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Annex 3

**DOCTORAL SCHOOLS/INTERNATIONAL COURSES  
AND RELATED RESEARCH LINES**

**1. DOCTORAL SCHOOL: ASTRONOMY**

**website:** <http://dipastro.pd.astro.it/dottorandi/dottorandi.html>

**contact person:** [giampaolo.piotto@unipd.it](mailto:giampaolo.piotto@unipd.it)

Padova hosts Italy's largest Astronomical research community. Between the Department of Astronomy and the nearby Astronomical Observatory there are more than 60 staff researchers, well known at an international level, and about 25 postdocs. In Padova there are research groups actively working on observational and theoretical astrophysics, on topics ranging from the solar system, the extrasolar planets, stellar evolution, supernovae, star clusters, galaxies, galactic nuclei (active and not), to observational and theoretical cosmology. Research groups develop advanced astronomical instruments, and are involved in international collaborations for new instruments, both Earth and space-based. The Department of Astronomy is a member of the European Association for Research in Astronomy (EARA: <http://www2.iap.fr/eara/EARA.html>), a collaboration involving six of the major European astronomical institutes, with the aim of fostering research training for young scientists, and the development of research in Astrophysics. Padova pays particular attention to education and training to research, as testified by the 30 doctoral students presently enrolled in our School, and by the high percentage (78%) of researchers who hold a permanent position at universities or research institutes in astronomy, in Italy or abroad, among those obtaining their doctoral (pHD) degree in Padova before 2003.



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## 2. DOCTORAL SCHOOL: REGENERATION BIOLOGY AND MEDICINE

**website** : <http://www.dsfarm.unipd.it/html/biomedreg.htm>

**contact person**: [pierpaolo.parnigotto@unipd.it](mailto:pierpaolo.parnigotto@unipd.it)

Biotechnological applications based on chromosome set manipulation, genotyping and epigenetic modulation for the productive improvement of thermophilic fish species of interest for culture in developing countries of equatorial Africa.

- Study of neuroestrogen synthesis and cerebral expression of estrogen receptors in relation to the reproductive cycle of teleost fish
- Interactions among circulating adrenocortical prehormones (dehydroepiandrosterone sulfate and cortisone), organic anion transporters, intracrine steroid conversions and peptides acting as adiposity signals in the regulation of the human adipogenic process
- Development of innovative models of cultured human skin for therapeutic and diagnostic purposes
- Localization, quantification and transcriptional regulation of steroidogenic enzymes in the human hair follicle
- Using of nanomaterials to study adipogenesis
- Using of peripheral blood stem cells for obtaining bone and cartilage prostheses
- Proliferative and angiogenic effects of angiogenin and its tryptic peptides, RNase and lactogenin on Huvec cell cultures
- Natural and synthetic biopolymers as support of tridimensional prostheses stereolithographically produced
- Tissue engineering of skeletal muscle
- Peptide mimicry



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## 3. DOCTORAL SCHOOL: BIOMEDICINE

**website** : <http://www.imbm.unipd.it/DOTTORATO.htm>

**contact person**: [giorgio.palu@unipd.it](mailto:giorgio.palu@unipd.it)

The School offers a strong interdisciplinary research program based on the study of several aspects of the molecular mechanisms of physiology and their alteration during degenerative, neoplastic and infectious diseases. Research is also focused on the development of new diagnostics and therapies. Specific research fields are as follows:

- Structure and function of viral genes and their interaction with host genes involved in signal transduction, apoptosis, cell cycle and oncogenesis. genetic and biochemical mechanisms of resistance to antiviral drugs
- Development of viral and bacterial vectors for gene therapy and vaccine delivery; development of alternative delivery systems
- Bacterial pathogenetic mechanisms; drug-target finding
- Identification and development of new anti-tumour drugs
- Molecular basis of central and periferic nervous system physiopathology
- Tissue engineering and regenerative medicine
- Physiopathology of reproduction, development of diagnostic approaches and therapies of sterility
- Development of new image diagnostic technologies
- Structure-function studies of enzymes involved in proteins redox homeostasis using X-ray, NMR and bioinformatics
- Molecular role of micronutrients and vegetal antioxidants in the control of aging and degenerative and neoplastic pathologies
- Bioelectronics and nano-technologies: new materials for biosensor development
- Role of growth factors (Wnt, TGF-beta, Notch) in signal transduction during embryogenesis, development and carcinogenesis
- Function and transcriptional regulation of extracellular matrix genes
- Generation and characterization of murine models to study hypertension, inflammation, neoplastic transformation and metastasis
- Hepatitis C pathogenesis and hepatic fibrosis mechanisms



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## 4. DOCTORAL SCHOOL: BIOSCIENCES AND BIOTECHNOLOGY

**website :** <http://www.bbpd.eu>

**contact person:** [giuseppe.zanotti@unipd.it](mailto:giuseppe.zanotti@unipd.it)

The PhD School in “Biosciences and Biotechnologies” is organized in six curricula: Biochemistry, Biotechnologies, Cell biology, Neurobiology, Genetics and Development, Evolutionary biology.

- The course in Biochemistry focuses on proteins, which are investigated in terms of structure, of modulation of gene expression and function. In particular: signal transduction pathways; role of protein phosphorylation; homeostasis of intracellular Ca<sup>2+</sup>; mitochondrial dysfunction and myocardial ischemia; biochemistry and biophysics of photosynthetic processes; Bioinformatics.
- The course in Biotechnologies entails research programs in biotechnological aspects of animal and plants, bioinformatics, genomics, structural and computational biology.
- The Course in Cell Biology entails research programs in signal transduction, mitochondrial pathophysiology and its involvement in programmed cell death and pathogen-host interactions.
- The Course in Genetics and Development focuses on research programs in the fields of molecular genetics, structural and functional genomics and molecular biology of development. In particular, mechanisms underlying embryonic development, cell differentiation, circadian rhythmicity, genome instability and inherited human disorders are studied in humans and in model organisms, such as mouse, zebrafish and Drosophila.
- The Course in Evolutionary Biology entails research programs in biological evolution, at molecular, cellular and organismal levels.

The Course in Neurobiology entails research programs in physiopathology of neuronal ion channels, Ca<sup>2+</sup> signalling and neuron-glia interactions; neurobiology of auditory, vestibular and olfactory systems; physiopathology of skeletal muscle, with special interest to nerve-muscle interactions and gene regulation.



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## 5. DOCTORAL SCHOOL: INTERNATIONAL LAW AND PRIVATE AND LABOUR LAW

**website:** <http://www.dircomp.unipd.it/dottorato.htm>  
**contact person:** [renato.pescara@unipd.it](mailto:renato.pescara@unipd.it)

The school embraces an interdisciplinary perspective, by integrating international law, private Italian and European law, as well as labour law and private comparative law. It aims at training researchers in the following domains:

- Private law, not only considered in the optical of the Italian legal system, but also in comparison with the other European legal systems and in the perspective of their unification
- Labour law and union law in the Italian system, in comparison with the other European legal systems and the international law.
- International private and public law and European Union law also in the perspective of their historical evolution.



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## 6. DOCTORAL SCHOOL: ECONOMICS AND MANAGEMENT

**website:** [http://www.decon.unipd.it/dottorato/eng/index\\_new.html](http://www.decon.unipd.it/dottorato/eng/index_new.html)

**contact person:** [sdem.decon@unipd.it](mailto:sdem.decon@unipd.it) (Asmàa Haimar, administrative issues)  
[federico.biagi@unipd.it](mailto:federico.biagi@unipd.it) (public economics)  
[efrem.castelnuovo@unipd.it](mailto:efrem.castelnuovo@unipd.it) (macroeconomics)  
[andrea.furlan@unipd.it](mailto:andrea.furlan@unipd.it) (management, organization)  
[antonio.nicolo@unipd.it](mailto:antonio.nicolo@unipd.it) (economic theory, game theory)  
[antonio.parbonetti@unipd.it](mailto:antonio.parbonetti@unipd.it) (accounting)  
[guglielmo.weber@unipd.it](mailto:guglielmo.weber@unipd.it) (applied econometrics, economics of aging)

At the end of first-year courses, each PhD student is assigned to a supervisor, who will tutor him/her during the writing of the dissertation. Supervisors are normally selected among the members of the Economics Department, which covers most fields in economics and business. In particular, members of the Department are active in the following areas:

- Growth and development of SMEs and industrial clusters
- Supply Chain Management
- Organizational behaviour
- Marketing
- Financial and Management Accounting, Voluntary Disclosure
- Corporate Governance
- Monetary economics and macroeconomics
- Public economics, fiscal federalism, taxation, health economics, economics of education
- Environmental economics
- Applied econometrics
- Economics of Ageing
- Labour economics
- Game theory and social choice
- Industrial organization

## 7. DOCTORAL SCHOOL: PHILOSOPHY

**website:** <http://www.filosofia.lettere.unipd.it/html/dottorati/dottorati.htm>

**contact person:** [g.fiaschi@unipd.it](mailto:g.fiaschi@unipd.it)

Research lines:

- Philosophy and history of ideas
- Moral and theoretical philosophy
- Political philosophy and history of political thought



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## 8. DOCTORAL SCHOOL: PHYSICS

**website:** <http://www.fisica.unipd.it/~dott/dottorato.html>

**contact person:** [attilio.stella@unipd.it](mailto:attilio.stella@unipd.it)

Research lines:

- Theoretical physics and astrophysics
- Nuclear and subnuclear physics
- Condensed matter
- Plasma physics
- Biological physics

## 9. DOCTORAL SCHOOL: LAW

**website:** <http://www.storiafilogiuri.unipd.it/scuoladottorato>

**contact person:** [francescovittore.gentile@unipd.it](mailto:francescovittore.gentile@unipd.it)

The PhD School project is designed to have a joint programme for the first year of each cycle, represented by modules of legal topics, aiming to open the scientific and cultural horizons of the young people who are facing for the first time the world of research. At a second stage, and accordingly to the branches defined by the disciplinary scientific fields, specific programmes will be elaborated by each candidate, aiming to supply the educational process with a specialised significance, always promoting, besides that, the interdisciplinary values, and national and international participation to scientific cooperation networks.

The School is articulated in several research areas, which are coordinated with the aim of developing an educational plan for the scientific and professional preparation of a jurist, who, acquiring a method and field knowledge, knows how to critically penetrate every aspect of the many-sided juridical experience, without moreover neglecting the particular focus on the topics concerning the disciplines in which he/she will write his/her doctoral thesis, topics which will be more congenial to him/her with the aim to assure the possibility of spending the title within the entire professional marketplace, in addition to the usual academic career.



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## 10. DOCTORAL SCHOOL: INFORMATION ENGINEERING

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

**contact person:** [phdschool@dei.unipd.it](mailto:phdschool@dei.unipd.it)

Research lines:

- Control and system theory and applications
- Operations research
- Electromagnetic radiation, instrumentations, measurement procedures and reduction of the radiated em field
- Use of engineering methodologies and techniques to solve medicine and biology problems: Modeling and Control of Biological Systems; Computational Genomics and Proteomics; Systems Biology; Bioinformatics; Bioelectronics; Bioimaging; Processing of Biomedical Data and Signals; Computational Neurosciences; Biomaterials; Biomechanics; Bioengineering of Physical Activity; Rehabilitation Engineering; Telemedicine, Medical Informatics.
- Computer engineering: Software engineering, Information management systems, Computer networks, Computer music, Computation theory and applications
- Study, design and test of microelectronic systems and apparatus (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.

## 11. DOCTORAL SCHOOL: MANAGEMENT ENGINEERING AND REAL ESTATE APPRAISAL

**website:** <http://sdge.dimeg.unipd.it/>

**contact person:** [giuseppe.stellin@unipd.it](mailto:giuseppe.stellin@unipd.it)

Thematics analysed in the PhD Program in Managerial Engineering and Real Estate Appraisal are:

- Curriculum Real Estate Appraisal and Land Economics: Real estate appraisal, Evaluation of environmental and cultural goods, Land Economics, Economics of Projects Appraisal.
- Curriculum Managerial Engineering: Business Administration, Principles of Engineering Economy, Management of Innovation, Operations and Supply Chain Management, Business Strategy.



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## 12. DOCTORAL SCHOOL: INDUSTRIAL ENGINEERING

**website:** <http://www.sdii.dimeg.unipd.it/>  
**contact person:** [paolo.bariani@unipd.it](mailto:paolo.bariani@unipd.it)

Main research fields in the School are those of the Industrial Engineering and include:

- Chemical engineering
- Electrical engineering
- Energetics
- Technical physics
- Mechanical engineering
- Motorcycle engineering
- Manufacturing engineering
- Bio-mechanics and bio-manufacture
- Metallurgical engineering
- Mechatronics and industrial systems engineering

## 13. DOCTORAL SCHOOL: DEVELOPMENTAL MEDICINE AND PLANNING SCIENCES

**website:** <http://www.pediatria.unipd.it/on-line/Home.html>  
**contact person:** [giuseppe.basso@unipd.it](mailto:giuseppe.basso@unipd.it)  
[giovanni.dagata@unipd.it](mailto:giovanni.dagata@unipd.it)

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



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- 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.

- Pediatric and Experimental Surgery

This area studies the major pediatric diseases of surgical interest to allow for advances in both the introduction and use of new, innovative technologies to achieve the highest possibile standard of results. For most pediatric pathologies surgery approaches are complex and multidisciplinary in nature, thus it is extremely vital to use the procedural knowledge to provide tools that allow for the valorization of the general knowledge and to favour innovative research even through results application in applied basic research.

Specifically the present research includes:

- Complex surgical disease and multidisciplinary approaches.
- Severe respiratory system malformations.
- Severe gastro-intestinal tract malformations.
- Malformations of the thoracic-abdominal wall
- Tissue engineering and clinical application.

- Health planning Models/systems 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 insitutions and progammes of international cooperation are developed as well. Studies are also carried out in the areas of analytical and evacuative epidemiology, operational research using stochastic and linear methods as well as graphing and simulation



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## 14. DOCTORAL SCHOOL: ONCOLOGY AND SURGICAL ONCOLOGY

**website:** <http://www.dsoc.medicina.unipd.it/on-line/Home/OffertaDidattica/Dottorato.html>

**contact person:** [paola.zanovello@unipd.it](mailto:paola.zanovello@unipd.it)  
[dm.dagostino@unipd.it](mailto:dm.dagostino@unipd.it)

Research lines:

- Molecular oncology and histopathology
- Bioinformatics
- Viral oncology
- Tumor immunology
- Genetic predisposition to cancer
- Gene therapy of cancer
- Onco-hematology
- Tumor surgery and loco-regional treatments
- Tumors of urogenital tract

## 15. DOCTORAL SCHOOL: MATERIALS ENGINEERING AND SCIENCE

**website:** <http://www.chimica.unipd.it/index.php?lang=eng&context=336>

**contact person:** [gaetano.granozzi@unipd.it](mailto:gaetano.granozzi@unipd.it)

Research lines:

- Design of functional materials
- Advanced preparation methods (both bottom-up and top-down)
- Physico-chemical and functional characterization of innovative materials
- Surface properties of functional materials
- Preparation and characterization of thin films and functional coatings
- Preparation and characterization of nanodimensional and nanostructured materials
- Materials for energetics
- Advanced Ceramic Materials
- Modelization of nanostructured materials



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## 16. DOCTORAL SCHOOL: ANIMAL SCIENCES

**website:** <http://www.dsa.unipd.it/dottorato/index.asp>

**contact person:** [roberto.mantovani@unipd.it](mailto:roberto.mantovani@unipd.it)

Research lines:

- Husbandry, feeding, conservation and genetic improvement of farm, pet and venatorial species-populations
- Biotechnology applied to selection, conservation, feeding and husbandry of animals and to traceability of animal products
- Biostatistics and computer science applied to animal science
- Welfare of farm and pet animals
- Environmental impact of herds and strategies for decreasing pollutants of farm origin
- Improvement of animal products and safety through new systems of quality assessment and assurance
- Procedures and systems of genetic evaluation, selection and crossbreeding schemes

## 17. DOCTORAL SCHOOL: CIVIL AND ENVIRONMENTAL ENGINEERING SCIENCES

**website:** [http://www.image.unipd.it/scuola\\_dottorato/](http://www.image.unipd.it/scuola_dottorato/)

**contact person:** [stefano.lanzoni@unipd.it](mailto:stefano.lanzoni@unipd.it)

Research lines:

- Fluid mechanics and hydrodynamics
- Fluvial morphodynamics
- Surface hydrology
- Transport of pollutants within surface and subsurface water bodies
- Reclamation of contaminated sites. Solid waste management
- Slope stability
- Environmental geomechanics
- Structural mechanics and engineering
- Computational mechanics
- Dynamics of water-limited vegetation
- Self-organization and networks in nature
- Advanced numerical methods
- Theory and applications of finite-element methods
- Subsurface hydrology
- Ecogeomorphology
- Statistical hydrology and mechanics



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## 18. DOCTORAL SCHOOL: EARTH SCIENCES

**website:** <http://www.geoscienze.unipd.it/~dottorato/homedott.htm>

<http://www.geoscienze.unipd.it/>

**contact person:** [gilberto.artioli@unipd.it](mailto:gilberto.artioli@unipd.it)

The School focuses on the following fields of research:

- Applied Geology
- Geochemistry
- Geophysics
- Mineralogy
- Mineralogy and Petrography applied to Cultural Heritage
- Paleontology e Paleoecology
- Petrology
- Sedimentology and Stratigraphy
- Structural Geology

Applicants are advised to consult the web pages of the School and the web pages of the Department of reference and its staff for details of possible research themes.

Applicants should make preliminary contacts with possible Tutors or with the Director of the School, in order to check the availability of research themes

## 19. DOCTORAL SCHOOL: CROP SCIENCES

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

**contact person:** [andrea.battisti@unipd.it](mailto:andrea.battisti@unipd.it)

Research lines:

- 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
- Plant-environment interaction
- Interactions between crop production and agronomic techniques
- Crop rotation
- Potential productivity and soil fertility
- 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
- Plant protection from pests and diseases
- Ecological and molecular analysis of pest and disease populations
- Regulation of fruit development and ripening
- Fruit post-harvest physiology
- Fruit allergenicity
- Molecular basis of fruitlet abscission



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## 20. DOCTORAL SCHOOL: PHARMACOLOGICAL SCIENCES

**website:** <http://www.dfem.unipd.it/PostLauream/postlaureamA.htm>

**contact person:** [rosamaria.gaion@unipd.it](mailto:rosamaria.gaion@unipd.it)

Research lines:

- Pharmacokinetics, dynamics and therapeutic applications of natural, synthetic and biotechnological products
- Mechanisms of adverse reactions to drugs and toxic compounds
- Preclinical and clinical drug evaluation
- New approaches to disease treatment
- Critical care therapy
- Pharmacovigilance for the appropriate use of drugs
- Cardiovascular, gastrointestinal, respiratory and endocrine pharmacology
- Neuropsychopharmacology
- Immunopharmacology
- Antibiotics and cancer chemotherapy
- Pharmacogenetics and pharmacogenomics
- Toxicology
- Mutagenesis and cytotoxicity
- Clinical pharmacology
- Therapeutic drug monitoring
- Pharmacoepidemiology
- Pharmacoconomics
- Intensive neurological, respiratory and cardiocirculatory therapy
- Cell therapy

## 21. DOCTORAL SCHOOL: LINGUISTIC, PHILOLOGICAL AND LITERARY SCIENCES

**website:** [http://www.lettere.unipd.it/scuole\\_dottorato/scuoledott.html](http://www.lettere.unipd.it/scuole_dottorato/scuoledott.html)

**contact person:** [paola.beninca@unipd.it](mailto:paola.beninca@unipd.it)

The school is divided in the following six curricula:

- Anglo-German Linguistics, Philology and Literature: [http://www.maldura.unipd.it/dllags/dottorato\\_ricerca/index\\_index.html](http://www.maldura.unipd.it/dllags/dottorato_ricerca/index_index.html);
- Classical Philology: <http://www.mondoantico.unipd.it>
- Italian Studies <http://www.maldura.unipd.it/italianistica/>;
- Linguistics <http://www.maldura.unipd.it/ddlcs/>;
- Romance Philology <http://www.maldura.unipd.it/romanistica/>;
- Slavic Studies <http://www.maldura.unipd.it/dllags/>



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## 22. DOCTORAL SCHOOL: MATHEMATICAL SCIENCES

**website:** <http://www.math.unipd.it/~dottmath/>

**contact person:** [daipra@math.unipd.it](mailto:daipra@math.unipd.it)

The School focuses on the following fields of research:

- Algebra
- Analysis
- Geometry
- Logic
- Mathematical physics,
- Number theory
- Numerical Analysis
- Operations research-optimization
- Probability-stochastic processes

## 23. DOCTORAL SCHOOL: MEDICAL, CLINICAL AND EXPERIMENTAL SCIENCES

**website:**

[http://anpat.unipd.it/serv/iap.s3?action=page:::page=lezioni\\_dottorato](http://anpat.unipd.it/serv/iap.s3?action=page:::page=lezioni_dottorato)

<http://www.dmcs.unipd.it/rubrica/index.php?action=visualizzaDidatticaDottorati&step=2&id=1>

<http://www.unipd.it/esterni/wwwneuro/>

<http://www.unipd.it/esterni/wwwfisio/dipanfisum/>

<http://www.pediatria.unipd.it/ricerca/infogen.html>

**contact person:** [antonio.tiengo@unipd.it](mailto:antonio.tiengo@unipd.it)

The doctoral school is organized in different clinical and scientific areas:

- Diabetology
- Clinical physiopathology
- Clinical and experimental gerontology and haematology
- Clinical methodology and endocrinology
- Nephrology
- Neuroscience
- Clinical and experimental rheumatology
- Cardiovascular sciences



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## 24. DOCTORAL SCHOOL: MOLECULAR SCIENCES

**website:** <http://storage.chfi.unipd.it/~sds/>

**contact person:** [maurizio.casarin@unipd.it](mailto:maurizio.casarin@unipd.it)

Research lines:

- 1) Modeling, synthesis, and reactivity:
  - i) Coordination & organometallic chemistry;
  - ii) Metal complexes & metal nanoclusters in catalysis;
  - iii) Molecular Electrochemistry;  
NMR spectroscopy & Reaction mechanisms.
- 2) Chemistry of biological systems
  - v) Peptides;  
Proteins.
- 3) Supramolecular chemistry and nanoscience
  - vii) Functional, metal-based molecular systems;
  - viii) Structure and chemistry of surfaces & ultrathin films.
- 4) Material chemistry
  - ix) Functional materials;
  - x) Nanomaterials;  
Polymeric materials.
- 5) Chemistry for innovative technologies, the environment and cultural heritage
  - xii) Development of analytical methods;
  - xiii) Environmental chemistry;
  - xiv) Technologies for cultural heritage.
- 6) Pharmaceutical Sciences:
  - xv) Design, synthesis and characterization of biologically active compounds
  - xvi) Enzymes, proteins and aminoacids of pharmaceutical interest
  - xvii) Extraction and characterization of natural products

## 25. DOCTORAL SCHOOL: PEDAGOGICAL, EDUCATIONAL AND INSTRUCTIONAL SCIENCES

**website:** <http://www.educazione.unipd.it/index.php?stato=dottorandi>

**contact person:** [raffaella.semeraro@unipd.it](mailto:raffaella.semeraro@unipd.it)

The Doctoral School has three research areas composed by specific arguments. The research areas are the following:

- Educational and training sciences
- Instructional sciences and communication technologies
- Epistemology and methodology of educational research



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## 26. DOCTORAL SCHOOL: PSYCHOLOGICAL SCIENCES

**website:** <http://scuoladott.psy.unipd.it/>

**contact person:** [anne.maass@unipd.it](mailto:anne.maass@unipd.it)

### Research lines:

- Sensation (visual acuity, contrast sensitivity, visual search, adaptation, partial and temporal summation, dynamic vision and stereopsis)
- Perception (visual perception, environmental perception, animal perception)
- Visual cognition (representation, visual memory, visual attention, perception and action, visuo-motor behaviour)
- Uni-hemispheric sleep in the domestic chick
- Animal models of cerebral lateralization
- Gender identity and sexual orientation: genetic and evolutionary implication in humans
- Lifespan Cognitive Neuroscience
- Attentional and control deficits in patients with brain damage
- Psychobiology of language and language disorders (aphasia, dyslexia)
- Psychophysiology of emotion and anxiety
- Cardiovascular psychophysiology
- Cognitive deficits in sleep deprivation
- Biological basis of neural and psychiatric disorders
- Cognitive development in newborns and infants
- Cognitive and linguistic development
- Social, affective and emotional development
- Conceptual development and learning
- Literacy
- Learning and Instruction
- Psychodiagnosis in childhood and adolescence
- Community psychology and adolescence
- Attention, in relationship to other cognitive processes such as perception, memory, and emotion
- Psychology of language (word perception, comprehension, sentence and text processing etc.)
- Social cognition (causal inferences, social categorization, automatic processes, stereotyping, and cultural differences in social cognition)
- Computer simulation of cognitive processes
- Cognitive neuropsychology related to pathological aspects of cognitive functions in adults
- Methodology of Social Psychology and Personality Research
- Data Analysis and Formal Modelling in Personality and Social Psychology
- Personal and Social Identity
- Interpersonal and Intergroup Conflict Resolution
- Processes of Acculturation
- Work and Organizational Psychology
- Outcome Assessment in Psychotherapy



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## 27. DOCTORAL SCHOOL: STATISTICAL SCIENCES

**website:** <http://www.stat.unipd.it/phd>

**contact person:** [alessandra.salvan@unipd.it](mailto:alessandra.salvan@unipd.it)  
[dottorato@stat.unipd.it](mailto:dottorato@stat.unipd.it)

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, biology, 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.

## 28. DOCTORAL SCHOOL: HISTORICAL SCIENCES

**website:** <http://www.storia.unipd.it/index.php?pagina=dottorati3>  
<http://www.geogr.unipd.it/dottorato/>

**contact person:** [mariacristina.larocca@unipd.it](mailto:mariacristina.larocca@unipd.it)

The Doctorate School in Historical Sciences will offer critical and methodological instruments to elaborate research abilities through the exploitation of a large spectrum of sources, to develop research skilness on historical problems, to understand complexity and relations between different phenomena of territory and landscape dynamics, inside historiographical international debate

Research lines:

- History of economical and social structures (from Classical Antiquity to Contemporary Age)
- History of political and ecclesiastical institutions (from Classical Antiquity to Contemporary Age)
- History of Christian theology and spirituality (from Late Antiquity to Contemporary Age)
- Cultural History (from Classical Antiquity to Contemporary Age)
- Gender History ((from Classical Antiquity to Contemporary Age)
- History of Industrial heritage
- Participatory geography for development
- Pluvial geomorphology, glacial and periglacial geomorphology, geoarchaeology.



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## 29. DOCTORAL SCHOOL: SPACE SCIENCES, TECHNOLOGIES AND MEASURES

**website:** [http://cisas.unipd.it/didactics/STS\\_school/phd\\_course.php](http://cisas.unipd.it/didactics/STS_school/phd_course.php)

**contact person:** [cesare.barbieri@unipd.it](mailto:cesare.barbieri@unipd.it)

The School is divided in two Curricula :

Astronautics and Satellite Sciences -ASS

- Solar system exploration and observations of the Universe
- Space systems
- Satellite navigation
- Optics and space Instrumentation
- Analysis of space missions for astronomy and earth observations

Mechanical Measures for Engineering and Space - MMIS

- Diagnostics and reliability of mechanisms and structures
- Innovative methods for measurements in fluids
- Innovative methods for mechanical and thermal measurements
- Measurements and instrumentations in aerospace engineering
- Methods of biomedical measurements

## 30. DOCTORAL SCHOOL: VETERINARY SCIENCES

**website:** <http://www.dottorato.veterinaria.unipd.it>

**contact person:** [massimo.morgante@unipd.it](mailto:massimo.morgante@unipd.it)

The main subjects of the research activities are: health and drug surveillance; food quality and food safety, diagnostic, etiopathogenic, epidemiologic, therapeutic and preventive aspects of animal and zoonotic diseases, also considered as human diseases models; veterinary anaesthesiology and surgery; animal reproduction; genetic approach to animal health and animal production; structure and function of animal body; animal ethology and animal welfare.



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## 31. DOCTORAL SCHOOL: SOCIAL SCIENCES : INTERACTIONS, COMMUNICATION, CULTURAL CONSTRUCTIONS

**website:** <http://www.sociologia.unipd.it/>

**contact person:** [franca.bimbi@unipd.it](mailto:franca.bimbi@unipd.it)  
[alberta.contarello@unipd.it](mailto:alberta.contarello@unipd.it)  
[italo.desandre@unibo.it](mailto:italo.desandre@unibo.it)  
[pierpaolo.giglioli@unipd.it](mailto:pierpaolo.giglioli@unipd.it)

Research lines:

- Conflicts and acknowledgment of Social Difference: Gender, Generations, Socio-cultural and Religious Minorities
- Migrations, Citizenship Rights and Social Exclusion
- Processes of social interaction, deviance and norms
- Theories and techniques of ritual, public, social and mass communication
- Religious pluralism
- Qualitative and Quantitative research Methods including Ethnography

## 32. DOCTORAL SCHOOL: HISTORY AND CRITICISM OF ARTISTIC AND MUSICAL HERITAGE AND OF PERFORMING ARTS

**website:** <http://www.dottorato-ams.lettere.unipd.it/>

**contact person:** [alessandro.ballarin@unipd.it](mailto:alessandro.ballarin@unipd.it)

Research lines:

- Architecture, Sculpture and Painting in Europe and in the Mediterranean in the Middle Ages; History of Art in Italy in the Middle and Modern Ages; Relationships between Italy and Northern Europe in the Art of the Renaissance; History of the Medieval and Renaissance Illumination; History of Art in 19th and 20th century; Methodologies of Criticism and Conservation of Art; Analysis of the artistic sources.
- Monodic liturgical repertoires in Christian West; Renaissance Polyphony; Music in Europe during the XVIII century; Relationships between Poetry and Music; History of Musical Theatre; Electronic Music in the 20th century; Analysis of the musical sources; Methodologies of Criticism and Conservation of Music
- History of the Italian Cinema; Semiology of Cinema and Audiovisual aids; Documentary studies; Filmology; History and Technics of Photography; Theory and Technics of cinematographic language; History and Criticism of Cinema
- Renaissance and Baroque theatrical treatise; History of the stage design and theatrical space in the Renaissance and the Baroque; History of the stage lighting techniques; Theatrical Iconography; History of the Ballet between 15th and 18th century; Theatre and education in the Renaissance and Baroque; Celebrations and ceremonial theatrical devices between the 15th and 17th century; History of the Drama in the Renaissance and Baroque; Success and influence of Renaissance and Baroque Theatre between 19th and 20<sup>th</sup> century; Acting.



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### 33. DOCTORAL SCHOOL: STUDY AND PRESERVATION OF ARCHEOLOGICAL AND ARCHITECTONICAL HERITAGE

**website:** <http://www.archeologia.unipd.it/>

**contact person:** [giovanni.leonardi@unipd.it](mailto:giovanni.leonardi@unipd.it)

Research lines:

- Greekl archaeology
- Roman archaeology
- Pre-protohistoric archaeology
- Methods in archaeology
- Ancient topography
- Surveying for cultural heritage
- Chemico-physical, mineralogical and petrographical investigations on materials constituting the cultural heritage
- Structural aspects of historical constructions

### 34. DOCTORAL SCHOOL: TERRITORY, ENVIRONMENT, RESOURCES AND HEALTH

**website:** <http://www.tesaf.unipd.it/Dottorato/Ecologia%20Forestate/tarsen.asp>

**contact person:** [vasco.boatto@unipd.it](mailto:vasco.boatto@unipd.it)  
[tommaso.anfodillo@unipd.it](mailto:tommaso.anfodillo@unipd.it)  
[marioaristide.lenzi@unipd.it](mailto:marioaristide.lenzi@unipd.it)  
[cesare.dezanche@unipd.it](mailto:cesare.dezanche@unipd.it)  
[bruno.saia@unipd.it](mailto:bruno.saia@unipd.it)

Research lines:

#### **Ecology curric.**

- Ectomycorrhizal dynamics in the forest expansion on sandy soils
- The role of ectomycorrhizae and soil nutrients in naturally expanding alpine forests
- Short-term effects of thinning on forest decline
- Effects of climate change on forest ecosystems
- Carbon balance of forest ecosystems
- Global determinants of treeline
- Forests and bioenergy
- Fitoremediation
- Landscape ecology
- Forest dynamics
- Tree water relations

#### **Economics curric.**

- Agrifood sector competitiveness
- European agricultural policy
- Food quality, made in Italy, geographical indications, organic products
- Marketing of agrifood products
- European rural development
- Economcs of bionenergy



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## **Mechanics of agricultural and forestry processes curric.**

- Water and fertilization management with precision agriculture
- Technologies and machineries for reduction environmental impacts and conservation of natural resources
- Technologies in precision agriculture and forestry
- Energy supply in agriculture and forestry, energy saving and by-product retrieval

## **Hydromony curric.**

- Hydrological processes and flash-flood
- Fluvial morphology, sediment transport, mountain rivers
- River and streams dynamics and restoration

## **Environmental medicine: nutrition and pollution curric.**

- Pollution and human health
- Hygiene standards related to humans and food safety ones
- Safety standards of air and water
- Working environment safety.
- Food science and technology
- Food quality and safety

## **35. INTERNATIONAL COURSE: ARTERIAL HYPERTENSION AND VASCULAR BIOLOGY**

### **website**

<http://www.dmcs.unipd.it/rubrica/index.php?action=visualizzaDidatticaDottorati&step=2&id=2>

**contact person:** [teresamaria.seccia@unipd.it](mailto:teresamaria.seccia@unipd.it)

The International PhD program in Arterial Hypertension and Vascular Biology is based in the Department of Clinical and Experimental Medicine (DMCS)-Internal Medicine 4 of the 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 Humboldt-Charité University of Berlin, Germany and the Medical Academy of Gdansk, Poland. It requires a rotation across the three Universities and possibly stages at other leading research centres in Europe and the USA.

Upon completion of the 3 years course it confers a PhD degree which is officially recognized in all three Countries.



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## Aim and Organizational Framework

The overall aim of the course is to develop PhD students' knowledge in order to enable them to gradually undertake independent research in the cardiovascular field by enhancing their laboratory skills facing innovative technologies.

After being introduced to a wide array of inter-disciplinary and comprehensive cardiovascular disease programs, each PhD student will be gradually educated to cutting-edge instrumentation, methods and technologies. Thus, he/she will be assigned a specific research project in the field of Arterial Hypertension and Vascular biology under the strict supervision of an experienced tutor.

The program also includes regular seminars on themes of basic and clinical research, clinical care devoted to cardiovascular health, and regular journal clubs and reviews of ongoing research projects in the different laboratories participating to the PhD Program. The PhD student is required to actively participate in research teams and to spend stage at least one of member University at Berlin or Gdansk for a minimum of 6 months.

PhD students will benefit from the inter-departmental collaboration with Anatomy, Pharmacology, Vascular Surgery and Endocrinology Units, which share their core facilities and expertise in tissue and intracellular protein localization, morphologic and morphometric techniques and tissue transplant in animal models. Moreover, PhD students referring to Padua, Berlin and Gdansk mutually benefit from the integrative and research collaborations among the three Universities.

## **The PhD 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.
- Principles of pharmacokinetics and pharmacodynamics applied to arterial hypertension.

### 2. Clinical research.

- Epidemiology and statistics applied to hypertension.
- Principles of pharmacoeconomics 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.

To date the PhD Program has been extremely successful in reaching these goals as testified not only by an impressive list of publications of the most prestigious journals in the field of Hypertension but also by the swift (immediately after and sometimes even before graduation) appointment of practically all the PhD students in industries and academic or hospital positions of the past years.



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## 36. INTERNATIONAL COURSE: FUSION SCIENCE AND ENGINEERING

**website:** <http://www.igi.pd.cnr.it/wwwedu/index.html>

**contact person:** [antonio.buffa@unipd.it](mailto:antonio.buffa@unipd.it)

The research field of the Course concerns Thermonuclear Fusion.

In particular the main lines of research are:

- Physics of thermonuclear fusion
- Engineering of thermonuclear fusion
- Diagnostics of thermonuclear fusion