



THE HANDY GUIDE
FOR THE
IEIE-UNIPV PHD STUDENTS

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1. INTRODUCTION

1.1 Scope of the PhD guide

The aim of this guide (rev.02, updated on June 2015) is to provide comprehensive answers to the most frequent issues that the IEIE (Ingegneria Elettronica, Informatica ed Elettrica) PhD candidates can face during their postgraduate studies at the Dept. of Electrical, Computer and Biomedical Engineering (a.k.a. Dipartimento di Ingegneria Industriale e dell'Informazione, DIII) of the University of Pavia (UNIPV).

In order to guide PhD candidates through their doctoral training, from the initial enrollment to the final defense, this guide reports the fundamental duties and rights to be appropriately undertaken during the doctoral itinerary.

Not only, but also a detailed list of the research activities carried out in each laboratory of the DIII is provided, to allow new candidates to get in touch with the latest scientific trends and to choose the most appropriate working environment according to their own interests and penchant. Furthermore, some useful tips are included to illustrate the facilities offered by the University of Pavia, in particular to PhD students.

This guide has been set up thanks to the volunteering work of the IEEE student branch in Pavia, the help from the PhD offices and supervised by the PhD- IEIE Board. This is not an official document from the University of Pavia. If you think something here is missing, please let us know. In the final section you will find how to contact us.

We hope that you will come across what you are looking for and we wish you a pleasant and fruitful stay in Pavia.

Thanks and have a nice reading!

The Handy Guide staff

Pavia, June 2015

2. STRUCTURE & ORGANIZATION

2.1 The University of Pavia: a little history

The University of Pavia is one of the oldest universities in Europe. An edict issued by King Lotharius quotes a *higher education institution in Pavia* as already established in 825. This institution, mainly devoted to law studies, was then chosen as the main education centre for Northern Italy. Enlarged and renovated by the Duke of Milan, Gian Galeazzo Visconti, it became the University of the Duchy, officially established as a Studium Generale by Emperor Charles IV in 1361.

Alessandro Volta (1745-1827) is only one of a large group of famous professors who taught at the University of Pavia. To mention just a few, let us recall Girolamo Cardano (1501-1576), Antonio Scarpa (1752-1832) and Camillo Golgi (1843-1926). The “cardanic joint”, a widely used mechanical device, takes its name from the first. Scarpa was professor of anatomy and medicine. Many parts of human anatomy are today named after him, e.g. “Scarpa’s triangle” and “Scarpa’s fascia”. Golgi invented the so called “black reaction”, which, for the first time, displayed the ramified structure of nerve cells. This was the key to open the chapter of neuroscience, nowadays advancing so quickly. For this discovery, Golgi was given the Nobel prize in 1906, together with the Spanish Santiago Ramon y Cajal. The “Golgi complex” is only one of the many microstructures which are today named after him.

Today Pavia is a Research University, offering a wide variety of disciplinary and interdisciplinary teaching, organized in 18 Departments. The University offers degree courses, PhD programs, post-graduate schools, specialization courses and masters. Research is carried out in departments, institutes, clinics, centers, and laboratories in close association with public and private institutions, enterprises and companies.

The University of Pavia enjoys a strong tradition of international student and teacher exchanges: bilateral agreements involve, among others, the historical universities of the Coimbra Group, and many universities in Europe, the Middle East, the Mediterranean area, the United States of America, China, Japan and many other countries.

The University of Pavia is in a way unique, not only because of its prestigious historical origins and top quality achievements, but also due to its leading and promoting role in the so-called “Pavia System”, characterized by 15 colleges and residences where thousands of students can live, study and play sports. The oldest residences, named Collegio Borromeo and Collegio Ghislieri, were built in the 16th century; more recently other colleges for male and female students were founded through both public and private initiatives.

The University of Pavia today is made up of:

3 hospitals

15 colleges

20 master degrees

35 libraries

18 departments

54 specialization schools

104 degree courses

17 PhD courses
310 exchange relationships over the world
1.120 professors
1.600 study grants
4.000 graduated each year
23.000 students.

2.2 The School of Engineering

The School of Engineering at the University of Pavia is a relatively young institution since it was established in 1971, but it is nowadays ranked one of the best Italian Schools of Engineering. The annual ranking published by [CENSIS](#), in the last years, has always placed it in the top positions on the forty existing Italian Faculties: 2nd in 2008 and 2009, 1st position in 2010 and 3rd in 2011.

The Faculty of Engineering is located in the West northbound of the city, also known as *Polo Cravino*, and it is made up of two Departments: the DICAR (Dipartimento di ingegneria civile ed architettura) and the DIII (Dipartimento di Ingegneria Industriale e dell'Informazione - Department of Electrical, Computer and Biomedical Engineering).

The available services can make life enjoyable and profitable: special mention shall be given to the library, the green areas, the wide indoor and outdoor wireless network, several cafeterias and also a Museum ([MTE](#): Museum of the Electrical Technology). Since 2009, a multi-purpose sports complex has been established, including indoor and outdoor swimming pools, which provides Polo Cravino the look of a real university campus, with an unusual range of services, if compared to the Italian standards.

In recent years, the two Departments have spent a considerable effort towards a stronger development of the internationalization process in the educational field: several Master of Science programs are taught in English, the Erasmus exchange program is widely supported and promoted and several agreements have been signed for the achievement of joint degrees with foreign universities.

2.3 The DIII - Dipartimento di Ingegneria Industriale e dell'Informazione

DIII was established on March 2012 with the merger of the Departments of Electrical Engineering, Electronics, Computer Science and Systems.

The staff consists of 23 Professors, 23 Associate Professors, 31 Assistant professors, several adjunct professors, 14 technicians and 11 administrative staff. Also 17 Research Fellows and 84 PhD students, on the overall amongst the various PhD courses, work at the DIII (on June 2015). The roster of the School Board can be found at http://www-3.unipv.it/dottIEIE/index.php?pag=italiano/collegio_docenti.html

The research areas covered at the DIII deal with several topics, ranging from electronics and computer science to electrical engineering, and several more. In the following a list of the laboratories is reported in alphabetical order.

2.4 The Laboratories

Aerospace Education and Research Lab

Where: H floor

Contacts: prof. Fabio Dell'Acqua (fabio.dell'acqua@unipv.it)

Website: <http://aerospace.unipv.it/>

Research Activities:

- Digital signal and image processing for avionic systems
- Radar remote sensing
- Remote-sensing based mapping and risk analysis
- Geospatial data processing
- Crowdsourcing and remote sensing

Computer Vision and Multimedia Lab

Where: D Floor

Contacts: Prof. Virginio Cantoni (virginio.cantoni@unipv.it), Prof. Marco Porta (marco.porta@unipv.it), Prof. Luca Lombardi (luca.lombardi@unipv.it), Prof. Mauro Mosconi (mauro.mosconi@unipv.it)

Website: <http://vision.unipv.it/>

Research Activities:

- Visual Attention Mechanisms
- Perceptive Interfaces
- EyeTracking
- Visual Data Mining for e-learning Applications
- Artificial Vision for Mobile Mapping
- Image Analysis and 3D Vision
- Proteomic and bioinformatics
- Hierarchical Architectures.

Digital Content Analysis Lab

Where: D Floor

Contact: Prof. Maria Grazia Albanesi (mariagrazia.albanesi@unipv.it)

Website: <http://dcalab.unipv.it>

Research Activities:

- Evaluation of user-experience in the multimedia field
- Digital image quality assessment
- Computer vision methodologies for sustainability (computational sustainability).

Electrical Drives and Industrial Robotics Lab

Where: A and E floor

Contacts: Prof. Ezio Bassi (ezio.bassi@unipv.it), Prof. Lucia Frosini, (lucia.frosini@unipv.it), Prof. A. Ferrara (antonella.ferrara@unipv.it)

Website: <http://www-3.unipv.it/dmae;> <http://www-3.unipv.it/electric/azionamenti/hpage.htm>

Research Activities:

- Identification and Control Algorithms, Robust Control, Optimal Control, Sliding-mode Control, Fault Detection, Cooperative robotic systems
- Robotics Standards, Hybrid position/force control applications, Electrical drives for robotic applications
- Control of electrical drives and machines
- Electrical drives diagnostics

Electromagnetic Devices CAD Lab

Where: E floor

Contact: Prof. Paolo Di Barba (paolo.dibarba@unipv.it)

Website: <http://www-3.unipv.it/electric/cad/>

Research Activities:

- Inverse problems and optimization methods in electricity and magnetism
- Computer-aided analysis and synthesis of electromechanical devices
- Finite elements in electromagnetism
- Electrical models of neurophysiological phenomena.

Electronic Instrumentation Lab

Where: D floor

Contacts: Prof. Carla Vacchi (carla.vacchi@unipv.it)

Website: <http://eil.unipv.it/eil/>

Research Activities:

- Design of electronics for scientific, industrial and medical instrumentation
- Vertical integration CMOS technologies for monolithic pixel detectors
- CMOS monolithic active pixel sensors for charged particle tracking applications

Electrooptics Lab

Where: F Floor

Contacts: Prof. Valerio Annovazzi Lodi (valerio.annovazzi@unipv.it), Prof. Sabina Merlo (sabina.merlo@unipv.it), Prof. Guido Giuliani (guido.giuliani@unipv.it), Prof. Giuseppe Martini (giuseppe.martini@unipv.it)

Website: <http://www-3.unipv.it/optoele/>

Research Activities:

- Laser sensors and instrumentation
- Optical techniques for characterization of micro-machined devices
- Dynamic behavior of semiconductor lasers
- Optical cryptography
- Nonlinear analysis of biological signals
- Optical biosensors
- Optofluidics
- Silicon Photonics
- Low-noise electronic circuits and systems.

Energy Management Lab

Where: A and E floors

Contacts: Prof. Norma Anglani (norma.anglani@unipv.it), Prof. Francesco Benzi (francesco.benzi@unipv.it), Andrea Albini (andrea.albini@unipv.it),

Website: <http://www-3.unipv.it/energy/>

Research Activities:

- *Energy planning and management (Laben):*

Modeling and analysis of energy systems for manifold scopes: elaboration and assessment of emission reduction scenarios, implementation of electrical technologies replacing traditional thermal technologies; PAES elaboration; evaluation of the impact of renewable technologies, storage and electric vehicles; energy management systems for hybrid microgrids.

- *Energy efficient compressed air systems (Labac):*

Simulation and modeling of compressed air plants; methodology studies on how to assess energy efficiency actions; application and simulation of controlling techniques for adjustable speed drives.

- *Smart metering and building automation:*

Smart metering and protocols for industry and building automation

Femtolab

Where: A floor

Contact: Prof. Luca Tartara (luca.tartara@unipv.it)

Research Activities:

- Nonlinear microscopy systems development

Identification and Control of Dynamic Systems Lab

Where: C Floor

Contacts: Prof. Giancarlo Ferrari Trecate (giancarlo.ferrari@unipv.it), Prof. Giuseppe De Nicolao (giuseppe.denicolao@unipv.it), Prof. Antonella Ferrara (antonella.ferrara@unipv.it), Prof. Lalo Magni (lalo.magni@unipv.it), Prof. Davide Raimondo (davide.raimondo@unipv.it), Gianluca De Felici (gianluca.defelici@unipv.it)

Website: <http://sisdin.unipv.it/>

Research Activities:

- Model Predictive Control,
- Artificial Pancreas
- Sliding Mode Control
- Robotics
- Traffic control
- Fault Detection
- Fault Tolerant Control
- Hybrid systems
- Systems biology
- Decentralized and distributed control
- System Identification.

Lab. Microcalcolatori

Where: D Floor

Contacts: Prof. Giovanni Danese (gianni.danese@unipv.it), Prof. Francesco Leporati (francesco.leporati@unipv.it), Prof. Claudio Cusano (claudio.cusano@unipv.it), Ing. Gianmario Bertolotti (gianmario.bertolotti@unipv.it)

Website: <https://sites.google.com/site/microcalcolatori/home>

Research Activities:

Custom Computing and Programmable Systems section:

- High performance computing through Application Specific Processors
- Embedded Systems
- Industrial Informatics
- Computerized instrumentation.

Biomedical Instrumentation section:

- Ergonomics
- Sport and Medicine instrumentation
- Automotive
- Wearable and portable instrumentation.

Laser Source Laboratory (Industrial Photonics Group)

Where: F and A Floors

Contacts: Prof. Antonio Agnesi (antonio.agnesi@unipv.it), Prof. Federico Pirzio (federico.pirzio@unipv.it), Prof. Alessandra Tomaselli (alessandra.tomaselli@unipv.it), Giancarlo Reali (giancarlo.reali@unipv.it)

Website: <http://www-3.unipv.it/lsl/>

Research Activities:

- Diode-pumped solid-state lasers
- Fiber lasers
- Ultrashort pulse generation
- Laser beam and resonator modeling
- New laser material investigations
- Non linear optical harmonic and parametric generation
- Laser material processing
- Non linear microscopy and laser spectroscopy.

Light-matter Interaction Lab.

Where: A floor

Contact: Prof Daniele Bajoni (daniele.bajoni@unipv.it)

Website: <https://sites.google.com/site/ilmunipv/>

Research activities:

- Nonlinear photonics in micro- and nanostructures
- Integrated quantum photonics
- Sources of entangled states
- Strong light-matter interaction
- Photonic crystals and cavities.

Microwave Lab

Where: H Floor

Contacts: Prof. Luca Perregrini (luca.perregrini@unipv.it), Prof. Maurizio Bozzi (maurizio.bozzi@unipv.it), Prof. Salvatore Caorsi (salvatore.caorsi@unipv.it)

Website: <http://microwave.unipv.it/>

Research Activities:

- Inverse scattering problems and real-time monitoring
- Green Microwaves
- Microwave industrial applications
- Antennas for deep space communication.

Performance Evaluation Lab

Where: D Floor

Contacts: Prof. Maria Carla Calzarossa (mcc@unipv.it), Prof. Luisa Massari (luisa.massari@unipv.it)

Website: <http://peg.unipv.it/>

Research Activities:

- Methodologies and tools for performance evaluation and workload characterization of complex systems and services
- Characterization of Web dynamics
- Benchmarking.

Power System Analysis Lab

Where: E floor

Contact: Prof. Mario Montagna (mario.montagna@unipv.it)

Research Activities:

- Analysis and management of large interconnected systems by computer methods: load flow and OPF studies, transient stability, impact of FACTS devices on power system management
- Non-deterministic approaches to power system design, planning and operation: application of genetic algorithms, tabu search and interval arithmetic to the traditional computations of power system analysis.

Quantum Electronics and Nonlinear Optics Lab

Where: F Floor

Contacts: Prof. Ilaria Cristiani (ilaria.cristiani@unipv.it), Prof. Paolo Minzioni (paolo.minzioni@unipv.it)

Website: <http://www-3.unipv.it/eqn/>

Research Activities:

- Non linear waveguides
- Wave length conversion and optical phase conjugation in optical communication system
- Non linear propagation of conical waves
- Biophotonics.

Robotics (Lab. di Robotica)

Where: C Floor

Contact: Prof. Tullio Facchinetti (tullio.facchinetti@unipv.it)

Website: <http://robot.unipv.it/>

Research Activities:

- Mobile robotics
- Real-time systems
- Energy efficiency
- 3D graphics
- Distributed embedded systems
- Sensors, sensor fusion
- Smart grid, load management
- Domotics, home automation, smart buildings.

Service Engineering Lab

Where: C Floor

Contact: Prof. Gianmario Motta (motta05@unipv.it)

Website: <http://camellia.unipv.it/servizi/>

Research Activities:

- Techniques of systems analysis
- Systems for urban mobility
- Service and enterprise systems.

Telecommunications & Remote Sensing Lab

Where: H Floor

Contact: Prof. Lorenzo Favalli (lorenzo.favalli@unipv.it)

Website: <http://tlclab.unipv.it/>

Research Activities:

- Digital signal and image processing for avionic systems
- Remote sensing data processing
- Remote sensing for human settlements and risk monitoring
- Telecommunication systems and components
- Multimedia data processing
- Wireless telecommunications and sensor systems.

3. PhD

3.1 PhD Higher Education in Pavia

The doctorate is a post-graduate qualification, at the highest level of education, established for the first time in Italy in 1980. PhD is an acronym of the Latin 'Philosophiae Doctor'. The term Philosophy is used here with the original meaning of the Greek word: *love for learning*.

The doctoral teaching began in Germany in the early nineteenth century, and today it is going through discussions at a European level and beyond. In particular, the role that the Doctoral training plays in today's modern society is a matter under constant debate.

It is a common view that the complexity of our society leads, next to an unstoppable development, to many sustainability issues that can only be addressed by high level researchers. Therefore, in order to improve the quality of life in a global sense, it is essential to initiate doctoral training in an appropriate manner, to prepare young people who have the potential to foster innovation and economic growth based on knowledge.

Consequently, the skills sets acquired through PhDs must be addressed and rethought, and the major change of direction can only begin within the University which has a crucial role in the renewal process and content of the doctoral institution.

The University of Pavia is very much involved in developing new pathways that allow research students not only to develop their skills useful for future careers in academia, but also the skills necessary to be active outside of University. The Board of Directors of the five PhD Schools that make up the Institution of PhD Higher Education, are constantly engaged in a mission to improve the quality of the PhD content and consequently the preparation of doctoral students. Particular attention is given to internationalization, organization of structured teaching, of high quality content held in English, and implementation of initiatives that strengthen the link between university, research and the business world.

All this allows us to make our problem solving postgraduates competitive at both a national and international level.

PROF. GIUGLIELMINA M. RANZANI

Pavia PhD Higher Education Director

3.2 PhD Program in Electronics, Computer Science and Electrical Engineering (IEIE – Ingegneria Elettronica, Informatica ed Elettrica)

The PhD course, active since 1983, is well-established and addresses a large variety of topics in the fields of Electronics, Computer Science and Electrical Engineering (IEIE: Ingegneria Elettronica, Informatica ed Elettrica). These topics are related from the cultural and application viewpoints.

The PhD program aims to train researchers with advanced methodological knowledge and technical skills and it fosters the personal growth of students' creativity through the practice of scientific research in cutting-edge sectors of Engineering. This will enable them to start a successful career at Universities, companies and research centers both nationally or abroad.

The large network of international collaborations of the research groups involved in the PhD course gives students the opportunity to exchange with prestigious Universities, research centers and companies.

In Tab.1 the number of the new PhD students, annually enrolled, in the engineering area (I), in the IEIE course (II) and the share of foreigners for the IEIE course (III):

Tab. 1: New enrollment of PhD students every AY for the engineering area (I) and the IEIE course (II) and (III)

Academic Year (AY)	(I) PhD students in the overall Engineering Area, per AY	(II) IEIE- PhD students, per AY	(III) IEIE- PhD <i>foreign</i> students, per AY
2014/15	40	13	6
2013/14	38	15	6
2012/13	33	14	6
2011/12	31	10	2

Objectives

Scientific research in the fields of IEIE is the basis of the PhD course, whose main aim is to foster researchers with adequate skills, contributing to what Society asks in terms of development, innovation and services. Scientific creativity and organization skills represent the major drivers of the course. The professors involved in the course are very active in research at international level. Moreover, their well equipped laboratories represent an excellent playground for the students.

Research Projects/Areas

The research has to be carried out, starting from an independent original project or idea, in close and continuous contact with one (or even better, more) research groups. Interdisciplinary studies are very welcome and constitute a value added for the Department activities.

The main areas are: (i) Electrical Engineering, (ii) Informatics & Automation and (iii) Photonics and Space Communication Systems.

In details such areas cover topics in: Automation, Electric and Magnetic CAD, Electromagnetic waves, Energy and Electrical Systems, Informatics, Instrumentation, Photonics and Telecommunications.

Courses

During the three year-study, PhD students must acquire 180 credits; 30 awarded for attending courses and seminars and 150 for their research activities. The PhD course organizes many seminars, even along with other courses of the School of Engineering Science. All is registered on a personal academic record booklet.

PhD students are recommended to attend - possibly every year - an international doctoral school relevant to the thematic areas they are working in. Moreover, they are encouraged to promote the diffusion of scientific results e.g. exploiting the web dissemination of their resume. Scientific dissemination is strongly encouraged through giving presentations at conferences and through seminars.

Job Opportunities

The possible career of PhD students spans over academic and research institutions as well as industries and entrepreneurship in Italy and abroad.

Director

Prof. Paolo Di Barba (2014/2015-2016/2017)

Dipartimento di Ingegneria Industriale e dell'Informazione

Address: Via Ferrata, 5 – 27100 Pavia - Italy

Ph.: +39 0382 98 5250

e-mail: paolo.dibarba@unipv.it

http://www-3.unipv.it/dottIEIE/index_en.php?pag=english/welcome.html

4. THE PhD ROLE

4.1 Why becoming a PhD Student?

There may be several reasons addressing to such a choice: the interest to master a specific subject, an inspiring mentor, to be keen in working in the research field, an opportunity gained over time, a mean to improve our own career, an innate love for science and knowledge.

Whatever the reason is, there must be a self consciousness that, however inspired one can be, the way ahead can also be tough and although it is an intellectually exciting experience, it requires sacrifices.

No matter how big, well organized or guided the research group, which you will be working with, can be, once you get started you are expected to find your own way through and give your share of contribution with ideas and actions.

Supervisors can feature their role in different ways: some play a very controlling role and plan the majority of the activities and some other believe in a more proactive role for the PhD student, being able to formulate, support and argue his/her own project proposal and ideas. Anyway, all are expecting you to fulfill your duties at the very best, by blending creativeness and scientific rigor.

There are very nice guides on the web you can read if you want to have a more insightful overview on “how to survive your PhD”: we, of course, recommend you to surf for and read them!

4.2 Admission & Enrollment

Doctoral studies at University of Pavia (UNIPV) are open to candidates without any restriction on age and citizenship.

Once in a year, during the summer, a call for applications is published at the <http://www.unipv.eu/site/en/home/research/phd-courses.html>, with all the information you need to apply. Candidates are admitted to the program through a selection procedure based on exams and/or qualifications assessment.

The main requirement to access the doctoral studies is to have a second-level University degree; candidates who graduated in a foreign University must own a degree similar to an Italian second-level degree for duration, level and disciplinary field. In this case, some documents are needed for the declaration of equivalence, clearly listed in the call for applications. The degree must be attained by the deadline specified in the call for applications.

The applications must be submitted online, as specified in the call. Also the selection results will be published online and the candidate will have to enroll in the PhD program by completing an online procedure and paying the enrollment fee (the exact amount is set each year by UNIPV's Academic Board (Consiglio di Amministrazione, CDA), so please look for updated information on the indicated websites at the end of this guide.

The call for applications announces the PhD positions available for each PhD program. Some of these positions can be reserved to specific categories of applicants, such as candidates holding a degree awarded abroad, or candidates with scholarship from a foreign country; for those positions, a different selection procedure can be foreseen (e.g.,

qualification assessment + Skype interview). All these details are specified in the call for applications, which must be read carefully.

In case of doubts, we recommend you to contact the PhD office (contacts are reported at the end of this guide).

4.3 First duties

Within few days from the beginning of the school, each student must:

- choose the curriculum and the supervisor who will supervise the research activities;
- in agreement with the supervisor, define in principle the research subject;
- in agreement with the supervisor, define the educational program for the first year, in accordance with the educational regulation that has been approved by the Board of the School (Collegio Docenti di Dottorato -CDD);
- fill in the appropriate form with the research subject, the name of the supervisor and the educational program, which has to be approved by the CDD.

The supervisor must be chosen within the teaching staff (full professors, associate professors, assistant professors), belonging to the DIII. Customarily, the student will carry on his/her research activity in the supervisor's laboratory. The supervisor must suggest and orientate the educational and research activity of the student and he/she has to manage the assigned funds. The supervisor's approval is necessary for whatever request that the student submits to the CDD or to the PhD Director. The supervisor can be changed upon authorization by the CDD.

The educational program can be changed during the year. This adjustment can be made by filling a new form that has to be submitted to the PhD Director for approval. It is not allowed to gain credits or to use the allocated funds for attending courses or schools that have not been approved before.

4.4 Periodic duties

At the end of each academic year, the Board of the School verifies the activity carried out during the year by each student and decides on his/her admission to the following academic year, according to the law requirements (currently, Art. 36, Par. 1 of the DM 45/2013).

In October, the first and second year students must:

- provide the PhD Director with a short written report about the activity that has been done during the previous year;
- present and discuss their research activity in front of a specific Academic Board that has been selected by the CDD.

Within a few days from the admission to the next year of course, the students must present a new one-year educational program and they must fill in the usual form reporting the number of credits already acquired. At the beginning of the third year, the foreseen educational activity must include the final acquisition of 30 credits.

For each year, it is not required to present a minimum number of publications.

4.5 Final duties

The PhD thesis can be written either in English or in Italian, conversely, in other language upon authorization that can be obtained by presenting the appropriate application form to the PhD Director. In the second half of October, the students of the third year present their research activities that have been described in the PhD thesis. The presentations are open to the public and they are scheduled according to a calendar that must be circulated in advance.

According to the evaluation done by specific Academic boards that take charge of one or more curricula, the CDD writes a report on the students' activity.

By the end of October the students must submit to the PhD Director's authentication the copies of the PhD thesis, according to Art. 25, Par. 1 of the DM 45/2013, which is the *current* legal reference framework. On this occasion, the students receive three copies of the written report by the CDD and the report must be attached to the thesis that must be sent to the members of the specific Academic board. Each PhD thesis is submitted to two reviewers, who decide whether to admit the candidate to the discussion or to suggest modifications to be made within six months.

On the same occasion, the students can give the PhD Director a declaration, where they authorize the storage and the consultation of a copy of the thesis at the library of the Engineering Departments.

4.6 Useful info for foreign PhD students

- The **Welcome Point** gives support and advice to incoming international students, researchers and university professors visiting the University of Pavia. In particular, the Welcome Point staff provides information on enrollment at the university, housing, fiscal code, University canteens, health insurance, University Sports Centre (CUS), scholarships, opening a bank account. For more information: <http://welcomepoint.unipv.it/>.
On the Welcome Point website a very useful and detailed "International incoming student's guide" is made available in English, Chinese, Arabic, German, Spanish and Portuguese ("Download" section).
- The **Foreign Students' Office** is available to assist foreign students during the gathering of the necessary documentation for the *residence permit (permesso di soggiorno)* and other issues related with being a non-EU student. Please see the Frequently Asked Questions webpage <http://www.unipv.eu/site/en/home/research/phd-courses/articolo5119.html> for more information and opening hours.
- The **Language Centre** organizes Italian courses for foreign students (from beginner to advanced level) three times a year, in September, October and February. More information at the Language Centre website: http://cla.unipv.it/?page_id=171.
- The **PhD office website** is available also in English version: <http://www.unipv.eu/site/en/home/academics/research-doctorates---phd.html>. Also the annual Call for applications is published both in Italian and in English.
- All PhD students are covered by an accident **insurance** and third-party liability insurance during their authorized PhD activities in Italy and abroad. However, foreign students are in charge of their own health insurance, which is also mandatory to get the *Permesso di soggiorno*. More details are available in the

above-mentioned “International incoming student’s guide”. For further information, please contact the Welcome Point for assistance (contact information in the “Contacts & links” section).

4.7 IEEE Student Branch UNIPV

What is the IEEE?

The IEEE (Institute of Electrical and Electronics Engineering) is the largest scientific organization in the world focused on technological innovation, with more than 400.000 members in 150 nations worldwide. The IEEE is the leading authority in many fields of interest, ranging from Informatics to Electrical Engineering, from Biomedical technology to consumer Electronics, from micro-sensors to aerospace applications.

What is an IEEE Student Branch?

Student Branches are the backbone of the IEEE student program. A Student Branch is composed of post-graduate and under-graduate engineering students longing to contribute to the “active” part of IEEE. IEEE has created a variety of resources to ensure that students are successful in their work.

The goal is to bring young students closer to the world of research and to encourage them to meet and to share their ideas with each other.

What about the IEEE Student Branch UNIPV?

The IEEE Student Branch of the University of Pavia has again proven itself to be one of the most active branch associations in Italy since 2011 and is currently carrying on serving the scientific community with its rich program of seminars, workshops and other various activities open to everybody.

For more info, contact ieee.sb@unipv.it or visit the official website <http://ieee.unipv.it/>.

What can I get from a IEEE Student Membership subscription?

IEEE membership helps support the IEEE mission to foster technological innovation and excellence for the benefit of humanity. Three main reasons for joining IEEE:

Knowledge

IEEE members gain exclusive access to the latest and best research, news, television programs, and educational resources needed to expand their expertise and stay current.

Community

As an IEEE member, you are part of the world's largest community of technology professionals—a network of communication and learning where innovators share what works, what does not, and what is needed now.

Profession

IEEE members can achieve more of what matters in your life and career through IEEE student programs such as competitions, scholarships, awards, continuing education courses and certifications, conferences, and more.

Uncover IEEE member benefits that are most relevant to you: IEEE members can access information on local events and activities by signing in to my IEEE (http://www.ieee.org/membership_services/membership/my_ieee.html) the members' personalized gateway to IEEE membership. Additionally, members can also:

- access individual Society memberships and subscriptions;
- connect with local IEEE Sections and volunteer leadership;
- find upcoming conferences;
- learn more about individual benefits;
- read the latest news from IEEE, IEEE Spectrum, IEEE Standards News, and The Institute.

5. ADMINISTRATIVE ISSUES

5.1 The program

The PhD programs offered by the University of Pavia have a three-year legal duration.

According with the current Italian regulations (DM 45/2013), a PhD program is a full-time commitment and requires attendance to lessons and research activities. Long-distance attendance is not possible.

5.2 PhD degree attainment

The PhD degree is conferred after the thesis discussion, upon positive evaluation of a Committee. The official diploma is delivered by the Rector during the annual PhD ceremony which takes place usually at the beginning of December, but, if you need the diploma in advance for some specific reason (to have it legalized, for instance), you can ask the PhD office if it is possible to speed up the procedure.

The PhD office is able to certify the PhD attainment a few days after the thesis discussion.

5.3 Incompatibility

According with the Italian law, if you are enrolled in a PhD course you are not allowed to enroll in another University course at the same time, neither in Italy nor abroad.

5.4 Enrollment fees

At present, the enrollment fees have an approximate amount of 300 € per year. The amount may change in the future, on the basis of the Administrative Council's decisions.

5.5 Financial support

PhD positions at UNIPV can be either with or without scholarship. Your right to get a scholarship depends on your position on the final ranking of the PhD public selection.

In Italy the PhD student is not considered as an early-stage researcher as in other European countries, for such reason, the financial support is not provided through a *stipend* but through a *scholarship*.

At present (2015/2016), the PhD scholarship has a total pre-tax amount of 13.638,47 € per year, that is about 1.030 € net per month. The scholarship amount can be increased by 50% in case of research periods carried out at foreign institutions, for a maximum of 18 months in total, not necessarily consecutive (see par. 5.15). For more information on how to get the scholarship increase, see par. 5.15.

5.6 Budget for research activity

Each PhD student (with or without scholarship) can benefit from a budget for research activity amounting to at least 10% of the scholarship (from the II year onward). This budget is aimed at supporting the PhD student mobility, in Italy or abroad, and the costs related to his/her educational program.

For information on how to use this budget, see <http://www.unipv.eu/site/home/ricerca/dottorati-di-ricerca/articolo12702.html> (in Italian only).

5.7 Authorizations

All PhD students must take care of being authorized for all PhD activities which take place outside the structures of the University of Pavia, in Italy or abroad. This is very important: should you be hurt or cause damage to somebody during a non-authorized activity outside the University, the insurance may not accept to refund the damage.

So, if you are planning to perform your research in structures other than the University's, contact the PhD Director and ask him/her to include your request in the next PhD CDD meeting. The PhD Director will then take care of forwarding the PhD CDD's minutes to the PhD office for the authorization.

In addition, you must ask for the PhD CDD authorization if you are willing to accept a job, to suspend the course or the scholarship, to teach a course, to start a cotutelle (see also par. 5.8, 5.11, 5.12, 5.21). Besides, it is always advisable to discuss in advance with your supervisor any significant request.

5.8 Program/scholarship suspension

You can ask for a suspension of the program for periods up to one year, upon approval of the PhD CDD. During the suspension period, you do not receive the scholarship installments and you are not subject to the duties of a PhD student. You will have to catch up the suspension period and the scholarship installments at the end of the 3rd year.

In order to ask for a suspension, you must get in touch with your PhD Director and ask him/her to submit your suspension request to the PhD CDD; in addition, you have to send a written request to the PhD office. The appropriate form is available at the "*Modulistica dottorandi e dottori di ricerca*" section of the PhD Office Italian webpage.

You can also ask for a suspension of the PhD scholarship only, while going on with the PhD program, in case of possible funding other than the scholarship. Also in this case, you must ask for the PhD CDD approval and submit the appropriate form to the PhD office.

5.9 Withdrawal

You can withdraw from the PhD by simply filling in a form and submitting it to the PhD office; it is advisable to discuss your decision with your supervisor and your PhD Director before. The scholarship installments already received must not be reimbursed.

The withdrawal form is available at the "*Modulistica dottorandi e dottori di ricerca*" section of the PhD Office Italian webpage.

5.10 Maternity leave

In case you get pregnant during the PhD program, you are supposed to submit to the PhD Office (mariagrazia.ronfani@unipv.it) a certificate of your doctor stating the expected birth date. You will have to take a five-month mandatory leave: 2 months before the delivery + 3 months after, or 1 before the delivery + 4 after (but in the latter case your occupational doctor must give a written favorable opinion). Also the scholarship (if you are a scholarship

holder) will be suspended during the maternity leave. The maternity leave period will be recovered at the end of the third year, together with the possible scholarship installments.

If you wish, you can extend your maternity leave up to a maximum of one year, including the mandatory 5 months.

5.11 Working during the PhD

According with the Italian and University regulations, the PhD program is a full time commitment. If you wish to undertake an occasional working activity, you must ask for the PhD CDD authorization.

5.12 Teaching activity

If you have been offered to teach a course, you must ask the PhD CDD authorization before accepting. The maximum allowed number is 40 teaching hours per academic year.

5.13 Vacations

PhD students do not have to stick to a strict work schedule; their timetable and vacations are agreed with their supervisors, according with the Department closure days. Public holidays in Italy occur on the following recurrences: New Year's Eve (January 1st), Epiphany (January 6th), Easter/Easter Monday (in March-April), Liberation Day (April 25th), Labour Day (May 1st), Republic Day (June 2nd), Assumption Day (August 15th), All Saints' Day (November 1st), Immaculate Conception (December 8th), Christmas (December 25th), St. Stephen's Day (December 26th), San Siro Day (Pavia's patron saint, December 9th).

5.14 Insurance

Everyone who is regularly enrolled in a PhD program (that is, who has paid the enrollment fee) is covered by accident insurance and third-party liability insurance during their authorized PhD activities in Italy and abroad. More details on the insurance policies are available at the following link <http://www.unipv.eu/site/home/naviga-per/laureati/assicurazioni.html> (in Italian only).

Please note that those policies do not replace the general health insurance.

If you need a certificate stating that you are insured as a PhD student for accidents and third-party liability, see par. 5.16 below.

5.15 Research periods abroad

You can spend up to 18 months (not necessarily consecutive) abroad during the PhD program. Mobility periods must be agreed with the supervisor; in addition, all PhD students (with or without scholarship) who want to spend a research period abroad must ask for the PhD CDD authorization.

PhD students with scholarship who want to spend a research period abroad can ask for a 50% increase of their scholarship.

In order to ask for the CDD authorization and, for scholarship holders, to get the 50% increase of the scholarship, PhD students must follow the procedure described in the

following link: <http://www.unipv.eu/site/en/home/study/courses/phd-courses/articolo12687.html>.

If you are not a scholarship holder, you can consider applying for the Erasmus program in order to get a financial contribution to support your period abroad (see par. 5.23).

5.16 Certificates

The PhD office issues many types of certificates – enrollment, scholarship, PhD attainment etc. – in Italian, English or French. For information on how to request a certificate, see the following links:

- <http://www.unipv.eu/site/home/ricerca/dottorati-di-ricerca/articolo5124.html> (it)
- <http://www.unipv.eu/site/en/home/research/research-doctorates-ph.d/articolo10582.html> (en)

Please note that a duty stamp (*marca da bollo*) must be put on each certificate or copy (current fee).

If you need a transcript stating the courses/exams taken during the PhD program, you must contact your PhD Director.

If you are planning a research period outside the UNIPV structures, you might be requested to submit to the hosting structure a certificate of insurance. This kind of document does not need the duty stamp to be issued. You can request it to virginie.gallati@unipv.it, specifying the name and address of the structure and the name of your supervisor in the structure, and attaching a copy of your authorization to carry out your research activity there.

5.17 E-mail account and personal area

As soon as you get enrolled in the PhD program, you will be assigned a new *ateneopv.it* (= *universitadipavia.it*) e-mail account, which is the one the Office will use to communicate with you. It is important that you check it frequently. In order to access your *ateneopv.it* e-mail, visit the www.unipv.it website, then click on webmail (on the top), then webmail *studenti*.

As a student of UNIPV, you will also have access to a Personal Area (Area Riservata, <https://studentionline.unipv.it/esse3/Home.do>) with all information on your career; there you'll find the online procedures to enroll in the next academic years, to pay the enrollment fees etc. The credentials to access the Personal Area are also valid for all the UNIPV online facilities: Wi-fi, online libraries...

Please note that the password to access the *ateneopv.it* e-mail account is different from the one you need to enter your Personal Area.

- If you forgot the password of the *ateneopv.it* e-mail, send an e-mail to virginie.gallati@unipv.it, attaching a copy of a valid ID, and ask for a new one.
- If you forgot the password of the Personal Area, follow the instructions available at the following link: <https://studentionline.unipv.it/Anagrafica/PasswordDimenticata.do>

5.18 Students card

All PhD students receive from their PhD Director a Students Card, which must be stamped each year to be valid. This is a document you can use on your daily life to prove that you are a student and to benefit from discounts if available (theatre, cinema, gymnasium, swimming pool...). However, the students card may not be enough in case you have to register for a conference, rent a house etc: in those cases you will be probably required to submit a certificate (see par. 5.16).

5.19 Bus and canteen cards

As a PhD student, you are entitled to ask for a bus card and a canteen card.

The bus card is issued by the Line s.p.a., that is the company managing public transports in Pavia. You can ask for it at the beginning of each academic year, by following the instructions available at the Line webpage: <http://www.lineservizi.it/uni/universita.asp>.

The canteen card is issued by the EDiSU (the Regional Institute for the Right to Education) and must be requested at the following webpage (in Italian only): <http://www.edisu.pv.it/index.php?page=richiesta-benefici>.

During the online procedure, you will be asked to provide documentation on your financial situation. If you do not have such document, you will receive the canteen card anyway, with the right to a complete meal for 5,50 € (current fee) in the EDiSU canteens.

5.20 PhD students' representation in the University Bodies

- **Academic Senate**
1 PhD student (see the *Statuto*, art. 11 <http://www.unipv.eu/site/home/ateneo/statuto-e-regolamenti/nuovo-statuto-dateneo.html>). The Academic Senate members are elected according with the rules specified in the *Regolamento Generale di Ateneo* <http://www.unipv.eu/site/home/ateneo/statuto-e-regolamenti/nuovo-regolamento-generale-dateneo.html>.
- **Department Council**
The number of PhD students included in the Department Council is set according with the rules specified in the *Regolamento Generale di Ateneo*, art. 51 <http://www.unipv.eu/site/home/ateneo/statuto-e-regolamenti/nuovo-regolamento-generale-dateneo.html>.
- **PhD Academic Board**
2 PhD students, enrolled in different cycles, who remain in office for one academic year and can be re-elected (see the *Regolamento in materia di dottorati di ricerca*, art. 7, par. 8 <http://www.unipv.eu/site/home/ricerca/dottorati-di-ricerca/articolo837.html>)

5.21 Cotutelle

The cotutelle is a useful opportunity to enhance the international dimension of PhD studies. The key feature of this tool is that the PhD student can carry out his/her doctoral program both at UNIPV and at a foreign university, under the joint supervision of two experts in the subject (one for each University). Upon successful completion of the PhD

course and after a single final exam, the candidate will receive a double or joint PhD degree, valid in both the countries involved.

If you are interested in starting a cotutelle project or you just wish to have more information, please get in touch with virginie.gallati@unipv.it. You can also find some general information at the following link: <http://www.unipv.eu/site/en/home/research/phd-courses/articolo11469.html>

5.22 Executive PhD

The Executive PhD is a doctoral study path co-supervised by University and external institutions. Employees of companies or external institutions (mostly enterprises) apply for the PhD public competition and, if successful, are admitted to the PhD program without scholarship. During the 3-years program, the student will share his/her time between the job and the PhD, while keeping his/her full salary.

The PhD student focuses on a research topic agreed between University and company, which both take advantage of the other party contribution to the project (instruments, courses...).

The Executive PhD is a way for the company to invest in a brilliant employee by offering him/her a high-level training on research, and for the University to train a good and motivated PhD student while strengthening its bonds with the enterprises.

If you are interested in undertaking an Executive PhD project and your company is willing to support you on this path, please check the call for application to ensure there are positions available for this kind of project; then, get in touch with the PhD office before applying for the PhD selections.

5.23 Erasmus

All PhD students can take part in the Erasmus program (see <http://www.unipv.eu/site/home/internazionalizzazione/erasmus.html>), but only those without scholarship are entitled to apply for the Erasmus scholarships.

For more information: erasmus@unipv.it.

6. CONTACTS & LINKS

6.1 PhD Office

Via Ferrata 5 – Pavia

Open from Monday to Friday 9.30am-12.00pm

www.unipv.it/dottorati (ita)

<http://www.unipv.eu/site/en/home/research/phd-courses.html> (eng)

Staff:

claudia.morini@unipv.it (responsible)

lorenza.andreoli@unipv.it

virginie.gallati@unipv.it (eng)

mariagrazia.ronfani@unipv.it

6.2 IEIE Administrative Staff

Via Ferrata, 5 - Pavia

Open from Monday to Friday 9.00am-12.30pm and 2.00pm-5.00pm

tel. +39 (0)382 98 9898

e-mail: leonora.bianchi@unipv.it

http://www-3.unipv.it/dottIEIE/index_en.php?pag=english/welcome.html

6.3 Welcome Point

Corso Strada Nuova 65 (main entrance) - Pavia

Open from Monday to Friday 9.00am-12.30pm and 2.00pm-5.00pm

welcomepoint@unipv.it

<http://welcomepoint.unipv.it/>

6.4 International Relations Office - International Mobility (for information on Erasmus program)

Via Sant'Agostino, 1 - PAVIA

erasmus@unipv.it

<http://www.unipv.eu/site/en/home/international-relations/erasmus.html>

6.5 URP (Ufficio Relazioni con il Pubblico)

Corso Strada Nuova, 65 - Pavia

Open from Monday to Friday 9.00am-12.30pm and 2.00pm-5.00pm

tel. +39 (0)382 98 9898

urp@unipv.it

<http://www.unipv.eu/site/home/ateneo/amministrazione/area-didattica-e-servizi-agli-studenti/servizi-general-agli-studenti/urp---ufficio-relazioni-con-il-pubblico---informastudenti.html>

***** Suggestions on how to improve this guide? *****

Email to: iee.sl@unipv.it

7. Updates since July 2014

rev.02 (June 2015): Section 5 and 6

Thanks for your reading!

