# "FORESTS MECHANIZATION " SYLLABUS

| Basic data of the subject | |
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| **Academic Unit:** | **University "Ukshin Hoti" Prizren** |
| **Course title:** | **Mechanization of Forests** |
| **Program:** | **Forestry and Environmental Sciences** |
| **Level:** | **Bachelor** |
| **Course status:** | **Oblicative (O)** |
| **Study year:** | **Second year, second semester** |
| **Number of hours per week:** | **2+2** |
| **Credit value – ECTS:** | **5** |
| **Time / location:** | **To be announced** |
| **Lecturer:** | **Prof. Ass.dr.Ylli Kortoçi** |
| **Contact details:** | **Email: ylli.kortoci@uni-prizren.com; Tel: +38345846817** |
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| **Course description:** | In the forest Mechanism module are treated topics that are helpful to the preparation of students as future technician in sustainable forestry management and environment in general. Some of the most important topics are: The goal and introduction to forest mechanization, which treat the levels and patterns of forest mechanization in Europe and Albania. In this topic are given the definition and meaning of mechanization and rationalization, as well as discussing the premise, obstacles and development trends of forest mechanization. Also, this module provides the opportunity for updating knowledge in theoretical physics and mechanics with definitions, sizes and units of measurement, and machine performance. Students acquire the necessary knowledge for the machines parts, their connections and internal combustion engines. They also study transmissions and their applications in machinery and tools for carrying out forest works.<br>Further, students gain deep theoretical knowledge for the construction, operation, maintenance and use of machines and tools for performing of forest operations, which are essential to the growth of labor productivity, creating favorable conditions for safety and health at work. The use of mechanization at the proper level not only increases incomes for workers but also protects the forest environment from damages. Students are prepared to be able after graduation to train workers on the use of means/ vehicles and forestry machines. In the forest mechanization module are treated the simple tools like; Lever, wedge, fixed pulley, movable pulleys, Polispasts, winches and slope Plan.<br>Also, a particular interest is paid to the theory of wood cutting and practical use of cutting tools like professional and non-professional chain saw. Operations of delimbing debarking and timber cross-cutting are treated in an integrated way not only from technical and economical point of view, but also |

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| | environmentally, as well. To have a high level of mechanization of forest work is important to mechanize not only the cutting operations but also interior timber transport as well. For this purpose, forest mechanization handles with priority the forest specialized tractors for carrying out forest works (Forwarder, Harvester and processor) and those adapted as such. Adapted tractors are treated together with their auxiliary equipment for carrying out forest operations such as interior transport and timber loading.<br>Besides terrestrial transport operation which is carried out with tractors and their equipments, forest mechanization also treats the air transport as the mostfriendly to the forest environment and wider. For this type of transport are studied in details the traditional and mobile winches and forest cable cranes. About these machineries there are provided knowledge not only for the construction and functioning of the cable crane line but also for their main components like steel ropes, pillar and trolley, while helicopters are treated only to acquire some basic knowledge about them. Forest mechanization does not leave out of attention the operations mechanization in young natural and artificial forests with relevant topics such as: Mechanisms, tools and machines used in pre-commercial and commercial thinnings in natural and artificial forests, as well as the mechanization of afforestation works, by soil tilling and its systematization, digging holes and planting forest seedlings. Finally, mechanization of forest fire protection. |
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| **Course objectives:** | Modification of traditional working systems with inovative working systems and techniques;<br>Usage of released energy with low costs;<br>The usage of complex tools that significantly help in carrying out work but always this is associated with great risks of physical, ecological and economic nature.<br>Knowing the tools to be used, as well as the possibilities, limitations and systems of their use. Harvesting of forest products or their utilization, while today the work is transferred by paying more attention to the cultivation of the forest for protection of the land from erosion, preservation of the water regime and the creation of social and aesthetic functions. |
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| **Learning outcomes**: | Through the "Forest Mechanization" program, students will:<br>1. Identify car components, details, transmissions and internal combustion engines.<br>2. Describe the cutting tools used to carry out forestry works (chainsaw, its components and operation). |

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| | 3. Choose the tools and machines that are used in various forestry works, such as tractors, motorcycles and their auxiliary equipment.<br>4. Categorize the fully mechanized machines and work systems used in various forestry works, such as harvesters, processors and their auxiliary equipment.<br>5. Evaluate the cost calculation and production of cars.<br>6. Design the factors that influence the choice of the forest machine and the implemented work system. |

| **Contribution on student load (must correspond with learning outcomes)** | | | |
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| **Activity** | **Hours** | **Days/week** | **Total** |
| Lectures | 2 | 15 | 30 |
| Exercise theoretical/laboratory | 2 | 15 | 30 |
| Practice work | - | - | - |
| Contact with lecturer/consultations | 1 | 15 | 15 |
| Field exercises | 1 | 13 | 13 |
| Mid-terms, seminars | 2 | - | 2 |
| Homework | - | - | - |
| Individual time spent studying (at the library or home) | 1 | 15 | 15 |
| Final preparation for the exam | 1 | 15 | 15 |
| Time spent in evaluation (tests, quiz, final exam) | 1 | 5 | 5 |
| Projects, presentations, etc. | - | - | - |
| **Total** | | | **125 hours (5 ECTS)** |

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| **Teaching methods :** | Lectures, discussions, laboratory exercises, expeditions consultations, seminars, independent projects, homework assignments, colloquium, course assignments, exams |
| **Evaluation methods:** | First assessment (colloquium): 10%,<br>Second assessment (colloquium): 10%,<br>Seminars or other engagements: 10%,<br>Final exam: 70%,<br>Total: 100%. |
| **Literature** | |
| **Basic Literature:** | Mine V. Leksionet Mekanizimi Pyjor (2014) Qendro at al "Mekanizimi i Shfrytezimit Pyjor" (1989).<br>Kortoçi,Y.,Kellezi, M. (2012):Shfrytezimi i pyjeve te ahut te Shqiperise me nje silvikulture te qëndrueshme. |

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| | G. Hippoliti “Mekanizacione Forestale” (Firence 1998).<br>S. Baldini, P. Fabbri “Guida all’uso della motorsega”1985. |
| **Additional Literature:** | Haxhi A. Mine V. “Motosharra” 1999.<br>Mine V. “Rrallimet Para – tregtare” 2000.<br>Mine V, Postolo A, Tabaku V. “Rrallimet Tregtare” 2002<br>Dano K, Mine V. “Puna per riperteritjen e pyjeve” 2004 |

| **Designed study plan:** | | |
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| **Week** | **Lectures** | **Exercises** |
| *First week:* | The goal of forest mechanization. Introduction to forest mechanization. Review of some issues of physics and mechanics. | Practical applications of the models and levels of mechanization. |
| *Second week:* | Parts of machines. | Recognition with machines parts and their connections. |
| *Third week:* | Transmissions. | Recognition with transmissions. |
| *Fourth week:* | Internal combustion engines. | Recognition with mechanisms & systems of internal combustion engine. |
| *Fifth week:* | Internal combustion engines. | Intermediate examinations (written & oral). |
| *Sixth week:* | Simple tools. | Recognition with mechanisms & systems of internal combustion engine. |
| *Seventh week:* | The theory of wood cutting | Chainsaw (constituent parts). |
| *Eighth week:* | Chainsaw. Debarking. | Chainsaw (Maintenance). Chainsaw (Operating by chainsaws). |
| *Ninth week:* | Chipping machines .<br>Combine machines. | Recognition with debarking and chipping machines. |
| *Tenth week:* | Tractors. | Recognition of the auxiliary equipment of the Forest tractor. Intermediate examinations (written & oral). |
| *Eleventh week:* | Cable cranes. | Calculation of machines pulling power. |
| *Twelfth week:* | Cable cars. | Exercises. Calculation of the drum carrying capacity. Exercises. |

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| | | Calculation of the line assamblaging forces. |
| *Thirteenth week:* | Mechanization of afforestation and reforestation. | Exercises. Calculation of Pilones. |
| *Fourteenth week:* | Silvicultural interventions. | Exercises. Calculation of drops. course assignment. |
| *Fifteenth week:* | Machines and means against forest fires. Helicopters. | Exercises. Cost calculation of forest machines. Intermediate examinations (written & oral). |

**Academic policies and rules of conduct:**

Regular and active participation of students in lectures, exercises (practical part) and in seminar work.
Keeping quiet in lecture, disabling mobile phones, timely access to the classroom, etc.