER and DEMO components. In this context particular attention will be paid to the problems connected to the design of the thermonuclear reactor.

Main topics of the training and of the research experience

The PhD course addresses the subject of controlled thermonuclear fusion in magnetically confined plasmas. Both fusion science and technology topics are taught. The goal of controlled thermonuclear fusion is to bring on Earth the energy, which powers the Sun: an inexhaustible and environmentally sustainable source, to contribute to the solution of the world energy issue.

To reach this goal a number of problems need to be solved, both theoretically and experimentally. This course aim at giving its students the scientific and technological basis to become key players in this important research task. The course covers 3 main areas: Physics of Controlled Thermonuclear Fusion, Engineering of a Magnetically Confined Fusion Reactor, Experimental tools for diagnosing and controlling in real-time fusion relevant plasmas.

Students will be guided from the basics to state-of-the-art problems and solutions. Strong links with the European Fusion program and the ITER project are in place.

ITER will be the largest magnetic fusion device ever built. ITER is a 17 meters high, 1000 cubic meter plasma volume device, which is under construction in France as a result of a joint project between China, India, Korea, Japan, European Union, Russia and USA. Its goal is to demonstrate the scientific and technological feasibility of fusion by producing 500 MW of fusion power. ITER will start its operation in 2019. To be a success and a key step in the achievement of fusion, ITER

need a strong support from the scientific community and a large basis of scientists, who could build it and later exploit it. ITER will need a broad range of expertise, in physics and engineering, also on developing areas like material science and plasma control. This PhD course works in tight contact with ITER and aims at educating new generations of future ITER scientists. To this extent, the topics of the classes are selected among those mostly relevant.

The PhD course is supported by experimental activity in three important European devices: the ASDEX Upgrade tokamak in Garching by Muenchen, the RFX-mod reversed field pinch in Padova and the ISSTOK tokamak in Lisbon. The course will use experiments and tools of these three devices for a modern, experiment based, education. The PhD course at University of Padova will in particular benefit from direct training experience in RFX-mod, which is one of the leading experiments in the world in the field of active feedback control of plasma stability.

HISTORICAL, GEOGRAPHICAL AND ANTHROPOLOGICAL STUDIES (University of Padua, Ca' Foscari Venice, University Of Verona)

website: <http://gesta.scuoladottorato.it>

contact person: mariacristina.larocca@unipd.it, segreteria@gesta.scuoladottorato.it

language/s: Italian, English

The PhD program is the first experiment in Italy of a regional doctoral school in historical, geographical and anthropological studies, that coordinate the skills and areas of research developed in the three Universities of Padua, Venice and Verona, increasing the opportunities for dialogue and scholarly debate among teachers and doctoral students. The union emerges from the strong academic links which already unite the three Universities at an individual level, and from numerous joint activities (seminars, research, tutorials) established in the past in the three doctoral schools of the Veneto in the disciplines of History, Geography, Anthropology and Historical Religious Studies. The School aims to establish itself as a landmark, at a national and international level, for the training of young researchers and of teachers of those disciplines. The presence within the PhD Programme of history, physical and human geography, and cultural anthropology seeks to stimulate, in the research of its doctoral students, the learning of specific methodologies and the habit of posing open questions about the potential for cross-links both among the disciplines related to humanities research, and between the humanities and the sciences. The PhD Programme can assure the doctoral students of a comprehensive training which each institution would find it difficult to offer independently.

The doctoral programme in Historical, geographical and anthropological studies is structured on three didactic paths (curricola):

- **Historical studies (from ancient to contemporary history);**

- **Geographical studies;**
- **Historic- religious history and anthropology.**

Areas of Research

1. Society and cultural representations: the study of identity and identity construction (national and international, professional, religious, racial, family, intergenerational), rules and law, public and private sociability. Ritual and religious practices. The history of spirituality.
2. Politics and its functioning: institutions (civil and ecclesiastical), the history of communication, of public opinion, military history, colonialism and post-colonialism.
3. The economic and social history and anthropology of the material and immaterial patrimony: ethnographic museums, understanding the natural environment, the history and anthropology of the countryside (natural and semi-natural), the history of business and of industrial heritage, cultural and religious transformation, the history and anthropology of cities, of migration and of the workforce.
4. Analysis of spatial and territorial processes: the dynamics of the physical environment; the impact of man on the physical environment, (climatic variations, geomorphologic processes, and population), the development and sustainability of projects within the country; studies and presentations of the countryside; the produce of a locality. The historical, geographical and anthropological problems of globalisation: technology, politics, ethics.

Teaching Organisation

Teaching will extend to at least 120 hours of lectures for each doctoral student over the three year period, provided by internal and external teachers from Italian and foreign universities. The lectures will mainly be addressed to participants in the first and second years of the course, in order to leave maximum freedom for those in the third year, who are more involved in the drafting of their thesis. PhD students will take active part in the Seminars.

Teaching activity

- The main educational activities are organized jointly in a calendar that focuses in some periods of the year (October-January, March-June). They are divided into: activities common to all curricula, activities on specific chronological periods or on particular issues. These are in particular:
 - a. Training courses for students of the first and second year
 - b. Discussion seminars on the research of PhD students.

- c. Seminars on specific methodological research, related to historical, geographical, anthropological methods.
- Especially during the second years, doctoral students are directed to spend periods of study abroad, at institutions that can contribute to their training for specific research needs. The stays abroad at universities affiliated (about 18 months over three years) are an essential part of the training in the case of agreements of co-supervision.
 - seminar activities directed to shared themes of research of the doctoral students who need to accustom themselves to the presentation and public discussion of their arguments in front of colleagues and PhD professors.

HISTORY, CRITICISM AND PRESERVATION OF CULTURAL HERITAGE

website: <http://www.beniculturali.unipd.it/www/corsi/dottorati-di-ricerca/presentazione/>

contact person: vittoria.romani@unipd.it; attilio.fortunato@unipd.it; monica.salvadori@unipd.it

language/s: English/ Italian.

The PhD school carries out research work in the following fields:

- Antiquities, Philological, Literary, Historical and Artistic studies
- Earth sciences
- Civil Engineering and Architecture
- Chemical sciences
- Information engineering

Archaeology

Reconstruction of population development, settlement strategies and territorial organization from Late Prehistory to the Classical World and the Middle Age; reconstruction of social structure in Recent Prehistory and Late Antiquity-Middle Age through the integration of archaeological data with anthropological and paleopathological ones; study of ancient, production through the integration of archaeological and archaeometric data to reconstruct production processes, know-how transmission across time and space and potential trade networks; study of building techniques in Classical and Middle Age cities by analysis (including archaeometric ones) on building materials and elevation stratigraphy; survey and technical-stylistic analysis of paintings and mosaics in the Roman world in order to reconstruct craftsmanship and craftsmen - commissioners relationship; studies of History of greek and roman art.

Topics: Prehistory; Archaeology of greek and roman world; History of greek and roman art; Archaeology of the Middle Ages; Management of Cultural Heritage L-ANT/01; L-ANT/04; L-ANT/05; L-ANT/06; L-ANT/07; L-ANT/08; L-ANT/09; L-ANT/10; L-FIL-LET/05;

Archaeometry

Compositional and structural characterization of cultural assets to reconstruct production techniques and to identify raw materials provenance; study of alteration process and methods for the control of archaeological and artistic artefacts deterioration, analysis of deterioration causes and effects; validation of materials for restauration, analysis and interpretation of the structural behaviour of historic buildings by experimental diagnostics and monitoring techniques and numerical modeling; materials and techniques for the static improvement and adjustment and control methods for their efficiency; 3D metric survey methodologies at small, medium, large scale for Cultural Heritage; integration of geo-referenced data acquisition; techniques for storage and management in the framework of Cultural Heritage; techniques for virtual restoration and analysis of chromatic sequence on artistic artifacts.

Topics: ICAR/06; ICAR/09; ICAR/19; GEO/07; GEO/09; GEO/11

Art history

Art History domain will promote aptitude for research and understanding of figurative materials and artistic sources, refining the capacity to combine the most diverse methodologies and a conscious use of investigation tools, such as sources, archival documents, historical and cultural contexts, technical data, so as to penetrate the significance of the disciplines.

Topics : Architecture, liturgy, plastic and pictorial decoration in Medieval Europe; Art History in Italy in the Medieval and Modern age; Renaissance Painting in Northern Italy; Relations between Italian and European art in the Renaissance; History of Drawing and Prints; History of Collecting, Iconography and Iconology, History of Medieval and Renaissance Illumination; History of Goldsmith's Art, History of Applied Arts, Art History in the 19th and 20th centuries; Methodologies for the criticism and conservation of artistic heritage, Analysis of artistic sources.

Topics: L-ART/01; L-ART/02; L-ART/03, L-ART/04,

Musicology

The field of musicology is inquired from both a theoretical - systematic and historical point of view, with a particular attention to the issues of criticism, preservation and valorisation of musical Heritage. From the historical perspective the main fields are: monophonic and polyphonic repertoires in the West, with a particular focus on the liturgical ones; musical features of the

Medieval Age; European modern music (with particular attention to electro-acoustic music), including popular music. From the methodological point of view, the disciplines treated with more attention are: musical theory, musical analysis, analysis of the relationship between poetry and music, dramatic and musical analysis

Topics: L-ART/07

Cinema Photography, Audiovisual

Cinema, photography and audiovisual are inquired from both a theoretical and historical point of view, with a particular attention to the issues of criticism. Specific attention is also paid to the relationships between cinema and the other arts, cinema and the cultural processes.

Specific areas: pre-cinema and italian silent-cinema studies, history of italian cinema; history of francophone cinema; history and technique of photography; history of cinema theories; history of film studies; non-fictions film studies, theory and technique of film language; film criticism; film-genres; media and cinema literacy; theories of film preservation and museology of cinema; tools for the automatic analysis of audio/visual content. For the relationships between cinema and cultural processes: representation of war; cinema and psychoanalysis; cinema and cultural studies; cinema and postcolonial studies; autobiography in film and audiovisual

Topics: L-ART/06

Theatre

Theatre theory and praxis at the beginning of the modern Age (Renaissance and Baroque theoretical essays; stage design; stagings and settings; performance places, forms and genres between the 16th and 17th century). Festive events and ceremonial settings from 15th to 18th Century; the fortune and influence of the Renaissance and Baroque theatre in 19th and 20th Century; History of ballet from 16th to 19th Century; History of modern dance; History of theatrical lighting: theory and practice; Theatre and pedagogy from the 16th Century to the contemporary Era; Iconographic sources for the history of the performing arts; History of drama; History of stage-direction and staging; Theory and practice of acting; History of paratheatrical genres.

Topics: L-ART/05

HUMAN RIGHTS, SOCIETY, AND MULTI-LEVEL GOVERNANCE

website: <http://humanrights-jointphd.org> (under construction)

contact person: giuseppe.giordan@unipd.it

language/s: English

“Human Rights, Society, and Multi-level Governance” is a joint PhD programme run by five Universities: University of Padova, Italy; University of Canterbury, New Zealand; Panteion University, Athens, Greece; University of Western Sidney, Australia; University of Zagreb, Croatia.

The international joint doctorate will organise teaching, research and training in the area of human rights studies, covering legal, political, social, philosophical and economic approaches and methodologies, in different geographical areas. Both theoretical dimensions and practical analyses will be given relevance. The doctoral programme shall address the multi-level dimensions of human rights implementation policies, focusing on the most innovative and critical developments. Research will address national and international institutions as well as private actors (transnational civil society, social movements, religious and cultural groups, NGOs, corporate companies, etc.).

Research Lines:

1. International and European law of human rights
2. European Citizenship and fundamental rights
3. Human rights multilevel governance
4. Economic institutions and human rights
5. Religions and human rights
6. Cultures and human rights
7. Civil society, social cohesion and multilevel governance
8. Production, globalization, economic institutions and human rights
9. Income distribution, inequality and poverty
10. Fundamental rights and multilevel governance in constitutional comparative law
11. European foreign, security and development policies in global perspective – the human rights dimension
12. Difference, diversity and human rights
13. Migration and human rights

14. Technological innovation and human rights
15. Democracy Rule of law and human rights
16. Theories of human rights
17. Global justice and human rights
18. Measuring the compliance with international law of human rights: theoretical and practical issues
19. Private actors and human rights

INDUSTRIAL ENGINEERING

website: <http://www.cdii.dii.unipd.it/en/>

contact person: paolo.colombo@unipd.it

language/s: English

Doctoral candidates are recruited in any of the Curricula of the PhD school, which offers them a wide range of advanced courses and research activities and projects. The research deals with engineering science and technology aimed at designing, developing and sustaining technologies, products, processes and systems in the following domains:

Curriculum in Chemical and Environmental Engineering:

- Chemical reaction engineering
- Engineering systems and processes
- Processes and industrial plants for the production of alternative fuels
- Analysis of the safety and risk in manufacturing and transport
- Biological chemical engineering, particle technology
- Special chemical synthesis, with particular reference to fluorinated compounds
- Environmental chemistry engineering
- Chemical engineering of polymers
- Environmental impact of industrial activities
- Environmental fluid dynamics

Curriculum in Materials Engineering:

- Metallurgical engineering
- Advanced ceramic components for engineering applications
- Development and production of multifunctional porous ceramics
- Development and production of eco-sustainable ceramics
- Additive Manufacturing of ceramics
- Manufacturing engineering of metals and plastics
- Hot forming of metals
- Biological tissue engineering
- Biomedical research and production systems
- Molecular and chemical systems for technologies

Curriculum in Mechanical Engineering:

- Industrial product development, modeling and prototyping
- Modeling and optimization of processes
- Micro/nano manufacturing
- Geometric industrial metrology
- Mechanics of a two-wheeled vehicles
- Simulators of motorcycle guide
- Structural integrity
- Identification and measurement of mechanical systems
- Light vehicles for the development of sustainable mobility

Curriculum in Energy Engineering:

- Thermal fluid dynamics of single and two-phase systems
- The technology of heat exchangers
- Energy savings in refrigeration equipment and in industrial processes
- Environmental control techniques and building physics
- Environmental control techniques
- Physics and energy balance of buildings
- Modeling of the thermodynamic properties and transport of pure fluids and mixtures
- Conversion of solar energy
- Fluid machinery
- Internal combustion engines
- Aeronautical propulsion
- Development of heuristic optimization techniques
- Microgeneration
- Energy saving

Curriculum in Electrical Energy Engineering:

- Electric machines and drives
- Electric equipment and electrical systems
- Electrothermics
- Electromagnetic compatibility
- Computational electrical engineering
- High voltages
- Industrial automation
- Photometry and lighting
- Controlled thermonuclear fusion
- Analysis and optimization of complex systems
- Conversion of solar energy

INFORMATION ENGINEERING

website: <http://www.dei.unipd.it/phd>

contact person: phdschool@dei.unipd.it

language/s: English

Research lines:

- Control and system theory and applications
- Operations research
- Electromagnetic radiation, instrumentations, measurement procedures and reduction of the radiated em field
- Computer engineering: Software engineering, Information management systems, Computer networks, Computer music, Computation theory and applications
- Study, design and test of microelectronic systems and apparata (design of low power CMOS circuits for telecommunications and biomedical applications, statistical modelling of integrated circuits, fabrication processes of VLSI devices) and of industrial electronics
- Transmission of information and signal processing: Wideband mobile communication systems (UMTS and B3G); WLAN and ad hoc networks; sensor networks; voice, moving and still images processing; multimedia systems over fixed and mobile networks; fiber optic transmission systems; design of optic instruments; quantum communication; measurement techniques for telecommunication systems, ultrashort laser pulses generation.

For further references concerning research activities, please see following web pages:

<http://www.dei.unipd.it/node/193>

INTERNATIONAL LAW AND PRIVATE AND LABOUR LAW

website: http://www.dircomp.unipd.it/scuole_dottorato.htm

contact person: manuela.mantovani@unipd.it

language/s: Italian

Background and aims of the Ph.D. course

The Course offers interdisciplinary training by integrating the perspectives of International Law, European and Italian Private and Comparative Law and Labour Law, which provide the groundings for competency in one of the following domains:

- qualifying doctoral graduates for research in the field of Private Law, which is no longer considered only from the point of view of the Italian legal system but also from the perspective of comparison with other European legal systems and within the dynamics of their harmonization;
- Labour Law and Trade Union Law from the perspectives of the national legal system, in comparison with the legal systems of the other EU member States, and International Law;
- Public and Private International Law and European Union Law, also from the perspective of their historical background and development.

LAND, ENVIRONMENT, RESOURCES AND HEALTH (L.E.R.H.)

website: <http://www.tesaf.unipd.it/en/lerh>

contact person: davide.pettenella@unipd.it

language/s: English

LERH Program mission is to define integrated strategies for the management of natural resources, for promoting an intersectoral rural development and associated bio-based economic activities using advanced knowledge and expertise. The emphasis is on applied research on sustainable technologies, innovative management options and integrated policies.

Research area Agriculture, forest and food economics and policy

- Consumer attitudes towards food quality attributes
- Geographical indications: i) common property right protection in the extra-EU countries ii) common property rights governance
- Forest governance issues related to illegal logging, deforestation, forest degradation and corruption
- Wine economics and policy
- The role of social innovation in enhancing the adaptation capacity of rural communities to climate change
- Economic valuation of Environmental Resources and non-market goods □
- Energy markets and demand analysis
- Community-based forest management: resilience, adaptation and impact on natural resources
- Landscape and economy
- Italian food exports and foreign consumer perception
- Food supply chain analysis
- Consumer attitudes towards food quality attributes
- Farm economics and Common Agricultural Policy analysis

Research area Forest ecology and forest management

- Optimality principles driving the hydraulic architecture in trees
- Allometric approaches for modelling forest structure
- Dendroecology and quantitative wood anatomy
- Soil biology and ecosystem services
- Post-disturbance forest dynamics
- Forest structure analysis by LiDAR and optical data
- Forest and Tteeline dynamics
- Tree farming and agro-forestry system for biomass and quality timber
- Forest biodiversity conservation and management in the Natura 2000 ecological network and other areas
- Management and plant diversity in alien tree communities
- Landscape-forest patterns and processes in urban and suburban areas
- Urban forests biodiversity and recreational use
- Pest risk management of recently introduced forest diseases
- Integrated pest management of fungal diseases in agroforestry

Research area Hydrology, water resources, land and soil conservation

- Hydrology, hydraulic, debris flow, sediment and log transport in mountain watersheds

- Fluvial morphology, streams dynamics and restoration
- Erosion processes and sediment transport: risk management
- Geomorphology: geomorphometry-geomatics, landform analysis and erosion modelling
- Flood and soil erosion processes: monitoring, prediction and forecasting
- Soil, Water and Society
- Forest hydrology, ecohydrology and hillslope hydrology
- Snow and glacier hydrology
- Phytoremediation: study of the ability of plants to tolerate and accumulate organic and inorganic pollutants from soil and water

Research area Agriculture and forest mechanization and operations management

- NH₃ emission in agriculture and livestock
- Controlled Traffic Farming
- Innovative sensors for vineyard management
- LCA analysis for high quality woodchip supply chain
- Forest operation monitoring by innovative low cost sensor and GNSS system
- Development of smart-phone and tablet apps for forest operation analysis

Research area Viticulture and enology, food quality and nutrition

- Characterization of plant food allergens
- Food digestibility and nutrition
- Wine proteins and wine quality
- Valorisation of by-products from the food industry

LINGUISTIC, PHILOLOGICAL AND LITERARY SCIENCES

website: <http://www.disll.unipd.it/corso-di-dottorato/PHD-programme>

contacts: annalisa.oboe@unipd.it (program coordinator)

simone.canesso@unipd.it (administrative referent)

language/s: Italian / English / other Modern languages (see below)

The course includes all scientific disciplines in the fields of literary and linguistic study and research present at the University of Padua. These are grouped around six major disciplinary areas which share scientific concerns, themes of inquiry, research methodologies, practices and aims, and together form one cohesive community of scholarship in the humanities.

The program offers a first semester of introductory lectures to all the selected students in the course, followed by seminars by Italian and foreign scholars, and workshops in which research is shared among fellow students. Young scholars joining the program will be given advice on research, course selection, and career planning by tutors and dissertation supervisors in the various fields of interest.

During the three years the students will have the opportunity to attend and take active part in workshops and conferences, in order to acquire the essential skills of oral and written scientific communication and to develop a wide, interdisciplinary and comparative approach to the humanities. They will be asked to produce oral presentations and written work relating to their research or field of investigation (2 academic papers of 5000 words in the first year + 2 academic papers of 7000 words in the second year), and to submit the final results of their research in the form of a doctoral dissertation in the third year.

The course includes periods of study and research abroad, at fellow universities and research institutions in Europe, aimed at promoting scientific exchange and international cooperation. Our network includes, among others, the universities of Grenoble 3, Zurich, La Sorbonne Nouvelle Paris III, Warsaw, Ecole des hautes études Paris, Frankfurt, and Swansea.

The overall aim of the doctoral program is to help bright young scholars to produce original work and to contribute to the development of knowledge and research in the humanities at the international level and for the future. We therefore provide cutting-edge theoretical-critical and methodological tools by which to encourage research in the following fields:

- Italian studies
- Romance philologies, languages and literatures
- English and German studies
- Slavic studies
- Classical philology
- Linguistics

ITALIAN STUDIES

- Italian Literature, Philology of Italian Literature, History of Italian Literature, Literary Criticism
- Contemporary Italian Literature
- Comparative Literature and Literary Theory

In particular: Latin, medieval and Dantesque philology, Renaissance studies, Tasso studies; literature of drama, literature of the Enlightenment and the proto-Romantic period (including critical and philological research on Alfieri and Cesarotti), the 19th century (Leopardi, Nievo, the national literary production), the contemporary age (fiction, non-fiction, poetry in the post-modern and mutation age), comparative literature studies, theory and criticism of literature (geo-criticism and representation of space in the contemporary age, gender studies, psycho-analytic

hermeneutics and inter-cultural studies); history of Italian literature; literary criticism; Philology, history of Italian language, stylistics, and metrics, from the origins to the present, with a focus on: rhetorical tropes and schemes, literary genres; translation theory and history of translation, “mirror” manifestations in the local dialect literature, especially in the Veneto region (from Ruzante and the pavano dialet to Calmo, Goldoni, and contemporary Italian poetry), Italian linguistics (with a focus on languages for specific purposes and the language of politics), the teaching of Italian as an L2.

Contact: prof. Guido Baldassarri guido.baldassarri@unipd.it

ROMANCE PHILOGIES, LANGUAGES AND LITERATURES

Middle-Latin and Romance philologies and literatures – in particular: history of medieval Latin literature (up to the 14th century), medieval Romance languages and literatures; in all its language varieties (Galician, Portuguese, Occitan, old French, Italian vulgar language, Franco-Venetian, etc.), ecdotics, medieval metrics and rethoric, history of the discipline; modern and contemporary Galician literatures (the Galician study center focuses mostly on translation); Portuguese (research on literary movements, lexicographic issues, also in the Brazilian context), and Romanian (the relationship with national identity, the development of the literary language, etc.).

Spanish and Latin-American languages, literatures and cultures – in particular: the Spanish novel between the 19th and the 20th century; the literature of the Spanish civil war and of the Republican exile; avant-garde poetry; literary and film culture of the post-Franco period; the relationship between the great Spanish-American novel of the ‘60s and contemporary (in the strictest sense) narrative styles; literary translation; variationist linguistics from a synchronic and diachronic perspective; contrastive grammar and grammatical historiography; historical lexicography; text philology and translation analysis, especially the issues of the critical edition of multilingual metalinguistic repertoires and of early translations.

French language, literature and culture – in particular: the late Middle Ages; literature of the Reformation and the 16th century; important literary figures of the 19th century (Chateaubriand and Baudelaire); contemporary French and francophone literature (especially Proust); the fable in the 16th century; poetry spanning the 19th and 20th centuries; Surrealism; book circulation between France and Italy; stylistics of the literary text; Text linguistics and pragmatics applied to literary texts; linguistics of the French verb; languages for specific purposes; terminology

Contact: prof. Anna Bettoni anna.bettoni@unipd.it

ENGLISH AND GERMAN STUDIES

English and Anglo-American languages, literatures and cultures – in particular: texts, authors and cultural aspects of the early and late modernity; relationships between the Italian culture and English cultures in the Middle Ages and the Renaissance; European influence on English literature from the Renaissance to early Romanticism; contemporary Anglophone literatures in a post-colonial perspective, and in a comparative and trans-national approach to the literatures of Europe and Italy, and the travelling cultures of the Black Atlantic; English as a language for intercultural communication, with special reference to text analysis of non-literary genres (academic, political, scientific), and the compilation and consultation of corpora for lexico-grammatical investigations and discourse analysis; contrastive linguistics; specialized and audio-visual translation from the perspective of intercultural communication; non-verbal, multi-modal and multi-media communication; second/foreign language teaching.

Anglo-Germanic Languages, literatures and cultures – in particular: History of German literature; literary criticism; Jewish Studies; reception of literature; Relationships between psychoanalysis and literature and political knowledge in the early modern era; contemporary Dutch literature.

Contact: prof. Annalisa Oboe annalisa.oboe@unipd.it

SLAVIC STUDIES

In particular: modern and contemporary Russian, Czech, Polish, Serbian, Croatian and Slovenian literatures; literary genres (especially the autobiography genre); Russian and Czech underground literature; relationships between Slavic cultures and the Italian culture, the history of Slavic countries; Slavic philology and linguistics from a synchronic and diachronic-comparative perspective; history and historical grammar of Russian; Verbal aspect in Slavic languages; minority Slavic languages in Italy (Slovenian in the Friuli region and Croatia in the Molise region).

Contact: prof. Rosanna Benacchio rosanna.benacchio@unipd.it

CLASSICAL PHILOLOGY

In particular: Theory and development of Greek and Latin literary genres; Classical theatre: the city, the performances, the audiences; Synchronic and diachronic study of Classical Languages; Greek and Latin Christian Literature; Medieval Latin Literature; Byzantine Civilization; Greek and Latin texts and transmission; Reception and persistence of the ancient classics.

Contact: prof. Margherita Losacco margherita.losacco@unipd.it

LINGUISTICS

Historical and general linguistics – in particular: research on the morphological, syntactic and phonological structures of modern and ancient languages and of the dialects of Italy; research on language change, with a focus on the languages, texts and cultures of ancient Italy; dialectology, also in the perspective of sociolinguistics, and etymological research; neurolinguistics, especially in its relations with the theoretical reflection on language; the relationship between linguistic theory and language teaching, both modern and ancient.

Contact: prof. Laura Vanelli laura.vanelli@unipd.it

MANAGEMENT ENGINEERING AND REAL ESTATE ECONOMICS

website: <http://www.gest.unipd.it/en/scuole-di-dottorato/ingegneria-gestionale>

contact person: cipriano.forza@unipd.it

language/s: English

The PhD course in Management Engineering and Real Estate Economics includes two PhD specializations: “Management and Engineering” and “Real Estate Economics”. The educational programme of the School covers three years and includes both compulsory and optional training activities. The first year is mostly devoted to taking courses and seminars, whilst the second and the third are focused on research activities, particularly those related to the writing of the dissertation, under the supervision of a member of the School faculty.

- “Management and Engineering” specialization. Main research lines:
 1. Innovation management and economics
 2. Technology management
 3. Management of new products development
 4. Project management
 5. Operations & supply chain management
 6. Quality management
 7. Service management
 8. Organisation theory
 9. Strategy
 10. Complexity management
 11. Mass customisation
 12. Risk management.
- “Real Estate Economics” specialization. Main research lines:
 1. Valuation theory and methodology
 2. Valuation and valorisation of urban real estate
 3. Valuation and management of historical architectonic goods
 4. Land economics
 5. Valuation of the economy of mountain territories
 6. Valuation and management of environmental goods

MATHEMATICAL SCIENCES

website: <http://www.math.unipd.it/it/corsi/dottorati/phdmath/>

contact person: pierpaolo.soravia@unipd.it

language/s: English

The School focuses on the following fields of research:

- Algebra
- Analysis
- Geometry
- Logic
- Mathematical physics
- Mathematical finance
- Number theory
- Numerical Analysis
- Operations research-optimization
- Probability-stochastic process

MECHATRONICS AND PRODUCT INNOVATION ENGINEERING

website: www.gest.unipd.it/it/dottorati/sdimip

contact person: alessandro.persona@unipd.it
alberto.trevisani@unipd.it

language/s: English

1. Fatigue assessment of structural components in automatic machines and plants for the manufacturing mechanical industry
2. Fracture Mechanics and analysis of fracture surfaces
3. Structural analysis of mechanical components
4. Design and testing of mechanical components made of polymer matrix composite and nanocomposite
5. Analysis of manufacturing defects and of damage processes
6. Numerical simulation of welding processes
7. Magnetic levitation casting
8. Innovative metallic and composite materials
9. Functional design of mechanical and mechatronic
10. Automatic machines and industrial robots
11. Control techniques for mechatronic systems
12. Power electronics and power conversion
13. Electric, hydraulic and pneumatic actuators
14. Planning, design and simulation of industrial plants, industrial logistics and material
15. Logistic networks design
16. Automated logistic plants design (automated warehouses, automated material handling systems, packaging automated lines, picking shuttle, etc.)
17. Integrated design of the system "product-package-machine"
18. Transportation and person/asset info-mobility
19. Industrial plants maintenance, machines and plants reliability analysis, Reverse logistics and spare parts logistics
20. Food logistics

MOLECULAR MEDICINE

website : <http://www.medicinamolecolare.unipd.it/ricerca/dottorati-di-ricerca>

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mariateresa.conconi@unipd.it

language/s: English/ Italian

The School offers a strong interdisciplinary research program and is organized in two curricula: Biomedicine and Regenerative Medicine. The main objective of the Course is to form scientists with biological knowledge to apply to medicine with the final aim to understand the molecular bases of diseases and develop new diagnostic systems and new therapeutic and preventative tools. This knowledge in the fields of biochemistry, biophysics, histology, physiology, microbiology and biotechnology, will provide the student with a wide professionalism aimed to ideate and develop biomedical research projects both basic and translational.

The didactic program include practical activity in the laboratory under the guidance of a tutor, attendance to seminars given monthly by external invited speakers, Summer Schools and preparation of seminars. Every 6 months a special seminar section (retreat) will be organized during which every student will expose the advancement of his/her data to the other students and to the Faculty members of the School. The students will be invited to attend national and international meetings of interest for their research and to participate to collaborate with other Italian and foreign research groups.

Specific research fields are as follows:

- Basic research are focused on the identification of molecular mechanisms driving cell differentiation, stemness, and involved in the pathogenesis of infectious, genetic, degenerative and neoplastic diseases. In particular: signal transduction mediated by growth factors and hormones; enzymes involved in the redox homeostasis of proteins involved in differentiation; genes involved in extracellular matrix biosynthesis; mechanical stimula and wound repair; physiopathological basis of reproduction; micronutrients and vegetal antioxidants in degenerative and neoplastic diseases and in the aging; hepatitis C pathogenesis and hepatic fibrosis mechanisms; alteration of liver function after liver transplantation; structure and function of viral genes; genetic and biochemical mechanisms of resistance to antiviral drugs; characterization of the bacterial pathogenetic mechanisms; molecular basis of the physiopathological mechanisms of the nervous system; development and characterization of murine models.

- Translational research aim to develop preventative agents (vaccines), diagnostic and therapeutic tools, including gene therapy, new anticancer drugs, and regenerative medicine. In particular: development of viral and bacterial vectors for gene therapy and vaccine delivery; development of new tools of molecular diagnostics based on "omic" sciences; bioelectronics and nano-biotechnologies: new materials at nanometric scale for

the development of biosensors; biomarkers and predictability of the response to the therapy of chronic inflammatory gut diseases; development of diagnostic approaches and sterility therapy; cell and gene therapy of infectious, degenerative and neoplastic diseases; stem cells from peripheral blood, adipose tissue, enteric nervous system, and IPS (induced pluripotent stem cells); metallic, polymeric, and biological biomimetic surfaces; design, synthesis, and delivery of cell adhesion, growth, pro- and anti-angiogenic factors; in vitro reconstruction of vascular, tracheal, esophageal, liver tissue engineered substitutes; drug-target finding; drug delivery.

MOLECULAR SCIENCES

Website: <http://www.chimica.unipd.it/sdsm>

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language/s: English/Italian

The Graduate School in Molecular Sciences (Corso di Dottorato in Scienze Molecolari, hereafter, CDSM) starts on January 2005, from the merge of the pre-existing Doctoral Courses of Chemical Sciences and Pharmaceutical Sciences, both active since 1984. The CDSM is strongly committed to excellence in education and research in chemistry, biochemistry, pharmaceutical chemistry and material sciences. In the period ranging from 2005 to 2012, 130 PhD students, uniformly distributed among the active research groups of the departments of Chemical Sciences and Pharmaceutical Sciences were enrolled at CDSM.

Due to the large number of very active research groups and dedicated teaching staff, the CDSM provides to each student a rich array of choices of research themes, widely classifiable within the standard areas of analytical chemistry, physical chemistry, organic chemistry, inorganic chemistry, industrial chemistry, pharmaceutical chemistry. A description of all research activities is presented in CDSM web site, <http://www.chimica.unipd.it/sdsm>. The main research topics available are:

1. Life chemistry

- Synthesis and analysis of peptides and proteins
- Studies of photosynthetic systems via optic and magnetic spectroscopies

2. Environment, energy and cultural heritage

- Development and application of chemical methods to technologies for the production and storage of energy
- Environment control
- Cultural heritage conservation

3. Materials, nanomaterials and surfaces

- Synthesis of functionalized organic, inorganic and hybrid materials
 - Development of functional materials with controlled chemical, optic, electric, magnetic properties
 - Studies of interfaces, films and supported nanoparticles
4. Supramolecular chemistry and nanochemistry
- Supramolecular systems and colloidal chemistry
 - Self assembly of nanostructures and nanoparticles
5. Synthesis, catalysis and reactivity
- Synthesis and characterization of homogeneous/heterogeneous catalysts
 - Coordination chemistry
 - Organic synthesis, electrosynthesis
6. Theoretical and computational chemistry
- Theoretical methods for molecular modeling
 - In silico characterization of molecular dynamics and reactivity via quantum and statistic methods
 - Development of computer methods in chemistry
7. Strategies for drug design
- Bioinformatics for pharmaceutical chemistry and biorganic chemistry
8. Novel molecules with biological activity
- Conventional and innovative synthesis methods
 - Chromatographic, spectroscopic methods and integrated methods
9. Molecular mechanisms of activation of pharmaceutical compounds
- Studies of interaction with cells, tissues, receptors; molecular biology

PEDAGOGICAL, EDUCATIONAL AND INSTRUCTIONAL SCIENCES

website: <https://elearning.unipd.it/scienzeumane/course/view.php?id=289&lang=it>

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language/s: English/ Italian

Educational aims of the Ph.D. Programme:

The three following courses take into account the current groups and research projects undertaken in the undersigned department, together with other associated university departments.

FIRST COURSE: PEDAGOGICAL AND TRAINING SCIENCES

The current relevant demand for education and training outlines the following research areas: 1) the historical dimension of pedagogical research; 2) new educational and training processes; 3) the ways and means for developing a new pedagogical language; 4) the development of a 'practical' pedagogy, capable of translating theoretical stances into choices and operational procedures; 5) intercultural pedagogy; 6) social and family pedagogy; 7) the development of professionalism in education (for teachers, school managers/headmasters, educators, trainers), and direct impact methodologies, such as job analysis in business organizations, 8) professional ethics, for the qualification and the social recognition of education and training professions; 9) lifelong education.

SECOND COURSE: TEACHING AND COMMUNICATION TECHNOLOGIES

The second course covers two complementary, closely integrated research areas: Teaching and Communication Technologies.

The areas concerning teaching regard the following elements: 1) reflections on theoretical and operational aspects related to the definition of different curricular frameworks and their comparative analysis; 2) educational processes, starting from student-centered teaching and meaningful learning; 3) teaching methodologies, teaching disciplines methodologies and interdisciplinary approaches, 4) class and group dynamics, considering interactions, communication strategies and techniques involved in the creation and management of "learning communities" and collaborative/cooperative setting; 5) the study and definition of teaching methodologies, technologies, and tools suitable for a modular perspective, towards an integration of diversity/difference in its multiplicity of forms and features; 6) Disability, Special Pedagogy and Inclusive Education, differentiated didactics in intercultural setting and against marginalization and exclusion.

The areas related to communication technologies include the following themes: 1) the design and structure of educational sites and communication environments for the management of learning activities, shifting focus from a "machine-centered" to a "human-centered" technology; 2) the

representation of knowledge through ontologies, the shift from Web-archive documents to the Semantic Web and related network information research 3) the design of multimedia and interactive learning objects-materials, within the framework of integrated, blended on-site/on-line instruction and learning; 4) methodologies of social communication on the net, models of cooperative, situated learning designed to build competences and knowledge; 5) the assessment and evaluation of learning processes and an integrated technological system of instruction (on-site and on-line).

THIRD COURSE: EPISTEMOLOGY AND METHODOLOGY OF EDUCATIONAL RESEARCH

The third course covers new methods of research that are defined referring to processes, interactions and necessary integrations between educational systems. New approaches and complex processes of inquiry come to the fore, for the evaluation and assessment of learning, competences and systems.

The research areas proposed are as follows: 1) the epistemology and methodology of pedagogical research; 2) comparative methods of analysis; 3) the analysis and planning of research designs; 4) qualitative, quantitative and mixed research methods; 5) the history of education systems, 6) documentary methods in education; 7) the assessment and evaluation of learning and competences, as well as of educational systems; comparative assessment and evaluation ; 8) the ethnography of interacting systems; 9) computer-assisted research and evaluation procedures, data analysis software, and so on.

PhD students ought to find opportunities for learning to observe phenomena and events, to formulate and test hypotheses, experiment with investigation procedures, collect and analyse data and other research materials, acquire evaluation and assessment methods and techniques, interview and listen to those working in educational, school and training contexts, within communities, institutions and organizations.

PHARMACOLOGICAL SCIENCES

website: <http://www.dsfarm.unipd.it/ricerca/phd-graduate-programs/phd-degree-program-pharmacological-sciences>

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language/s: English

The mission of the 3 years PhD Course in Pharmacological Sciences is to prepare new young generation of scientists with a solid background in the field of Molecular Pharmacology, Clinical Pharmacology, Pharmacoepidemiology and Toxicology. To this purposes the PhD scholar program is organized in two parallel curricula:

- *Molecular and Cellular Pharmacology*
- *Pharmacology, Toxicology and Therapeutics*

Research lines - Molecular and Cellular Pharmacology

- Neuro-degenerative disorders: molecular mechanisms, genetics, and studies of therapeutic interventions
- Autonomic nervous system on bronchial function, new pharmacological agents.
- Enteric nervous system and immune system, search for therapeutic targets .
- Cardiovascular diseases, aging, gender and pharmacological responses
- Antitumoral compounds and mechanisms in drug resistance
- Metabolomics and lipidomics studies to the identification of new drug targets
- Immune system and search for molecular pharmacological targets
- Pharmacological modulation of chronic inflammatory diseases
- Medicinal plants as source of pharmacological agents
- Phenotyping/genotyping and therapeutic monitoring to develop new diagnostic screening tests
- Pharmacokinetic studies in healthy and disease

Research lines - Pharmacology, Toxicology and Therapeutics

- Critical care therapy. Pain therapies, both intensive and hyperbaric.
- Risk prevention and occupational medicine
- Airway inflammation induced by inhaled pollutants.
- Environmental toxicology xenobiotics in the urban water cycle
- Development of new environmentally friendly and species-selective pesticides
- Clinical pharmacology and therapeutic drug monitoring
- Pharmacoepidemiology
- Pharmacoeconomics
- Pharmacovigilance

PHILOSOPHY

website: <https://elearning.unipd.it/scienzeumane/course/view.php?id=1888>

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language/s: Italian/English

The PhD Program in Philosophy is based on the collaboration between the faculty members of the Department of Philosophy, Sociology, Pedagogy, and Applied Psychology (FISPPA) and the Department of Political and Juridical Sciences and International Studies (SPGI).

The Research Areas of the Program include the entire History of Philosophy and of Science, Political Philosophy and the History of Political Thought, and the issues of Theoretical and Practical Philosophy.

Specific Research Areas include:

1. Philosophy and History of Ideas: History of Ancient Philosophy, History of Medieval Philosophy, History of Modern Philosophy, History of Contemporary Philosophy, History of Philosophical Historiography.
2. Political Philosophy and History of Political Thought, with an emphasis on the genesis and the modifications of the central modern political concepts and the issues concerning the modern political subjectivity.
3. Theoretical and Practical Philosophy: Theoretical Philosophy, Logic, Philosophy of Language; Ethics and Applied Ethics; Aesthetics and Philosophy of Art; Themes and Problems of Classical German Philosophy.

In this way, the program aims to train scholars with a strong expertise both in the field of historic-philosophical research and in the field of the theoretical philosophical disciplines. The program will also provide the skills for operating in contexts where the novelty and the complexity of the processes require the capacity to understand the trends and the prospects of new economic, social, and political subjects.

PHYSICS

website: <http://www.dfa.fisica.unipd.it/index.php?id=phd-physics>

contact persons: santo.lunardi@unipd.it **Coordinator**
cristina.mazzucco@unipd.it **Secretary**

language/s: English

Research lines:

- Theoretical particle physics (contact: Massimo Passera, passera@pd.infn.it)
- Theoretical astrophysics (contact: Sabino Matarrese, matarrese@pd.infn.it)
- Nuclear physics (contact: Santo Lunardi, lunardi@unipd.it)
- Subnuclear physics (contact: Luca Stanco, stanco@pd.infn.it
Donatella Lucchesi, Donatella.lucchesi@pd.infn.it)
- Astroparticle physics (contact: Denis Bastieri, denis.bastieri@pd.infn.it
Mosé Mariotti, mariotti@pd.infn.it)
- Condensed matter (contact: Giampaolo Mistura, giampaolo.mistura@unipd.it)
- Biological physics (contact: Amos Maritan, maritan@pd.infn.it)

For further details on the research lines at the Department of Physics and Astronomy,
http://www.dfa.unipd.it/index.php?id=cetest_firstpage1&L=jvjkmbmbira

PSYCHOLOGICAL SCIENCES

website: <http://dottorato.psy.unipd.it/en>

contact person: francesca.peressotti@unipd.it

language/s: English

The PhD Course in Psychological Sciences offers a highly competitive 3-year programme to train high-level researchers in the field of Psychology. The programme is centred on providing general skills that can be applied across diverse fields of research, with particular emphasis on the theoretical plan and the rigour of methods. Interdisciplinary between the different domains and approaches in psychological research is strongly supported. The limited number of candidates and the large number of academic scholars involved in the program ensures that each student can receive a continuous and focused attention to the development of an individualized curriculum in which more than one supervisor is usually involved.

Research lines:

- Clinical and Experimental Psychology
- Neuropsychology and cognitive psychology
- Human life-span development
- Cognition
- Social, cultural and group psychology
- Behavioral neuroscience
- Neuroimaging and computational neuroscience
- Language and psycholinguistics
- Evolution of mind and cognitive functions
- Consumer choice, behavioural economics, marketing

SCIENCE AND ENGINEERING OF MATERIALS AND NANOSTRUCTURES

website: <http://www.chimica.unipd.it/corsi/corsi-di-dottorato/scienza-ed-ingegneria-dei-materiali/sim-english>

contact person: gaetano.granozzi@unipd.it

language/s: English

The PhD Course in Science and Engineering of Materials and Nanostructures represents the third educational level in the field of Materials. It offers an advanced training in the field of Materials through the organization of specialized courses and a thesis work on a research project to be chosen among the main research themes active at Padua University, which can be summarized as:

- Materials for sustainable energy
- Graphene and related materials
- Nanomaterials for Photonics and Plasmonics
- Materials for Photovoltaics
- Fuel cells and electrocatalysts
- Design of new functional materials
- Synthesis of advanced materials (both bottom-up and top-down)
- Preparation and characterization of nanometric and nanostructured materials
- Preparation and characterization of thin films and functional coatings
- Modeling and prediction of innovative materials properties in the field of nanoscience and nanotechnology
- Physico-chemical and functional characterization of new materials
- Study of the surface properties of functional materials.

The PhD Course in Science and Engineering of Materials and Nanostructures is strongly linked to the research activities present in the three participating Departments (Mechanical Engineering, Physics and Chemical Sciences), which stand out within the University for their size and the international level of the research carried out by their groups.

SOCIAL SCIENCES: INTERACTIONS, COMMUNICATION, CULTURAL CONSTRUCTIONS

website: <http://www.unipd.it/en/phd-course-social-sciences-interaction-communication-cultural-construction>

contact person: devi.sacchetto@unipd.it

language/s: Italian/English

Research lines:

- Theories and research approaches for the analysis of cultural and communication processes and social reproduction;
- Theoretical models and analytical tools of interaction processes and cultural construction;
- World Migration and trans-cultural reconfiguration of European and global Social and Political Space;
- Religions and religious behaviours;
- Cultural pluralism: public sphere, religions, ethic social issues and mass-media;
- Cultures of citizenship and solidarity, social exclusion processes in the transformation of European social spaces;
- Gender studies in the international context;
- Conflicts and recognition of differences, pluralisation of identities, formation of shared memories at the local and European and global level;
- Inter-generational relations: social construction of childhood and under-age individuals;
- Social construction of normality and deviance;
- Cultural pluralism: sciences and public opinion;
- Communication and mass-media, social and public communication;
- Ethnography and Qualitative research methodologies;
- Statistic for Social Sciences and Quantitative research methodologies;
- Quality of Life: individual treatments and social contexts;
- Labour studies and Global society;
Economic Sociology

SPACE SCIENCES, TECHNOLOGIES AND MEASUREMENTS

website: http://cisas.unipd.it/phd_course.php

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language/s: English/ Italian

The main purpose of the Space Sciences, Technologies and Measurements PhD Course is the formation of Research Doctors able to realize research in disciplines connected with Sciences, Technologies and Measurements for Space with a broad vision of the respective problematic. The doctoral students usually operate within defined programs and experiments of interest for the School Curriculum research subjects, acquiring wide and interdisciplinary knowledge, learning methodologies and techniques.

The educational process shall enable students to acquire skills and credits toward a University career, and/or a position in other Research Institutes, or Industries. It should also stimulate the potential capabilities of the doctoral student to induce a fall-out of his/her knowledge in the territory, to stimulate the growth of high tech spin-offs, to improve local industry's ability to compete in the wider national and international scenario. A corollary of the above approach is the formation of Research Doctors capable to raise to leadership levels in scientific and/or industrial programs.

In order to provide not only a broad, interdisciplinary vision, but also a specific competence in particular fields, two main Curricula have been instituted in the STMS Course, each one with its own educational program:

- Mechanical Measurements for Engineering and Space (MMIS), whose research lines are: analysis and definition of measuring methodologies and data processing; functional analysis of instrumentation and representation through general theory; definition of methods to evaluate the uncertainty; innovative procedures for measuring by means of non conventional methods; measurements of time variable phenomena with on-line data processing and industrial process monitoring; methods to validate interpretative models in industrial and clinical diagnostics; industrial installation and equipment testing with the design of optimal measuring system; measuring techniques in clinical diagnostics; design and setup for laboratory experiments simulating harsh environmental conditions; mechanical system testing: development, acceptance and qualification tests; design and set up of measuring and testing devices for opto-mechanical and ultrasonic instrumentations
- Sciences and Technologies for Aeronautics and Satellite Applications (STASA), whose research lines are: system engineering and mission analysis; structural and thermal analysis of space systems; advanced robotics; mechanisms and tethers in space; dynamics of space flights and attitude control; space navigation; mechanics of composite materials; photon

detectors from soft-X rays to near infrared; optics and scientific instruments for space; physics of planets, moons, comets, asteroids; mission analysis for universe and Earth observations; interaction between spacecraft and space environment; design, verification and test of laboratory simulation in harsh environment; neurosciences and comparative psychology for space applications

STATISTICAL SCIENCES

website: <http://www.stat.unipd.it/fare-ricerca/dottorato-di-ricerca>

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phd@stat.unipd.it

language: English

The doctoral programme in Statistical Sciences aims at developing a comprehensive expertise in statistics for students with a good background in mathematics, providing them with the tools to conduct research in a variety of theoretical and applied fields. Candidates will not only acquire the theoretical tools that underpin the methodology of the discipline, but will also gain substantive experience working on applications. Lectures in the first year courses are delivered in English by leading international researchers and experts. Doctoral candidates completing the programme will be well prepared either to pursue a career in research or to start a job as highly professional statisticians.

Research lines:

- Statistical methodology and its applications. Methodological aspects range from statistical models to inference and computational issues. Applications may concern a variety of fields such as environmental studies, technology, life sciences, medicine, finance.
- Statistical methods and applications in Economics. In particular: time series analysis, forecasting, statistical methods for labour economics and evaluation of public policies.
- Social Statistics and Demography. In particular, survey methodology, models for individual and aggregated data, segmentation techniques, multilevel models, population structure and dynamics, statistical analysis of demographic behaviours and policies.

TRANSLATIONAL SPECIALISTIC MEDICINE G.B. MORGAGNI

website: <http://www.dctv.unipd.it/>

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language/s: English

Research lines:

The PhD course in Specialistic Medicine “G.B. Morgagni” offers highly competitive PhD. Programs in the biomedical field of Cardiothoracic And Vascular Sciences, Neurosciences, Endocrine And Metabolic Sciences. The main objective of the course is to form top-level scientists in the biomedical disciplines and offers a wide range of facilities to perform research in clinical and experimental medicine from basic science to clinics with particular emphasis on translational medicine. At the end of their research program the Ph.D. Students acquire specific knowledge concerning basic sciences and molecular medicine, technical laboratory skills, and a research method in Medicine and Surgery to be applied in the prevention, diagnosis and therapy of human diseases.

Using a multidisciplinary approach to biomedical sciences, competences in epidemiology, genetics, biology and molecular pathology, regenerative medicine, physiopathology, diagnostics and therapy are integrated.

The Ph. Doctors will gain skills for designing experimental protocols, for directing research projects and for treating patients with the power of the experimental scientific method.

The research project is carried out under the supervision of one of the Faculty members.

The PhD course recognize a three step training approach for the PhD students during the three year course.

The teaching activity includes frontal lessons, lectures, seminars, clinico□pathological conferences, a summer school during the first year, an autumn school at the second year, and a winter school at the third year. The remaining time must be devoted to the research activity (Basic laboratories, Clinical and Diagnostic Activities)

The Ph.D. Course in Specialistic Medicine “G.B. Morgagni” is organized in 3 curricula:

- I. Curriculum: Cardiothoracic and Vascular Sciences,
- II. Curriculum: Neurosciences,
- III. Curriculum: Endocrine And Metabolic Sciences.

Specific research fields are as follow:

CARDIOTHORACIC and VASCULAR SCIENCES

Experimental and applied molecular Cardiology and cell biology of the heart. Cardiomyopathies. Genetics of heredofamiliar cardiomyopathies and myocarditis. Regenerative medicine. Heart transplant. Cardiovascular physiopathology. Interventional cardiology, arrhythmology, Congenital heart diseases. In vivo imaging, Cardiovascular pathology.

Heart surgery, Mechanical assistance, artificial heart. Valve prosthesis and tissue engineering.

Angiology. Vascular Surgery. Lung Pathology, lung transplant and thoracic surgery. Paleopathology and anthropological museology, History of Medicine.

Coordinator of the Curriculum: Prof. Gaetano Thiene (email: gaetano.thiene@unipd.it)

NEUROSCIENCES

Clinical Neurobiology and Neurogenetics. Neuromuscular diseases: muscular dystrophy, mitochondrial and metabolic diseases, Biological psychiatry: Psychopharmacology of depressive syndromes, neuroimaging of Psychiatric disorders. Neuroimmunology. Cerebral metabolism: neuroimaging and functional neuroimaging (PET/SPET) to degenerative Diseases of the central nervous system. Neurophysiopathology. Neurological rehabilitation. Neuro-otology. Experimental neurosurgery.

Coordinator of the Curriculum: Prof. Elena Pegoraro (email: elena.pegoraro@unipd.it)

ENDOCRINE and METABOLIC SCIENCES

Diabetes: epidemiology and genetics of diabetes. Diabetic vasculopathy. Diabetic Ulcer. Risk factors for diabetic vasculopathy. Physiopathology of endothelial dysfunction in diabetes, circulating progenitor endothelial cells in diabetic microangiopathy. Diabetic cardiomyopathy. Mass spectrometry. Biotechnologies.

Coordinator of the Curriculum: Prof. Angelo Avogaro (email: angelo.avogaro@unipd.it)

VETERINARY SCIENCES

website: <http://www.dottorato.veterinaria.unipd.it/index.php?lang=en>

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elena.giora@unipd.it

language/s: English/Italian

The research is focused into five overlapping and inter-related themes and is sustained by a complementary mixture of clinical and non-clinical academic staff:

1. Veterinary basic sciences: research covers the bio-pathologic subjects related to animals of veterinary interest (mammals, birds and fish), including molecular and cell biology, stem cell technology, microbiology, anatomy, physiology and endocrinology, zoology, pathology, animal behavior and man-animal relationship, animal welfare and bioethics.
2. Veterinary epidemiology, hygiene and public health: research includes the study of the diffusion of animal infectious and parasitic diseases (including zoonosis and molecular epidemiology) and the development of advanced diagnostic techniques; the development and evaluation of methods for disease prevention plans and risk factor assessment; the development of screening methods for ecotoxicology.
3. Food safety and Food science: This is an important and peculiar research and professional field in the veterinary sector. Research is addressed to investigate the bond between animal husbandry and the production of healthy and safe foods and diets for all, the development of methods to detect xenobiotic residues and assess the microbiological risk in food and feed, and methods for food traceability. PhD candidates will have also the opportunity to follow research programs related to the impact of food and feed production on human health.
4. Animal models to study spontaneous and experimental human diseases: The research projects are usually conducted in association with research groups in the area of human medicine, and applicants are invited to contact the reference person for further information about the topics.
5. Animal diseases: Research projects deal with the development of diagnostic and therapeutic tools, the evaluation of veterinary drugs and (functional) feed. All the areas of veterinary medicine are covered: internal medicine, reproductive medicine, surgery. The PhD students with a degree in Veterinary medicine will have also the chance to follow the activities at the University Veterinary Hospital, and learn about the methodologies and the scientific principles necessary for research and study in different fields of clinical veterinary science.