

University of Sarajevo Faculty of Agriculture and Food Sciences

Master Study program: Urban agriculture



Study program: Urban agriculture

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Index

GENERAL PART.....	1
DESCRIPTION OF PROGRAM	4

1. GENERAL INFORMATION

Program name

Urban Agriculture

Program Type

Graduate (Master's) degree (2nd degree of university education)

Nivo programa: academic

Aim of the curriculum

Training of experts in the field of urban agriculture and related fields, in order to make cities sustainable, more flexible and green, as well as developing new ways of running business related to the activities of urban agriculture. This study program is focused on :

- providing advanced knowledge in the field of urban agricultural systems;
- providing skills related to the development and management of sustainable production systems ;
- offering knowledge on urban planning and related regulations;
- providing expertise in business models of urban agriculture.

Basic importance of this curriculum lies in new teaching techniques based on problem-based learning (PBL) and experiential learning (EL), which promote development of critical thinking, problem-solving and communication skills.

Program holder(s)

Main holder of the program is the Faculty of Agriculture and Food Science of the University of Sarajevo. Realization of the curriculum will be carried out in cooperation with several faculties of the University of Sarajevo: Faculty of Science, Faculty of Architecture and Faculty of Mechanical Engineering.

Scientific / art fields the proposed study program belongs to

According to the Frascati classification, proposed study program belongs to the scientific field of Biotechnical Sciences. As stated in the Revised Classification in the Field of Science and Technology (Official Gazette of BiH, 47 / 12- Attachment 6), scientific field of the proposed study program belongs to the domain(4) Agricultural Science:

- 4.1 Agricultural Plant Science, Forestry and Fishing
- 4.2 Science on animals and milk
- 4.3 Veterinary Science
- 4.4 Agricultural Biotechnology
- 4.5 Other Agricultural Sciences

The scientific field of agriculture is interdisciplinary by definition, encompassing various scientific branches - from those with a biological and wider environmental background, to technically and economically oriented ones.

This program provides a solid connection between these branches, giving excellent opportunities for a wider interdisciplinary approach to particular scientific problems. Additionally, a considerable number of professors from other scientific institutions in BiH and abroad have been engaged in the curriculum: it includes subjects (modules) from the scientific domain (2) Engineering and technology.

Organization and duration of the curriculum

Two years – four semesters

Minimum number of ECTS credits required to complete the study

120 ECTS

Curriculum language

The study program will be conducted in one of the official languages of Bosnia and Herzegovina (Bosnian / Croatian / Serbian). Besides this, students will have the opportunity to attend subjects within the first semester in English, in the form of on-line (distance learning) learning. This form of attendance can not exceed 20% of total hours for the full-time curriculum. The option of on-line learning will be specially noted in syllabi of subjects that offer this opportunity. All required literature, as well as additional details will be stated in syllabi of individual subjects. Proficiency in English is not obligatory, but is encouraged as a valuable skill.

Terms of enrollment

The curriculum is open for enrollment for all students who have accomplished at least 180 ECTS points (Bologna system of study), as well as students who have completed a four-year study program (pre-Bologna system of study). Foreign citizens who meet these criteria have the right to participate in a public competition in accordance with the law. At least an intermediate level of English efficiency is advised.

<http://www.unsa.ba/sites/default/files/dodatak/2018-11/Pravila%20studiranja%20UNSA.pdf>

Applications are submitted to the Student Service of the Faculty of Agriculture and Food Science UNSA. The documentation required for enrollment is in accordance with the University of Sarajevo public contest (original diploma of the first study cycle or, if the first cycle was completed outside BiH, the original decision or confirmation that the process of nostrification is in progress; birth certificate; certificate of citizenship; residence certificate).

Candidates selection is made by a commission for admission of students, appointed by the Faculties Council in accordance with the given criteria. Results of the students selection will be published on the website of the faculty (www.ppf.unsa.ba).

- Minimum number of students: 5
- Optimal number of students: 10
- Maximum number of students: 20

If the number of applicants exceeds the number of approved available places, the ranking of candidates will be made according to the average grade of the 1st cycle of studies.

After the selection is made and the final ranking list is published, the chosen candidates need to submit entry material. (See Study Rules for the First and Second Study Cycle; Integrated, Professional and Specialist study at the official University of Sarajevo website):

<http://www.unsa.ba/sites/default/files/dodatak/2018-11/Pravila%20studiranja%20UNSA.pdf>

Organisation of study is in harmony with the Rules of Studying on the I and II Study Cycle at the University of Sarajevo. Sarajevu (<http://www.unsa.ba/o-univerzitetu/propisi/pravila-studiranja-za-prvi-drugi-ciklus-studija-integrirani-strucni-i>) The study is organized according to the current academic callendar.

Class attendance is performed by the given schedule, which is available at the Faculties website, as well as the notice boards within the Faculty building. Students' rights, obligations and responsibilities are defined by University and Faculty rule books, and all courses-related obligations are explained in detail in individual subject syllabi.

Professional qualifications acquired by completing the program

After successfully passing all of the planned subjects and presenting the final Masters thesis, acquiring the planned total number of ECTS credits (minimum 120), the student is officially awarded the title *Master of Urban Agriculture*. (Pravilnik o korištenju akademskih titula i sticanju naučnih i stručnih zvanja na visokoškolskim ustanovama u Kantonu Sarajevo, član 4-Prilog 8).

Analysis of employment opportunities after graduation

Job opportunities for students after completion of master's degree in Urban Agriculture are multiple:

- Head of Projects in Urban Agriculture and Innovation in Food Production
- Project manager or environmental planning consultant
- Researcher or project manager in eco-innovations and reconstruction of urban areas
- Official for the development of sustainable urban planning in the administration bodies at different levels
- Advisor for Sustainable Development in the governing bodies at different levels
- Project leader in a local government body, office for urban planning or environmental protection, or development agency
- In the urban planning sector as a green city planning specialist
- Project manager or manager of urban agriculture – based production
- Consultant or researcher specialized in application of sustainable planning techniques, methods and strategies in urban areas
- Self-employment through starting a small-business based on food production in urban and peri-urban areas (primary production and processing)

The suggested study program is compatible with the mission and vision of The World Bank, regarding models of employment through urban agriculture.

Study program mobility

High mobility of this masters program is possible within 6 universities in the Western Balkans, as its curriculum is the same or very similar to the ones in those universities. The BUGI Erasmus project is also planning to sign cooperation agreements between partner institutions at the end of the project, which will enable mobility of students and teaching staff. Internationally, horizontal mobility is possible within the EU Member States with complementary study programs. Horizontal mobility gives the student an opportunity to change the direction of their education during studying. Vertical mobility means that, after finishing the planned Masters program, the student can attend the third (Doctorate) study cycle at the Faculty of Agriculture and Food Science, as well as other faculties of a similar orientation. As the curriculum is identical for the University of Sarajevo and the University Džemal Bijedić in Mostar, mobility of students within the country is provided. Internationally, horizontal mobility is possible within the EU Member States and countries within the region (Montenegro and Kosovo).

Scoring and grading scale

After completing all subject-related obligations stated in the syllabus, the student is graded in a unique way given by the Pravilnik o polaganju ispita na visokoškolskim ustanovama Univerziteta u Sarajevu. A grade is awarded based on the total number of acquired points, for performing all planned activities. Grading is done by the following system:

10 - (A)	95 - 100 points	outstanding performance, with insignificant errors
9 - (B)	85 - 94 points	above average, with minor errors
8 - (C)	75 - 84 points	average, with noticeable errors
7 - (D)	65 - 74 points	fair, but with significant shortcomings
6 - (E)	55 - 64 points	meets the minimal criteria
5 - (F, FX)	less than 55 points	doesn't meet the minimal criteria, considerable further work required

Quality assurance

The University of Sarajevo, according to guidelines of the EUA (European University Association) program, defined organisation of a quality management system, through the following bodies:

- Quality management committee of the University
- Quality assurance service of the University
- Quality assurance committees of Faculties within the University, which perform individual self-assessment

The quality management system of the „Urban agriculture“ curriculum includes monitoring, gathering, verification, assessment and valorization of data, which the Faculty later uses to promote the teaching process of this curriculum.

The Board for Quality of the Faculty is in charge of reviewing and monitoring procedures and activities for managing and overall quality improvement. The syllabi and curriculum of the program as a whole will be reviewed and improved every year,

through the process of „annual overview and development of the Faculty curriculum“. The program is performed in coordination with guidelines stated in the manual for academic quality and standards, and it is annually analysed for harmonization with that manual by the University Quality Assurance Service.

Students will be able to give evaluation and feedback on teaching quality of the program via:

- Results of their evaluations of all subjects(modules), which are given to subject(module) professors and revised by a program board as part of the „annual overview and development of the Faculty curriculum“
- Results regarding the program, coming from the annual student survey, as well as results of constant inquiry on their learning experience, carried out by the Faculty. These results will be analysed in detail, and the results they show will be used for program planning.

- Feedback offered by student representatives from both years of study will be considered on each meeting of the Faculty Quality Committee

Subjects included in quality assurance of the study program are:

1. Students, who will be given access to criteria, rules and procedures of grading within defined rules. By analysing the number of students enrolled in a higher year of education, their progress and studying success will be evaluated
2. Teaching staff will be observed in the process through information on professors-to-students ratio, students feedback and professors self-evaluation
3. Quality committee of the Faculty of Agriculture and Food Science
4. Faculty management which, within the process of quality assurance, has the task of analysing all procedures, overviews analysis results and monitoring condition of the program within the frames of higher education in Bosnia and Herzegovina and Europe.

2. PROGRAM DESCRIPTION

Learning outcomes within the program

The context of the „Urban Agriculture“ Masters study has the objective of training future managers of urban-agricultural and horticultural businesses, through an innovative and widely accepted approach to planning, development and sustainability. The curriculum is created to provide future graduates with all necessary tools and special skills needed for private and professional progress in an area responsible for designing, performing and monitoring innovative and multi-functional agricultural and horticultural projects in urban areas. The capacity of a modern city to implement biological diversity conservation strategies faces many challenges, mostly associated with designing coherent, efficient projects which include the following five principles:

- Local, organic and high-valued food production
- Production and optimized use of renewable energy sources
- Rationalization of water use
- Waste recycling
- Building energy-efficient structures and objects

Attending this study program allows students to develop their abilities of creative problem solving and independent critical thinking, team-work, cooperation, as well as master specific theoretical and practical skills. Upon finishing this program, students obtain some general skills (obtained by finishing any Masters program) and a set of competences regarding urban agriculture.

General learning outcomes of a Masters academic level:

Knowledge and understanding based on widening and deepening knowledge gathered on the first level of university education - a foundation for the ability of creative approach in development or application of ideas in a research context

Ability of knowledge application and understanding, along with problem-solving in a new, unfamiliar or multi-disciplinary environment

Ability to integrate knowledge and make judgement while analysing complex situations, including situations with incomplete or limited information

Building social and ethcal responsibility while applying knowledge and making judgement
 Capability to argue, communicate standpoints, offer clear and precise conclusions both in a professional and secular environment (communion)
 Learning skills and habbits developed up to a high level of independence

Special learning outcomes of the „Urban agriculture“ study program

- demonstrating skills and knowledge in designing, creating and managing green surfaces in urban landscapes
- interpreting, critically analysing and valorising data obtained through investigation, in order to efficiently apply programs of sustainable agriculture and manage resources (soil and water)
- researching and applying innovative and interdisciplinary approaches of urban green surface and infrastructure managing, through biological, socio-cultural and ecological principles
- evaluation and critical evaluation of the design and functionality of urban vegetation, taking into consideration plant health, soil features and water management
- Predicting and combining future effects of climate change on urban agriculture and efficiency of green infrastructure. Studying the role of urban vegetation in adjustment of urban areas to climate change and extreme environment
- Understanding different approaches to problem solving and showing individual responsibility and professionalism by offering good solutions for a series of problems urban agriculture is facing.
- Effective communication with the general public
- Biodiversity conservation and development of ecological and functional value of urban agriculture, in order to develop creative, green and smart cities

Acquired competences upon finishing the program

- acquire and develop knowledge and skills related to urban agriculture, urban ecology and urban planning
- identify and assess entrepreneurial opportunities and innovation possibilities related to urban agriculture activities
- understand and explore the multifunctionality of urban agriculture in order to redesign and redefine urban spaces
- organize and lead multi-disciplinary groups with experts, including planning, setting up, coordinating, team working, business development, problem-solving skills
- plan green areas within the city framework
- write a business plan for development and management of economic activities
- analyse urban food supply system and be able to shorten the food supply chain

List of mandatory and elective courses

Nastavni plan master studijskog programa *Urbana poljoprivreda* predstavljen je u narednoj tabeli.

R. br.	Course status	The course name	Struktura ECTS P+V	ECTS	Prijedlog nosioca
First semester					
1.	M	Statistics	4+2	6	Prof. dr Senada Kalabušić
2.	M	Experimental methodology	2+1	3	Prof. dr Mirsad Kurtović
3.	M	Urban agriculture: introduction, hystory and evolution	4+2	5	Prof. dr Pakeza Drkenda
4.	M	Urban food system	2+2	4	Doc. dr Mirza Uzunović
5.	M	Urban ecology	2+2	4	Prof. dr Samir Đug
6.	M	Entrepreneurship and urban demands	2+2	4	Prof. dr Aleksandra Nikolić
7.	M	Precision agriculture and smart food production	2+2	4	Doc. dr Adnan Mašić
Second semester					
8.	M	Sustainable agriculture	2+1	3	Prof. dr Mirha Đikić
9.	M	Urban fruit and vine growing	4+2	6	Prof.dr Pakeza Drkenda
10.	M	Urban vegetable and field crop production	4+2	6	Prof. dr Lutvija Karić
11.	E	Urban farming, nutrition and irrigation	2+1	3	Prof. dr Hamdija Čivić
12.	E	Urban farming plant protection	2+1	3	Prof. dr Nedžad Karić

	E	Use and cultivation of ornamental plants		3	Prof. dr Jasna Avdić
13.	E	Floristic and landscape design	2+1	3	Prof. dr Jasna Avdić
14.	E	Aromatic and medicinal plants	2+1	3	Prof. dr Drena Gadžo
15.	E	Urban beekeeping	2+1	3	Doc. dr Lejla Biber
16.	E	Biogenic waste management	2+1	3	Prof. dr Saud Hamidović
17.	E	Application of Geographic Information System in Urban agriculture	2+1	3	Doc. dr Melisa Ljuša
18.	E	Plant propagation in Urban Agriculture	2+1	3	Prof. dr Fikreta Behmen
19.	E	Dynamic input and climate management in urban agriculture systems using informatics tools	2+1	3	Doc. dr Adnan Mašić
20.	E	Sustainable cities and eco innovation	2+1	3	Prof. dr Pavle Krstić
21.	E	Economic and organisation of UA production	2+1	3	Prof. dr Sabahudin Bajramović
22.	E	Renewable energy sources	2+1	3	Prof. dr Lulić Haris
23.	E	Project Cycle Management	2+1	3	Prof. dr Dragana Ognjenović
24.	E	Programming in agribusiness	2+1	3	Doc. dr Mirza Uzunović
25.	E	Principles of food processing	2+1	3	Prof. dr Zlatan Sarić
Third semester					
PBL (Problem based learning)				18	Odabrani nastavnik za tutora
internship				12	
Fourth semester					
Master thesis				30	
Total				120	
Legend:					
M – mandatory					
E - elective					

Study structure and conditions of enrollment into the next semester

The curriculum is realized as a Masters study consisted of four semesters, with a total of 120 ECTS credits (30 per semester).

One ECTS credit means 25 hours of work (750 working hours per semester). In this way, a student needs to put in a total of 3000 working hours to collect 120 ECTS credits.

Course groups of the curriculum:

#	Courses group	ECTS (udio u sumi ECTS)
1.	Basic courses (obligatory for all Masters programs (Statistics and Experimental methodology)	9 ECTS (7,5%)
2.	Courses of agriculture	38 ECTS (31,67 %)
3.	Courses of economics	13 ECTS (10,8%)
4.	Courses of architecture and urbanism	7 ECTS (5,8 %)
5.	Courses of IT	10 ECTS (8,3%)
6.	Obligatory courses	45 ECTS (37,5%)
7.	Elective courses	15 ECTS (12,5%)
	Practical classes	30 ECTS (25%)
8.	- Practical work – PBL with tutoring	18 ECTS (15%)
	- Practice work in companies/institutions	12 ECTS

9. Masters thesis

(10 %)
30 ECTS
(25%)

List of courses and condition of choosing courses from a different curriculum

Floristry and landscaping
Medicinal and aromatic plants
Project cycle managing

Students may choose the listed courses, under condition that they hadn't attended them previously.

List of courses which are identical for all Masters study programs at the Faculty:

1. Statistics
2. Experimental methodology

- (1) Students can prolong subject completion onto the next year of study, as long as that subject isn't a precondition for completing other subjects. Students may prolong completion of more than one subject in the same way, as long as the sum of their ECTS credits is a maximum of 6.
- (2) If a student is renewing a study year, they are not obliged to attend classes for subjects they hadn't passed.

ECTS credits collected for similar subjects in other Faculties will be accepted as ECTS credits obtained within the Urban Agriculture curriculum.

Documentation of 30 ECTS for practical work

Practical work and field practice is organised as a part of study during the third semesters, and taking up 30 ECTS credits (18 – PBL classes, 12 – field practice)

PBL is a form of practical work that trains students for research, integration of practice and theory and application of knowledge and skills to develop sustainable solutions for problems in urban agriculture. It is conducted in small groups (6 students) to achieve cooperation. The Council of the Study Program defines three case studies at the beginning of the semester, each of them being multidisciplinary. Every case study is defined by a group of professors, out of which one is selected to be a tutor. Students need to write a report on the case study, which is then verified by the tutor. This way, the student collects their 18 ECTS credits.

The Head of Department verifies each student's field practice, approving their remaining 12 ECTS credits. Field practice can be completed within the Faculties' experimental fields, or in related companies/institutions.

The student works on their Masters thesis during the fourth semester, and in that way ensuring the remaining 30 ECTS credits. The thesis topic is defined in cooperation with a mentor, and needs to be applied from the beginning of the fourth semester. All subjects and the written part of the thesis must be successfully completed before determining a date of public thesis presentation.

All documentation regarding the students' Masters thesis can be found on the official website of the Faculty. Upon completion of the curriculum, the public thesis presentation gives the student a title – Master of Urban Agriculture.

Information on curriculum completion

After successfully passing all of the planned subjects and presenting the final Master thesis, acquiring the total number of ECTS credits (minimum 120), the student is officially awarded the title *Master of Urban Agriculture*.

