



ANNEX 1

PHD COURSE IN COMPUTATIONAL MATHEMATICS, LEARNING, AND DATA SCIENCE

LOCATION: DEPARTMENT OF MATHEMATICS "F. CASORATI"

COORDINATOR: Prof. LUCA FRANCO PAVARINO;

COOPERATING INSTITUTION: Università della Svizzera Italiana (USI) and Bruno Kessler Foundation

The PhD degree will be jointly conferred by the Rector of the University of Pavia and the Rector of the Università della Svizzera Italiana (USI).

RESEARCH TOPICS:

Computational Mathematics

- **Mathematical Analysis and Modeling:** partial differential equation models and applications, functional analysis, nonlinear analysis, variational models and methods, calculus of variations
- **Numerical Analysis and Scientific Computing:** numerical methods for ordinary and partial differential equations (finite elements, spectral elements, isogeometric analysis), approximation of data and functions, numerical linear algebra, parallel and distributed computing, numerical simulation
- **Optimization and Operational Research:** Optimization methods, convex, integer, quadratic, and nonlinear programming, optimization algorithms, Control Theory
- **Biomathematics and computational medicine:** mathematical and numerical modeling in Biology, Physiology, Neurosciences, Cardiology, Epidemiology

Machine Learning, Deep Learning

- **Machine Learning:** Machine Learning and Statistical learning Algorithms
- **Deep Learning:** Artificial Neural Networks, mathematical and computational aspects; Physics-Informed Neural Networks, Deep Operator Networks;
- **Data Science and Artificial Intelligence:** Methodologies for integration, reproducibility and interpretability of models; generative models for the construction of synthetic data in medicine
- **Computational Intelligence:** Application to Life Sciences, Neuroimaging, Cardiology, Epidemiology

Health Data Science and Statistical Learning:

- **Health Data Science:** Data Science methodologies and predictive, interpretable, and reproducible machine learning and deep statistical learning models for Medicine and Sciences.



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- **Multivariate Statistics:** structural equation models, graphical models, causal structure discovery (learning), network and path analysis applied to genomic, genetic and neuroimaging data.
- **Statistics and Genetic Epidemiology, Bioinformatics:** integration of genetics, epigenetics, gene expression and sequencing data, both case-control and familial, in the study of complex and rare diseases. Frequentist and Bayesian approaches to causal inference.
- **Medical Statistics:** application and development of data science models for randomized clinical trials and epidemiological observational studies in the fields of medicine, biology and psychology.

Computational Physics

- **Mathematics Physics:** kinetic theories, granular media, statistical mechanics, diffusion equations, hyperbolic systems, and application, socio-economic modeling.
- **Computational Physics and Biophysics:** mathematical and computational methods in Elementary Particle Physics and High Energy Physics, Monte Carlo methods, quantum computing, biophysical models, and Monte Carlo codes for Radiotherapy and Hadrontherapy.

A more detailed description of the research carried out in this PhD program is available at <http://compmat.unipv.it/>. For details about research at the Department of Mathematics of the University of Pavia, see <http://matematica.unipv.it/>; for details about research at the Department of Brain and Behavioral Sciences of the University of Pavia (Medical and Genomic Statistical Unit), see http://dbbs.unipv.it/ricerca_biostatistica_neurofisiologia_psichiatria/ and <https://mastergds.it/>; for details about research at USI Institute of Computational Sciences see <https://www.ics.usi.ch>; for details about research at Bruno Kessler Foundation, see <https://www.fbk.eu/it/>.

ADMISSION PROCEDURE: qualifications assessment and interview via videoconference. Candidates are allowed to take the interview in English.

LINGUISTIC KNOWLEDGE: candidates' knowledge of English will be verified during the interview.

QUALIFICATIONS ASSESSMENT: UP TO 15 POINTS ARE ASSIGNED UPON ASSESSMENT OF EACH CANDIDATE'S QUALIFICATIONS, AS FOLLOWS:

- a. letter of intent written in English (max 2000 words) including the research project to be carried out during the PhD course. This will not be binding if the candidate is admitted to the PhD program: **up to 3 points**;
- b. exams taken during the candidate's masters degree course: **up to 4 points**;
- c. a maximum of 1 reference letter, issued and submitted directly by a professor from the university where the applicant's degree was awarded or by other professors/researchers who have had direct contact with the applicant. During the online application, the candidate will enter the contact data of the chosen referee who, through a specific online procedure, will have to upload the reference letter directly in the University portal by the deadline of the call. Unlike the other documents, the letter must not be uploaded by the candidate during the online application procedure. Letters uploaded by the candidate him/herself will not be evaluated by the committee: **up to 2 points**;
- d. abstract of the Master thesis, if available (max 1000 words), publications and preprints. Concerning publications and preprints, candidates may also send an abstract and



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indicate a DOI (Digital Object Identifier), or otherwise provide a link to a web repository. Only publications from the last 5 years that are congruent with the research topics of the PhD course will be considered: **up to 2 points**;

e. *curriculum vitae*: **up to 4 points**.

Excluding for the reference letter, qualifications must be submitted according to the procedure indicated in art. 5, para. 2 of this call for applications.

The minimum score to be admitted to the interview is 10/15.

The results of the qualifications assessment will be published online no later than **November 15, 2023**. The results will be posted in the Personal Area of the candidate in the University website. This can be accessed using the login information provided at the end of the registration procedure.

INTERVIEW: November 28, 2023 at 10:00 (CET), via videoconference.

The interview will be held in Italian or English and will verify the candidate's knowledge of English. The interview will concern the main topics covered by the PhD course and will include a short presentation of the research project meant to verify the candidates' aptitude towards research.

Before the interview, candidates will be asked to show a valid identity document. The University of Pavia does not take any responsibility for a candidate's failure to take the interview due to technical difficulties.

INFORMATION: <http://compmat.unipv.it/>

**PhD COURSE
IN PHYSICS**

LOCATION: DEPARTMENT OF PHYSICS;

COORDINATOR: Prof. DANIELA M. REBUZZI

TOPICS: Nuclear and subnuclear physics, theoretical and mathematical physics, condensed matter physics (including experimental and theoretical solid-state physics, optics and photonics, quantum information), interdisciplinary and applied physics (biomedical physics, energy, ICT-Information and communication technology)

ADMISSION PROCEDURE: qualifications assessment and interview. Candidates are allowed to take the interview in English and/or via videoconference. The videoconference must be requested by selecting the appropriate option in the online application procedure (see art. 5 of this Call for applications).

The candidates' qualifications must, in the judgement of the examining committee, meet the standards of a solid application story. Subsequently, the preparation of the applicants is evaluated in an interview, whose purpose is to demonstrate a comprehensive knowledge of basic Physics and to assess the student's analytic ability, creativity, and potential for successful completion of the PhD course in Physics.



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Candidates are allowed to take the interview in English and/or via videoconference. The videoconference must be requested by selecting the appropriate option in the online application procedure <http://studentionline.unipv.it/esse3/Home.do>.

The candidates' qualifications must, in the judgement of the examining committee, meet the standards of a solid application story. Subsequently, the preparation of the applicants is evaluated in an interview, whose purpose is to demonstrate a comprehensive knowledge of basic Physics and to assess the student's analytic ability, creativity, and potential for successful completion of the PhD course in Physics.

LINGUISTIC KNOWLEDGE: candidates' knowledge of English will be verified during the interview.

QUALIFICATIONS ASSESSMENT: UP TO 10 POINTS ARE ASSIGNED UPON ASSESSMENT OF EACH CANDIDATE'S QUALIFICATIONS, AS FOLLOWS:

- a. exams taken during the candidate's degree courses, bearing the marks: **up to 4 points**;
- b. Master's degree thesis, possible publications and professional experience. A 2-page abstract of the thesis must be attached to the application. Publications and similar documents must be attached to the application in their complete version: **up to 2 points**;
- c. outline of the research project (max 2 pages), in Italian or English. This will not be binding if the candidate is admitted onto the PhD course: **up to 2 points**;
- d. a maximum of 2 reference letters, issued and submitted directly by professors from the university where the degree was awarded or by other professors/researchers who have had direct contact with the applicant. During the online application, the candidate will enter the contact data of the chosen referees who, through a specific online procedure, will have to upload the reference letter directly in the University portal by the deadline of the call. Unlike the other documents, these letters must not be uploaded by the candidate during the online application procedure. Letters uploaded by the candidate him/herself will not be evaluated by the committee: **up to 2 points**.

Except for the reference letters, the qualifications must be submitted according to the procedure indicated in art. 5, para. 2 of this call for applications.

The minimum score to be admitted to the interview is 6/10.

The results of the qualifications assessment will be published online no later than **November 10, 2023**. This can be accessed using the login information provided at the end of the registration procedure.

INTERVIEW: November 21, 2023, at 9:00 (CET), Physics Department, Via Bassi n. 6, Pavia.

The interview will concern the main topics covered by the PhD course and the research project.

Candidates who requested to take the interview via videoconference will be informed by the Committee about the date and time of the interview. Before the interview, candidates will be asked to show a valid identity document. The University of Pavia does not take any responsibility for a candidate's failure to take the interview due to technical difficulties.

NOTE: Candidates wishing to compete for one of the scholarships to undertake research on specific topics must express their interest in this theme before the start of the interview. These candidates' interviews will therefore also include a discussion of the project topics. Candidates will be included in the main ranking list, with the attribution of a possible eligibility for the topic-related scholarships. Such scholarships will be attributed to the first eligible candidate in the



ranking list. If the candidate renounces the scholarship, he/she will be excluded from the ranking.

INFORMATION: <http://www-2.unipv.it/dottorati/scienzeetecnologie/fisica/index.php>

The PhD course involves the following programs:

1. Physics of Fundamental Interactions;
2. Condensed Matter;
3. Interdisciplinary and Applied Physics.

**PhD COURSE
IN ELECTRONICS, COMPUTER SCIENCE
AND ELECTRICAL ENGINEERING**

LOCATION: DEPARTMENT OF ELECTRICAL, COMPUTER AND BIOMEDICAL ENGINEERING

COORDINATOR: Prof. ILARIA CRISTIANI

RESEARCH TOPICS: Photonics and Microwave Technologies, Space Communications Systems, Computer Engineering and Automation, Electrical Engineering, Mechatronics and Robotics

ADMISSION PROCEDURE: **qualifications assessment and interview.** Candidates are allowed to take the interview in English.

LINGUISTIC KNOWLEDGE: candidates' knowledge of English will be verified during the interview.

QUALIFICATIONS ASSESSMENT: UP TO 10 POINTS ARE ASSIGNED UPON ASSESSMENT OF EACH CANDIDATE'S QUALIFICATIONS, AS FOLLOWS:

- a. degree marks of both the bachelor and master's degree. If the master's degree hasn't been attained yet, the marks obtained during the master's degree course will be considered, provided that at least half of the total credits required for the master's course have been achieved by the date of the application submission (**up to 6 points**);
- b. publications (**up to 1 point**);
- c. *curriculum vitae* (**up to 1 point**);
- d. 2 reference letters, issued and submitted directly by professors from the university where the degree was awarded or by other professors/researchers who have had direct contact with the applicant. The Committee will assess the relevance of what is declared in the letter, the scientific reputation of the person signing the letter and the number of letters submitted. During the online application, the candidate will enter the contact data of the chosen referees who, through a specific online procedure, will have to upload the reference letter directly in the University portal by the deadline of the call. Unlike the other documents, the letter must not be uploaded by the candidate during the online application procedure. Letters uploaded by the candidate him/herself will not be evaluated by the committee (**up to 2 points**).

Except for the reference letters, the qualifications must be submitted according to the procedure indicated in art. 5, para. 2 of this call for applications.



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The minimum score to be admitted to the interview is 6/10.

The results of the qualifications assessment will be published online no later than **November 15, 2023**. This can be accessed using the login information provided at the end of the registration procedure.

INTERVIEW: November 20, 2023, at 9:30 (CET), via videoconference.

The interview will be held only via videoconference. Candidates will be informed by the Committee about the date and time of the interview. Before the interview, candidates will be asked to show a valid identity document. The University of Pavia does not take any responsibility for a candidate's failure to take the interview due to technical difficulties.

For the evaluation of the interview, the committee will assign up to 30 points.

INFORMATION: <https://phdieie.unipv.it/>

The PhD course involves the following programs:

- a. Photonic, Microwave and Telecommunications
- b. Computer Engineering and Automation – including the curriculum in Financial Technologies (FinTech);
- c. Industrial Engineering.

**PhD COURSE
IN CHEMICAL AND PHARMACEUTICAL SCIENCES,
AND RELATED INDUSTRIAL INNOVATION**

LOCATION: DEPARTMENT OF CHEMISTRY;

COORDINATOR: Prof. GIORGIO COLOMBO;

RESEARCH TOPICS:

Chemistry: Green Chemistry; Asymmetric synthesis, Computational methods in bio-inorganic systems; Ligands for nucleic acids; synthesis of biologically active compounds via pericyclic reactions; Polymers for energetics; Supramolecular devices; Functional nanomaterials; Surfaces with molecular monolayers; Adsorbants and solid catalysts for analytical applications; Biomimetic chemosensors; Materials for stone/wood supports; Structures/properties of metallo-enzymes; Photochemistry, C-H activation; Development of new generation perovskite based solar cells/Fabrication and characterization of perovskite based solar cells/Physico chemical characterization of nanostructured materials; Analytical Chemistry applied to forensic sciences; Electroanalytical chemistry; Adsorbents, Solid Catalysts; Optical sensors for analytical applications.

Pharmaceutical sciences: Identification of novel neuroprotective and anticancer drugs; macromolecule immobilization; Identification of new neuroprotective and antitumor agents; Immobilization of macromolecules; Nutraceuticals from agri-food waste: isolation, characterization, bioactivity and bioaccessibility studies; Study of Molecularly Imprinted Polymers-biological target interactions; Development of innovative supports for analytical applications in the pharmaceutical field; LC-MS for the characterization of proteins of pharmaceutical interest; Drug discovery from plants; New site-specific therapeutic systems,



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development of scaffolds for tissue repair (cutaneous, tendon-osteoarticular, central and peripheral nervous system and tubular organs); Development of nanoparticulate protein systems for the active delivery of drugs and for anticancer immunotherapy; Development of medicines based on mesenchymal stem cell derivatives for regenerative medicine and drug delivery; Development of medicinal products for advanced therapies, somatic cell therapy and tissue engineering.

Industrial innovation: Scale-up of products and processes in the chemical and pharmaceutical fields; development of formulation strategies in pharmaceutical industry.

ADMISSION PROCEDURE: qualifications assessment and interview. Candidates are allowed to have the interview in English and/or via videoconference. The videoconference must be requested by selecting the appropriate option in the online application <http://studentionline.unipv.it/esse3/Home.do>.

LINGUISTIC KNOWLEDGE: candidates' knowledge of English will be verified during the interview.

QUALIFICATIONS ASSESSMENT: UP TO 15 POINTS ARE ASSIGNED UPON ASSESSMENT OF EACH CANDIDATE'S QUALIFICATIONS, AS FOLLOWS:

1. arithmetic average of the marks obtained in the exams taken during the candidate's degree courses, to be calculated and declared by the candidates themselves; in the case of degree obtained in a foreign institution, the committee will use the ECTS grading tables: **up to 9 points;**
2. *curriculum vitae et studiorum*: **up to 3 points;**
3. motivation letter, either in Italian or English (max 1000 characters, spaces included), along with / including a research project developed by the candidate (max 3000 characters, spaces included; max 2 figures), either in Italian or English: **up to 3 points**. The project, which will not be binding if the candidate is admitted onto the PhD program, must contain a general introduction about the state of the art on the topic, a presentation of the research objectives, a discussion of the expected results as well as an evaluation of the theoretical and/or practical implications.

The qualifications must be submitted according to the procedure indicated in art. 5, para. 2 of this call for applications.

The minimum score to be admitted to the interview is 9/15.

The results of the qualifications assessment will be published online no later than **November 7, 2023**. The results will be posted in the Personal Area of the candidate in the University website. This can be accessed using the login information provided at the end of the registration procedure.

INTERVIEW: November 14, 2023, at 9:00 (CET), at the Department of Chemistry – Viale Taramelli n. 12 – Pavia.

The interview will concern the topics covered by the PhD course and may include a discussion on the candidates' experimental thesis and/or on the research project, in order to assess their aptitude and potential.

Candidates who requested to take the interview via videoconference will be informed by the Committee about the date and time of the interview. Before the interview, candidates will be



asked to show a valid identity document. The University of Pavia does not take any responsibility for a candidate's failure to take the interview due to technical difficulties.

NOTE: Candidates wishing to compete for one of the scholarships to undertake research on specific topics must express their interest in this theme before the start of the interview. These candidates' interviews will therefore also include a discussion of the project topics. Candidates will be included in the main ranking list, with the attribution of a possible eligibility for the topic-related scholarships. Such scholarships will be attributed to the first eligible candidate in the ranking list. If the candidate renounces the scholarship, he/she will be excluded from the ranking.

INFORMATION: please contact the PhD Coordinator Prof. Giorgio Colombo: phd.cfi@unipv.it

PhD course involves the following programs:

- a. Chemistry;
- b. Pharmaceutical Sciences;
- c. Industrial Innovation.

PHD COURSE IN EARTH AND ENVIRONMENTAL SCIENCES

LOCATION: DEPARTMENT OF EARTH AND ENVIRONMENTAL SCIENCES;

COORDINATOR: Prof. RICCARDO TRIBUZIO;

RESEARCH TOPICS:

- Chemical-physical parameters ruling the lower crust and upper mantle rheology
- Integrated soil erosion assessment in a Mediterranean catchment of the Northern Apennines. An innovative modelling framework to analyse sediment sources, transport and deposition processes.
- The effect of changing soil surface conditions on runoff and soil erosion using an experimental approach.

ADMISSION PROCEDURE: **qualifications assessment and interview via videoconference.** Candidates are allowed to take the interview in English.

LINGUISTIC KNOWLEDGE: candidates' knowledge of English will be verified during the interview.

QUALIFICATIONS ASSESSMENT: UP TO 10 POINTS ARE ASSIGNED UPON ASSESSMENT OF EACH CANDIDATE'S QUALIFICATIONS, AS FOLLOWS:

1. arithmetic mean of the marks obtained in the exams taken during the candidate's degree courses, to be calculated and declared by the candidates themselves: **up to 5 points**;
2. research project and qualifications: **up to 5 points**. The research project (max 5000 characters, spaces included), in Italian or English, must concern one of the research topics included in the PhD course. The project is meant to verify the candidate's aptitude towards research. It will not be binding if the candidate is admitted onto the PhD course. The qualifications include research and development activity for public and private



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institutions, scientific publications, postgraduate scientific education (internships, training courses, participation in conferences).

The qualifications must be submitted according with the procedure indicated in art. 5, para. 2 of this call for applications.

The minimum score to be admitted to the interview is 5/10.

The results of the qualifications assessment will be announced no later than **November 10, 2023**. The results will be posted in the Personal Area of the candidate in the University website. This can be accessed using the login information provided during registration.

INTERVIEW: November 17, 2023, starting at 9:30 (CET), via videoconference.

The interview will be held in Italian or English and will be an opportunity to verify the candidate's knowledge of English. The interview will consist of a short presentation of the research project (max 15 minutes; the use of technological support such as slides is encouraged) that is designed to verify the candidate's aptitude towards research. The research project presented by the candidate will not, in any way, be binding if the candidate is admitted onto the PhD course. More details on research topics are available at the following website: <http://phd-dsta.unipv.it/>.

Before the interview, candidates will be asked to show a valid identity document. The University of Pavia does not take any responsibility for a candidate's failure to take the interview due to technical difficulties.

NOTE: Candidates wishing to compete for one of the scholarships to undertake research in specific topics must express their interest in this theme before the start of the interview. These candidates' interviews will therefore also include a discussion of the project topics. Candidates will be included in the main ranking list, with the attribution of a possible eligibility for the topic-related scholarships. Such scholarships will be attributed to the first eligible candidate in the ranking list. If the candidate renounces the scholarship, he/she will be excluded from the ranking.

INFO: <http://phd-dsta.unipv.it>

PhD COURSE IN GENETICS, MOLECULAR AND CELLULAR BIOLOGY

LOCATION: DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"

COORDINATOR: Prof. DAVIDE SASSERA

ADMISSION PROCEDURE: **qualifications assessment and interview via videoconference.** Candidates are allowed to take the interview in English.

Candidates are allowed to have the interview in English and/or via videoconference. The videoconference must be requested by selecting the appropriate option in the online application procedure <http://studentionline.unipv.it/esse3/Home.do>.

LINGUISTIC KNOWLEDGE: candidates' knowledge of English will be verified during the interview.



QUALIFICATIONS ASSESSMENT: UP TO 10 POINTS ARE ASSIGNED UPON ASSESSMENT OF EACH CANDIDATE'S QUALIFICATIONS, AS FOLLOWS:

- a. reference letters (up to two) in Italian or English, issued and submitted directly by professors from the university where the degree was awarded or by other professors/researchers who have had direct contact with the applicant. During the online application, the candidate will enter the contact data of the chosen referee who, through a specific online procedure, will have to upload the reference letter directly in the University portal by the deadline of the call. Unlike the other documents, the letter must not be uploaded by the candidate during the online application procedure. Letters uploaded by the candidate him/herself will not be evaluated by the committee: **up to 1 point**;
- b. scientific publications. Only publications from the last 5 years that are congruent with the research topics of the PhD course will be considered: **up to 1 point**;
- c. arithmetic mean of the marks obtained in the exams taken during the candidate's degree courses, to be calculated and declared by the candidates themselves: **up to 4 points**.
- d. research project (max. 5000 characters, including spaces), in Italian or English. This will not be binding if the candidate is admitted onto the PhD course: **up to 4 points**;

Except for the reference letters, the qualifications must be submitted according to the procedure indicated in art. 5, para. 2 of this call for applications.

The minimum score to be admitted to the interview is 6/10.

The results of the qualifications assessment will be published online no later than **November 8, 2023**. The results will be posted in the Personal Area of the candidate in the University website. This can be accessed using the login information provided at the end of the registration procedure.

INTERVIEW: November 15, 2023, at 11:15 (CET), at Aula C of the Department of Biology and Biotechnologies, Genetics buildings, Via ferrata n. 9A, Pavia.

Candidates who requested to take the interview via videoconference will be informed by the Committee about the date and time of the interview. Before the interview, candidates will be asked to show a valid identity document. The University of Pavia does not take any responsibility for a candidate's failure to take the interview due to technical difficulties.

NOTE: Candidates wishing to compete for one of the scholarships to undertake research in specific topics must express their interest in this theme before the start of the interview. These candidates' interviews will therefore also include a discussion of the project topics. Candidates will be included in the main ranking list, with the attribution of a possible eligibility for the topic-related scholarships. Such scholarships will be attributed to the first eligible candidate in the ranking list. If the candidate renounces the scholarship, he/she will be excluded from the ranking.

INFORMATION: <http://dottorati.unipv.eu/on-dip/phdsgb/Home.html> homepage of the website "Admission to PhD".



LOCATION: DEPARTMENT OF BRAIN AND BEHAVIORAL SCIENCES

COORDINATOR: Prof. GABRIELLA BOTTINI

RESEARCH TOPICS: Psychology, Cognitive Neurosciences, Neuropsychiatric disorders.

ADMISSION PROCEDURE: qualifications assessment and interview. Candidates are allowed to take the interview in English and/or via videoconference. The videoconference must be requested by selecting the appropriate option in the online application procedure (see art. 5 of this Call for applications).

NOTE: Candidates who intend to apply for the scholarships to undertake research in specific topics must select, during the application process, the appropriate category (982); these candidates' interviews will therefore also include a discussion of the project topics. The examining committee will draw up a specific ranking list.

LINGUISTIC KNOWLEDGE: candidates' knowledge of English will be verified during the interview.

QUALIFICATIONS ASSESSMENT: UP TO 10 POINTS ARE ASSIGNED UPON ASSESSMENT OF EACH CANDIDATE'S QUALIFICATIONS, AS FOLLOWS:

- a. motivation letter in Italian or English (max 500 words) (**up to 2 points**);
- b. research experience, work activity in scientific fields related to the topics of the doctorate, publications (**up to 2 points**);
- c. research project in Italian or English (max. 3000 words), related to PhD research topics. The project's structure must be novel and original and must be written as follows: 1) general introduction about the state of the art relative to the chosen topic; 2) presentation of the research objectives, including a clear definition of the research hypothesis; 3) description of the of materials and methodology (with a particular focus on the experimental procedure and the statistical data analysis); 4) discussion of the expected results with evaluation of the theoretical and/or practical implications of the research project. In any case, the project will not constitute a binding work program in case of admission to the PhD course (**up to 3 points**);
- d. arithmetic mean of the marks obtained in the exams taken during the candidate's degree courses (**up to 3 points**). For students with qualifications obtained abroad, a transcript of the grades is required, showing:
 - i. the arithmetic mean of the exams obtained for each course of study;
 - ii. the minimum grade for sufficiency and the maximum grade in the university of origin.

A *curriculum vitae* is also required, which will not be considered for assessment.

Except for the reference letters, the qualifications must be submitted according to the procedure indicated in art. 5, para. 2 of this call for applications.

The minimum score to be admitted to the interview is 7/10.

The results of the qualifications assessment will be published online no later than **November 10, 2023**. The results will be posted in the Personal Area of the candidate in the University website. This can be accessed using the login information provided at the end of the registration procedure.



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INTERVIEW: September 13, 2023, starting from 8:30 (CET), Sala Riunioni, Department of Brain and Behavioral Sciences (Psychology section), Piazza Botta n. 11, Pavia.

If the interview is held in Italian, the Committee will verify the candidate's knowledge of the English language through the reading and translation of a short text taken from an essay or scientific article. The candidate will be asked to describe the content and methodology of the research project submitted, as well as the reason why he/she is willing to undertake a doctoral course. The interview will take into consideration the candidate's disciplinary orientation, in particular for what concerns the research methodology in the field of behavioural, biomedical and instrumental sciences.

Candidates who requested to take the interview via videoconference will be informed by the Committee about the date and time of the interview. Before the interview, candidates will be asked to show a valid identity document. The University of Pavia does not take any responsibility for a candidate's failure to take the interview due to technical difficulties.

INFORMATION: phd-pnds.unipv.eu

PhD COURSE IN BIOMEDICAL SCIENCES

LOCATION: DEPARTMENT OF BRAIN AND BEHAVIORAL SCIENCES

COORDINATOR: Prof. ANTONIO PISANI

RESEARCH TOPICS:

Biochemical and immunological characterization of bacterial proteins, their role in infective process and possible vaccinal use.

Molecular bases of diseases associated to aging and amyloidosis; analysis of connective matrix in normal and pathological conditions; proteins of biomedical interest: functional and structural studies.

Generation and characterization of animal models of human diseases: basic to translational research

Biochemistry of human erythrocyte. Pathogenic mechanisms of diseases related to protein-misfolding: biochemical markers.

Biochemical mechanisms of platelet production.

Identification of new biomarkers in biological fluids from patients affected by severe lung disorders and rare neurodegenerative diseases; analysis of bronchoalveolar lavage fluids from COVID-19 and chronic airways disease patients to investigate the role of proteases and associated inhibitors in extracellular matrix degradation.

Elucidation of the molecular mechanism of amyloid fibrils formation in vivo and in experimental models of the disease. Investigation of structure, folding/misfolding dynamics of amyloidogenic proteins. Mechanism of toxicity of amyloid fibrils in vivo.

PHARMACOLOGY TRACK:



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Receptor pathology, metabolism and cell kinetic study; environmental toxicology; gastrointestinal pharmacology; clinical pharmacology of active drugs on the central nervous system.

Antineoplastic drugs pharmacology; transplant pharmacology; pharmacoepidemiology and pharmacoconomics of active drugs on the central nervous system, the cardiovascular system and gastrointestinal system.

Pharmacology and molecular mechanisms associated with neurodegenerative diseases, such as neuroinflammation; single-cell -omics and nanotechnology for precision medicine applications.

Environmental effects on the immune system; pharmacology of the signaling transduction systems in the neurologic, oncologic and immune system diseases.

Neurobiology and behavioral pharmacology of neurodevelopmental disorders.

PHYSIOLOGY TRACK:

Molecular and cellular physiology of the nervous system; cellular communication and plasticity in the cerebral circuits; physiology and biophysics of sensory, motor and cognitive functions; mathematical model of cells, circuits and brain; cellular communication in the cardiovascular system; physiology of the skeletal and cardiac muscles; physiology of the gastrointestinal system.

NEUROSCIENCE TRACK:

Neurodegenerative diseases; neuroimmunology; neuro-oncology; epilepsy and sleep; primary headaches; neurorehabilitation; experimental models of neurological diseases; neuroepidemiology and research methodology; neuroendocrinology and functional neurology; pediatric neuroscience.

MEDICINE TRACK:

Disciplines within the medical sciences (cardiology, hematology, pathology, pediatrics); translational fundamental and clinical research on human diseases.

Cardiology: molecular basis of inherited cardiomyopathies and arrhythmias.

Pediatrics: immunopathological bases of diseases in childhood.

Hematology: molecular basis of myeloid neoplasms and its clinical implications; recognition of the mechanisms of progression to neoplasm; integrated genomic DNA/RNA profiling of myeloid malignancies in the diagnostic setting, as well as the development of genomic classification and prognostic models.

Pathology: etiopathogenic role of viral infections and immunodeficiency-related conditions; molecular basis of extranodal lymphomas and its clinical implications; immunophenotypical characterization.

The PhD course in Biomedical Sciences is dedicated both to candidates graduated in scientific disciplines (for example Biology, Physics and Engineering) with an interest in basic and applied research to disease, and to candidates graduated in Medicine who choose the postgraduate doctoral training with the intent to acquire skills in the context of translational research. The mandatory training activity is intended to improve knowledge and skills required for understanding functional and pathological mechanisms using a multi-scale approach (molecular, cellular, systemic) and includes courses in mathematics, biophysics, computer science, physiology, biochemistry, pharmacology, pathology and therapy.



ADMISSION PROCEDURE: qualifications assessment and interview. Candidates are allowed to take the interview in English and/or via videoconference. The videoconference must be requested by selecting the appropriate option in the online application procedure <http://studentonline.unipv.it/esse3/Home.do>.

LINGUISTIC KNOWLEDGE: candidates' knowledge of English will be verified during the interview.

QUALIFICATIONS ASSESSMENT: UP TO 10 POINTS ARE ASSIGNED UPON ASSESSMENT OF EACH CANDIDATE'S QUALIFICATIONS, AS FOLLOWS:

- a. arithmetic mean of the scores obtained in the exams taken during the candidate's degree courses, to be calculated and declared by the candidates themselves: **up to 4 points**;
- b. *curriculum vitae et studiorum*: **up to 2 points**;
- c. scientific publications: **up to 2 points**;
- d. research project in Italian or English (max 3000 words), related to the PhD research topics. The project must be structured according to the template available at the following link: <http://drsbm.unipv.it/admission>: **up to 2 points**.

The qualifications must be submitted according to the procedure indicated in art. 5, para. 2 of this call for applications.

The minimum score to be admitted to the interview is 6/10.

The results of the qualifications assessment will be published online no later than **November 10, 2023**. The results will be posted on the noticeboard of the Department of Brain and Behavioral Sciences and in the Personal Area of the candidate in the University website. This can be accessed using the login information provided at the end of the registration procedure.

INTERVIEW: November 16, 2023 at 14:00 (CET) - Department of Molecular Medicine, Library of Biochemistry Unit – Via Taramelli 3B – Pavia.

The interview will be focused on the main topics covered by the PhD course and in particular the research project submitted by the candidate. The research project will not be binding if the candidate is admitted to the PhD program.

Candidates who requested to take the interview via videoconference will be informed by the Committee about the date and time of the interview. Before the interview, candidates will be asked to show a valid identity document. The University of Pavia does not take any responsibility for a candidate's failure to take the interview due to technical difficulties.

NOTE: Candidates wishing to compete for one of the thematic scholarships must express their interest in this theme before the start of the interview. These candidates' interviews will therefore also include a discussion of the project topics. Candidates will be included in the main ranking list, with the attribution of a possible eligibility for the topic-related scholarships. Such scholarships will be attributed to the first eligible candidate in the ranking list. If the candidate renounces the scholarship, he/she will be excluded from the ranking.

INFORMATION: <http://phdbms.unipv.it/admission/>



**PHD COURSE IN
COMMUNICATION SCIENCES AND PRACTICES**

LOCATION: DEPARTMENT OF POLITICAL AND SOCIAL SCIENCES

COORDINATOR: Prof. FLAVIO ANTONIO CERAVOLO

RESEARCH TOPICS: Digital communication, reputation management and public opinion, narrative models, quantitative and qualitative research for communication and marketing.

ADMISSION PROCEDURE: **qualifications assessment and interview.**

Candidates are allowed to have the interview via videoconference. The videoconference must be requested by selecting the appropriate option in the online application procedure <http://studentionline.unipv.it/esse3/Home.do>.

LINGUISTIC KNOWLEDGE: the candidates' knowledge of English will be verified during the interview.

QUALIFICATIONS ASSESSMENT: UP TO 10 POINTS ARE ASSIGNED UPON ASSESSMENT OF EACH CANDIDATE'S QUALIFICATIONS, AS FOLLOWS:

- a. graduation marks of both the bachelor and master's degree, or weighted and arithmetic average of the marks obtained during the degree course: **up to 7 points;**
- b. internship, research or work experience consistent with the topics of the PhD course: **up to 2 point;**
- c. any training courses, "*master*" courses or other educational qualifications consistent with the topics of the PhD course: **up to 1 point.**

The qualifications must be submitted according to the procedure indicated in art. 5, para. 2 of this call for applications.

The minimum score to be admitted to the interview is 6/10.

The results of the qualifications assessment will be announced no later than **November 17, 2023**. The results will be posted in the Personal Area of the candidate in the University website. This can be accessed using the login information provided at the end of the registration procedure.

INTERVIEW: November 24, 2023, at 9:30 CET via videoconference.

The interview will focus on the topics of the PhD course as well as on the candidate's studies.

Before the interview, candidates will be asked to show a valid identity document. The University of Pavia does not take any responsibility for a candidate's failure to take the interview due to technical difficulties.

INFORMATION: <https://scienzepolitichesociali.dip.unipv.it/it/didattica/post-laurea/dottorati/phd-scienze-e-pratiche-della-comunicazione>