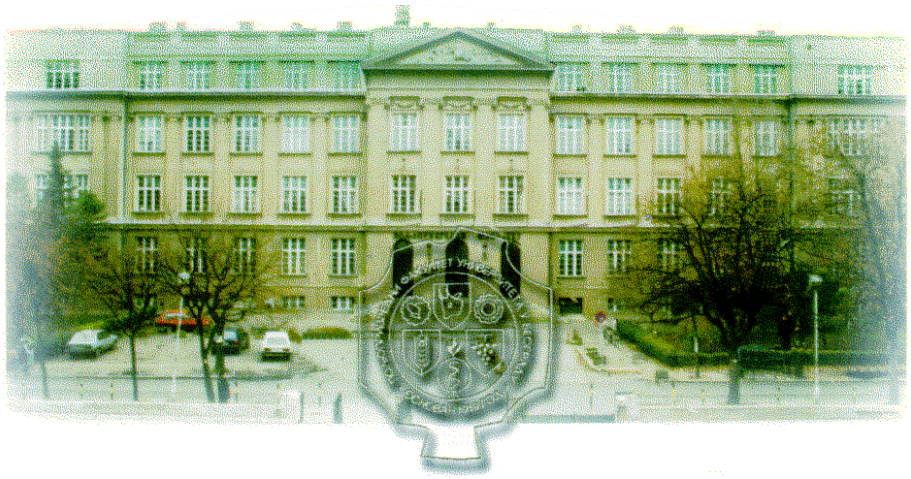
University of Belgrade **Faculty of Agriculture**



MASTER STUDY PROGRAMME: ENVIRONMENTAL PROTECTION IN AGRICULTURE

Belgrade, 2021

Content

Title of the study programme	Environmental protection in agriculture
University	University of Belgrade
Faculty	Faculty of Agriculture
Educational/scientific field	Technical and technological field
Scientific area	Engeneering of the environmental and labor protection
Type of studies	Master academic study
ECTS	60
Title of diploma	Master engeneer of environmental protection
Duration of studies	1 school year, 2 semesters
School year in which study programme begun	2009/2010
Number of students studing	32
Number of students planned to study	32
Date of study programme acceptance	27.01.2021. Faculty Teaching Council 24.03.2021. University Senat
Language	Serbian and English
Year in which programme was accredited	2010, 2015
Web adress with the details of the programme	www.agrif.bg.ac.rs

Standard 1. Structure of the study programme

Study programme Environmental protection in agriculture of second level of higher education is the multidisciplinary master programme. By completing it student gets a degree: Master engeneer of environmental protection. The aim of this programme is achieving generic and subject specific competences at the end of the study programme (student competences, Standard 4), as well as skills for the continuation of studies. Study programme lasts 1 year, 2 terms. The first group of subjects containts compulsory subjects: Ecology and agroecosystems, Ecological microbiology and Economy of natural resources and environmental protection. This group provides a good basis which will help students to follow next, more specialized subjects in the area of applied ecology: Applied ecophysiology and Ecotoxicology. For the sustainable use of naural resources in agriculture knowledge and skills are provided by subject: GIS and precision farming. At the end of first semester student can choose one elective subject from the last group providing knowledge and skills in the area of environmental protection in the particular cropping system, fruit and viticulture, animal husbandry or aquaculture.

The third group of compulsory subjects provides insight in the natural resources: biodiversity, water and soil, their protection and management in agriculture. The third group of electives provides insight in special ways of production such as Ecological aquaculture, Ecological farming of invertebrates or Waste water teatment.

Every compulsory and elective subject has 6 ECTS in the first semester, 5 ECTS in second semester while elective subject have 4 ECTS. Practical work has 3 and master thesis 8 ECTS. All of these have 60 ECTS.

List of compulsory and elective subjects as well as their ECTS values is shown in Table 5.1.b, while subject content in Tables 5.2.a (Book of subjects).

Students graduated at all study programmes with 240 ECTS are eligible for this study programme. In case more students than 32 are registered, they will be ranked according their previous success.

Teaching methods are: lectures, practicals in the laboratory, field trips, interactivne teaching/learning methods such as: team work, cooperative and collaborative exercises, elements of e-learning. Interactive methods are both, group (debates, workshops, joint learning sessions) and individual (student projects, study cases, diary, evaluation of teaching etc.) of the special importance in this type of active teaching/learning process are stimulating discussions, cooperative and joint learning, conceptual mapping, mini research projects.

At all subjects students knowledge will be continuously evaluated by tests and coloquia and final exam is planned at the end of the teaching process.

Evidence: Faculty publication (printed or electronic, web site http://www.agrif.bg.ac.rs/)

Standard 2. Objectives of the study programme

There are 2 aspects of the objectives for creating this study programme: its relevance for the labour market and its relevance for the continuation of studies. The objective is acheiving educational, expert and research goals of environmental protection in the area of agriculture. Type and structure of the programme are adjusted to the needs of the development and application of environmental and natural resources protection in agriculture. Its major objective is educating experts qualified to work in the area of protection and proper use of natural resources (soil, water and biodiversity) in agriculture. Students will get functional knowledge and skills that will enable them solving problems related to the bad practices in agriculture resulting in environmental pollution. Programme provides analysis of physical, technical and agronomical aspects in soil, water and biodiversity management their mutual relationships in agriculture. Priorities of the study programme are that in future these experts contribute to the protection of natural resources enabling conditions for ecological agricultural production as well as for the safety in food production and thus improving quality of agricultural product and protect environment for future generations.

This study programme provides competences neccessary for acheiving short-teerm and long-term goals in serbian agriculture since graduates will be qualified for creative and inovative work, use of knowledge and skills, experimental work, writting and presenting data. Programme is created for students who want challenge facing threats of pollution to find inovative methods enabling them to improve environment in a sustainable way. Basics of this programme is in the natural, technical and social sciences. Its objective is to give a better insight in socio-economic couses and consequences of pollution and degradation of environment on people, other organisms and ecosystems. Using interdisciplinary approach students learn to develop analitical tools, models and technologies in environmental protection and socio-political and economical instruments in the control of environmental problems.

Graduates can get employment in companies and public institutions, governmental or non governmental in the area of agriculture and environmental protection working on optimization and adjusting agriculture to the existing laws requirements, fulfilling high standards in environmental protection, human health and animal welfare. In addition to that graduates can work in agricultural companies, stations, associations, state and local offices, inspectorates, education (secondary and high).

In the creation of this study programme it was taken into account that Serbia is in the period of economical and social transitions. In the process of EU integration environmental protection is of very high priority. As a mostly agricultural country, Serbia has a lot of problems with pollution deriving from agriculture, especially because of the bad agricultural practices. Lot of work has to be done for fulfilling all requirements and EU standards in this area. On the other side there are no experts qualified in the area of environmental protection in agriculture. It was the result of the labor market research by interviewing peple from governmental and nongovernmental sector. Questionires were distributed in Labour market agency, Chamber of Commerce, Conference of cities and municipalities, agricultural institutes (Maize research institute, Belgrade; Institute for field and vegetable crops, Novi Sad), agricultural companies (Victoria group, MK group, PK Bečej, Agromarket, Bojoni DOO, Milurović komerc, IMT Agromehanika), consultative companies (FIDEKO, Pediment, Libertas). Based on answers of the competent people from these institusions list of student competences was created. The need for qulifications in environmental

monitoring, strategic planning and evaluation of the imact of agricultural companies on the environment was especially emphasised.

Competences acquired are, also good basis for the further studies such as skills in applying new methods and practices for sustainable agriculture and environmental and natural resources protection.

Evidence: Faculty publication (printed or electronic, web site http://www.agrif.bg.ac.rs/)

Standard 3. Aims of the study programme

Goal of the study programme is achieving competences at the end of the studies that provide students with certain level of specialization and enable them to do research in the area of environmental protection in agriculture and sustainable use of natural resources.

Goal of the programme is to develop both generic (objectivity, critical thinking, communication skills, professional ethics, planning, management etc.) and subject specific competences such as knowledge and skills of principles of agroecology, ecotoxicology, ecological microbiology and plant ecophysiology, natural resources nad their management, economy, legislation in the area of environmental protection, use of IT for monitoring pollution deriving from agriculture and measures for protection.

These goals are achieved by diverse teaching methods (classical lectures, laboratory practicals, field trips and interactive teaching such as team work, cooperative and collaborative methods). Goal of the programme is development of the learning skills to enable continuation of studies.

This programme has a goal to educate socialy-responsible expert graduated engeneer capable to face complex problems of management of natural resources in agriculture and environmental protection. Graduates should be capable to do monitoring and apply preventive measures to protect environment from agricultural pollution.

Goals of the programme are in accordance with basic tasks and goals of the Faculty of agriculture to follow the principles of Bologna and enable students inclusion in European higher education area and realisation of European common agricultural policies.

Basic orientatiton of the study programme is promoting european cooperation in quality assurance by acceptance european criteria in high education, inter-institutional cooperation and mobility and integrated studies in the area of environmental protection. Goal of the study programme is the introduction of the concept of life-long learning nad e-learning for what has project provided resources.

Goals of this programme are realistic and could be achieved concerning resources, both human and material. Development of new study programmes is within the mission of the Faculty which is periodically evaluated in the process of planning and allocating resources.

Evidence: Faculty publication (printed or electronic, web site http://www.agrif.bg.ac.rs/)

Standard 4. Student competences

By completeing this study programme student acquires the following generic competences: capability to apply the knowledge into the practice, objectively evaluate his own work and work of others, capability to analyze and synthetize, capability to work in the team and to communicate with other professions, posseses professional ethics, capable to plan and organise production, to work individually, to run research, analyse and present results, to be crative, to learn continuously, to possess social responsibility in regard to environmental pollution, to prevent and protect environment according to the principles of sustainable development.

By completeing this study programme student acquires the following subject-specific competences: detailed knowledge of types of agricultural pollution, changes in biodiversity due to agriculture, physical, chemical and economical aspects in management of soil, water and biodiversity as well as their interactions in agricultural practices. Student also gets the following skills: application of the IT - communication technologies for detecting environmental pollution from agriculture, creation of efficient and economically justified solutions for prevention soil, water and biodiversity pollution, strategic planning nad management and raising public awareness about need to protect environment.

All competences could be useful for evaluating influence of different tecnologies used in agriculture on environment.

Evidence: 4.1. Diploma supplement

Standard 5. Curriculum

Master study programme Environmental protection in agriculture has 2 semesters. By completing it student gets 60 ECTS credits. All subjects are single term, and have certain number of ECTS credits. Their sequence is logical, based upon the knowledge of the previous subjects and also knowledge needed for the next subjects. List of compulsory and elective modules, as well as their ECTS are presented on table 5.1.b. In the structure of this programme 6 subjects are compulsory and 3 are elective. Elective subjects student selects from the list of 3 or 4 subjects presented on table 5.3.

Curriculum has description of all subjects (on table 5.2. for every subject) presented in Book of subjects. In table 5.2 are presented goals of the subject, content, teaching and examination methods, learning outcomes. During the course of the programme practical work of 3 ECTS is planned.

At the end of the studies student defends master thesis and gets 8 ECTS which is divided on two position each contains 4 ECTS. By completion of the study programme student gets 60 ECTS and degree of master in environmetal protection. Diploma supplement presents all details of the study programme.

Evidence: Lessons schedule - Annex 5.1**,** Book of subjects – Annex 5.2, Decissions of acceptance of the study programme by faculty Council and University Senate- Annex 5.3, 5.3.a

Standard 6. Quality, contemporariness and similarity with other international study programmes

Quality assurance of the study programme is done by continous modernisation of the curriculum, checking programme goals and collecting information on student evaluation of the teaching process and examination procedures. In addition to the questionaires given to students we are introducing expert peer-review control of the teaching process. International experiences in the quality assurance and assesment (QAA) is also regularly collected.

Faculty continously checks and revizes programme goals and their accordance with the falculty mission and goals, study programme structure, content and learning outcomes as well as student competences and possibilities of employment. Faculty has developed procedures for QAA through faculty bodies: departments, institutes, commision for quality control and sefevaluation and faculty council. Faculty also collects informations from the stakeholder community (agricultural companies, governmental and nogovernmental organisations etc.) on the quality of the study programme. Students are enabled to take part in QAA by evaluating teaching process. Faculty is permanently modernising its curricula and makes it comparable to the international programmes.

Conditions and procedures for acheiving particular degree are clearly defined and made public in, both, electronic and printed format nad also in accordance with goals of the faculty. Study programme is tuned with the modern concept in simmilar study programmes abroad, especially within european higher education area.

This study programme is tuned and compatible with simmilar programmes of the master studies in Zagreb, Hohenheim and Cirencester. Quality of the programme is reflected by standards requsted for the accreditation process. It is also in agreement with the strategic and specific goals regarding environmental protection in our countray and in EU.

https://www.agr.unizg.hr/en/group/395/INTER-EnAgro (Anex 6.1)

https://www.uni-hohenheim.de/en/environmental-protection-and-agricultural-food-production-masters (Anex 6.2)

https://www.masterstudies.com/Master-of-Science-in-Sustainable-Agriculture-and-Food-Security/United-Kingdom/RAU/ (Anex 6.3)

Evidence: Documents proving international accordance with 3 master study programmes – Annex 6.1,2,3. Annex 6.4. Accordance with a good practices at other higher education institution

Standard 7. Student entry

Number of students enrolling this master programme is confirmed every year by decission of the faculty teaching and scientific council. In 2020/21 32 students were planned for enrollment. This number of students is reflection of the resources avilable as well as the needs of the society. Decission about the students that will be financed by budget is brought by government.

Faculty publishes informations related to the entry as well as study programme in printed form as well on the faculty web site. Call for entry is announced in the newspapers. Faculty commision is responsible for the regular entry procedures.

Equality (race, sex, sexual orientation, national and social origin, language, religion, political or different opinion, birth and material status and hendicape) of students is guaranteed by Constitution Law.

The only precondition for the entry to this study programme is that student has 240 ECTS. In case more then 32 students applies, their ranking will be done according to the success in their previous studies, length and equivalence of previous studies.

Evidence: Table 7.1 Number of the students enrolled in current and previous two school years, Table 7.2 Number of the students enrolled on study program in current school year by study year; Call for student enrollment to master study programme - Annex 7.1, Decission about nomination of the Comission for entry - Annex 7.2, Conditions for enrollment (from the faculty statute)- Annex 7.3.

Standard 8. Student examination and progress

Examination of students is done according to the previously stated rules, criteria, procedures stated in the Book of regulations for examination procedures and also the date presented in Table 5.2. for every subject.

Methods of student examination are complemetnary to the aims and content of the study programme. Student outcomes are evaluated during the teaching process and at the final exam. Student attendance to the classes is obligatory and they are motivated to be active during the teaching process and collect point for various activities stated in table 5.2. for every subject. Total points during teaching process and points obtained at the final exam could be maximum 100. Out of this total number of points minimum 30 and maximum 70 could be earned during the teaching process.

Teacher evaluates the knowledge at the final exam with the marks: 10 – exelent-extraordinary, 9-exelent, 8-very good, 7-good, 6-enough to pass and 5-not enough to pass. The final mark is the sum of points from the pre-exam activities and final exam.

Faculty is permanently keeping evidence on student exams. Teachers are obliged to regularly analyse the results of exams, and to suggest measures for improving examination procedures.

Student have, both, right and obligation to participate in this process, to give suggestions on criteria or exam procedures to the faculty Commission for QAA and faculty Teaching-research Council through their representatives or in direct communication with the heads of the departments.

Faculty sistematicaly analyses, evaluates and improves methods of examination, if it is adjusted to the nature of the subject, are learning outcomes evaluated during the teaching process, the ratio between points earned before and at the final exam, criteria for evaluating knowledge application and for the final mark, etc.

Faculty also permanently checks student marks in all subjects and takes measures if there are irregularities in the mark distributions (to much high or low marks) in the longer period, if the pass rate is to small etc. Vice-dean for teaching informs faculty Teaching-research Council on the exam results for every exam term. The council bring the corrective measures if neccessary.

Student parlament also does analysis of student exam results, study conditions and gives suggestions for improvement.

Evidence: Book of subjects, other publication, faculty web-site; Table 8.1 Total list of points by subjects that student can earn during the teaching process and at the final exam; Table 8.2 Statistical data about student progress on study program of 60 ECTS

Standard 9. Teaching staff

Quality of the teaching staff is enabled by: long-term planning and tuning of the number of teachers and assistants with national and international standards, applying high criteria for elections, providing conditions for permanent improving to both teachers and assistants, checking the quality of their teaching and research performance and applying policy of long-term good selection of young teaching staff.

Total number of teachers in this programme is 25. Work load of all teachers is according to the standards. All teachers are permanent staff at the faculy. All teachers are PhDs and numer of teachers and assistants is appropriate for acheiving quality in the teaching process. The quality of their teaching is monitored by student questionaires done by faculty Commision for evaluation of the pedagogical activites of teachers and by peer reviewing. In the teaching process 1 assistant is included with 100% of work time. Data on teachers and assistants (CV, elections, references) are publicly avilable (on faculty and university web site). All teachers have at least 5 references in the area of their subjects.

Evidence: Fotocopies of the working documents. – Anex 9.1, Act on regulation of teaching staff elections - Anex 9.2, Book of teachers - Anex 9.3, Proof that data on teachers are publicly available - Anex 9.4.

Standard 10. Teaching and learning infrastrucrure

25 teachers are included in this programme. All of them have a suitable working place. Total bruto working space at the faculty is 27.723 m^2. Bruto working space 1.345 m^2, or 684 m^2 net. For teaching are used 1 amfitheater, 4 class-rooms, 7 laboratories, 1 microscopy laboratory, 1 reading room, 1 computer room. Teaching is in 2 shifts and what satisfies need of 312 students of the undergraduate studies and 32 students of this study programme. They have more then 4 m^2 space each. In addition to that student have school estate and library as well as learning platform Moodle and MS Teams. Library has all teching material: textbooks, scripts, monographs.

Faculty has positive financial results in the period longer then 3 years and the financial plan during the study programe.

Anex10.2. Proff on possesing the information tehnologies, no of internet accessions, etc.

Standard 11. Quality control

Faculty has strategy for quality assurance and assesment for all aspects of its work: teaching, science and management. The document is publicaly available. Faculty has a Comission for quality assurance. Quality control will be realized regularly by external evaluation and by selfassesment. Commision for Quality assurance is in charge of these proceses. Students are also involved in these activities. At the end of every term students evaluate teaching process as well as examination procedures. Students are also involved in the process of permanent improvement of teaching, development of evaluation methods etc. The Rulebook on publishing was adopted. Conditions and infrastructure are provided for regular collection and processing of data required for external quality control.

Evidence: Anex 11.1. Report on self-evaluation of the study program, Anex 11.2. Rules on quality assurance**;** Anex11.3. Rulebook on publishing**;** Anex 11.4. Part of the Statute regulating quality assurance

Standard 12. Studies on foreign language

The study program Environmental Protection in Agriculture is accredited in Serbian and English. All teachers and assistants who participate in this study program have the appropriate language competencies for teaching in English, and most of them have proof of compliance with this requirement of the standard. During the accreditation period, teachers and assistants will systematically improve their language and other competencies and obtain relevant evidence (anex for Standard 12). The Faculty of Agriculture has over 100 library units in English, as well as the necessary teaching materials. Faculty services are trained to provide services in English, as well as to issue bilingual public documents and administrative documents in Serbian and English. Students who apply for the Environmental Protection in Agriculture program must submit evidence of competence for monitoring classes in English, prescribed by the regulations of the University of Belgrade.