

**Name of Degree: Msc. Urban Agriculture**

**Semester: II<sup>nd</sup>**

**Course: Technology and engineering in urban environment**

**Key Theme: Introduction of methodologies in the broad spectrum of agricultural mechanization in Urban Agriculture**

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### ***A. Development part***

#### **1. Description**

Urbanisation is an important factor influencing agriculture. Cities and agglomerations hold advantageous as well as disadvantageous framework conditions for farming – especially the large number of potential consumers for goods and services on one side and land-related constraints on the other side. The diversity and complexity of urban influences result in a variety of farm activities, adjustments strategies, and business models. Production methodologies and mechanization used is very important for farms to adjust to the urban conditions aiming to achieve profitability and business success.

Through this case study the students will learn to understand the importance of methodologies and mechanization – agricultural machinery and tools used to increase productivity and profitability. The purpose of the study case is to implement the theoretical knowledge acquired during the learning process in practice. The students will investigate the best methodologies and proper mechanization, using the common methodology and support the farmers through introduction of methodologies in the broad spectrum of agricultural mechanization including safety, tool identification and use, construction methodology, agricultural power systems, and application of methodologies through structured experiential activity.

#### **2. Methodology/Guidelines for development of the case study**

The purpose of Case study is implementation of knowledge skills and competences, gained in the following II<sup>nd</sup> semester of the course Technology and engineering in urban environment.

The learning objectives of teaching are:

- Analyse major issues and constraints on urban engineering;
- Identify the constraints related to the agricultural power and machinery;
- Identify agricultural electrification and application;
- Understand small-scale production system and agricultural structures in small area
- Understand soil and water conservation and conservation structures
- Understand surveying equipment, hand and power tools, measuring devices, tools, and diagnostic equipment
- Improving field efficiency, matching machine size and capacity: theoretical, effective, and actual field capacities

The core problem statement is how to successfully implement proper use of appropriate agricultural machinery and tools in urban agriculture business.

The problem statement for this Case study is:

- How can agricultural mechanization contribute significantly to the development of value chains and food systems as it has the potential to render postharvest, processing and marketing activities and functions more efficient, effective and environmentally friendly
- How to identify advantages and disadvantages of used mechanization
- How can mechanization improve the quality of farm produce
- What is the role of the farmer on the rational use of natural resources, increasing environmental requirements for agricultural machinery and development of resource for the economical and ecological machinery for agriculture?
- How to develop a strategy for the development of new program for use of agricultural machinery and tools.

During lectures students learned about UA power and machinery, agricultural electrification and applications (motors, controls, and materials handling and processing), agricultural structures (plans, loads, construction materials and layout and design), and soil and water conservation (surveying, mapping, drainage and conservation structures). In the case study, students will work in groups, and will be divided into two groups of ten students. Each of them will have specific case study assignments, and will compile the case report and oral presentation together. In fact the presentation will be presented together and each student will present a certain part of the case study.

The students beforehand will be provided with source of materials (literature, books, and different reports that were prepared for the development of the Urban Agriculture master study program) which can help them to understand the case study.

In the case study students and farmers will be involved and each of the students will have specific tasks.

The case will begin in the middle of the semester after students learn and understand the case study and will end by end of semester.

The study case is important, because students will learn in practice how to solve a practical problem. In other hand the farmers will also have benefit through the selection of the appropriate machinery, equipment and tools needed for increase of productivity and profitability in their farms.

During the implementation of the case study students will set up, adjust, operate, and maintain agricultural machinery and equipment in order to be able to adjust the use of the right mechanization. Therefore, this will be an opportunity for the students to be able to interpret, judge, decide and take various measures to solve the problem.

### **3. Drafting**

The main idea of the case study is to introduce to farmers the methodology in the broad spectrum of agricultural mechanization including safety, tool identification and use, construction methodology, agricultural power systems, and application of methodologies through structured experiential activity in the field of the urban agriculture.

### **4. Revising**

The major case study components are:

- UA power and machinery,
- agricultural electrification and applications (motors, controls, and materials handling and processing),
- agricultural structures (plans, loads, construction materials and layout and design),
- and soil and water conservation (surveying, mapping, drainage and conservation structures).

The criteria to evaluate the case are:

- field visit
- literature review
- team work
- presentation
- writing of case study
- learning outcomes

The case study should be structured into four parts that are as follow:

1. Introduction of the topic and description of the problem that is going to be analyzed.
2. Literature review and the development of an appropriate methodology.
3. Data collection and interpretation of results.
4. Develop a strategy for successful apply of the technology and engineering in urban environment.

## **5. Description of the case study**

The farm belongs to a private farmer located in an urban part of the city of Prishtina. The total area planted with vegetable crops is 1,2 ha, and dominant plants are peppers, tomatoes, lettuce, spinach, and cucumbers. It has an old fashioned greenhouse in 0,2 ha growing with soil where plants rely on soil for structural stability. Soil provides the physical substrate for plant roots to grow, oxygen for plants, and a rich community of microorganisms that provide plants with nutrients. But the quality of soil is not good enough to produce high yield and quality products. In the open field of the farm, vegetable production is also characterized with low yield and quality of products. The machinery, equipment and tools used were not enough and nor appropriate for high yield and quality production.

The farmer has requested a new approach to his farm in order to increase the production and quality since there is no other opportunity to increase production surface that will increase quantity of produced vegetables.

The approach in this case study was firstly understanding urban farming, both vertical farming and farming on vacant open spaces, is a favourable way for ensuring production of high yield and quality. Since cities in Europe have already implemented vertical farming and are dealing with big projects for future concerns, Kosovo still has a long way to go as it is restricted to only few projects that aim to implement the best practices of modern urban farming. The idea for transformation of this farm was a progressive growth of urban agriculture that can act as an urban regeneration tool for this farm by providing social interaction and increasing job opportunities and environmental benefits to the urban areas like the city of Prishtina.

The proposed case study is a hydroponic greenhouse with the predominant growing system used in vertical farms, involving growing plants in nutrient solutions that are devoid of soil. This is a convenient way of getting what the plants really wanted in the first place: nutrients. In a hydroponic system, the plants grow directly in a water-based nutrient solution or some kind of growing medium rather than soil. The plant roots are submerged in a nutrient solution, which is frequently examined and circulated to ensure that the correct chemical composition is maintained. Hydroponics gardens are usually constructed vertically because city space is limited. Apart from immediate improvement in the environmental quality, vertical farms on top of traditional buildings serve as large heat sinks that radiate heat and increase ambient air temperature. Hydroponic systems also thermo regulate buildings by trapping heat in the winter and cooling buildings in the summer. The air quality inside the greenhouse can also be improved by growing plants on interior walls.

Our idea is that the traditional farm of the farmer will be transformed into an innovative farm that uses the methodology in the broad spectrum of agricultural mechanization including safety, tool identification and use, construction methodology, agricultural power systems, and application of methodologies through structured experiential activity in the field of the urban agriculture in order to increase production and quality in small areas. The advantage of this farm is that it is located near the largest city in Kosovo which can be visited by many other farmers that can implement similar projects in their farms.

**Student Involvement:** they will learn about the fundamentals of modern agricultural production in small areas with the implementation of hydroponic farming and the importance of having access to fresh, nutritious produce. The farm is entirely operated with students and local farmer providing

## ***B. Implementation part***

### **1. Methodology for Implementation of the case study**

The case study is a task that students will perform in groups. The tasks of the students are to perform successfully their field analyzes and each of them is responsible for their results achieved during the case.

Students will use knowledge from the course technology and engineering in urban environment, analyze the problem, use the qualitative methodology and set the study case. The case study will begin in mid-semester with field visit to farms, data interpretation and development of strategy for appropriate use of technology and engineering until the end of the semester.

The expected outputs and outcomes are that students will be able to discuss about a case study, to solve a case problem, to assign their duties, to prepare a report based on the results, to apply knowledge from lectures and literature used and to prepare a presentation.

The learning module is involved at a study subject as an intensive study on proper use of agricultural engineering in urban agriculture. Except regular students, it is designed for research and extension workers, quality control personnel in the produce industry, and business, government or academic professionals interested in current advances in the agricultural engineering. It is particularly of interest to technical professionals' responsible use of the proper machinery, equipment and tools in agriculture production.

This qualification is 40-60 mix of theoretical and practical studies. The participants will be able to understand of the rational use of agricultural machinery for the intensification of agricultural production.

### **2. Assessment of case study**

The case study will be evaluated based on written part as well as oral presentation. The written part will be graded as group written work with 30% and Individual written work (study case retrospective report) with 20%. The total weights on written part are allocated to equal 50% of grade while the group oral presentation will be allocated to equal 50% of such grade for each student.

<b>Study case</b>	<b>Grade Weighting</b>
Group written work (30%)	50%
Individual written work (study case retrospective report) (20%)	
Oral Defence	50%

**Important:** Work together but mark your contribution clearly. Plagiarism (no quota of resource in the text/presentation) is not tolerated.

**Panel for exam:** Mentor Thaqi

**Available teachers for project**

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### **3. Include other important details**

#### **Literature review**

*About ten years ago the global society has turned predominantly urban – for the first time in history (United Nations, 2014; Wiskerke, 2015). Future population growth is predicted to concentrate in cities and agglomerations so that by 2050 about two thirds of until then nearly ten billion people will live urban (United Nations, 2015).*

*Population growth and ongoing urbanisation processes continuously demand land – especially in urban and peri-urban areas. As this land in and around cities is often comparable fertile, farmland losses are concentrated in one of the most productive areas for food production. Agriculture is an important land user in urban and peri-urban areas. The UN estimates – based on expert judgements – that globally about 800 million people were engaged in UA in the late 1990s (Smit et al., 1996; van Veenhuizen and Danso, 2007). Out of these 800 million, about 200 million were expected to act commercially providing food for the urban market.*

*Nowadays rationalized and efficient globalized food systems and long value chains offer benefits for people from the global North, but cause also long food miles and increasing alienation of – especially urban – people from food and nutrition. Apart from providing benefits, the globalized food systems hold also inherent costs, which are progressively criticised. Thus, since about two decades increasing dynamism and interest in food-related issues can be detected in and around cities. The UN's Sustainable Development Goals and the New Urban Agenda explicitly name urban agriculture an important building block for sustainable and resilient cities and agglomerations (United Nations, 2016; United Nations, 2017).*

*Urbanisation is an important factor influencing agriculture. Cities and agglomerations hold advantageous as well as disadvantageous framework conditions for farming – especially the large number of potential consumers for goods and services on one side and land-related constraints on the other side. Farms located in close proximity to cities have to cope with both*



– the local and the global – framework conditions. This increasingly incentivizes farms to adjust to the urban conditions aiming to achieve profitability and business success. The diversity and complexity of urban influences result in a variety of farm activities, adjustments strategies, and business models. Van der Schans (2010) proposes the business models specialization, differentiation, and diversification, while later classifications put a stronger emphasis on urban farming's social innovation, co-production, and participation with business model nominations like 'reclaiming the commons', 'shared economy', and 'experience'. The FAO report 'Profitability and sustainability of urban and peri-urban agriculture' highlights a 'lack of sufficient [economic] data [...] [and] 'limited number of studies with sound economic analysis' (van Veenhuizen and Danso, 2007: 29). Still today, urban farming 'remains poorly quantified' (Thebo et al., 2014: 1) and Specht et al. (2016) highlight, that especially in Europe urban farming's entrepreneurial activities have been largely neglected.

## Reference & Literature Suggestion

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### ***Implementation part***

Each student will be asked to submit a study case report of their tasks (individually written work) of 1000 words in length at the end of the semester together with the group written work and before the oral defense (see Annex 2). The entire report of each group of students about the study case should contain about 5000 words. Please use APA format style. Please see the instructions on Annex 1.



## **Annex 1. APA format style**

### **Format:**

**Font:** Times New Roman

**Font Size:** 12pt

**Spacing:** Double spaced

**Page numbers:** Top right, including the cover page

### **Referencing:**

**1) You must write an in-text reference every time that you use another person's words, facts, idea, data, theory, model, concept, etc.**

In brackets next to your quote, paraphrase or summary, provide the surname of the author and year the source was published.

E.g. The tendency towards longer working hours for much of the labour force in the UK and North America (Ogden, 2008), along with escalating numbers of dual-income families and employed single parents (Office for National Statistics, 2007), creates increasing opportunities for multiple roles to clash with one another.

**\*\*Footnotes should only be used for additional information, not for references\*\***

**2) You must include a full reference for every source used in the reference list at the end of your report.**

Full references should be formatted in the following way:

<b>Book</b>	Ogden, J. (2008). <i>Health Psychology</i> , Buckingham: Open University Press
<b>Journal article</b>	Petrov, A. (2008). The development and actual condition of industrial relations in Bulgaria as an element of national security in the transition period. <i>SEER South-East Europe Review For Labour And Social Affairs</i> , 239-255
<b>Newspaper article</b>	Meier, B. (2013, January 1). Energy Drinks Promise Edge, but Experts Say Proof Is Scant. <i>New York Times</i> , p. 1.
<b>Online newspaper</b>	Retrieved from <a href="http://www.theguardian.com/australia-news/2015/oct/12/older-single-women-new-face-of-homelessness-anglicare-report">http://www.theguardian.com/australia-news/2015/oct/12/older-single-women-new-face-of-homelessness-anglicare-report</a>
<b>Website</b>	World Health Organization,. (2015). <i>World Mental Health Day – 10 October: Dignity in mental health</i> . Retrieved 13 October 2015, from <a href="http://www.who.int/mediacentre/news/notes/2015/world-mental-health-day/en/">http://www.who.int/mediacentre/news/notes/2015/world-mental-health-day/en/</a>

## Annex 2. Study Retrospective Report

The study case report is an individual written work submitted at the end of the semester together with the group written work and before the oral defense. This is mandatory for related course.

This case study should be written as report format and uses the following guidelines (structure):

- **Introduction:**  
(What was the goal and purpose of the study case; who were the participants, what were their roles, and what was your role in the study case?)
- **Critical Analysis:** What went well, what could be improved? What factors contributed to success/failure on different components of the study case (problem statement, literature review, methodology, time management, team work, communication, etc.). What surprised you during the process of the completing study case? Consider external and internal factors. All statements must be justified with evidence and examples.
- **Conclusion and recommendations:** How would you approach the same study case differently, and what have you learned for study cases.

## Annex 3. Grading study case presentation

Grading section	Description	Allocation of points	Grade Equivalent	Out of 100%
Oral Presentation Skills	<b>Excellent presentation</b>	For an excellent performance	12	100
	<ul style="list-style-type: none"> <li>• An outstanding presentation indicating evidence of wide knowledge and understanding of the subject.</li> <li>• Mastering of the topic with confidence while providing detailed and accurate relevant information.</li> <li>• Clear evidence of research and preparation.</li> <li>• Strong and structured arguments based on concise and persuasive approach.</li> <li>• Maintaining eye contact while focusing on attention and interest</li> <li>• Clear and loud speech</li> <li>• Questions answered to with courtesy and authority</li> <li>• Positive body language, formal dressing code and appropriate appearance</li> <li>• Use of appropriate grammar and vocabulary, demonstrating high English language proficiency</li> </ul>			

	<ul style="list-style-type: none"> <li>Excellent PPT presentation and its layout</li> </ul>			
	<b>Very Good Presentation</b> <ul style="list-style-type: none"> <li>An excellent presentation indicating evidence of wide knowledge and understanding of the subject.</li> <li>Very good explanation of the topic with fair confidence</li> <li>Mastering of the topic with confidence while providing easily understood information</li> <li>Providing compelling evidence for selected ideas</li> <li>Actively engages and communicates with the audience</li> <li>Appropriate use of dressing code and appropriate appearance</li> <li>Uses appropriate grammar and vocabulary with good English language proficiency</li> <li>Good PPT presentation layout</li> </ul>	For a very good performance	10	90
	<b>Good Presentation</b> <ul style="list-style-type: none"> <li>The audience can understand the topic/ subject matter</li> <li>Reasonable justification of ideas based on arguments</li> <li>Some evidence of outside reading but mainly based on the key tasks.</li> <li>Insufficient analysis and evaluation</li> <li>Active engagement and communicates with the audience</li> <li>Appropriate use of dressing code and appropriate appearance</li> <li>A competent answer showing sound knowledge and while relating to particular theories and concepts</li> <li>Uses appropriate grammar and vocabulary with adequate English language proficiency</li> <li>Good PPT presentation layout</li> </ul>	For a good performance	7	80
	<b>Fair Presentation</b> <ul style="list-style-type: none"> <li>Demonstrating a reasonable knowledge but lacking depth of understanding</li> <li>Presenting the topic so the audience can understand it</li> <li>Heavy reliance on class materials with no evidence of outside reading</li> <li>Weak or no evidence of analysis and evaluation</li> <li>Actively engages and communicates well with audience</li> <li>Appropriate dressing code and appropriate appearance</li> <li>Some errors in presentation are evident</li> <li>Uses appropriate grammar and vocabulary with adequate English language proficiency</li> <li>Satisfactory presentation layout</li> </ul>	For a fair performance	4	70
	<b>Bare Pass Presentation</b> <ul style="list-style-type: none"> <li>Presenting the topic so the audience can barely guess the subject matter</li> <li>Mentions some relevant points but lacks focus on the</li> </ul>	For low performance	2	55

	<p>question</p> <ul style="list-style-type: none"> <li>• No evidence of reading or using other sources but the class material</li> <li>• Notable errors and omissions</li> <li>• Hardly answers the questions related to the subject matter</li> <li>• Weak presentations and its structure, poorly presented and not easy to follow.</li> </ul>			
	<p><b>Inadequate presentation</b></p> <ul style="list-style-type: none"> <li>• Notably Poor presentation skills</li> <li>• Unable to demonstrate the minimum understanding of the subject matter <ul style="list-style-type: none"> <li>• Substantial omission and errors in presentation No presentation skills and confusion</li> <li>• Poor introduction of the topic with no relevance</li> <li>• Time limits ignored</li> <li>• Contains evident fundamental errors and misunderstanding</li> <li>• Unable to answer questions</li> <li>• Poor English language proficiency</li> <li>• Clumsy presentation layout</li> </ul> </li> </ul>	For inadequate performance	0	0-54
	<p><b>Plagiarism, Cheating or Non submission of the required task</b></p>	Academic offence or no work done at all	-03	NA