UNIVERSITY OF PRISHTINA "HASAN PRISHTINA"

FACULTY OF ELECTRICAL AND COMPUTER ENGINEERING

PhD Study Programme Guidebook

Prishtina, 2022

Table of Contents

1. Introduction

University of Prishtina "Hasan Prishtina" is the oldest and the largest institution of higher education in Kosovo. University of Prishtina is based in Prishtina, Republic of Kosovo, and the Faculty of Electrical and Computer Engineering (FECE) as an integral part of it, is committed to be integrated in the European Higher Education Area (EHEA) and the European Research Area (ERA).

Faculty of Electrical and Computer Engineering was established on 20 October 1961, on the foundation of the Technical High School. In 2001, the Senate of the University of Prishtina approved study programs based on the Bologna Declaration. Since then, FECE offers study programs in all three study levels: bachelor, master, and doctoral level.

Doctoral level studies in FECE are organized since the establishment of the university. In 1976 the first doctorate degree at FECE was defended. During the period 1976 - 2004 in FECE 25 doctoral candidates have graduated. Doctoral studies have only stopped in the period 2004-2009, to harmonize these studies with the new statute then (2004) and European trends in higher education. In 2009 doctoral school was opened under the Bologna Process where in doctoral studies in FECE 12 PhD students were enrolled. In the November 2022 have graduated the last 2 students enrolled in previous accredited PhD programme.

The mission of the PhD program in Electrical and Computer Engineering is to provide students with advanced research and professional courses that lead to the highest level of scholarly achievement and enable them to carry on research independently, to address new challenges, and disseminate the results in well-known journals and conferences.

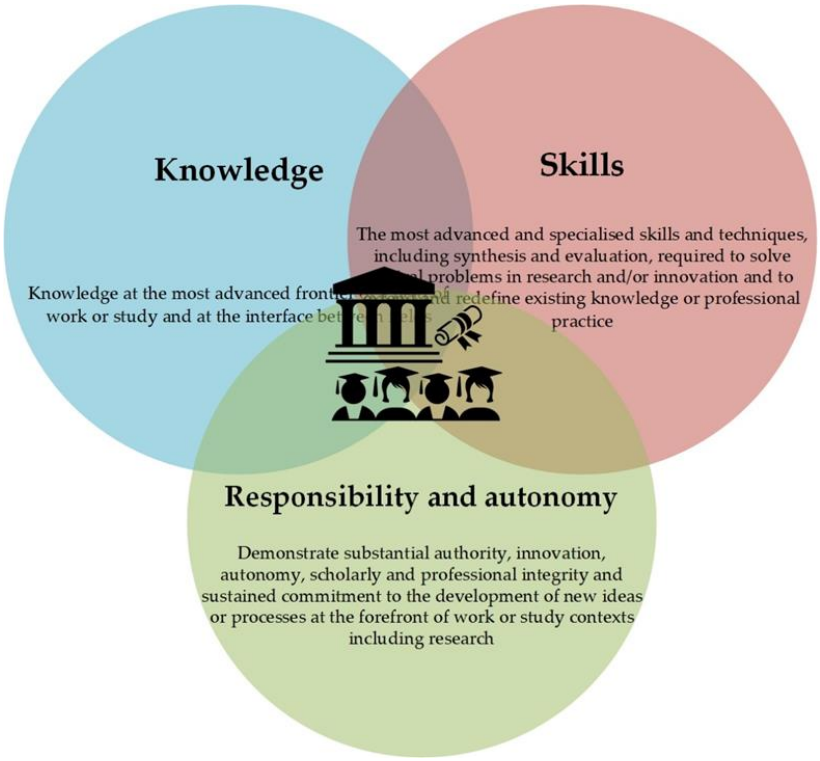

Figure 1: EQF learning outcome for PhD programme

2. Admission requirement and enrollment criteria

The selection and admission criteria for PhD applicants are defined in the PhD Regulation and in the Statute of the UP. The Statute of UP (specifically Article 122) and the PhD Regulation (specifically Article 7) defines detailed procedures for selection of PhD students.

According to the regulation on doctoral studies, there should be a public call in the university and faculty web page, and it should contain specific application criteria (entry examination format and time, selection criteria, location of the entry examination, etc.) for admission of new doctoral students. This shall be announced at least one month before the start of the academic year. The overall admission results are published in the web page of the faculty (as defined in PhD Regulation Article 7, point 2).

The criteria for evaluation of the PhD candidates include average grades from previous studies, proven record in scientific/artistic research (i.e., publications in journals and conferences, evidence of English language proficiency and the entry examination.

Specifically, the enrollment criteria include:

- The average grade (30%) - during the studies at the bachelor and master level, respectively the average grade of the integrated studies, is evaluated with a maximum

of 30 points, which are calculated by multiplying the arithmetic average grade of the bachelor and master studies by 3.

- Students with postmaster studies (pre-Bologna magisterium) shall receive extra 5% (5 points),
- Research activity shall be valued up to 15% per published journal article, conference paper, book chapters and presentations - in national and international level (PhD Regulation, Article 7, Point 4 from a to h)
- Proficiency in English language is mandatory and is evaluated up to 20%. ITOEFL certificate with at least 79 points or IELTS with at least 5.65 points, and
- Enty examination is valued up to maximum of 30% (or 30 points) from the group of questions that are part of professional courses

Doctoral candidates research capabilities are assessed even during the enrollment phase, as stipulated in PhD Regulation of UP (Article 7, Point 5), whereby Doctoral candidate has to submit a research concept in his/her area of interest and his/her potential mentor (supported by letter of recommendation).

The research activity of doctoral candidates is evaluated with a maximum of 15 points by considering candidate's experience in the domain of scientific publications in peer reviewed journals and presentations at scientific conferences, as outlined below:

- For each article that is published in the last five years, and it is indexed in the Web of Science (SCIE, SSCI and AHCI) and / or SCOPUS (Q1, Q2), the doctoral candidate gets 5 points if he/she is the first author or 2 points if he/she is the correspondent author.
- For each article that is published in the last five years, and it is indexed in SCOPUS (Q3, Q4) or SCOPUS without quarterly specifications, the doctoral candidate gets 4 points if he/she is the first author or 1.5 points if he/she is the correspondent author.
- For each article that is published in the last five years, and it is indexed in other international journals that are indexed on the platforms as specified in the regulation for selection and enrolment of the academic staff, the doctoral candidate gets 3 points if he/she is the first author, 2 points if he/she is the second author or 1 point if he/she is part of the author list.
- For each article that is published in the last five years in local academic journals (i.e., published by the University of Prishtina or its centers or institutes, the Academy of Sciences and Arts of Kosovo, the Institute of Albanian Language, and the Institute of History), the doctoral candidate gets 2 points if he/she is the first author or 1 point if he/she is part of the author list.
- For a university book published in the last five years in a narrow study field, the doctoral candidate gets 5 points if he/she is the first author or 3 points if he/she is part of the author list. In addition, a published monograph in the field where the PhD candidate applies is evaluated with 4 points.

- For each oral presentation of research results, in the last five years, at international scientific meetings (i.e., conferences, congresses, symposia, workshops, etc.) that publish papers in the form of proceedings, the doctoral candidate gets 2 points if he/she is the first author or 1 point if he/she is part of the author list.
- For each poster/abstract presentation of research results, in the last five years, at international scientific meetings (i.e., conferences, congresses, symposia, workshops, etc.), where the papers are published in the form of book of abstracts, the doctoral candidate gets 1 point if he/she is the first author or 0.5 point if he/she is part of the author list.
- For each oral presentation of research results, in the last five years, at scientific meetings (i.e., conferences, congresses, symposia, workshops, etc.) at national level, the doctoral candidate gets 1 point if he/she is the first author or 0.5 point if he/she is part of the author list.

3. Period of study

The PhD regulation of UP (specifically Article 8) does define the timeline for completion of doctoral studies, which can last from at least three years and at most six years. With a special permission from the Senate of UP that is accompanied with a prior recommendation from faculty and central committee of doctoral studies, PhD studies can be extended with an additional year, making it at most seven years. After the enrolment into PhD program and within a maximal period of six years, the PhD student must finish all six study semesters (i.e., three years) that have been proposed in this study program. Therefore, it is up to the PhD student's decision whether she/he wants to complete all study semester consecutively without any break, or she/he wants to pause their studies at any time point, but always having into consideration that the maximal duration (including breaks) cannot be longer than 6 years (or seven years subject to the decision of Senate of UP), as presented in Figure 2.

Figure 2: Timeline for completion of PhD studies

In case a PhD student decides to pause for a year, then, formally, according to the Statute of UP, she/he must m again in the same study year as the last enrolled.

4. Aims of PhD studies and competences acquired

Based on the strategic mission of FECE, to improve the overall performance of the doctoral programmes offered, the Doctoral study in Electrical and Computer Engineering aims at maintaining a high level of integrity and excellence in postgraduate education, through clear and consistent policies, high standards, efficient procedures, and direct support for the students. With this study programme we support and serve as the only provider at national level for graduates holding degrees in electrical and computer engineering, offering comprehensive research possibilities in all electrical and computer engineering fields for graduates of previous cycles.

The main goal of the PhD program is to develop researchers who are well-prepared to undertake research challenges of the future for the benefit of the Kosova society, and more generally, in one of the narrow research fields that include: computer and software engineering, information and communication technologies, electronics, automation, robotics and power systems.

After the completion of the proposed PhD study program, a PhD graduated will acquire a set of competences, such as:

- Exhibit creative thinking and originality in the application of knowledge, alongside with a practical understanding of how research and analysis mechanisms are used to create and interpret knowledge in a narrow research field,
- Demonstrate capacity for research paper analysis and synthesis as well as review and assess new and complex phenomena, issues, and situations autonomously and critically,
- Demonstrate ethical and professional responsibilities in engineering situations and make informed judgments to consider the impact of engineering solutions in global, economic, environmental, and societal contexts,
- Work effectively on research and development teams and be able to provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives by answering complex research questions,
- Develop and conduct appropriate experimentation, analyses and data interpretation and use engineering judgment to draw conclusions for further research,
- Make critical evaluation of the state-of-the-art literature, research techniques and methodologies,
- Demonstrate the ability to acquire and apply new knowledge as needed, using appropriate research strategies (with originality in mind) for solving research problems and applying knowledge and skills to the needs of the society,
- Demonstrate the capacity to contribute to social development and support the learning of others through research and education,
- Demonstrate effective abilities in presenting research results, in both, national and international conferences, workshops and similar activities to present and discuss research findings with the academic peers and members of the society in general.

5. Research programmes

The proposed PhD program on Electrical and Computer Engineering has its scientific and applied research goal defined in line with the strategic plan of actions of the University of Prishtina, Faculty of Electrical and Computer Engineering (UP-FECE) for the period 2021-2023. The faculty aims at increasing its budget by providing professional services to the other institutions and by partnering with international organizations/universities in joint research projects.

There are two main pillars (associated with specific measures) that encompass the research goals of UP-FECE, as in the following:

I. Improving and increasing research results in UP-FECE
   a. Encourage the inclusion of diaspora capacities in scientific research work, as well as increase of other international cooperation,
   b. Increasing academic integrity during research / scientific work

II. Enabling innovation through research and development projects
   a. Drafting the legal basis for innovations (to be drafted by the respective departments at the university level),
   b. Harmonization of UP-FECE internal regulations with the Law on Intellectual Property of the Republic of Kosovo.

5.1. Research laboratories

UP-FECE has in its long-term possession a large infrastructure base, which is maintained in regular basis and upgraded with new facilities in yearly basis, or sometimes even more frequently through funding coming out of many research and development projects going on in the faculty. Explicitly, UP-FECE has dozen specialized laboratories that are used for research and development projects in narrow research fields of Electrical and Computer Engineering as presented in Table 1.

Table 1: List of research and development laboratories at UP-FECE

No.	Name	Description
1	Big data & high-performance computing lab	This is a room with a cluster of 12 servers placed in three racks. Two of the servers are equipped with GPU NVDIA Tesla and AMD Radeon Graphics Cards with 100 GB RAM. The other 10 servers are equipped with 32 GB RAM. It is mainly used for research and development work in data science, algorithms for problem solving, optimisation and parallel computing.
2	Information Security Lab	This lab consists of several hardware devices, dedicated for network monitoring (switches, routers, and firewalls), vulnerability injections via special USB or other hardware, Burp Suite Professional (software licence paid by university) and many

		other open-source software tools (KALI Linux, OWASP Top 10 and much more).
3	Laboratory of National Research School in ICT	The laboratory consists of set of equipment for research and development in the field of computer networks (15 High Performance Routers), Internet of Things (a set of air quality mobile phone detection sensors), Human Computer Interaction (a set of equipment for analysis of user-device interaction through eye tracking and head signal sensing), and Text Recognition (a set of specialized touch screens for detection of handwritten characters).
4	Laboratory of integrated research in Internet of Things (IoT)	This laboratory is equipped with a set of equipment for optical communication, mobile workstations, digital oscilloscope, and other supporting devices. This laboratory serves as a facility for experimentation in developing standards for 5G communication that include also LET and MIMO communications.
5	Laboratory of applied electromagnetics	This lab contains devices for measuring, evaluating, and monitoring electromagnetic radiation in high frequencies. Furthermore, the lab has its dedicated software, which allows automated processing of experimental results. This lab can be used for professional and research projects that aim in studying characteristics of electromagnetic radiation with the focus of minimizing side effects of the radiation coming out of antennas of mobile network operators. The lab has specific equipment that can operate in a wide frequency range and measuring different parameters for the electric and magnetic fields, for the following communication/transmission systems: TV, TETRA, WIFI, GSM, DECT, DCS, 2G, WiMax, WiFi 5G, LTE 800 MHz/2600, etc.
6	Laboratory of advanced computer and wireless networks	This lab is equipped with advanced devices for research and development in the narrow fields of communications that include Software Defined Radio - SDR, MIMO communications in WiFi/WiGig frequency ranges, cellular networks GSM/LTE, radars frequency range, etc. The lab has a range of devices that include routers, antennas, wireless access points, LabVIEW Communications System Design Software, desktops, and laptops.

7	Laboratory of power systems for electricity transmission and distribution	This lab consists of three main components: (1) Primary injector for alternative (AC) and direct (DC) current/voltage, (2) Equipment for examination and testing of three-phase transmission lines, and (3) Equipment for examination of the process of the distribution of electric energy.
8	Laboratory of electronics for production of prototypes	This lab contains equipment for developing electronic boards and implementation of prototypes. The lab has its computer workstation and software for preparation of electronic board models, whose performance can be tested in a virtual format, which helps in shortening the development cycle. The lab contains a wide range of equipment that include microcontrollers, FPGA, CNC devices and material for Printed Circuit Boards.
9	Laboratory of robotics for speech, vision, robot manipulation and mobile robots	This lab is dedicated for developing automated and robotic approaches for completion of industrial or human centred real-life tasks. To achieve this, the lab has vision equipment, physical robots, dedicated software tools and other supporting devices. Specific equipment that are available in this lab include laser scanner (LIDAR), colour and distance cameras (RGB+D), Humanoid robots, microcontrollers, GPUs, and FPGAs.
10	Computer Networking Lab	This lab consists of 5 cabinet racks and each equipped with of a CISCO Switch, 5 WiFi Routers, and 25 PC with dual boot options (Linux and Windows) for different configuration setups.
11	Human-Computer Interaction lab	This lab consists of two interactive multi board monitors of 70" that are dedicated for research on Human-Computer Interaction, but also, they represent advanced digital tools for interaction in class while teaching.
12	Water & air quality measurement lab	It consists of a Wireless Sensor Network for monitoring surface water quality, placed in river Sitnica near the village of Plemetin. Further, a set of air quality sensor are placed in the building of UP-FECE, which are connected to a central cloud database. This set makes an Internet of Things platform used for gathering data for air quality, which are then then analysed with various techniques from Data Science.

5.2. Visits at partner institutions

Based on the regulation of PhD studies (Article 8), the PhD candidates can accumulate up to 10 ECTS credits when they go for research or study visits to international institutions and up to 6 ECTS credits when they get involved in internship activities in other local or international institutions (e.g., research institutes, R&D departments of companies from the industry). In this respect, as depicted in Figure 3, within the second semester, PhD candidates will have to choose between one of the two research components:

1. Do a two-month internship in a company or research intuition for testing and verification of research results and then present them to a scientific conference, or
2. Do a month research/study visit mobility to an international university.

The regulation of UP on financing research/scientific, artistic and sports activities (specifically Article 7) enables PhD students to apply for grants for research projects, which are sponsored by the budget of the university. In addition, PhD students are encouraged to apply for mobility grants, supported by the Ministry of Education or other local Higher Education Programs such as HERAS+ (www.heraskosovo.org). Furthermore, thirteen of the academic staff members of FECE collaborate and present their research work within their associated working groups in European research networks known as COST actions. Within these research groups, PhD students as well can get funding for Short Term Scientific Mission (STSM) study visits in various universities around Europe.

In addition, in the framework of several capacity building projects from ERASMUS+ funding schema and other programs, FECE has a long-lasting collaboration with various universities around the world, such as: Vienna University of Technology (TU Wien), Freiburg University, NTNU University in Gjøvik, Linnaeus University, Pittsburg University, Purdue University and others.

After the completion of the research mobility or internship phase, a total of 10 ECTS credits are registered into the Student Electronic Management System (SEMS) by the supervisor of the PhD candidate.

According to the structure of the presented PhD program, in the first semester, besides the obligatory courses, there are two categories of electives courses, namely: professional courses and the soft skills course. As outlined in Table 3 (see the last two rows), these courses can also be taken outside of the university in the form of free electives. Nonetheless, the doctoral candidate should select such courses in close coordination with the supervisor and only at any international university that is listed in the well-known platform of Shanghai Ranking. It is the responsibility of the supervisor to check the content of such courses and register the equivalent ECTS credits of the course in the electronic system (i.e., SEMS).

Moreover, in the 2nd semester and afterwards, to receive the foreseen ECTS credits, the doctoral candidates are expected to attend conferences, PhD workshops and engage in research mobility activities. In general, there are three sources of funding that can be used to support these activities:

- The funding provided by the university in accordance with the regulation on financing of research - scientific, artistic and sports activities (specifically Article 2, Paragraph 1.2),
- The funding provided by the Ministry of Education, Science, Technology, and Innovation of Kosova (based on annual public calls)
- The funding that is available out of various research projects, as well as student exchange and capacity building projects from the Erasmus+ program.

5.3. Research projects

The Faculty of Electrical and Computer Engineering is involved in three research projects, as presented below:

1. Security of e-Voting with Blockchain Technologies - that involves two former PhD students,
2. Cooperative projects that solve real problems using IoT technology – that involves several bachelor and master students,
3. Automated Examination Timetabling in the Faculty of Electrical and Computer Engineering - University of Prishtina – that involves several bachelor and master students (see the web page for more information https://examination-timetabling.uni-pr.edu)

In addition, students and academic staff are involved in capacity building projects that are sponsored by Erasmus+ schema of the European Commission. In the following, we give details about eight specific projects:

1. Development and Implementation of PhD in ICT in Kosovo Education System (View more details here),
2. Developing Research and InnoVation CapacitiEs in Albania and Kosovo / DRIVE (View more details here),
3. Innovating Multimedia and Digital TV curricula / DIMTV (View more details here)
4. Innovative Teaching Education in Mathematics (ITEM) (View more details here),
5. INTERnationalization at Home: Embedding Approaches and Structures to Foster Internationalization at Western Balkans (INTERBA) (View more details here),
6. Accelerating Western Balkans University Modernization by Incorporating Virtual Technologies / VTechh (View more detail here)
7. Mobility in ICTs between Linnaeus University in Växjö and University of Prishtina (View more details here

8. Mobility in ICTs between Norwegian University of Science and Technology in Gjøvik and University of Prishtina (View more details here)

These projects will help PhD students and the staff benefit in several aspects, such as: (1) Possibility of getting funding for short research visits, (2) Funding for research resources (equipment or material0, (3) Getting the possibility to get co-mentoring with partner institutions, and (4) Presentation in conferences.

6. Structure of the programme and study guidelines

The structure and organization of doctoral studies is regulated by Article 124 of the Statute of University of Prishtina and, in more detail, by the PhD Regulation. In Figure 3, is presented the distribution of student ECTS credit load over a period of six semesters (denoted with S1, S2, S3, S4, S5 and S6). In the 1st semester (S1) the PhD student accumulates 30 ECTS credits from three categories of courses, as in the following:

1. Two mandatory fundamental courses that are related to the philosophy of science and research methods, as well as ethics and research integrity (12 ECTS)
2. Two elective professional courses that are related to the narrow field of the PhD research topic (specified by student during the enrollment phase) of the specific doctoral candidates (14 ECT)
3. One elective soft skills course, which is related to one of the disciplines, such as: Personality and Self-Management, Innovation, Entrepreneurship and Start-ups, Leadership and Responsibility, Business and Industry, Communication (transferable skills) and Methodological Competence (4 CTS)

The first contact with potential mentor PhD student starts even during the enrollment phase, through letter of recommendation, as specified in PhD Regulation, Article 7, Point 5. Further, in the 2nd semester, the PhD student, based on Article 8 and Article 12 of the PhD regulation, selects a potential mentor and then under her/his supervision, accumulates another 30 ECTS credits from several scientific research activities or professional works that include lab work, systematic literature surveys, presentation of preliminary work on doctoral seminars, research mobility and internship for verification of research results. Furthermore, the PhD candidate, under the consultation of the potential mentor, can opt to take professional or soft skill courses (in form of free electives) at any international university.

In the 3rd semester the PhD candidate prepares a detailed project proposal, which is initially submitted for approval to the Faculty Doctoral Council, and then to the to the University Doctoral Counsel, which is finally approved by the Senate of the University of Prishtina and as a result the potential mentor gets formalized as the PhD supervisor for the thesis. The PhD thesis proposal is prepared using the standard university form (entitled as Form F1). This form contains following sections (i.e., Form 1) such as:

- Formulation of the research problem,

- Preliminary research work,
- Literature review and
- Detailed plan for future research work.

The doctoral candidate must present his/her PhD proposal in viva in front of the members of doctoral council of the faculty, where other interested members of the academic staff can be invited to participate. During the presentation, the members of the doctoral council might ask questions to the PhD candidate about the proposed research topic and the methodology for research work.

In the last three semesters, the PhD candidate is expected to work on publishing the research results in at least one journal venue that is indexed either in Web of Science (SCIE, SSCI, and AHCI) or SCOPUS. In addition, the student is expected to make two publications in conference proceedings, where one of them should be at an international venue, while both should be related to the PhD topic of the doctoral candidate. As proof, the student is required to submit to the faculty council of doctoral studies the evidence about publication of research results and the specific publication venues (i.e., journal name, conference name and publisher), which will be checked for their adherence to the quality criteria stipulated in the PhD regulation of UP (Article 8).

<table>
<tr><td rowspan="4">S4, S5, S6</td><td colspan="3">Compilation of doctoral thesis and public defence (60 ECTS)</td><td rowspan="5">PhD thesis (120 ECTS)</td></tr>
<tr><td colspan="3">Publication of research results in international peer-reviewed journals (20 ECTS)</td></tr>
<tr><td colspan="3">Publication and presentation of research results at international conferences (5 ECTS)</td></tr>
<tr><td colspan="3">Publication and presentation of research results at national conferences (5 ECTS)</td></tr>
<tr><td>S3</td><td colspan="3">Detailed PhD project proposal and dynamic plan of actions (30 ECTS)</td></tr>
<tr><td rowspan="2">S2</td><td rowspan="2">Proposal about the narrow field of research topic (6 ECTS)</td><td rowspan="2">Preliminary research work, laboratory experimentation or literature survey (14 ECTS)</td><td>Two-month internship for testing and verification of research results (6 ECTS)</td><td colspan="2">Presentation of research work at a scientific conference (4 ECTS)</td></tr>
<tr><td colspan="3">One month research mobility abroad (10 ECTS)</td></tr>
<tr><td>S1</td><td colspan="4">Selection of a potential mentor</td></tr>
<tr><td></td><td>Two mandatory fundamental courses for philosophy of science, research methods, ethics, and research integrity (12 ECTS)</td><td colspan="2">Two elective professional courses that are related to the narrow field of the PhD research topic (14 ECTS)</td><td>One elective soft skills course (4 ECTS)</td></tr>
</table>

Figure 3: PhD study pathway with ECTS distribution structure

Table 2 presents the list PhD courses along with information such as: course type and category, course name, number of ECTS credits and the responsible lecturer.

Table 2: List of PhD courses at FECE

No.	Course type (Mandatory/ Elective/Free Elective)	Course category (Fundamental/ Professional/ Soft Skills)	Course name	ECTS	Lecturer
1	Mandatory	Fundamental	Philosophy of Science & Research methods in Electrical and Computer Engineering	6	Blerim Rexha
2	Mandatory	Fundamental	Ethics and research integrity	6	Enver Hamiti
1.	Elective	Professional	Cyber Security: advanced programming and technologies	7	Blerim Rexha
2.	Elective	Professional	Research in Cyber Security	7	Blerim Rexha
3.	Elective	Professional	Radio Wave Propagation for MmWave	7	Enver Hamiti
4.	Elective	Professional	Research in mmWave massive MIMO	7	Enver Hamiti,
5.	Elective	Professional	Electronic components theory	7	Sabrije Osmanaj
6.	Elective	Professional	Research in Power Inverters in Renewable Energy System	7	Sabrije Osmanaj
7.	Elective	Professional	Advanced power electronics and renewable energy Conversion	7	Qamil Kabashi
8.	Elective	Professional	Research topics in Power electronics systems	7	Qamil Kabashi
9.	Elective	Professional	Computing Algorithms	7	Kadri Sylejmani
10.	Elective	Professional	Research on Programming Languages	7	Kadri Sylejmani
11.	Elective	Professional	Models and theories in HCI	7	Isak Shabani
12.	Elective	Professional	Research in Human-Computer Interaction (HCI)	7	Isak Shabani
13.	Elective	Professional	VLSI interconnections	7	Milaim Zabeli

14.	Elective	Professional	Research on Energy processing and integrated circuits	7	Milaim Zabeli
15.	Elective	Professional	Selected topics on Electromagnetic Interference and Radiation	7	Mimoza Ibrani
16.	Elective	Professional	Research topics on Communications and Networking	7	Mimoza Ibrani
17.	Elective	Professional	Convex Optimization and Machine Learning for Wireless Communication	7	Bujar Krasniqi
18.	Elective	Professional	Research on Recent Trends in Wireless Communication	7	Bujar Krasniqi
19.	Elective	Professional	Research in Pervasive and Heterogenous Networks		Zana Limani Fazliu
20.	Elective	Professional	Research in Guidance, Navigation and Control		Drilon Bunjaku
21.	Elective	Professional	Problem Solving and Search in Artificial Intelligence	7	Nysret Musliu
22.	Elective	Professional	Research in Data Science	7	Lule Ahmedi
23.	Elective	Professional	Research in Computing Continuum Systems	7	Ilir Murturi
1.	Elective	Soft skills	Innovation, Entrepreneurship & Startups	4	Kadri Sylejmani
2.	Elective	Soft skills	Leadership & Responsibility	4	Isak Shabani
3.	Elective	Soft skills	Communication, Transferable skills & Methodological Competence	4	Blerim Rexha
1.	Free elective	Professional	A free elective professional course from a PhD program in a national or international institution	7	The PhD candidate selects the course with the approval of the supervisor.
2.	Free elective	Soft skills	A free elective professional course from a PhD program in a national or international institution	4	The PhD candidate selects the course with the approval of the supervisor.

7. Methods of assessment

Based on Article 14 of the PhD regulation of UP, the PhD thesis must be confirmed by the candidate to be his/her original work and it can be written in one of the two forms:

1. Research monograph, or
2. Compilation of at least three research papers that are related to PhD candidate's topic, where the PhD student is the first author, and the papers are published in peer-reviewed journals relevant to the field (indexed in Web of Science or Scopus). In this case, in addition to the inclusion of at least three papers, the PhD thesis should contain a general first section which outlines the introduction, methodology and a conclusion with the main findings.

The criteria for the assessment of the doctoral thesis are described in the PhD Regulation (Article 16 and 17) and they are defined to be applied in two different phases, as outlined below:

The evaluation at the council of the faculty results in one of the three outcomes:

1. Acceptance of the doctoral thesis without changes (i.e., the submitted version),
2. Return of the doctoral thesis for amendments and changes,
3. Refusal of the doctoral thesis due to the failure to achieving expected goals.

The evaluation of the committee for the doctoral defense will result with one of the following outcomes:

1. A thesis defense with an outstanding grade,
2. A thesis defense with a very good grade,
3. A thesis defense with a good grade,
4. A thesis defense with a satisfactory grade,
5. A thesis defense with failure.

There are two main policy documents that address the issues regarding eventual doctoral candidate or academic staff members misconduct (e.g., unethical practice, plagiarism, fabrication of data, etc.), which are:

1. The PhD Regulation of UP (Article 19) foresees the act of the revocation of doctoral title of the PhD graduates, in two cases: (1) Falsification or cheating in the process of evaluation/examination and (2) Plagiarism or violation of author rights in the process of compilation of the doctoral thesis. Regarding the plagiarism check the University of Prishtina has full license for well-known plagiarism software https://plagiarismcheck.org/, as presented in Figure 10 (the view usage of Prof. Rexha).

2. The Code of Ethics of the University of Prishtina (in several articles) has a detailed description of different penalties for various misconduct behaviors for students and academic staff members.

8. Requirements for progression through the programme

The process of monitoring PhD studies is mandatory for both, supervisor, and student, which is sanctioned in the Statute of University, Article 124 and outlined also in PhD Regulation in Article 10 (Mentor obligations) and Article 11 (PhD Student rights and duties). In this regard, the process for monitoring the progress of doctoral candidates is conducted at four different reporting levels (see Figure 6), as given below:

1. The student makes a yearly report about her/his progress on doctoral studies according to the predefined templates,
2. The supervisor makes a yearly report about the progress of the candidates she/he is supervising according to the defined templates,
3. The council of doctoral studies at the faculty level, based on the reports of the students and the supervisors, makes a self-evaluation report on a yearly basis,
4. The report of the council of doctoral studies is discussed by the council of the faculty and the central council of doctoral studies at the university level.

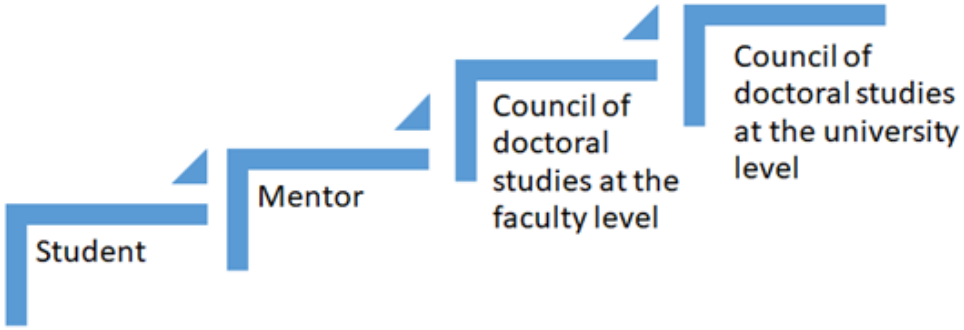

Figure 4: Four levels of reporting

The reporting is carried out using designated forms, which contain details about course work, research mobilities, participation in doctoral seminar schools and publications in journals and conferences/workshops. In addition, the tracking of student progress, in terms of ECTS accumulation, is done via the University Electronic System for Managing Students (SEMS), which enables generation of statistical reports about student progress (https://sems.uni-pr.edu).

The first contact with potential supervisor PhD candidate starts even during the enrollment phase, through letter of recommendation, as specified in PhD Regulation, article 7, Point 5.

Further, Article 8 (specifically Paragraph 5) of the PhD regulation requires that the doctoral candidate, at the beginning of the 2nd semester must get in touch with her/his potential supervisor and together with her/him compile a proposal about the narrow field of the research topic, which needs to be submitted to the council of the faculty for approval. The decision of the council of the faculty for the approval of the narrow research field, also includes the normative act for the assignment of the supervisor, so that the doctoral candidate can consult him right away for the research work foreseen in the second semester and for the preparation of a detailed thesis proposal.

Based on Article 124 of the Statue of UP and Article 12 of the PhD regulation, the thesis proposal must be compiled in the 2nd semester of the PhD study program and the recent updates need to be presented in front of colleagues and/or the department staff, who will receive the candidate's proposal two weeks prior to the department research meeting.

The PhD candidate initiates the procedure of submitting the proposal of the doctoral thesis upon submission of the designated form (entitled as Form F2), which contains the following elements:

- Title of the proposed thesis,
- Details about the supervisor,
- Thesis description and research objectives,
- A summary of preliminary research work,
- Research hypothesis,
- Research material, methodology and research plan,
- Expected research contribution,
- List of referenced research articles from the literature
- The thesis proposal will undergo the following procedures:
- It will be prepared under the supervision of the supervisor that has been assigned by the council of the faculty,
- It will be presented in front of the council of doctoral studies at the faculty level and the respective department (I.e., the department where the supervisor is part of),
- It will be approved by the respective committees (department, council of doctoral studies and the faculty council) by the end of the second semester,
- The final formal approval is done by the senate of UP after the proposal has passed the approval of the central council of doctoral studies at the university level,
- After the final approval, the student will be granted 30 ECTS credits

The doctoral candidates will be invited to present their achievements in the research meetings that are organized by the respective departments. In addition, starting from their second semester, they will also be required to attend every presentation that is given in the department research meetings.

After the submission of the manuscript of the doctoral thesis, the evaluation committee (that is set up the council of the faculty) has a two-month period to prepare the evaluation report, which, in sequence, will have to get approved by the following decision-making academic hierarchies:

1. The Council of Doctoral Studies at the Faculty of UP-FECE,
2. The Council of UP-FECE,
3. The Council of Doctoral Studies at the University of Prishtina,
4. The Senate of the University of Prishtina

After getting the approval from the Senate of UP, the doctoral candidate, in coordination with the dean of the faculty and the examination committee, must take the public defense exam within a period of maximum two months.

The protocol and procedures for assessment of the doctoral thesis is explicitly defined in Article 17 of the PhD Regulation of UP. In the following, we briefly present that steps that will have to be undergone, before the public defense is made:

1. The doctoral candidate submits the thesis manuscript (physical and electronic copy) to the faculty with the written approval of the supervisor.
2. The student office ensures that the doctoral candidate has fulfilled all needed requirements in terms of accumulation of ECTS credits.
3. The council of the faculty, with the proposal from the council of the doctoral studies, sets up an evaluation committee consisting of three members, where one of them comes from another university (either local or abroad). Further, the mentor should not be part of the evaluation committee, and all members should, at minimum, have the title of assistant professor, whereas also be experts in the narrow research field as the topic of the doctoral thesis.
4. The committee should prepare the evaluation report within a period of maximum two-months.
5. The council of the faculty, with the recommendation of the commission of doctoral studies at the facility, makes the decision for further proceedings or eventual amendments.
6. The council of doctoral studies at the university level makes its decision within a maximum of one-month of duration.
7. Finally, the Senate of UP, with the recommendation of the council of studies at the university level, makes the final decision about the PhD thesis.