



## “SILVICULTURE 2” SYLLABUS

<b>Basic data of the subject</b>	
<b>Academic Unit:</b>	<b>Life and Environmental Sciences Faculty</b>
<b>Course title:</b>	<b>Silviculture 2</b>
<b>Program:</b>	<b>Forestry and Environmental Sciences</b>
<b>Level:</b>	<b>Bachelor</b>
<b>Course status:</b>	<b>Compulsory</b>
<b>Study year:</b>	<b>Second year, second semester</b>
<b>Number of hours per week:</b>	<b>3+2</b>
<b>Credit value – ECTS:</b>	<b>6</b>
<b>Time / location:</b>	<b>To be announced</b>
<b>Lecturer:</b>	<b>Prof. Asoc .Dr. Mirvjena Kellezi</b>
<b>Contact details:</b>	<b>mirvjena.kortoci@uni-prizren.com</b>
<b>Course description:</b>	<p>This course will introduce the students to the basic principles of the object, purpose and destination of forestation. Possibilities of forest creation: the bases of artificial forest cultivation, forestation, bare grasslands, under canopy, etc.</p> <p>Recognition of the forestation object environment. Criteria that are followed for the recognition of the environment.</p> <p>Fruit and forest seeds collection. Maturity time and seed collection time. Selection of forest stands and trees, tree plantations. Collection technique.</p> <p>Extracting seeds from cones and fruits. Extraction of pine seeds using artificial heat. Seed preservation methods. Seed transportation rules.</p> <p>Quantitative and qualitative indicators of forest seeds and their designation methods. Seeds preparation for sowing. Preparation methods.</p> <p>Forest nurseries. Types of forest nurseries and their organization. Choosing the nursery place. The order of planting the crops and the technical and organizational plan of the forest nursery.</p> <p>Land processing and maintenance in nurseries.</p> <p>Seedlings production by seeds. Asexual (vegetative) production of forest saplings. Harvesting planting material in nurseries.</p> <p>Artificial reforestation techniques. Possible areas for reforestation. Reforestation methods: seedling seedlings, saplings, cuttings and mixed.</p> <p>Tilth methods and soil preparation in forestation. Soil preparation and improvement. Precautions for soil preparation and improvement. Methods and time of soil preparation.</p> <p>Mixing species and planting cultures in forestation. Forestation schemes and formulas.</p> <p>Afforestation by seeds. Means and planting times: with spreading, in rows, and pits.</p>



	<p>Afforestation by seedlings. Planting material and its preparation. Time and method of seedlings plantation: by hand or mechanized means. Depth and planting technique. Care work on forest crops after forestation. Importance and types of cultural care. Time to complete them.</p> <p>Measuring and controlling work in new forestations. Seedling survival rate verification and survey of new forestations. Methods of studying forest crops. Sample plots determination.</p> <p>Special forestation cases.</p>		
<b>Course objectives:</b>	<p>The purpose of Silviculture 2 is the environment recognition and choice of suitable species in artificial afforestations.</p> <p>Collection and storage methods, laboratory tests of forest seeds.</p> <p>Technical and economic procedures for the construction and operation of forest nurseries.</p> <p>Seed preparation procedures and seedling production techniques in forest nurseries.</p> <p>Working and soil preparation systems, fertilization and irrigation in forest nurseries.</p> <p>Generative and vegetative multiplication of forest species in nursery.</p> <p>Cultivation of forest species in greenhouses and covered roots (containers).</p> <p>Methods and time of soil preparation in artificial afforestation. Methods of mixing and placing forest species in the forestation areas (formulas and schemes).</p> <p>Methods and techniques of artificial afforestation by seed and seedlings. Labor mechanisms.</p> <p>Work evaluation methods in afforestations and their study.</p>		
<b>Learning outcomes:</b>	<p>Upon completion of this course the student must be able to know the:</p> <ol style="list-style-type: none"> <li>1. Identify the purpose and destination of reforestation</li> <li>2. Select the appropriate species in forestation.</li> <li>3. Clasify appropriate forest fruits and seeds for collection.</li> <li>4. Use appropriate methods for the forest seeds preservation.</li> <li>5. Design and manage the forest nurseries.</li> <li>6. Evaluate seedlings production in closed environments (solar and artificial heating greenhouses).</li> <li>7. Compare the artificial afforestation techniques and establish the possible afforestation areas.</li> </ol>		
<b>Contribution on student load (must correspond with learning outcomes)</b>			
<b>Activity</b>	<b>Hours</b>	<b>Days/week</b>	<b>Total</b>
Lectures	3	15	45
Exercise theoretical/laboratory	2	15	30



Practice work	-	-	-
Contact with lecturer/consultations	1	15	15
Field exercises	1	15	15
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)	2	5	10
Projects, presentations, etc.	3	-	3
<b>Total</b>			<b>150 hours (6 ECTS)</b>
<b>Teaching methods :</b>	Lectures, discussions, laboratory exercises, expeditions, consultations, seminars, independent projects, course assignments, colloquium, exams.		
<b>Evaluation methods:</b>	First assessment (colloquium): 10%, Second assessment (colloquium):10%, Seminars or other engagements: 10%, Final exam: 70%, Total: 100%.		
<b>Literature</b>			
<b>Basic Literature:</b>	Tabaku, V. (2015): Silvicultura speciale. Leksione te shkruara per studentet. Treska .LL. Pyllzimet. Kortoçi, Y., Kellezi, M. (2012): Shfrytezimi i pyjeve te ahut te Shqiperise me nje silvikulture te qendrushme. Kellezi, M., Kortoci, Y. (2013): “L’impiego delle coltivazioni arboree a rapida crescita per produrre energia verde:metodi colturali raccolta e impieghi”.		
<b>Additional Literature:</b>	Tabaku, V. (2015): Silvicultura Speciale. Leksione te shkruara per studentet. Marku, V.(2014): Dendrologjia Grazhdani, S. (2003): Agrometeorologjia. Botim i UBT.		

<b>Designed study plan:</b>		
<b>Week</b>	<b>Lectures</b>	<b>Exercises</b>
<i>First week:</i>	Object, purpose and forests destination. Forest species reproduction. Possibilities of forest creation: the bases of artificial forests cultivation, forestation on	Practice on environment recognition for afforestation and the species selection in areas with different ecological conditions.

	<p>bare grasslands, beneath the main canopy, etc.</p> <p>Recognizing the environment in the reforestation area. Criteria that are followed for environmental recognition. Climate study, solar radiation, drought occurrence, soil study for species selection, etc.</p>	
<i>Second week:</i>	<p>Species selection in reforestation process. Importance and criteria to be followed. Domestic, foreign and pioneer (preparatory) species. The method of comparative ecology, forestry typology and experimentation.</p> <p>Fruits and forest seeds collection. Seeds harvest and collection time. Selection of forest and tree species, seed plantations. Collection technique.</p>	<p>Practice on the ways of forests seeds collection and foreseeing the production of seeds from forest trees and stands.</p>
<i>Third week:</i>	<p>Seeds extraction from the cones and fruits. Extraction of pines seeds by artificial heat (cone dryers). Extraction of seed of coniferous species that require special treatment.</p> <p>Preparation of seed samples for laboratory analysis on quantitative and qualitative seed indicators.</p>	<p>Practice on methods of laboratory determination of quantitative and qualitative indicators of forest seeds.</p>
<i>Fourth week:</i>	<p>Preservation of forest seeds. Seed preservation methods: dry, regular, well-regulated storage and airtight containers. Keeping in the wet environment. Seed transport rules.</p> <p>Quantitative Quality parameters of forest seeds and methods for their evaluation. Determination of germination ability: laboratory cultivation,</p>	<p>Practice on forest nurseries and ways of forest seeds treatment before planting them in the nursery.</p>

	biochemical and X-ray methods.	
<i>Fifth week:</i>	<p>Seeds preparation for sowing. Preparation methods: bedding, cold bedding, hydrothermal and chemical treatment, microelement processing, (disinfection and pre-germination).</p> <p>Forest nurseries. Types of forest nurseries and their organization. Choosing the nursery place. The order of planting the crops and the technical and organizational plan of the forest nursery.</p>	Practice on construction problems, use of mechanisms and other equipment in forest nurseries.
<i>Sixth week:</i>	<p>Land processing and maintenance in nurseries. Soil tillage systems, herbicides, fertilizer, fertilizer types. Land preparation for planting in nurseries.</p> <p>Seedlings production by seeds. Seed planting methods. Depth and planting time. Hand and mechanized planting. Herbal care work.</p>	Practical on soil preparation problems, fertilization and technique of irrigation in forest nurseries.
<i>Seventh week:</i>	<p>Production of seedlings in closed environments (solar and artificial greenhouses). Production of rooted seedlings covered in plastic bags, turfed vases, cardboard vases, containers. The transfer of seedlings to nurseries. Purpose and methods of seedlings transplanting. Care services.</p>	Nursery practice on generative and vegetative multiplication of forest species (in-vitro, grafting, cuttings, etc.).
<i>Eighth week:</i>	<p>Asexual (vegetative) production of forest saplings. Vegetative multiplication with 2-year cuttings, green cuttings, hardwood cuttings, air layering, grafting.</p> <p>Harvesting planting material in nurseries (calculation of planting material): seedlings</p>	Seminar 1: Chapters on forest seeds, their quantitative and qualitative indicators and production of forest seedlings in forest nurseries.

	inventory. Methods and timing of seedlings extraction. Selection, numbering, buckle, packaging, labeling and seedlings transport to destination.	
<i>Ninth week:</i>	Artificial reforestation techniques. Possible areas for reforestation. Reforestation methods: seedling seedlings, saplings, cuttings and mixed. Tilt methods and soil preparation in forestation. Soil preparation and improvement. Precautions for soil preparation and improvement. Methods and time of soil preparation.	Nursery practice on cultivation of forest species in field (planting, seedlings transfer, fighting bad herbs with herbicides.
<i>Tenth week:</i>	Mixing species and planting cultures in forestation. Forestation schemes and formulas. Afforestation by seeds. Means and planting times: with spreading, in rows, and pits.	Practical on soil preparation in greenhouses, soil irrigation techniques and cultivation of forest species in vases and different containers.
<i>Eleventh week:</i>	Afforestation by seedlings. Planting material and its preparation. Time and method of seedlings plantation: by hand or mechanized means. Depth and planting technique. Care work on forest crops after forestation. Importance and types of cultural care. Time to complete them.	Nursery practice on the extraction methods, fragmentation and seedlings material packing in nurseries.
<i>Twelfth week:</i>	Measuring and controlling work in new forestations. Seedling survival rate verification and survey of new forestations. Methods of studying forest crops. Sample plots determination. Special forestation cases. Forest shelterbelts.	Practice on artificial afforestation directly by seeds (preliminary work on the area to be planted, preliminary seed treatment. Seed planting ways and techniques.



	Classification of shelterbelts: according to material, function, density and structure. Species that are used, cultivation techniques and services.	
<i>Thirteenth week:</i>	Basins and landslides afforestation. Afforestation of coastal sandpits and river shingle. Choosing and placing species. Plantation and cultural care.	Field practice on afforestation methods by seedlings (afforestation with special hoes, with spades and holes.
<i>Fourteenth week:</i>	Afforestation on mountain pastures. Sowing technique and after-plantation care services. Afforestation on motorways and urban forests. Species selection and afforestation techniques. Services.	Machines introduction used in nurseries for seedling afforestation in forest areas.
<i>Fifteenth week:</i>	Cultivation of native coniferous species (white fir, spruce, pines, fir, etc.). Cultivation of native broadleaves species (beech, nut, lime, oaks, poplars, chestnuts). Cultivation of foreign species (greek fir, cedar of the atlases, cedar of lebanon, lace fir, bruce pines, sugar pines, corsica pine, calabrian pine, sea pine, yellow pine, white pine, green spruce, eucalyptus, red oak, poplar.	Seminar 2: Forest nurseries and artificial afforestation.
<b>Academic policies and rules of conduct:</b>		
Regular and active participation of students in lectures, exercises (practical part) and in seminar work. Keeping quiet in lessons, disabling mobile phones, timely access to the classroom, etc.		