

UNIVERSITY OF MOSTAR
Faculty of Civil Engineering

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CURRICULUM
of the Postgraduate Doctoral
University Study of Civil Engineering

Mostar, 2019

TABLE OF CONTENTS

1. INTRODUCTION

- 1.1. General
- 1.2. Reasons for the introduction of the study programme
- 1.3. Openness of the study and student mobility
- 1.4. Compliance with the mission of the University of Mostar and related programmes from the European Union

2. DESCRIPTION OF THE STUDY PROGRAMME

- 2.1. Basic information
- 2.2. Requirements for admission to the doctoral study and duration of study
- 2.3. Structure and organization of the doctoral study
- 2.4. Requirements for admission to the next year of study and requirements for transfer of ECTS credits from other faculties
- 2.5. Teaching and extracurricular activities
- 2.6. Completion of the study and competences acquired

3. LEARNING OUTCOMES AND COURSE SYLLABI

1. INTRODUCTION

1.1. GENERAL

Before the end of 1970s, there was only one faculty of civil engineering in Bosnia and Herzegovina. Ever increasing needs of the region for highly educated civil engineering professionals and the need to increase the number of institutions of higher education as a prerequisite for a more rapid economic and social development of the region resulted in the opening of the Faculty of Civil Engineering in Mostar. The Feasibility Study for establishment of the Faculty of Civil Engineering in Mostar was developed in January 1978. This document contained evidence of the long-term need for highly educated personnel in the field of civil engineering. A framework programme for scientific, teaching and research work was presented. Sixteen business organizations and companies adopted the then Self-governing Agreement to guarantee the funds for starting the operation and basic activities of the faculty. A total of 160 students were registered in the first academic year 1978/79 at the Faculty of Civil Engineering. Out of this number of registered students, 28 students completed the study on schedule in the academic year 1982/83. The first class of students attended only the structural and contractor's programme; however, the hydraulic engineering programme was introduced already from the second class. From then up to the end of the pre-war period, these two programmes remained the options in final years of studies at the Faculty of Civil Engineering in Mostar. Since the faculty was established until the academic year 1988/89, the study was organised in the period of eight semesters, or four academic years in total. Later, the duration of the study was extended to nine semesters, i.e. students were to enrol in the fifth academic year, and after successfully completing all examinations, they would take up preparation of their graduation theses. This system of studies was in effect until the war began in 1992. It should be noted that the faculties of civil engineering in Sarajevo and Split provided considerable support in human resources for the operation of the faculty during this pre-war period. In the academic year 1994/95, the Faculty of Civil Engineering moved back to its premises in Kralja Zvonimira Street #14 in Mostar.

The management of the Faculty of Civil Engineering University of Mostar, or persons managing the teaching, scientific and international cooperation affairs at the faculty, consists of:

Dean: Maja Prskalo, Ph.D.;

Vice Dean for Science: Amira Galić, Ph.D.;

Vice Dean for Academic Affairs: Dragan Ćubela, Ph.D.;

Faculty Secretary: Branka Šunjić, LL.B.

The mission of the Faculty of Civil Engineering is:

- organising and carrying out scientific and teaching work for education of personnel with university qualifications for the needs of business and other public activities in the field of civil engineering with titles Bachelor of Science in Civil Engineering and Master of Science in Civil Engineering;
- organising and carrying out scientific and research work for acquisition of the scientific degree of Doctor of Philosophy (PhD);
- organising systematic monitoring and use of scientific achievements, and preparing personnel for independent scientific research;
- providing conditions for production of textbooks and manuals for the needs of scientific and teaching process;
- balancing, directly or through other institutions, the needs of the economy with modern scientific and technical development;
- cooperating with other scientific and research institutions and institutions of higher education in the country and abroad in organising and promoting joint scientific and research projects as well as in the scientific and educational process.

In formal legal terms, the study programmes at the Faculty of Civil Engineering take into account the *Statute of the University of Mostar*, *Rulebook on studies of the University of Mostar*, and *Rulebook on organisation and operation of the quality assurance and promotion system of the University of Mostar*. The Faculty of Civil Engineering University of Mostar is a full member of the *Association of Croatian Civil Engineering Faculties* (Osijek, Rijeka, Split, Zagreb and Mostar). This membership provides the first degree of student mobility by means of an agreement on mutual alignment and recognition of the curricula of all five civil engineering faculties that organise teaching in Croatian language, while the alignment of programmes with European standards gives a mobility perspective at the European level. The Student Union has a direct communication with the faculty management and participates in the work of the Scientific and Teaching Council through their representatives. Students elect their representatives by study years directly in student elections.

For the purpose of better organization and coordination of activities of the faculty, and consideration of issues of common interest for performance of the scientific and teaching work, the following operate at the faculty:

- Department of Mechanics, Materials and Structures;
- Department of Roads and Construction Management;

- Department of Hydraulic Engineering and Geotechnics.

The faculty uses the *University Information System (ISS)* as technical and digital support. The Scientific and Teaching Council of the Faculty of Civil Engineering University of Mostar introduced rules for the use of ISS, compliance with which is mandatory for all teachers and students. ,

1.2. REASONS FOR THE INTRODUCTION OF THE STUDY PROGRAMME

The field of civil engineering is one of nine fields in the area of technical sciences (see the Rulebook on methodological frameworks and principles for the development of the Rulebook on classification of scientific areas, fields and branches, adopted by the University of Mostar Senate on 19 February 2015). The Faculty of Civil Engineering University of Mostar is the institution responsible for the civil engineering profession and the scientific field of civil engineering in Herzegovina and wider since its foundation in 1978 until this day. Besides, owing to its dynamics, civil engineering is also the driving force of development of every other area of domestic and foreign economies. The development of civil engineering initiates and promotes significant changes in other areas of life and work.

The field of civil engineering includes a wide range of scientific branches, and also participates in interdisciplinary branches together with other fields of technical sciences. Civil engineering is of strategic importance for the development of the entire society.

Constant and dynamic development of the field of civil engineering requires additional expansion of the education process due to new knowledge and achievements. Together with other components of the University, the Faculty of Civil Engineering University of Mostar entered the education system based on the principles of the Bologna Declaration in 2005 and has been continuously developing the system over the past decade. The good aspects of this development are reflected in several positive examples of accreditations/re-accreditations of the Faculty of Civil Engineering and its programmes since its entry into the new system until present days. In order to continue the indicated faculty evolution process and to keep pace with developed European and global related institutions, in the following years it is necessary to provide additional education that will bring progress in completing a high-quality, educational and competent scientific and professional base in the environment, but also encourage scientists from other regions to participate in further growth of the Faculty of Civil Engineering in different ways.

The development of the educational process would methodologically develop and improve systematic knowledge and experience with special emphasis on openness to new concepts

and innovative solutions. That is why the most natural possible way is to open the third cycle of studies at the Faculty of Civil Engineering University of Mostar, the postgraduate doctoral university study of civil engineering. It would educate scientists and professionals for top-quality scientific work, on the one hand, but also for managing complex and specific operations of the civil engineering profession in economy, science and public institutions, on the other hand.

1.3. OPENNESS OF THE STUDY AND STUDENT MOBILITY

The postgraduate doctoral university study of civil engineering is based on an advisory or mentoring system. With the assistance of his/her study advisor, and later also a mentor, by appropriately selecting courses a student can be directed to appropriate scientific branches or interdisciplinary research in the area of technical sciences, scientific field of civil engineering. Students are allowed to enrol in (up to two) courses from the doctoral studies of other members of the University of Mostar if they are compatible with the concept, or the curriculum, of the postgraduate doctoral university study of civil engineering. Similarly, students are allowed to enrol in courses from doctoral studies held at other related faculties of universities in the country and abroad. Again, it is possible to choose a maximum of two courses from a doctoral study at another university. It is worth noting the international dual doctorate (the so-called *cotutelle*) as an exception, but only in the case of an individual or general agreement on cooperation between universities (see *Cotutelle de these/Joint PhD Thesis Supervision*).

The postgraduate doctoral university study of civil engineering at the Faculty of Civil Engineering University of Mostar is also open to enrolment of students from other universities (to enrolment in full-time studies as well as to enrolment in individual courses for visiting students at the study).

It is planned to engage prominent foreign scientists and experts, especially in specialized scientific branches where there are no experts within the institution responsible for the study programme.

1.4. COMPLIANCE WITH THE MISSION OF THE UNIVERSITY OF MOSTAR AND RELATED PROGRAMMES FROM THE EUROPEAN UNION

At the Faculty of Civil Engineering University of Mostar, there are all prerequisites for the realization of the postgraduate doctoral university study of civil engineering. A significant number of teaching and non-teaching staff with appropriate scientific and professional qualifications are full-time employed and engaged in accordance with the standard teaching load stipulated by law and relevant regulations. Adequate space and part of equipment are also provided, in accordance with needs of high-quality studying. During the implementation of the postgraduate doctoral university study of civil engineering, it is planned to complete the laboratory equipment and additionally improve the conditions for scientific development.

The proposed postgraduate doctoral university study of civil engineering is aligned with short-term and long-term objectives and mission of the University of Mostar and the Faculty of Civil Engineering, or with the scientific strategy. By its structure and contents, the programme is fully aligned with similar studies in BiH, the European Union countries (Croatia, Slovenia, Austria) and Switzerland.

2. DESCRIPTION OF THE STUDY PROGRAMME

2.1. BASIC INFORMATION

Name of study: Postgraduate doctoral university study of civil engineering

Type of study: Doctoral university study

Scientific area: Technical sciences

Scientific field: Civil engineering

Scientific branches: structural engineering / hydraulic engineering / geotechnics /
transport engineering / construction management

Institution responsible

for the study: Faculty of Civil Engineering University of Mostar

Duration: 6 semesters (3 years)

Number of ECTS credits: 180

Enrolment procedure and requirements: Enrolment is made based on public competition.
Enrolment requirements are given in Subsection 2.1.

Competences: The competences of PhD in the scientific area of technical sciences, field of civil engineering, are acquired by completing the study. PhDs are trained primarily for the application of scientific methodology and future independent scientific and research work. Competences are acquired for leadership of scientific development based on new technologies, introduction of new scientific approaches based on design and research, as well as on scientific planning and decision-making using the most recent scientific methods of collecting, processing and analysing information.

Academic degree

(or title) obtained

by completing the study: Doctor of Philosophy (PhD) in the area of technical sciences

2.2. REQUIREMENTS FOR ADMISSION TO THE DOCTORAL STUDY AND DURATION OF STUDY

The following are eligible to enrol in the postgraduate doctoral university study of civil engineering:

- **candidates with completed university undergraduate and graduate studies** and who have achieved at least 300 ECTS credits during their studies (master's degree) with a minimum average grade of 3.50 for all courses in previous two cycles;
- **candidates with completed higher-education graduate studies with VII/1 degree** (graduate civil engineer) at faculties in Bosnia and Herzegovina and abroad (or at equivalent studies in countries where the study of civil engineering was a part of an interdisciplinary study programme at a faculty or university department) with a minimum average grade of 3.50 for all courses during the study
- **candidates with completed postgraduate scientific master's study** under the old system (Master of Science) in the area of technical sciences, field of civil engineering, and also candidates who are MSc in some other field in the area of technical sciences subject to having achieved at least 30 ECTS credits in the courses covered also by the postgraduate master's study in the field of civil engineering

Public competition for admission to postgraduate doctoral university study of civil engineering is announced by the University of Mostar Senate at the proposal of the Scientific and Teaching Council of the Faculty of Civil Engineering. The candidate evaluation criteria include success in undergraduate and graduate studies, interest shown in scientific research, published papers in scientific journals and proceedings, professors' recommendations, and research topic proposal.

In case the quality of work of the doctoral candidate, assessed through annual evaluation procedures conducted by the Doctoral Study Council, is not satisfactory, the Doctoral Study Council may decide that the doctoral candidate has lost his/her right to continue the studies.

2.3. STRUCTURE AND ORGANIZATION OF THE DOCTORAL STUDY

The postgraduate doctoral university study of civil engineering is conceived so that, after enrolling in the doctoral study, a student selects his/her study advisor on the basis of the scientific branch, proposed doctoral study module, or the desire and preference for a particular speciality.

To each student, the Doctoral Study Council assigns his/her study advisor after registration. The study advisor assists students in selecting courses, solving problems during their study and monitors and guides their work. The study advisor is also responsible for monitoring student progress during the study.

A study advisor does not need to (but can) be a mentor to his/her candidate for preparation of doctoral dissertation. A mentor is appointed during the dissertation topic registration and approval procedure. A study advisor may be the only mentor, and also a mentor within a dual mentorship for a candidate (if interdisciplinarity of work is involved or if the other mentor comes from another university where some research will also be conducted) but may also be a co-mentor to his/her candidate. After completion of the dissertation topic registration and approval, if the study advisor is not selected as mentor or co-mentor for the candidate whom he had previously monitored and guided, at that point his/her duties cease and are taken over by the selected mentor (and co-mentor).

At the beginning of each study year, the student should prepare an annual research plan that is jointly signed by the student and his/her study advisor (and later mentor).

A teacher holding a rank of full or associate professor (or equivalent rank if the academic rank is earned abroad) can be appointed as a mentor. A mentor can also be an assistant professor if he/she has held that rank for at least three years or is the head of a research project. In the case of interdisciplinarity of the topic, dual mentorship is proposed. In this case, each of them assumes the responsibility for a predetermined part of the research and the dissertation development process. As already indicated, in addition to a mentor, at the postgraduate doctoral study of civil engineering it is also possible to appoint a co-mentor from the institution responsible for the study or other institutions in the country and abroad. A teacher holding a rank of full professor, associate professor or assistant professor (or equivalent rank if the academic rank is earned abroad) can be appointed as a co-mentor. A co-mentor can also be appointed in case of appointment of two mentors.

At the postgraduate doctoral study of civil engineering at the Faculty of Civil Engineering University of Mostar, one mentor can simultaneously guide a maximum of three doctoral candidates from this study. A mentor or co-mentor who is not an employee of the University of

Mostar or its affiliated members shall sign a contract on cooperation and assumption of the responsibility for the candidate. Every mentor shall enclose a statement on the readiness to guide the candidate during preparation of the doctoral dissertation, and also a written permission of the head of the institution he/she is coming from.

The postgraduate doctoral university study programme is structured modularly. With the assistance of his/her study advisor, in addition to two mandatory general courses and a minimum of one (and a maximum of two) general elective courses, the student also selects specialist courses from one of the directing modules.

In agreement with the selected study advisor, the student can also choose courses from doctoral studies of related programmes at the University of Mostar, or at other universities and faculties.

The postgraduate doctoral university study of civil engineering consists of defined teaching and extracurricular activities. 60 ECTS credits can be obtained through teaching activities, and extracurricular activities bring the remaining 120 ECTS credits. Extracurricular activities include, among other things, registration and defence of topic, and development and defence of doctoral dissertation.

Teaching activities are conducted through compulsory and elective courses, or through direct forms of teaching consisting of lectures, exercises, research seminars, workshops... Direct forms of teaching consist of compulsory teaching activities (48 ECTS credits) and elective teaching activities (12 ECTS credits).

The student takes two compulsory courses, and with the assistance of his/her study advisor selects a minimum of one and a maximum of two general elective courses, with each course (compulsory, general elective or modular elective) being worth 6 ECTS credits. Also, the student selects a minimum of four and a maximum of five elective courses from the module that he/she chooses. If a student chooses only one general elective course, then he/she can choose the other course from the group of courses of some other module, and not the one that he/she has chosen. Mainly, he/she must select at least four elective courses from "his/her own" module, or the programme that he/she has chosen. The student should choose at least one elective course from "his/her own" module (with the assistance of the study advisor and possible future mentor), which is related to the planned topic of his/her future dissertation, as an introduction into it. If such a course is not included in the list of elective courses, the study advisor (and possibly later the mentor) should submit a request to the Doctoral Study Council with a proposal to include the specified course (at least one course and not more than two), whose holder would be the study advisor and/or mentor.

DOCTORAL STUDY

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graph TD; A[DOCTORAL STUDY] --- B[COMPULSORY TEACHING ACTIVITIES (48 ECTS)]; A --- C[ELECTIVE TEACHING ACTIVITIES (12 ECTS)]; A --- D[OTHER EXTRACURRICULAR ACTIVITIES (30 ECTS)]; A --- E[REGISTRATION AND DEFENCE OF THE TOPIC (30 ECTS)]; A --- F[PREPARATION AND DEFENCE OF DISSERTATION (60 ECTS)];
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**COMPULSORY
TEACHING
ACTIVITIES
(48 ECTS)**

**ELECTIVE
TEACHING
ACTIVITIES
(12 ECTS)**

**OTHER
EXTRACURRICU
LAR ACTIVITIES
(30 ECTS)**

**REGISTRATION
AND DEFENCE
OF THE TOPIC
(30 ECTS)**

**PREPARATION
AND DEFENCE OF
DISSERTATION
(60 ECTS)**

If interdisciplinary research is involved, on the request of the candidate (with the counter-signature of the study advisor) the Doctoral Study Council determines how the number of modular elective courses will be distributed "by weight" to different modules (depending on the interdisciplinarity branches).

By successfully passing compulsory courses, the student earns 12 ECTS credits, and by passing all elective courses, he/she earns 36 ECTS credits, which makes a total of 48 ECTS credits for compulsory teaching activities. The rest of the teaching activities are elective teaching activities (12 ECTS credits). Thus, all teaching activities, or direct forms of teaching, make up 33% (60 credits) or one third of the total obligations stipulated by the postgraduate study programme.

Extracurricular activities consist of the implementation of scientific research with guidance and supervision of a study advisor (and later mentor), and preparation of scientific papers, presentations, laboratory works, training on related institutions in the country and abroad or other forms of work aimed at preparing the dissertation. Extracurricular activities make 66% of the total obligations planned by the study programme, or 120 ECTS credits.

After acquiring 90 ECTS credits through teaching and extracurricular activities, the student initiates the procedure of earning a doctoral degree by submitting a dissertation topic proposal to the Doctoral Study Council. Also, the student then proposes a mentor with whom he/she arranges the conditions of work. The application for initiation of the procedure contains general information about the doctoral candidate, curriculum vitae and list of papers of the doctoral candidate, title of the proposed topic, information on the proposed mentor and his/her competences, explanation of the dissertation topic, anticipated original scientific contribution of the proposed research and research cost estimate.

The Doctoral Study Council proposes a mentor and a topic evaluation and defence committee to the Scientific and Teaching Council, and the Senate appoints them. The doctoral candidate must also submit a statement that he/she did not register a doctoral dissertation with the same subject at a study of another university. The topic of doctoral dissertation is registered on the form of the University of Mostar.

The topic evaluation and defence committee consists of three or five members, where at least one member is not an employee of the Faculty of Civil Engineering University of Mostar. Majority of the committee members must be from the scientific branch in which the topic is registered. If the topic is interdisciplinary, then at least two members must be from each branch covered by the proposed topic and the committee is a five-member committee. The mentor can be a member of the topic evaluation and defence committee, but cannot be the chair of

the committee. The proposed topic is defended publicly, before the topic evaluation and defence committee as well as all others who are interested. The Scientific and Teaching Council shall present their opinion on the proposal of the topic evaluation and defence committee, which is passed to the Senate for decision making.

The doctoral candidate acquires 10 ECTS credits by registering the dissertation topic, and earns new 20 ECTS credits with public presentation and successful defence of the topic. By a majority vote of the total number of members, the committee may accept the proposed topic, may send it for revision, and may also completely reject it. If the registered topic is fully rejected, the candidate also loses the 10 ECTS credits earned by registering the topic. Public presentation of the doctoral dissertation topic is an integral part of the report and proposal of the dissertation topic approval committee.

As indicated, the third year of the doctoral study, or the final 60 ECTS credits, consists of the preparation and defence of the doctoral dissertation, and this part is described in detail in Subsection 2.6, which is concerned with completion of studies and submission and assessment of the dissertation (see the Rulebook on doctoral studies at the University in Mostar).

2.4. REQUIREMENTS FOR ADMISSION TO THE NEXT YEAR OF STUDY AND REQUIREMENTS FOR TRANSFER OF ECTS CREDITS FROM OTHER FACULTIES

Before enrolling in the next year of postgraduate doctoral university study of civil engineering, a student should meet the appropriate requirements. To enrol in the second study year, a minimum of 30 ECTS credits must be earned, of which at least 24 ECTS credits must be acquired through compulsory teaching activities. So, 24 or 30 ECTS credits must be earned by successfully completing four or five compulsory and elective courses. If a minimum of 30 ECTS credits for enrolment in the second year are earned, a maximum of 6 ECTS credits of this amount can be obtained from elective teaching activities.

A student must earn a total of 120 ECTS credits to enrol in the third year of study. In order to enrol in this, final year of study, he/she must have an article (published or accepted for publication) in journals indexed in Current Contents, Science Citation Index or Science Citation Index Expanded (or an article in journals indexed in other relevant databases defined as recognized publications in the Rulebook on minimum requirements for appointment to scientific and teaching ranks of the University of Mostar). Otherwise, the final year of study consists of the preparation and defence of the doctoral dissertation, which rounds the amount of 180 ECTS credits of the doctoral study.

Each course at this postgraduate doctoral university study of civil engineering can be enrolled by students of related postgraduate studies from the University of Mostar and other universities in the country and abroad, which is decided by the Doctoral Study Council. Also, students from this study can choose courses from other postgraduate studies in the country and abroad, which they will attend and for which they will take exams. The Doctoral Study Council assigns credits for the courses completed in this manner in accordance with its study programme and includes the ECTS credits in student's credit scores at the study. Students who earn credits at some other postgraduate studies are required to enrol in and complete at least four courses of the postgraduate doctoral study of civil engineering at the Faculty of Civil Engineering University of Mostar. The criteria and conditions for transfer of ECTS credits are regulated by the university's general acts or agreements between faculties.

2.5. TEACHING AND EXTRACURRICULAR ACTIVITIES

As indicated in Subsection 2.3, which describes in detail the structure and organization of the postgraduate doctoral university study of civil engineering, the study consists of defined teaching and extracurricular activities. 60 ECTS credits can be obtained through teaching activities, and extracurricular activities bring the remaining 120 ECTS credits. Teaching activities consist of compulsory teaching activities (48 ECTS credits) and elective teaching activities (12 ECTS credits).

Extracurricular activities consist of the implementation of scientific research with guidance and supervision of a study advisor (and later mentor), and preparation of scientific papers, presentations, laboratory works, training on related institutions in the country and abroad or other forms of work aimed at preparing the dissertation. Extracurricular activities make 66% of the total obligations planned by the study programme, or 120 ECTS credits.

TEACHING ACTIVITIES – 60 ECTS

Compulsory teaching activities – 48 ECTS

The methodology of scientific research (6 ECTS)

Selected chapters of applied and numerical mathematics (6 ECTS)

Elective courses: general (one or two) and of individual module (four or five) (36 ECTS)

Elective teaching activities – 12 ECTS

EXTRACURRICULAR ACTIVITIES – 120 ECTS

Other extracurricular activities – 30 ECTS

Extracurricular activities related to the dissertation – 90 ECTS

Registration of the topic (10 ECTS)

Defence of the topic (20 ECTS)

Preparation and defence of the dissertation (60 ECTS)

PLAN OF TEACHING AND EXTRACURRICULAR ACTIVITIES BY YEARS

1st year – 60 ECTS

- Compulsory teaching activities – 48 ECTS

The methodology of scientific research (6 ECTS)

Selected chapters of applied and numerical mathematics (6 ECTS)

Elective courses: general (one or two) and of individual module (four or five) (36 ECTS)

- Elective teaching activities – 12 ECTS

2nd year – 60 ECTS

- Other extracurricular activities – 30 ECTS

- Registration and defence of the topic – 30 ECTS

(Registration of the topic 10 ECTS + Defence of the topic 20 ECTS)

3rd year – 60 ECTS

- Preparation and defence of the dissertation – 60 ECTS

DEFINING ELECTIVE TEACHING ACTIVITIES

(12 ECTS credits – 1st year of study)

1. Holding professional or scientific workshops or lectures organized by the institution responsible for the doctoral study (or related institution in the country or abroad) within the annual plan of professional and scientific workshops or lectures. (Every workshop conducted with obligatory presentation brings 4 ECTS credits and a lecture held 2 ECTS credits. The duration of every workshop is at least four academic hours, and of a scientific lecture at least one academic hour. The minimum number of participants in a workshop is six. The candidate's performance at the workshop as well as his/her lecture must be related to the dissertation topic. After holding the workshop or lecture, it is necessary to submit a report to the head of the doctoral study.)

maximum 6 ECTS

2. Pedagogical-psychological and didactic-methodical education (one specialized course/seminar with selected chapters in the maximum amount of 6 ECTS credits).

maximum 6 ECTS

3. Cooperation in teaching on courses of university undergraduate or graduate studies (seminars, exercises), thus earning ECTS credits in a way that 1 ECTS credit equals 20 hours of active participation in teaching (or in one course), where the sum cannot be greater than 6 ECTS credits.

maximum 6 ECTS

4. Authorship or co-authorship of a university textbook, book, and editorship (editor-in-chief) of peer-reviewed professional, teaching or scientific publications - the review must be signed by a teacher holding a rank in the branch treated by the specified publication (worth 6 ECTS credits).

maximum 6 ECTS

5. Authorship or co-authorship of peer-reviewed teaching materials from individual teaching units - the review must be signed by a teacher holding a rank in the branch treated by the teaching material (worth 3 ECTS credits).

maximum 3 ECTS

DEFINING OTHER EXTRACURRICULAR ACTIVITIES
(CREDITS RELATED TO THE TOPIC AND DISSERTATION ARE NOT INCLUDED)
(30 ECTS credits – 2nd year of study)

1. Scientific paper (published or accepted for publication) in journals indexed in Current Contents, Science Citation Index or Science Citation Index Expanded. (The student obtains the entire amount of 30 ECTS credits with a single paper.)

30 ECTS

2. Scientific paper (published or accepted for publication) in journals indexed in other relevant databases defined as recognized publications in the Rulebook on minimum requirements for appointment to scientific and teaching ranks of the University of Mostar. (One paper is worth 10 ECTS credits, so a student can have a maximum of 3 papers.)

10 ECTS

3. Papers published in proceedings and orally presented from international scientific conferences.

10 ECTS

4. Papers published in proceedings and presented on posters from international scientific conferences.

8 ECTS

5. Papers published in proceedings, but not presented either orally or on posters, from international scientific conferences.

6 ECTS

6. Stay at other domestic or foreign universities or scientific institutions for a period of minimum one month during the postgraduate study (only one stay can be considered for evaluation - at a university in the country 6 ECTS credits, and at a university abroad 12 ECTS credits).

12 ECTS

7. Stay at other domestic or foreign universities or scientific institutions, participation in international research projects, participation in international doctoral schools for a period of less than one month (a minimum of five days) during the postgraduate study (evaluation can include a maximum of two stays, and each of them is worth a maximum of 3 ECTS credits, or the number of ECTS credits awarded by each international doctoral school in its certificate after it is successfully attended).

6 ECTS

* If the student has fulfilled all his/her obligations to mandatory and elective teaching activities (60 ECTS credits) and has collected 30 ECTS credits from previously defined other extracurricular activities, he/she can proceed with dissertation topic registration (10 ECTS credits) and then dissertation topics defence (20 ECTS credits).

However, if the 30 ECTS credits collected for other extracurricular activities do not contain the paragraph 1 or 2 (a scientific paper in journals indexed in Current Contents, Science Citation Index or Science Citation Index Expanded, or a scientific paper in journals indexed in other relevant databases defined as recognized publications in the Rulebook on minimum requirements for appointment to scientific and teaching ranks), the student must have a paper from paragraph 1 or 2 published or accepted for publication as a requirement for admission to the third year of study, or for the official beginning of dissertation preparation.

** Papers from other extracurricular activities, published pursuant to paragraphs 1, 2, 3, 4 and 5, are evaluated and apply to all papers published by the student from the date of enrolment in the postgraduate doctoral university study of civil engineering (and ECTS credits can be obtained for them) provided that they are related to the subject of scientific research at the doctoral study and the future dissertation topic (as certified in writing by the candidate's study advisor).

*** Review of the papers published in scientific journals and proceedings from international scientific conferences should have the form that is used in appointments to ranks at the University of Mostar, and the specified form is an annex and integral part of the of the Rulebook on minimum requirements for appointment to scientific and teaching ranks of the University of Mostar.

2.6. COMPLETION OF THE STUDY AND COMPETENCES ACQUIRED

As indicated in previous subsections, the final year of study, or the final 60 ECTS credits, consists of the preparation and defence of the doctoral dissertation, which rounds the amount of 180 ECTS credits of the doctoral study.

After developing the dissertation, the candidate must submit with his/her application a written consent and opinion of the mentor on the conducted research and the achieved original contribution. It must be accompanied by a written statement of the supervisor of the Doctoral Study Council (selected by the Doctoral Study Council) that the dissertation is technically written in accordance with all the set rules and standards for preparation of doctoral thesis, and so technically, editorially, and fully according to the dissertation writing instruction (as a rule, supervisor is the head of the doctoral study, but does not need to be, it can be another person who is technically, linguistically and scientifically competent to confirm the specified requirements).

If the mentor does not want to give his/her consent, he/she must explain his/her reasons in writing within 20 days. If the dissertation is not technically (or in language editing terms) written in conformity with all set rules and standards for a doctoral dissertation, after comments of the supervisor of the Doctoral Study Council (which must be given in writing within 20 days), the doctoral candidate should correct all errors and bring them into full compliance with the technical form and appropriate level of scientific doctoral dissertation. Further, before sending the paper to the assessment procedure, the Doctoral Study Council establishes whether the doctoral candidate has met all the obligations specified by the study programme.

The doctoral candidate submits the dissertation in hard copy and electronic form for evaluation. At the proposal of the Scientific and Teaching Council of the Faculty of Civil Engineering, the University of Mostar Senate appoints a committee for evaluation of the doctoral dissertation. The committee has three or five evaluators, at least one of whom is not an employee of the Faculty of Civil Engineering University of Mostar, and is preferably an employee of another domestic or foreign university or a related scientific institution. Members of the committee for evaluation of the doctoral dissertation must hold at least the scientific and teaching rank of assistant professor or an equivalent rank in case a committee member has earned his/her rank abroad.

Members of the committee for evaluation of the doctoral dissertation, as well as all others who are provided access to the doctoral thesis, shall treat the data and findings from the paper confidentially in order to protect the scientific contribution of the doctoral dissertation and intellectual property, until the evaluation is published. The committee for evaluation of the

doctoral dissertation is obliged to submit a written report with evaluation of the doctoral dissertation within two months of its appointment.

Chairman of the committee for evaluation of the doctoral dissertation prepares a report based on the collected written opinions of committee members, and the (joint) report is signed by all committee members. Each member of the committee (if he/she considers it necessary) has the right to submit a separate evaluation.

In its report, the committee for evaluation of the doctoral dissertation proposes:

- acceptance of the doctoral dissertation with an explicit statement of the achieved original scientific contribution;
- revision of the doctoral dissertation and final re-evaluation after revision;
- rejection of the doctoral dissertation, after which the doctoral candidate loses the right to earn a PhD degree at that study programme.

Explanation is an essential part of the report. At the first subsequent meeting, the Senate passes a decision on the dissertation evaluation and appoints a dissertation defence committee.

When it comes to further procedures of defence and storage of a doctoral dissertation, and doctoral degree award ceremony, they are regulated in the Rulebook on doctoral studies at the University of Mostar (Article 12 through Article 16). By developing and successfully defending the doctoral dissertation, the doctoral candidate earns the remaining 60 ECTS credits, thereby completing the study with a total of 180 ECTS credits.

The competences of PhD in the scientific area of technical sciences, field of civil engineering, are acquired by completing the study. PhDs are trained primarily for the application of scientific methodology and future independent scientific and research work. Competences are acquired for leadership of scientific development based on new technologies, introduction of new scientific approaches based on design and research, as well as on scientific planning and decision-making using the most recent scientific methods of collecting, processing and analysing information.

3. LEARNING OUTCOMES AND COURSE SYLLABI

Learning outcomes of the compulsory, general elective and modular courses are presented in the following paragraphs of this chapter. They are given for each course separately. Complete learning outcomes for the postgraduate doctoral university study of the Faculty of Civil Engineering University of Mostar result from individual learning outcomes by courses:

- Identify, define and formulate a research problem;
- Scientifically analyse, evaluate and synthesize new and complex research ideas;
- Systematically understand subjects of the study programme and a high level of knowledge in the area of one's own specialization;
- Independently conduct scientific research;
- Independently construct experimental models;
- Apply specific knowledge to generate new knowledge and research projects;
- Publish scientific papers;
- Take responsibility for implementation of research and utility of research results;
- Take on the most complex scientific and professional tasks in one's own working environment;
- Apply ethical principles in research.