1. Title of course	Dendrology 2		
2. Code	ШФ2002		
3. Study program	Forestry		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Full Prof. Dr. Jane Acevski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Dendrology (science specialized for the characteristics of the woody plants) is a fundamental subject in the field of forestry. By studying this course, students learn knowledge of forest trees and shrubs of indigenous dendroflora (autochtoon species) and some important economic species of the non-indigenous dendroflora (allochtoon species).			
11. Course content The study material is divided into two parts: general and special section material. The general part elaborates the description of the most important organs of plants (Morphological characteristics); Division of the woody plants according to their dimensions and habitus; Nomenclature; Distribution (natural range); Forest formations of the globe. The second more specialized and detailed section is discussed about plant's classification into systematic types (according to Tahtadjian), with special emphasis on the following characteristics for each species: Systematics; Distribution (native range); Morphological characteristics; Reproduction; Ecological characteristics; Economic importance. Gymnosperms/Coniferous plants (Gymnospermae); Angiosperms/Flowering plants (Angiospermae).			
12. Learning methods Theoretical classes, laboratory and field classes, field exercises, visit of living plant and herbarium collections (arboreta, woody parks, forests, green houses and alpine houses); Field research, consultations.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points	
	17.2. Active participation in classes	up to 30 points	
	17.3. Final exam	up to 40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian		
21. Methods of monitoring the quality of	Internal evaluations and surveys		

teaching						
22.	**Literature**					
	22.1.	**Compulsory literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Џеков С.	Дендрологија	УКИМ-ШФС, Скопје	1988
		2.	Ем Х.	Преглед на дендрофлората на Македонија	Сојуз на шумарски инженери и техничари, Скопје	1967
		3.	Vidaković M., Franjić J.	Golosjemenjače	Sveučilište u Zagrebu, Šumarski fakultet, Zagreb	2004
		4.	Idžojtić M.	Dendrologija – list	Šumarski fakultet, Sveučilište u Zagrebu, Zagreb	2009
	22.2.	**Additional literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Acevski J., Simovski B.	E-materials of Dendrology	UKiM FoF (auth. e-lect.)	2014
		2.	Šilić Č.	Atlas drveća i grmlja	Zavod za udžbenike i nastavna sredstva, Sarajevo / Beograd	1983
		3.	Samuelson L. J., Hogan M. E.	Forest trees, a guide to the Eastern United States	Pearson Education Inc., New York	2006

1. Title of course	Protection of wood from epixylous fungi		
2. Code	ШФ2004		
3. Study program	Forestry		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Assoc. Prof. Dr. Irena Papazova-Anakieva			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introduction to basic principles of the wood rotting process; main causes of wood rotting (fungi and bacteria), methods for isolation and identification and protection measures.			
11. Course content Wood structure. Alterations in the wood (abiotic agents, bacteria, fungi). Effects of fungi on the membrane and contents of the cells. Definition of wood rot. Types of rot. Stages of decay. Technological implications of the rot processes on wood (mechanical resistance, wood density, wood shrinking, calorific value). Wood decay diagnostic methods (classical and modern methods). Factors of wood resistance to the rot. Classification of resistance of various types of wood. Wood staining fungi (fungi, diagnosis, protection, other changes of color, abiotic alterations). Methods for protecting of wood from decaying (processes with pressure, processes without pressure, other processes). Wood protecting pesticides. Wood-decaying fungi (morphology, ecology, biology, rot type, protective measures).			
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work, and via consultations.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points	
	17.2. Active participation in classes	up to 30 points	
	17.3. Final exam	up to 40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22.	Literature					
	22.1.	**Compulsory literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Sotirovski, K	Protection of wood from epixylous fungi	UKIM-FOF	2006
		2.				
	22.2.	**Additional literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Eaton, R. A & Hale, M. D. C	Wood decay, pests and protection	Champan & Hall	1993
		2.				

1. Title of course	Forest protection			
2. Code	ШФ2005			
3. Study program	Forestry			
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje			
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate			
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6			
8. Lecturer: Prof. Dr. Nikola Nikolov				
9. Preconditions for enrollment of the subject	none			
10. Course objectives (competences) The basic goal of this subject is to get knowledge for forest protection, more precisely how to recognize causers and damages with abiotic, biotic and anthropogenic character. The ultimate goal is introducing students to measures of protection from above mentioned factors.				
11. Course content Introduction; Damages from abiotic factors; Diagnosis and measures for protection against abiotic factors; Damages from biotic factors; Diagnosis and measures for protection against biotic factors; Damages from anthropogenic factors; Diagnosis and measures for protection from anthropogenic abiotic factors.				
12. Learning methods Theoretical lectures and practical exercises in classroom and field, and via consultations.				
13. Total available time (duration of course)	180 hours			
14. Distribution of the available time	3+3			
15. Teaching activities	15.1. Lectures (theory)			45 hours
	15.2. Practice (laboratory, auditory), seminars, team work			45 hours
16. Other forms of activities	16.1. Project tasks			30 hours
	16.2. Individual tasks			30 hours
	16.3. Home learning			30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points		
	17.2. Active participation in classes	up to 30 points		
	17.3. Final exam	up to 40 points		
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F	
	from 51 to 60 points	6 (six)	E	
	from 61 to 70 points	7 (seven)	D	
	from 71 to 80 points	8 (eight)	C	
	from 81 to 90 points	9 (nine)	B	
	from 91 to 100 points	10 (ten)	A	
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2. 17.1 min 15 points; 17.2 min 15 points; 17.3 min 21 points			
20. Language in which lectures are held	Macedonian (optional English)			
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys			
22. Literature				

22.1.	**Compulsory literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Z. Vajda	Zashtita shuma	Zagreb	**1984**
	2.	Staners D. And Bourdeau P	EUROPE'S ENVIRONMENT - The Dobrish Assessment	Copenhagen	**1995**
22.2.	**Additional literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Славко Влаткович	Животна средина функција шума	Инст. За шум. --Белград	**2001**
	2.				

1. Title of course	Methods and programs for amelioration of degraded forests and shrubberies		
2. Code	ШФ2007		
3. Study program	Forestry		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Kole Vasilevski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introducing students to methods and programs for amelioration of degraded forests and shrubberies. Competence to apply new knowledge in practice.			
11. Course content Teaching material covers the following topics: Introduction, Definition of terms, State of degraded forests in Macedonia, Description of the stands, Methods of amelioration of degraded forests and shrubberies, Direct methods of amelioration, Indirect methods of amelioration, Combined methods of amelioration, Forms of degraded forests and shrubberies, Degraded forests, Shrubberies, Implementation of methods of amelioration in degraded forests and shrubberies, Reclamation of degraded forest soils, Species of trees for introduction in degraded forests and shrubberies, Results of introduction of some native and introduced species in Macedonia, Silvicultural and protection measures for introduced species, Stands care, Documentation in performing the amelioration of degraded forests and shrubberies, Literature.			
12. Learning methods Teaching is conducted in the form of lecture, lab exercises, consultations, training and field exercises.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	6 (3+3) / 90		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points	
	17.2. Active participation in classes	up to 30 points	
	17.3. Final exam	up to 40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian (optional English)		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22. Literature

Compulsory literature

	No.	Author/s	Title	Publisher	Year
22.1.	**1.**	Мирчевски, С., Василевски, К., Велковски, Н.,	Мелиорација на деградирани шуми и шикари	Универзитет “Св. Кирил и Методиј”- Скопје, Шумарски факултет- Скопје	2012
	2.	Крстиќ, М.	Гајање шума – Конверзија, мелиорација и вештачко обнављање	Универзитет во Белград, Шумарски факултет	2006
	3.	Мирчевски, С.	Мелорација на деградирани шуми и шикари	Универзитет “Св. Кирил и Методиј”- Скопје, Шумарски факултет- Скопје	1995

Additional literature

	No.	Author/s	Title	Publisher	Year
22.2.	**1.**	Георгиев, Ж., Василев, В., Наумов, З., Костов, П.	Реконструкција на малоценните нискостбълени гори	Земиздат, София	1965
	2.	Јевтиќ, М.	Уношење четинара у лисчарске шуме	ЈСЦЛШ, Белград	1962
	3.	Фон Гедоу, К., Нагел, Ј., Саборовски, Ј.	Шумарство засновано на постојана покровност	Издавачки центар ТРИ, Скопје	2009

1. Title of course	Silviculture 2			
2. Code	ШФ 2008			
3. Study program	Forestry			
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje			
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate			
6. Semester: 9(winter semester)	**7. Number of ECTS:** 6			
8. Lecturer: Prof. Dr. Nikolcho Velkovski				
9. Preconditions for enrollment of the subject	none			
10. Course objectives (competences) Introduction to techniques for silviculture of forests and methods of combined regeneration. Ability to apply them in forest ecosystems.				
11. Course content Dynamics of development of forest stands, Developmental trends of natural regeneration, Measures that help the natural regeneration of the forest, Methods of artificial regeneration of the forest, Selection of silvicultural measures artificially raised forest stands, Combined methods of natural regeneration, Specific types of natural regeneration of forests, Methods for assessment of restoration of forests, Silviculture of natural regeneration, Silviculture of young stands, Silviculture of middle age and under matured forests, Application of thinned cuttings, Regeneration of coppice forests, Regeneration of even aged forests, Regeneration of uneven aged forests, Regeneration of pure forests, Regeneration of mixed forests, Choosing the way and method of regeneration of forest.				
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work, and via consultations.				
13. Total available time (duration of course)	160 hours			
14. Distribution of the available time	5 (3+2) / 75			
15. Teaching activities	15.1. Lectures (theory)			45 hours
	15.2. Practice (laboratory, auditory), seminars, team work			30 hours
16. Other forms of activities	16.1. Project tasks			40 hours
	16.2. Individual tasks			25 hours
	16.3. Home learning			20 hours
17. Assignments and grading	17.1. Seminar work / project	up to 20 points		
	17.2. Active participation in classes	up to 20 points		
	17.3. Final exam	up to 60 (2x30/60) points		
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F	
	from 51 to 60 points	6 (six)	E	
	from 61 to 70 points	7 (seven)	D	
	from 71 to 80 points	8 (eight)	C	
	from 81 to 90 points	9 (nine)	B	
	from 91 to 100 points	10 (ten)	A	
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.			
20. Language in which lectures are held	Macedonian (optional English)			
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys			

22.	Literature					
		Compulsory literature				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
	22.1.	**1.**	Д. Баткоски	Одгледување на шумите	ШФ-Скопје	**2006**
		2.	С. Јовановиќ	Гајење шума II-Методи природног обнављања и неговања шума	ШФ-Белград	**1980**
		3.	J. Шафар	Узгајање шума	СШДХ-Загреб	**1963**
		Additional literature				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
	22.2.	**1.**	Љ. Стојановиќ & М. Крстиќ	Гајење шума 1	ШФ-Белград	**2008**
		2.	Жан-Филип ШЮтц	Жан-Филип ШЮтц	Земиздат-СофиЯ	**1999**
		3.	К. Пинтариќ	Узгајање шума 2	ШФ-Сарајево	**1975**
		4	Т. Бунушевац	Техника обнове и гајења шума	ИПНРС-Белград	**1950**
		5.	Клаус фон Гедоу & Јирген Нагел & Јоаким Саборовски	Шумарство засновано на постојана покровност	Издавачки центар ТРИ-Скопје	**2009**

1.	**Title of course**	Forest management 2		
2.	**Code**	ШФ2010		
3.	**Study program**	Forestry		
4.	**Organizer of the study program**	UKiM Faculty of Forestry in Skopje		
5.	**Degree (undergraduate, postgraduate, doctoral)**	Postgraduate		
6.	**Semester:** 9 (winter semester)	**7. Number of ECTS:**6		
8.	**Lecturer:** Prof. Dr. Pande Trajkov			
9.	**Preconditions for enrollment of the subject**			
10.	**Course objectives (competences):** Principles for sustainable forest management and evaluation of sustainability of management in detail. Enabling to prepare a forest management plan.			
11.	**Course content:** Basics of forest management. Subject of management, goals and politics, social role of forestry, choosing the subject of management. Principles of sustainable forest management. Evaluation the sustainability of management – criteria and indicators for sustainable forest management. Forest space organization. Concept of sustainable yield, main yield, subsidiary yield. Concept of progressive yield. Rotation, types of rotation, length of rotation. Normal forest, basics of normal forest, basic factors for normal forest, types of abnormality, normality of even-aged forests, normality of uneven-aged forests, calculating the normal volume. Distribution of age classes. Yield determination, by area, by volume, in coppice forest system, in shelter-wood system, selective system. Types and levels of forest management planning. Forest management plans. Creating a plan for forest management, field research, office analysis.			
	Learning methods: auditory and audio-visual Theoretical classes, exercises, consultations, individual work.			
13.	**Total available time (duration of course)**	180 hours		
14.	**Distribution of the available time**	3 + 3		
15.	**Teaching activities**	15.1. Lectures (theory)		45 hours
		15.2.Practice (laboratory, auditory), seminars, team work		45 hours
16.	**Other forms of activities**	16.1.Project tasks		30 hours
		16.2.Individual tasks		30 hours
		16.3.Home learning		30 hours
17.	**Assignments and grading**	17.1. Seminar work / project	20 points	
		17.2. Active participation in classes	10 points	
		17.3. Final exam	70 points	
18.	**Evaluation criteria (points / grade)**	up to 50 points	5 (five)	F
		from 51 to 60 points	6 (six)	E
		from 61 to 70 points	7 (seven)	D
		from 71 to 80 points	8 (eight)	C
		from 81 to 90 points	9 (nine)	B
		from 91 to 100 points	10 (ten)	A
19.	**Conditions for signature (verification of attendance of classes) and final exam**	Fulfillment of the activities 15.1 and 15.2		
20.	**Language in which lectures are held**	Macedonian		
21.	**Methods of monitoring the quality of teaching**	-Internal evaluations and surveys.		
22.	**Literature**			

22.1.	Obligatory literature				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Mihajlov Ilija	Forest management – book 1	UKIM	**1961**
	2.	Mihajlov Ilija	Forest management – book 2	UKIM	**1963**
	3.	Ram Prakash	Forest management	Prashant Gahlot	**2006**
	4.	Pande Trajkov	Forest management	F.F. Skopje	**2012**

22.2.	Reccomended/ Additional literature				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Cavlovic Jura	Basics of forest management (in Croatian)	University in Zagreb	**2013**
	2.	Miletic Zarko	Basics of forest management – book 1 (in Serbian)	Beograd	**1950**
	3.	Miletic Zarko	Basics of forest management – book 2 (in Serbian)	Beograd	**1950**
	4.	Klepac Dusan	Forest management (in Croatian)	Nakladni zavod Zagreb	1965
	5.		Law for forests		
	6.		Rule-book for content of special plans for forest management		

1. Title of course	Forest pathology		
2. Code	ШФ2012		
3. Study program	Forestry; Landscaping and improvement of the environment		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Kiril Sotirovski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Detailed learning of the most important aspects of basic phytopathology (symptomatology, mechanism of infection, disease fundamentals, defense mechanisms of plants, etc.) as well as most important plant pathogens in forestry, with control methods).			
11. Course content Introduction (science of diseases of forest species of trees, conception of disease in plants, types of plant diseases, importance, basic processes in development of diseases, identification of previously unknown disease). Parasitism and development of disease (developmental phases of disease – inoculation, pre-penetration, penetration, infection). Attack of the pathogen (mechanical forces, enzymes, microbiological toxins, growth regulators, suppressors of plant resistance reactions of the plant). Effects of the pathogen on physiological functions of the plant. Defense mechanisms of plants. Genetics of plant diseases (variability, types of resistance, genetics of virulence of the pathogen and resistance of plant hosts, replication of resistant species). Environmental factors (temperature, humidity, wind, light, pH, soil structure). Epidemiology of plant diseases (elements of epidemics; rate of plant disease and estimation of yield losses; computer simulations of epidemics; prognostics of epidemiological plant diseases). Control of plant diseases. Plant disease caused by fungi (characteristics, morphology, reproduction, ecology, dissemination, classification of pathogenic fungi, identification, symptoms, isolation, life cycles of fungi. Diseases caused by fungi-like organisms, Myxomycota, Plasmodiophormycytes, Chromista, Oomycetes. Disease caused by true fungi, Chytridiomycota, Zygomycetes, Ascomycetes, Basidiomycetes, Fungi Imperfecti. Plant diseases caused by procariota (disease caused by bacteria, characteristics of bacteria pathogenic to plants, morphology, reproduction, ecology and dissemination, identification of bacteria, symptoms, control of bacterial diseases. Diseases caused by Mollicutes: phytoplasma and spyroplasma. Diseases caused by parasitic plants. Diseases caused by viruses (characteristics, biological function of the viral components, viral infections, translocation of viruses in plants, symptoms, physiology, transmission of viruses, epidemiology of plant viruses).			
12. Learning methods Lectures, auditory classes, consultations, individual work.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	30 points	
	17.2. Activities and participation in classes	30 points	
	17.3. Final exam	40 points	

18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A

19. Conditions for signature (verification of attendance of classes) and final exam	Condition for signature: Fulfilment of activities 15.1 and 15.2
20. Language in which lectures are held	Macedonian (optional English)
21. Methods of monitoring the quality of teaching	-internal evaluation -questionnaire

22. Literature

22.1. Compulsory literature

No.	Author/s	Title	Publisher	Year
1.	Agrios, G.	Plant pathology	Harcourt Academic Press	1997
2.	Schummann, G.L., D'Arcy, C.J	Essential plant Pathology	APS Press	2006
3.	Sinclair, W.A., Lyon, H.H.	Diseases of trees and shrubs	Comstock publishing associates	2005

22.2. Additional literature

No.	Author/s	Title	Publisher	Year
1.	Jones, R.K., Benson, D.M.	Diseases of woody ornamentals and trees in nurseries	APS Press	2001

1. Title of course	Forest genetics 2		
2. Code	ШФ2013		
3. Study program	Forestry		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Vlatko Andonovski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introduction to the processes of inheritance and variability of forest tree species and ornamental plants. Capacity for practical application in forestry and greening.			
11. Course content Contemporary knowledge about inheritance in the world and here, physical and chemical inheritance volatility ratio of phenotypes in hybrid progeny, interaction of heredity, basic quantitative genetics, extranuclear inheritance and its mechanisms, variability in wildlife and its classification, modification, phenotypic variations, basic physiological genetics, genetic control of metabolism and development, basic biochemical genetics, molecular structure of the genetic material, structure of nucleic acids, reproduction of mutations and determination of the phenotype, genetics of populations and genetic bases of microevolution of forest trees and decorative plants, application of genetic studies in particular areas of forestry and greening, ANOVA statistical method.			
12. Learning methods Lectures, auditory exercises, project work, consultations, independent work.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		30 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 20 points	
	17.2. Active participation in classes	up to 20 points	
	17.3. Final exam	up to 60 (2x30/60) points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian (optional English)		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22.	Literature					
	22.1.	**Compulsory literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	А. Андоноски	Генетика и облагородување на шумските дрвја	ШФ-Скопје	1994
		2.	Д. Кајба, Д. Балиан	Шумарска Генетика	ШФ-Загреб	2007
		3.	А. Туцовиќ	Генетика Биљака са Оплеменивањем	ШФ-Београд	1990
	22.2.	**Additional literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Тимоти Вајт Timothy L. White	Шумарска Генетика Forest Genetics	Кембриџ, САД Cambridge, MA, USA	2007
		2.	А. Туцовиќ	Практикум из Генетике са Оплеменивањем Биљака	ШФ-Београд	1987
		3.	А. Александров	Горска Генетика и Селекција на Горско-Дрвесните Видове	ШФ-Софија	1990

1. Title of course	Forest transport means		
2. Code	ШФ2014		
3. Study program	Forestry		
4. Organizer of the study program	UKIM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Zdravko Trajanov			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introducing of the techniques and technologies for construction of forest roads			
11. Course content Course Content: forest roads for hauling timber; importance of forest roads for forestry, construction elements of forest roads in the situation, longitudinal profile and cross section, depending on the structural elements of the road and the structural elements of the vehicle, building forest roads and maintenance of forest roads. Design and construction of forest roads for animal and tractor traction, structural elements in the situation, longitudinal and cross section, design of forest roads for delivery of wood, building forest roads for delivery of wood, protective measures against the erosive action of water on surface invades track extends the road; routes for skidding for the collection and supply of forest products, comparing the means of transport for the collection and supply of forest products, design and building of ginger, design, construction and maintenance of forest cableways.			
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work and via consultations. exercises (preparation of study - preliminary project of forest road), terrain teaching - exercises (tracing the road).			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points	
	17.2. Active participation in classes	up to 30 points	
	17.3. Final exam	up to 40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian		

21.	**Methods of monitoring the quality of teaching**		Internal evaluations and surveys			
22.	**Literature**					
	22.1.	**Compulsory literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	R. Akimovski	Forest transport means	Faculty of Forestry – Belgrade	1997
		2.	Z. Trajanov	Forest transport - authorized textbook	Faculty of Forestry - Skopje	2011
	22.2.	**Additional literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	S. Hristov	Forest transport	Faculty of Forestry – Sofia	1985
		2.	S. Angelov	Forest communication and transport	Faculty of Forestry – Skopje	2001

1. Title of course	Phytosociology 2				
2. Code	ШФ2016				
3. Study program	Forestry				
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje				
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate				
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6				
8. Lecturer: Full Prof. Dr. Jane Acevski					
9. Preconditions for enrollment of the subject	Dendrology 2 (enrolled as major)				
10. Course objectives (competences) By learning this course, students are upgrading their knowledge for forest communities that are prevalent in the country, their systematic affiliation, floristic composition, structure, and distribution and natural adaptation to specific site conditions.					
11. Course content The advanced study material consists of: Morphology of forest communities; Stand ecology (synecology); Stand dynamics (syndynamics); Synchronology; Synhorology; Classification (systematics) of forest communities; Typology of forests and pastures (an introduction).					
12. Learning methods Theoretical classes, field exercises, visit of forests and national parks; Field research, consultations.					
13. Total available time (duration of course)	180 hours				
14. Distribution of the available time	3+3				
15. Teaching activities	15.1. Lectures (theory)	45 hours			
	15.2. Practice (laboratory, auditory), seminars, team work	45 hours			
16. Other forms of activities	16.1. Project tasks	30 hours			
	16.2. Individual tasks	30 hours			
	16.3. Home learning	30 hours			
17. Assignments and grading	17.1. Seminar work / project	up to 30 points			
	17.2. Active participation in classes	up to 30 points			
	17.3. Final exam	up to 40 points			
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F		
	from 51 to 60 points	6 (six)	E		
	from 61 to 70 points	7 (seven)	D		
	from 71 to 80 points	8 (eight)	C		
	from 81 to 90 points	9 (nine)	B		
	from 91 to 100 points	10 (ten)	A		
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.				
20. Language in which lectures are held	Macedonian				
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys				
22. Literature					
22.1.	**Compulsory literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**

	1.	Ризовски Р.	Фитоценологија со основи на типологија на шумите и пасиштата	УКИМ-ШФС, Скопје (авторизирани предавања)	1999
	2.	Stefanović V.	Fitocenologija	Zavod za udžbenike i nastavna sredstva, Sarajevo	1986
	3.	Rauš Đ.	Šumarska fitocenologija	Šumarski fakultet, Sveučilište u Zagrebu, Zagreb	1987
22.2.	**Additional literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Acevski J., Simovski B.	E-materials of Phytosociology	UKiM FoF (auth. e-lect.)	2014
	2.	Венгер Ф. К.	Шумарство-прирачник	Академски печат, Скопје	2010

1. Title of course	Phytopharmacy and methods of application, Fungicides		
2. Code	ШФ2018		
3. Study program	Forestry; Landscaping and improvement of the environment		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Assoc. Prof. Dr. Irena Papazova-Anakieva			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Classification of pesticides with particular emphasis on fungicides, physicochemical properties, toxicology, mechanism of action of antifungal substances, symptoms of poisoning from pesticides, fungicide impact on plants.			
11. Course content Plant diseases in nursery production, and specific protection measures from them; soil borne pathogens, seed borne pathogens. Pesticide formulation. Nonpesticidal components. Physicochemical properties of pesticides. Biological properties of pesticides. Storage of pesticides and precautions; Fungicides. Classification of fungicides. Physicochemical properties of fungicides. Toxicology (way of entry of toxicants, mechanism of action of the active substances, toxicology, symptoms of poisoning, fungicides impact on plants. Modern fungicides. Fumigant fungicides. Wood protecting pesticides (fungicides and insecticides). Pesticide Application. Types of pesticide application.			
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work, and via consultations.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points	
	17.2. Active participation in classes	up to 30 points	
	17.3. Final exam	up to 40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22.	Literature					
	22.1.	**Compulsory literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Baltoski, B	Phytopharmacy	NIPRO, Nasa kniga	1981
		2.	Stankovik, A.	Phytopharmacy	DZBSS	1973
	22.2.	**Additional literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.				
		2.				

1. Title of course	Phytopharmacy and methods of application			
2. Code	ШФ2019			
3. Study program	Landscaping and improvement of the environment			
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje			
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate			
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6			
8. Lecturer: Prof. Dr. Nikola Nikolov				
9. Preconditions for enrollment of the subject	none			
10. Course objectives (competences) Getting familiar with the basic principles of plants health condition; getting familiar with the basic methods for plants protection; chemical methods and means; biological methods and means, administrative measures of protection.				
11. Course content Basic concepts and history. Classification of pesticides. Types and formulations of pesticide production. Non-pesticide components in pesticides. Physical-chemical characteristics of pesticides. Biological characteristics of pesticides. Storage of pesticides and measures of precaution. Rodenticides, Herbicides, Avicides				
12. Learning methods Theoretical lectures and practical exercises in classroom and field, and via consultations.				
13. Total available time (duration of course)	180 hours			
14. Distribution of the available time	3+3			
15. Teaching activities	15.1. Lectures (theory)			45 hours
	15.2. Practice (laboratory, auditory), seminars, team work			45 hours
16. Other forms of activities	16.1. Project tasks			30 hours
	16.2. Individual tasks			30 hours
	16.3. Home learning			30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points		
	17.2. Active participation in classes	up to 30 points		
	17.3. Final exam	up to 40 points		
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F	
	from 51 to 60 points	6 (six)	E	
	from 61 to 70 points	7 (seven)	D	
	from 71 to 80 points	8 (eight)	C	
	from 81 to 90 points	9 (nine)	B	
	from 91 to 100 points	10 (ten)	A	
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2. 17.1 min 15 points; 17.2 min 15 points; 17.3 min 21 points			
20. Language in which lectures are held	Macedonian (optional English)			
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys			
22. Literature				

22.1.	**Compulsory literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Б. Балтовски	Фитофармација	Скопје	**1981**
	2.	Рефик Нумич	Фитофармација	Сараево	**2000**
	3.				
22.2.	**Additional literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.				
	2.				

1. Title of course	Plant nutrition 2		
2. Code	ШФ2021		
3. Study program	Forestry ; Landscaping and improvement of the environment		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Kole Vasilevski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introduction to methods of plant nutrition, their relation to land and their characteristics important for forest trees. Competence to apply new knowledge in practice.			
11. Course content Teaching material covers the following topics: Introduction, Properties of the soil in terms of plant nutrition, The mineral and organic part of the soil as a source of food for plants, Adsorptive capacity of the soil (chemical and biological), Movement of soil nutrients, Fertility of the soil with nutritious macro and micro elements, Mineral and organic fertilizers, Types of fertilizers, Protection of fertilizers from losing nutrients, Storage of fertilizers, Foliar fertilizers, Physiologically active substances in plants, Theory of receiving ions from soils, Plant nutrition by macro and micro elements, Fertilization in nursery production, Foliar fertilization, Fertigation, Literature.			
12. Learning methods Teaching is conducted in the form of lecture, lab exercises, consultations, training and field exercises.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	6 (3+3) / 90		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points	
	17.2. Active participation in classes	up to 30 points	
	17.3. Final exam	up to 40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian (optional English)		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22. Literature

22.1. Compulsory literature

No.	Author/s	Title	Publisher	Year
1.	Vasilevski, K.	E-materials of Plant Nutrition	UKIM FoF (auth. e-lect.)	2012

22.2. Additional literature

No.	Author/s	Title	Publisher	Year
1.	Vukadinovic, V. Loncarcic, Z.	Ishrana bilja	SJJS - Osijek	1998
2.	Гулабоски, Р.	Агрохемија со исхрана на растенијата	УГД - Штип	2013

1. Title of course	Techniques for regeneration and silviculture of forests with special purposes		
2. Code	ШФ 2022		
3. Study program	Forestry; Landscape design		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Nikolcho Velkovski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introduction to techniques for silviculture of forests with special purposes. Ability to apply them in the forest ecosystems			
11. Course content Introduction, Definition of forests with special purpose, Types of forest with special purpose, Natural Forest and basic measures for care, analysis of the forest regeneration, Artificial ways of regeneration, Natural ways of regeneration, Natural conditions, Choice of way of regeneration, Techniques for natural regeneration by applying clear cuttings, techniques of natural regeneration by using selective techniques of natural regeneration by applying selective cuttings, Special techniques of natural regeneration, auxiliary measures for natural regeneration of the forest, application of different techniques of regeneration depending on the type of composition and purpose of the forest, reconstruction of law quality coppice forest with special function, measures for care of the forest, care of the forest in different development stages, protection of offspring and young plantations, filling the non-regenerated parts, cuttings as a measure of care , care by using cuttings for securing light for offspring, care by using cuttings for cleaning the offspring, care with thinning, good and bad sides of felling as a measure of care, care with trimming of branches Additional plantings, Special measures for care, application of modern methods intensive silviculture, Free technique of silviculture with application of measures of care, Silvicultural measures in matured forest stands.			
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work, and via consultations.			
13. Total available time (duration of course)	160 hours		
14. Distribution of the available time	5 (3+2) / 75		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		30 hours
16. Other forms of activities	16.1. Project tasks		40 hours
	16.2. Individual tasks		25 hours
	16.3. Home learning		20 hours
17. Assignments and grading	17.1. Seminar work / project	up to 20 points	
	17.2. Active participation in classes	up to 20 points	
	17.3. Final exam	up to 60 (2x30/60) points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A

19.	**Conditions for signature (verification of attendance of classes) and final exam**			Fulfillment of activities from 15.1 and 15.2.		
20.	**Language in which lectures are held**			Macedonian (optional English)		
21.	**Methods of monitoring the quality of teaching**			Internal evaluations and surveys		
22.	**Literature**					
	22.1.	**Compulsory literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Н. Велковски	Одгледување на шуми со посебна намена, скрипта	ШФ-Скопје	**2010**
		2.	М. Крстиќ	Гајење шума посебне намене	ШФ-Београд	**2008**
		3.	D. Milinšek	Slobodna tehnika gajenja šuma na osnovu nege	JPŠC-Beograd	**1968**
	22.2.	**Additional literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Т. Бунушевац	Техника обнове и гајења шума	ШФ-Београд	**1950**
		2.	D. Milinšek	Uvodjenje savremenih metoda intenzivnog gajenja	JPŠC-Beograd	**1965**
		3.	Г. Костов & В. Стипцов	Учебно помагало по обшо лесовъдство	БШПГ Силвика-СофиЯ	**2004**
		4.	Клаус фон Гедоу & Јирген Нагел & Јоаким Саборовски	Шумарство засновано на постојана покровност	Издавачки центар ТРИ-Скопје	**2009**
		5.				

1.	**Title of course**	Forest stand productivity			
2.	**Code**	ШФ2024			
3.	**Study program**	Forestry			
4.	**Organizer of the study program**	UKiM Faculty of Forestry in Skopje			
5.	**Degree (undergraduate, postgraduate, doctoral)**	Postgraduate			
6.	**Semester:** 9 (winter semester)	**7. Number of ECTS:**6			
8.	**Lecturer:** Prof. Dr. Pande Trajkov				
9.	**Preconditions for enrollment of the subject**				
10.	**Course objectives (competences):** Introduction with the single trees growth, forest stand dynamics, productivity of forests in R. Macedonia. Possibilities to increasing forest stand productivity.				
11.	**Course content:** Growth of single trees. Comparative analysis of the growth of different tree species, analysis by height, diameter, basal area and volume. Interactions between trees. Tree species competition. The limiting growth factors. Development of stand. Analysis of tree growing space, biological and numerical differentiation of the trees in a stand, tree's crown elements, size and development of the tree's crown. Productivity of stands. Productivity of forestc in R. Macedonia depending on tree species, the form of management, and the conditions of growth place. Productivity of forests in other European countries. Capabilities of improving the productivity of forests in R. Macedonia.				
	Learning methods: auditory and audio-visual Theoretical classes, exercises, consultations, individual work.				
13.	**Total available time (duration of course)**	180 hours			
14.	**Distribution of the available time**	3 + 3			
15.	**Teaching activities**	15.1. Lectures (theory)		45 hours	
		15.2.Practice (laboratory, auditory), seminars, team work		45 hours	
16.	**Other forms of activities**	16.1.Project tasks		30 hours	
		16.2.Individual tasks		30 hours	
		16.3.Home learning		30 hours	
17.	**Assignments and grading**	17.1. Seminar work / project	20 points		
		17.2. Active participation in classes	10 points		
		17.3. Final exam	70 points 5 points		
18.	**Evaluation criteria (points / grade)**	up to 50 points	5 (five)	F	
		from 51 to 60 points	6 (six)	E	
		from 61 to 70 points	7 (seven)	D	
		from 71 to 80 points	8 (eight)	C	
		from 81 to 90 points	9 (nine)	B	
		from 91 to 100 points	10 (ten)	A	
19.	**Conditions for signature (verification of attendance of classes) and final exam**	Fulfillment of the activities 15.1 and 15.2			
20.	**Language in which lectures are held**	Macedonian			
21.	**Methods of monitoring the quality of teaching**	-Internal evaluations and surveys.			
22.	**Literature**				

22.1.	Obligatory literature				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	C. Ivanovski	Growth of forests	UKIM	**1991**
	2.	V. Stamenovik & M. Vuckovik	Growth and productivity of stems and forest stands	F.F. Belgrade	**1988**

22.2.	Recommended/ Additional literature				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Chadwick D. Oliver & Bruce C. Larson	Forest stand dynamics	John Wiley & Sons Inc.	**1996**
	2.	Dusan Klepac	Growth of forest type of trees and forest stands	Nakladni zavod znanja, Zagreb	**1963**

1. Title of course	Theory of landscape and urbanism		
2. Code	ШФ2025		
3. Study program	Landscaping and improvement of the environment		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Vlatko Andonovski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introduction to theoretical concepts of landscape, architecture and urban disciplines. Application of theoretical knowledge, ethics and methodologies that are relevant to the design, community and research projects, and appropriate communication with other trans-disciplinary techniques from the social and spatial dimension in the landscape and urban planning.			
11. Course content Theory of Landscape and Urbanism explores critical and theoretical discourses landscape architecture and urban planning, which are subject to the design and planning of cities and other urban areas. The course program has an emphasis on landscape, architecture and urban planning, in order to open an interdisciplinary connections with other social, environmental and spatial concepts. To understand how historical and contemporary theories of art, ecology, geography, sociology, anthropology and architecture can be applied to the design of cities, landscapes and territories. In particular social, environmental, political and spatial relations that produce modern cities are part of the contents of this course.			
12. Learning methods Lectures, auditory exercises, project work, consultations, independent work.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		30 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 20 points	
	17.2. Active participation in classes	up to 20 points	
	17.3. Final exam	up to 60 (2x30/60) points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian (optional English)		
21. Methods of monitoring the quality of	Internal evaluations and surveys		

	teaching					
22.	**Literature**					
	22.1.	**Compulsory literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	В. Андоновски	Пејзажно и Дизајн во Зелените Површини	ШФ-Скопје	2005
		2.	Ц. Валдхајм	Урбанизам на Пејзажот	Принстон, САД	2006
	22.2.	**Additional literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	M. Mostafavi, G. Doherty	Ecological Urbanism	Harvard University, USA	2010
		2.	A. Duany, E. Talen	Landscape Urbanism and its Discontents	New Society Publishers, Canada	2013

Title of course	Breeding (Improvement) of forest trees and ornamental plants, 2		
2. Code	ШФ2027		
3. Study program	Forestry		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Vlatko Andonovski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Formation of professional staff who will have broad knowledge of the improvement of forest trees and ornamental plants. Capacity for practical application in forestry and greening.			
11. Course content Mass selection and its importance for the modern production of seedlings for forestry and greening (problem and possible solutions) individual selection: intensity (criteria), finding and using the numeric index for the construction of "plus trees", selection of one or more properties, selection of trees in stands, selection of stem quality, heredity, the environment and selection modern principles, methods and technique for breeding of forest tree species and ornamental plants, problems of genetics in the regulation of heterosis of forest trees and ornamental plants, induced mutations and their importance in breeding, polyploidy, advancements in refinement of forest trees and ornamental plants.			
12. Learning methods Lectures, auditory exercises, project work, consultations, independent work.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		30 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 20 points	
	17.2. Active participation in classes	up to 20 points	
	17.3. Final exam	up to 60 (2x30/60) points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian (optional English)		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22.	Literature					
	22.1.	**Compulsory literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	А. Андоноски	Генетика и облагородување на шумските дрвја	ШФ-Скопје	1994
		2.	И. Илиев	Шумарска Генетика	ШФ-Софија	2001
		3.	М. Видаковиќ, А. Крстиниќ	Генетика и Оплеменивање Шумског Дрвеќа	ШФ-Загреб	1985
	22.2.	**Additional literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	G. Erikson, I. Ekberg, D. Clapham	An Introduction to Forest Genetics	SLU Uppsala, Sweden	2006
		2.	B. Zobel, J. Talbert	Applied Forest Tree Improvement	North Carolina State University, USA	1984
		3.	T.L. White, W.T. Adams, D.B. Neale	Forest Genetics	CABI Publishing, USA	2007

1. Title of course	Opening the forests 2		
2. Code	ШФ2028		
3. Study program	Forestry		
4. Organizer of the study program	UKIM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Zdravko Trajanov			
9. Preconditions for enrollment of the subject	Previously listened to, Forest transport or Forest harvesting		
10. Course objectives (competences) Introducing the optimal road network for transport of wood			
11. Course content Optimization of the road network in the transport of the tree, opening the forest with a network of primary (export) of forest roads, basic principles of opening up of forests, gathering necessary data to prepare a master plan for the opening of forests, planning the density of the road network, design the road network. Opening the forest with a network of secondary (skidding) roads; basic principles of opening up forests to secondary roads, planning the density of the secondary road network, design of the secondary road network.			
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work and via consultations. exercises (preparation of study - a master plan for the opening of forests).			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points	
	17.2. Active participation in classes	up to 30 points	
	17.3. Final exam	up to 40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22. Literature

Compulsory literature

	No.	Author/s	Title	Publisher	Year
22.1.	1.	Z. Trajanov	Models of optimal solutions of forest transport depending on the type of woodcutting at forest management	Faculty of Forestry – Skopje	2008
	2.	V. Jelacic	Opening of the primary and secondary network rood	Faculty of Forestry – Belgrade	1983

Additional literature

	No.	Author/s	Title	Publisher	Year
22.2.	1.	Z. Trajanov	Opening forest - authorized textbook	Faculty of Forestry – Skopje	2013
	2.	B. Mihic	Opening forest, design and construction of forest roads	Faculty of Forestry – Sarajevo	1972

1. Title of course	Air pollution and health condition of forests and of decorative tree species			
2. Code	ШФ2029			
3. Study program	Forestry			
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje			
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate			
6. Semester: 1 (summer semester)	**7. Number of ECTS:** 6			
8. Lecturer: Prof. Dr. Nikola Nikolov				
9. Preconditions for enrollment of the subject	none			
10. Course objectives (competences) Introducing with mechanism of air pollution origination and its manifestation at global and regional level. The ultimate goal is getting familiar with influence of air pollution of forests, as well as getting familiar with measures of protection**.**				
11. Course content Main sources and mechanisms of air pollution origination. Ways of expansion, transport and deposition of the air pollution. Influence of the air pollution of the forests and decorative plants. Measures of protection.				
12. Learning methods Theoretical lectures and practical exercises in classroom and field, and via consultations.				
13. Total available time (duration of course)	180 hours			
14. Distribution of the available time	3+3			
15. Teaching activities	15.1. Lectures (theory)			45 hours
	15.2. Practice (laboratory, auditory), seminars, team work			45 hours
16. Other forms of activities	16.1. Project tasks			30 hours
	16.2. Individual tasks			30 hours
	16.3. Home learning			30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points		
	17.2. Active participation in classes	up to 30 points		
	17.3. Final exam	up to 40 points		
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F	
	from 51 to 60 points	6 (six)	E	
	from 61 to 70 points	7 (seven)	D	
	from 71 to 80 points	8 (eight)	C	
	from 81 to 90 points	9 (nine)	B	
	from 91 to 100 points	10 (ten)	A	
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2. 17.1 min 15 points; 17.2 min 15 points; 17.3 min 21 points			
20. Language in which lectures are held	Macedonian (optional English)			
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys			
22. Literature				

22.1.	**Compulsory literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Ashmor M.R., Bell J.N.B. and Brown J.I	AIR POLLUTION AND FOREST ECOSYSTEMS IN THE EUROPEAN COMMUNITY	London	**1990**
	2.	Markert, B.	Element Concentration Cadastars in Ecosystems	Paris	**1994**
22.2.	**Additional literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Jovic D. et al	Monitoring vlazne i suve depozicije u sumskim ekosistemima, Aerozagadjenje i sumski ekosistem	Beograd	**1994**
	2.	Jims, I. Morison, L & Mikle M.	Plant development and climate change	Skopje	**2009**

1. Title of course	Diseases and insects in forest nurseries		
2. Code	ШФ2030		
3. Study program	Forestry / Greening and Improvement of the Environment		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	postgraduate		
6. Semester: 9, winter semester	**7. Number of ECTS:** 6		
8. Lecturer: Assoc. Prof. Dr. Irena Papazova-Anakieva Full Prof. Dr.Sterja Nacevski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) This course provides an introduction to the most important plant diseases and pests in nursery production, and the methods, measures, strategies used in the control or management of plant diseases and pests.			
11. Course content Plant diseases in nursery production, and specific protection measures from them; soilborn pathogens, seed borne pathogens, (*Penicillium, Rhizopus, Trichoderma, Aspergillus, Alternaria, Cladosporium, Chaetomium, Trichothecium, Paecelomyces, Fusarium, Curvularia, Rihizoctonia, Gonatobotrys, Gliocladium, Botrytis, Verticillium, Achaetomium, Aureobasidium, Dermatophora* etc.), pathogens causing damping-off and root rot of seedlings (Oomycota, *Fusarium spp., Botrytis cinerea, Alternaria alternata, Rhizoctonia solani*), sapling pathogens (*Apiognomonia veneta, Guignardia aesculi, Herpotrichia juniperi, Kabatina thujae, Lirula nervisequia, Lophodermium seditiosum, L.pinastri, Melampsora pinitorqua, Microsphaera alphitoides, M.diffusa, Mycosphaerella pini, Nectria cinnabarina, N.galligena, Pestalotiopsis funerea, Rhabdocline pseudotsugae, Rhizoctonia solani, Seiridium cardinale, Valsa sordida,* etc.), bacterial disease, viral disease. Insects in nursery production: Fam. Gryllotalpidae; Fam. Scarabaeidae; Fam. Elateriae; Fam. Curculionidae; Fam. Noctuidae; Fam. Tipulidae; Fam. Aphididae; Fam. Chermesidae; Fam. Coccidae; Fam. Pseudococcidae; Fam. Aurodidae.			
12. Learning methods Theoretical classes, laboratory and field exercises, assignments, preparation of seminar works, individual presentation (.ppt) and paper work, and via consultations.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points	
	17.2. Active participation in classes	up to 30 points	
	17.3. Final exam	up to 40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A

19.	**Conditions for signature (verification of attendance of classes) and final exam**		Fulfillment of activities from 15.1 and 15.2.		
20.	**Language in which lectures are held**		Macedonian		
21.	**Methods of monitoring the quality of teaching**		Internal evaluations and surveys		
22.	**Literature**				
	Compulsory literature				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
22.1.	**1.**	Papazova-Anakieva,I	Important plant pathogens in nurseries for production of forest and ornamental plants in R. Macedonia	UKIM-FOF	2007
	2.	Karadzič, D. & Andelič	Bolesti u šumskim rasadnicima	ШФ-Белград	2001
	Additional literature				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
22.2.	**1.**	Sutherland, J.R et al.	Forest tree seed health for germlasm conservation	IPGRI Technical Bulletin No.6	2001
	2.	Jones, R.K., Benson, D.M	Diseases of woody ornamentals and trees in nurseries	APS Press	2001

1. Title of course	Gene conservation and genetic engineering		
2. Code	ШФ2032		
3. Study program	Forestry		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Vlatko Andonovski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introduction to methods of gene conservation and forest genetic resources. Introduction to the methods of genetic engineering and its application in forestry and horticulture. Capacity for practical application in forestry and greening.			
11. Course content Protection of Genetic fund of natural populations: genetic variability, selection of traits for detection of Genetic fund, criteria for selection of genetic resources, possibilities for fixing genetic fund of natural populations. Basics of genetic engineering and biotechnology in forest tree species and ornamental plants and its application, genetic manipulation of plant DNA, clonal forestry, genetic modification of plant genomes.			
12. Learning methods Lectures, auditory exercises, project work, consultations, independent work.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		30 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 20 points	
	17.2. Active participation in classes	up to 20 points	
	17.3. Final exam	up to 60 (2x30/60) points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian (optional English)		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22.	Literature					
		Compulsory literature				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
	22.1.	**1.**	М.Ш. Николиќ, J Миловановиќ	Конзервација и усмерено коришќење шумских генетичких ресурса	ШФ-Београд	2007
		2.	Т. Гебурек, J. Турок	Конзервација и управување со Шумските Генетски Ресурси во Европа	АРБОРА - Братислава	2005
		Additional literature				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
	22.2.	**1.**	A.G. Young, D.Boshier, T. J. B. Boyle	Forest Genetic Conservation, Principles and Practice	Универзитет у Београду	2006
		2.	P. Baradat	Population Genetics and Genetic Conservation of Trees	ФАО - Рим FAO - Rom	1994

1.	**Title of course**	Forest inventory		
2.	**Code**	ШФ2034		
3.	**Study program**	Forestry		
4.	**Organizer of the study program**	UKiM Faculty of Forestry in Skopje		
5.	**Degree (undergraduate, postgraduate, doctoral)**	Postgraduate		
6.	**Semester:**9 (winter semester)	**7. Number of ECTS:** 6		
8.	**Lecturer:** Prof. Dr. Pande Trajkov			
9.	**Preconditions for enrollment of the subject**			
10.	**Course objectives (competences):** To enable the students for organization and execution of forest inventory.			
11.	**Course content:** Operational measuring of single trees (measuring the diameter, crown, bark thickness, height). Finding out the size of the stem (basal area, length and area of the crown, volume of the stem, volume of the bark). Volume tables (creating and using). Finding out the weight of the tree. Forest management inventory. Sampling methods, choosing the size and shape of sample areas. Finding out the size of the structural elements of the plantation: number of trees in the plantation, height of trees – height curve, stand basal area, stand volume, assortments of stand volume. Complete or total forest inventory – control method of measuring the forest. National forest inventory. Special forest inventory (measuring damage, aesthetic measuring of forests, urban forest inventory).			
	Learning methods: auditory and audio-visual Theoretical classes, exercises, consultations, individual work.			
13.	**Total available time (duration of course)**	180 hours		
14.	**Distribution of the available time**	3 + 3		
15.	**Teaching activities**	15.1. Lectures (theory)		45 hours
		15.2.Practice (laboratory, auditory), seminars, team work		45 hours
16.	**Other forms of activities**	16.1.Project tasks		30 hours
		16.2.Individual tasks		30 hours
		16.3.Home learning		30 hours
17.	**Assignments and grading**	17.1. Seminar work / project	20 points	
		17.2. Active participation in classes	10 points	
		17.3. Final exam	70 points	
18.	**Evaluation criteria (points / grade)**	up to 50 points	5 (five)	F
		from 51 to 60 points	6 (six)	E
		from 61 to 70 points	7 (seven)	D
		from 71 to 80 points	8 (eight)	C
		from 81 to 90 points	9 (nine)	B
		from 91 to 100 points	10 (ten)	A
19.	**Conditions for signature (verification of attendance of classes) and final exam**	Fulfillment of the activities 15.1 and 15.2		
20.	**Language in which lectures are held**	Macedonian		
21.	**Methods of monitoring the quality of teaching**	-Internal evaluations and surveys.		

22. Literature

22.1. Obligatory literature

No.	Author/s	Title	Publisher	Year
1.	Pranic Ana, Lukic Nikola	Measuring forests	Zagreb University	**1997**
2.	Mihajlov Ilija	Dendrometry	UKIM	**1965**

22.2. Reccomended/ Additional literature

No.	Author/s	Title	Publisher	Year
1.	Michael S. Philip	Measuring trees and forests	Cab International	**1994**
2.	Gene W. Grey & Frederick J. Deneke	Urban forestry	Kringer Publishing Company	**1992**
3.				

1. Title of course	Quarantine diseases		
2. Code	ШФ2035		
3. Study program	Forestry; Landscaping and improvement of the environment		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	postgraduate		
6. Semester: I / IX	**7. Number of ECTS:** 6		
8. Lecturer: Assoc. Prof. Dr. Irena Papazova-Anakieva			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) This course provides an introduction to the administrative and legal aspects of the quarantine; ecology, biology and economical aspects of the most important quarantine diseases for forestry and horticulture.			
11. Course content Definition of quarantine. European legislation. Macedonian legislation. Administrative services and bodies responsible for plant health in Macedonia. Quarantine disease - fungi, bacteria, mycoplasmas, viruses, viroids and other pathogens (environmental and economic importance, origin, biology, characteristics, environmental and economic expectations).			
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work, and via consultations.			
13. Total available time (duration of course)	180 hours 180 часови		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points	
	17.2. Active participation in classes	up to 30 points	
	17.3. Final exam	up to 40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22.	Literature					
	22.1.	Compulsory literature				
		No.	Author/s	Title	Publisher	Year
		1.	DAISIE	Handbook of alien species in Europe	Springer	2008
	22.2.	Additional literature				
		No.	Author/s	Title	Publisher	Year
		1.				
		2.				

1. Title of course	Methods of diagnosis and eradication of epixylous fungi in untreated and treated wood		
2. Code	ШФ2039		
3. Study program	Forestry		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	postgraduate		
6. Semester: 9, winter semester	**7. Number of ECTS:** 6		
8. Lecturer: Assoc. Prof. Dr. Irena Papazova-Anakieva			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introduction to the causes of the decay of untreated and treated wood (art and museum objects) as well as methods for their isolation, identification and protection measures from wood inhabiting fungi.			
11. Course content Wood decay diagnostic methods. Invasive isolation methods of wood-decaying fungi. Noninvasive isolation methods of wood-decaying fungi. Artificial cultures. Identification of wood-decaying fungi with artificial cultures. Determination of the level of wood decay. Determination of the level of threat of artefacts from the wood decay. Methods of protection. Modern methods of eradication of the cause of decay. Wood protecting pesticides. Wood-decaying fungi (morphology, ecology, biology, rot type, protective measures).			
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work, and via consultations.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points	
	17.2. Active participation in classes	up to 30 points	
	17.3. Final exam	up to 40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22.	Literature					
	22.1.	**Compulsory literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Krstik, M	Wood protection-2,	SFB	2001
		2.	Unger,A., Schniewind, A.P., Unger, W	Conservation of wood artifacts: a handbook.	Springer,	2001
	22.2.	**Additional literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.				
		2.				

1. Title of course	Mechanization for transport of wood		
2. Code	ШФ2040		
3. Study program	Forestry		
4. Organizer of the study program	UKIM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Zdravko Trajanov			
9. Preconditions for enrollment of the subject	Previously listened to, Forest transport or Forest harvesting		
10. Course objectives (competences) Studying the current and contemporary machinery used in the transport of wood			
11. Course content The course taught the following content: resistance to the movement of the tree in traction, machines and mechanisms for delivery of wood assortments (tractors, cable wood, skidder), machinery transport (tractors, trucks), construction machinery forestry vehicles (tractors, scrapers, graders, excavators, compressors, rollers, etc.). Modern machines for transporting wood and technology to work for them. Economic justification for the use of certain machines in forestry.			
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work and via consultations.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points	
	17.2. Active participation in classes	up to 30 points	
	17.3. Final exam	up to 40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22.	Literature					
		Compulsory literature				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
	22.1.	**1.**	S. Nikolic	Forestry mechanization	Faculty of Forestry – Belgrade	1997
		2.	H. Statkov	Forestry mechanization	Faculty of Forestry – Sofia	1985
		Additional literature				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
	22.2.	**1.**	M. Simonovic	Forestry transport means	Faculty of Forestry – Belgrade	1979
		2.				

1. Title of course	Microbiology in forestry		
2. Code	ШФ 2041		
3. Study program	Forestry; Landscaping and improvement of the environment		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Kiril Sotirovski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introduction of basic principles and concepts in microbiology from aspect of relatedness to ecology and forestry.			
11. Course content Introduction to microbiology. Historical developments. Emergence and origin of life. Systematics of the living world. Associations between microorganisms. Endosymbiotic theory, primary, secondary and tertiary endosymbiosis. Algae (morphology, biology, systematics, role and importance for the environment); Lichens (morphology, biology, systematics, lichens as indicators for air pollution, role for the environment). Fundamentals of bacteriology. Basic make-up and terms of the bacterium cell. Bacteriological methods. Archaea (biochemical characteristics, types, role and importance, classification). Mycorrhizae (basics, biology, characteristics, types, benefits for symbionts). Actinorhiza. Endophytes.			
12. Learning methods Lectures, auditory classes, consultations, individual work.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	30 points	
	17.2. Activities and participation in classes	30 points	
	17.3. Final exam	40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Condition for signature: Fulfilment of activities 15.1 and 15.2		
20. Language in which lectures are held	Macedonian (optional English)		
21. Methods of monitoring the quality of teaching	-internal evaluation -questionnaire		

22.	Literature					
	22.1.	**Compulsory literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Willey, J., Sherwood, L., Woolverton, C,	Microbiology (selected chapters)	McGraw - Hill Science Engineering	**2007**
	22.2.	**Additional literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.				
		2.				

1. Title of course	Poisonous, medicinal and edible plants 2				
2. Code	ШФ2042				
3. Study program	Forestry; Landscaping and improvement of the environment				
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje				
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate				
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6				
8. Lecturer: Full Prof. Dr. Jane Acevski					
9. Preconditions for enrollment of the subject	none				
10. Course objectives (competences) Poisonous, medicinal and edible woody plants in the country, its importance for use during visit or work in forests and greening of public and private spaces; Nutritional and pharmacological usage.					
11. Course content Toxic and edible woody plants; Poisonous, medicinal and edible plant anatomical parts and organs; Special emphasis on Macedonian poisonous, medicinal and edible dendroflora; Identification of poisonous, medicinal and edible woody plants in Macedonia; Importance and possibility of utilization.					
12. Learning methods Lectures, laboratory and field exercises, field work, visiting forests, public and private green spaces, facilities for collection and processing of berries (forest fruits); Consultations.					
13. Total available time (duration of course)	180 hours				
14. Distribution of the available time	3+3				
15. Teaching activities	15.1. Lectures (theory)	45 hours			
	15.2. Practice (laboratory, auditory), seminars, team work	45 hours			
16. Other forms of activities	16.1. Project tasks	30 hours			
	16.2. Individual tasks	30 hours			
	16.3. Home learning	30 hours			
17. Assignments and grading	17.1. Seminar work / project	up to 30 points			
	17.2. Active participation in classes	up to 30 points			
	17.3. Final exam	up to 40 points			
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F		
	from 51 to 60 points	6 (six)	E		
	from 61 to 70 points	7 (seven)	D		
	from 71 to 80 points	8 (eight)	C		
	from 81 to 90 points	9 (nine)	B		
	from 91 to 100 points	10 (ten)	A		
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.				
20. Language in which lectures are held	Macedonian				
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys				
22. Literature					
22.1.	**Compulsory literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**

	1.	Grlić Lj.	99 jestivih i otrovnih boba	Prosvjeta, Zagreb	1984
	2.	Џеков С.	Дендрологија (одбрани поглавја)	УКИМ-ШФС, Скопје	1988
22.2.	**Additional literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Балтоски Б.	Фитофармација	Наша книга	1981
	2.	Станковиќ А.	Фитофармација, 1 и 2		
	3.	Kothe W. H.	1000 Kräuter	Naumann & Göbel Verlagsgesellschaft mbH, Köln	2006
	4.	Teuscher E.	Gewürzdrogen	Wissenschaftliche Verlagsgesellschaft mbH., Stuttgart	2002
	5.	World Wide Web			

1. Title of course	Basics of forest pyrology				
2. Code	ШФ2043				
3. Study program	Forestry				
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje				
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate				
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6				
8. Lecturer: Prof. Dr. Nikola Nikolov					
9. Preconditions for enrollment of the subject	none				
10. Course objectives (competences) Introducing of forest pyrology and basic principles of fire protection in open areas. The ultimate goal is introduction to influence of the fires of forests and planted green areas, as well introduction to measures of protection.					
11. Course content Basic principles of combustion; Factors which influence the occurrence and spread of fires; Measures of prevention; Measures of preparedness; Measures of forest fires suppression.					
12. Learning methods Theoretical lectures and practical exercises in classroom and field, and via consultations.					
13. Total available time (duration of course)	180 hours				
14. Distribution of the available time	3+3				
15. Teaching activities	15.1. Lectures (theory)				45 hours
	15.2. Practice (laboratory, auditory), seminars, team work				45 hours
16. Other forms of activities	16.1. Project tasks				30 hours
	16.2. Individual tasks				30 hours
	16.3. Home learning				30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points			
	17.2. Active participation in classes	up to 30 points			
	17.3. Final exam	up to 40 points			
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F		
	from 51 to 60 points	6 (six)	E		
	from 61 to 70 points	7 (seven)	D		
	from 71 to 80 points	8 (eight)	C		
	from 81 to 90 points	9 (nine)	B		
	from 91 to 100 points	10 (ten)	A		
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2. 17.1 min 15 points; 17.2 min 15 points; 17.3 min 21 points				
20. Language in which lectures are held	Macedonian (optional English)				
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys				
22. Literature					
22.1.	**Compulsory literature**				
	No.	**Autho /s**	**Title**	**Publisher**	**Year**

	1.	Timo V.H at all	Wildland fire management	Halsinki	**2007**
	2.	Group of autors	Vegetation Fires and Global Change	Frieburg	**2013**
	3.	Group of autors	EuroFire standars and training materials	Frieburg	**2007**
22.2.	**Additional literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.				
	2.				

1. Title of course	Basic principles and methods in science		
2. Code	ШФ 2044		
3. Study program	Forestry, Landscaping and improvement of the environment		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Kiril Sotirovski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introduction and learning the basic principles and methods in setting scientific research, collection and analyses of data, publication and presentation of results.			
11. Course content Evolution of scientific thought from past to present. What is science? Contemporary understanding of science. Choice of research problem (In fundamental science, in applied science; Cost of experiments and trials; Priorities and similar questions; Moral and ethical norms and standards). Search of literature (Importance, structure of scientific literature; Means of search, use of databases). Basic scientific principles (Authority in science; Observation and description; Cause and effect; Analysis and synthesis; Hypothesis; deduction; Testing of hypothesis, search for cause, errors). Setting up (design) of experiments (Basic principles; Variables; Choice of sample; Controls and standards; Psychological subjectivity; Replication). Execution of experiments (Basic notes; Notebooks and data; Psychological aspects; Principles of research; Fixing errors). Errors in measurement. Probability. Randomness (Use of tables for random numbers). Communication in science (writing of scientific articles and their publication; Structure of scientific publications; Presenting data in tables, diagrams, pictures and graphs; Writing other types of publications (Seminar work, masters theses, doctoral theses). Citing used literature (use of software for reference and citing). Ethical norms in publishing scientific articles. Research projects (from idea through proposal to realization).			
12. Learning methods Lectures, auditory classes, consultations, individual work.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	30 points	
	17.2. Activities and participation in classes	30 points	
	17.3. Final exam	40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Condition for signature: Fulfilment of activities 15.1 and 15.2		
20. Language in which lectures are held	Macedonian (optional English)		

21.	**Methods of monitoring the quality of teaching**		-internal evaluation -questionnaire			
22.	**Literature**					
	22.1.	**Compulsory literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Bright Wilson, Jr. E.	An introduction to scientific research	Dover publications, inc. New York	1990
		2.	Silobrcic, V.	Kako sastavti I objaviti naucno djelo	Jumena, Zagreb	1989
	22.2.	**Additional literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Carey, S.	A beginner's guide to scientific method	Wadssworth Publishing company	1989
		2.	Cargill, M., O.Connor, P.	Writing Scientific Research Articles: Strategy and Steps	Blackwell Publishing	2007
		3.	Valiela, I.	Doing Science: Design, Analysis, and Communication of Scientific Research	Oxford University Press	2001

1. Title of course	Basic phytopathological research methods		
2. Code	ШФ 2045 Phytopathology		
3. Study program	Forestry; Landscaping and improvement of the environment		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Kiril Sotirovski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introduction to the basic (classical) methods of research used in phytopathology, and their application.			
11. Course content Principles and methods of field work; collection and storing of pathogenic organisms. Sterilization of lab equipment; work in sterile conditions; preparation of nutritious media; types of media; isolation of pathogens in pure cultures; methods of pathogenicity testing; Koch's postulates; methods for detection of pathogens; microscopy and microscopic measurement; preparation of samples and analyses; photomicrography and analysis; specific methods for specific diseases.			
12. Learning methods Lectures, auditory classes, consultations, individual work.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	30 points	
	17.2. Activities and participation in classes	30 points	
	17.3. Final exam	40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Condition for signature: Fulfilment of activities 15.1 and 15.2		
20. Language in which lectures are held	Macedonian (optional English)		
21. Methods of monitoring the quality of teaching	-internal evaluation -questionnaire		

22.	Literature					
		Compulsory literature				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
	22.1.	**1.**	Sumia F., Vasant B. K.	In Vitro Phytopathology (Laboratory Manual of Plant Pathology)	Lambert Academic Publishing	
		2.	Grimstone, A.V.; Skaer, R.J.	A guidebook to microscopical methods	Cambridge at the University Press	1972
		3.	Blanchard, R.O.; Tattar, T.O.	Field and laboratory guide to tree pathology	Academic Press	1981
	22.2.	**Additional literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**

1. Title of course	Typology of forests and pastures			
2. Code	ШФ2048			
3. Study program	Forestry			
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje			
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate			
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6			
8. Lecturer: Full Prof. Dr. Jane Acevski				
9. Preconditions for enrollment of the subject	none			
10. Course objectives (competences) Typology and classification of forests and forest communities in the Republic of Macedonia.				
11. Course content Synecology, syndynamics, synhorology, typology of forests and pastures according to various classification schemes and schools, importance of forest typology in forest management and silviculture.				
12. Learning methods Interactive theoretical classes using print and e-material, consultations.				
13. Total available time (duration of course)	180 hours			
14. Distribution of the available time	3+3			
15. Teaching activities	15.1. Lectures (theory)	45 hours		
	15.2. Practice (laboratory, auditory), seminars, team work	45 hours		
16. Other forms of activities	16.1. Project tasks	30 hours		
	16.2. Individual tasks	30 hours		
	16.3. Home learning	30 hours		
17. Assignments and grading	17.1. Seminar work / project	up to 30 points		
	17.2. Active participation in classes	up to 30 points		
	17.3. Final exam	up to 40 points		
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F	
	from 51 to 60 points	6 (six)	E	
	from 61 to 70 points	7 (seven)	D	
	from 71 to 80 points	8 (eight)	C	
	from 81 to 90 points	9 (nine)	B	
	from 91 to 100 points	10 (ten)	A	
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.			
20. Language in which lectures are held	Macedonian			
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys			

22. Literature

22.1. Compulsory literature

No.	Author/s	Title	Publisher	Year
1.	Jović N., Tomić Z., Jović D	Tipologija šuma	Šumarski fakultet, Univerzitet u	1989

				Beogradu, Beograd (skripta)	
	2.	Ризовски Р.	Фитоценологија со основи на типологија на шумите и пасиштата	УКИМ-ШФС, Скопје (авторизирани предавања)	1999
22.2.	**Additional literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Stefanović V.	Fitocenologija	Zavod za udžbenike i nastavna sredstva, Sarajevo	1986
	2.	Rauš Đ.	Šumarska fitocenologija	Šumarski fakultet, Sveučilište u Zagrebu, Zagreb	1987
	3.	Венгер Ф. К.	Шумарство-прирачник	Академски печат, Скопје	2010

1. Title of course	Technical mechanics		
2. Code	ШФ2049		
3. Study program	Forestry		
4. Organizer of the study program	UKIM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Zdravko Trajanov			
9. Preconditions for enrollment of the subject	Previously listened to Forest transport or Forest harvesting		
10. Course objectives (competences) The objectives of the subject program is to introduce the students at the problems of the technical mechanics as well acquainted with the link of the technical mechanics with the means in forest transport vehicles.			
11. Course content Measures and measurement systems; Statics (basic notions and laws); Kinematics; The dynamics; Strength of materials; The basic terms and procedures for the resolution of the stability of one facility in practice. Dating the role and function of the objects that are most often seen in practice and resolution of the stability of that means.			
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work and via consultations. Exercises (preparation of feasibility study of the technical mechanics).			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)	45 hours	
	15.2. Practice (laboratory, auditory), seminars, team work	45 hours	
16. Other forms of activities	16.1. Project tasks	30 hours	
	16.2. Individual tasks	30 hours	
	16.3. Home learning	30 hours	
17. Assignments and grading	17.1. Seminar work / project	up to 30 points	
	17.2. Active participation in classes	up to 30 points	
	17.3. Final exam	up to 40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22.	Literature					
		Compulsory literature				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
	22.1.	**1.**	Z. Trajanov	Introduction to construction - authorized textbook	Faculty of Forestry - Skopje	2010
		2.	Н. Балед	Forest construction	Faculty of Forestry - Skopje	1964
		Additional literature				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
	22.2.	**1.**	M. Simonovic	Technical mechanic	Faculty of Forestry – Belgrade	1979
		2.	B. Dulic	Statics and strength of the materials	Prosfetno delo	1978

1. Title of course	Urban forestry			
2. Code	ШФ2051			
3. Study program	Forestry			
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje			
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate			
6. Semester: 9, winter semester	**7. Number of ECTS:** 6			
8. Lecturer: Full Prof. Dr. Jasminka Rizovska Atanasovska				
9. Preconditions for enrollment of the subject	None			
10. Course objectives (competences) Introduction with functions and role of the urban forests.				
11. Course content History of the urban forests. Functions of the urban forests. Resources of urban forests. Planning and designing of urban forests. Choosing plants for raising urban forests. The influence of the urban environment conditions on plants. Protection of the urban environment. Inventory and protection of the urban forests. Locations for raising trees and bushes.				
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work, and via consultations.				
13. Total available time (duration of course)	180 hours			
14. Distribution of the available time	6 (3+3) / 90			
15. Teaching activities	15.1. Lectures (theory)			45 hours
	15.2. Practice (laboratory, auditory), seminars, team work			45 hours
16. Other forms of activities	16.1. Project tasks			30 hours
	16.2. Individual tasks			30 hours
	16.3. Home learning			30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points		
	17.2. Active participation in classes	up to 30 points		
	17.3. Final exam	up to 40 (2x20/40) points		
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F	
	from 51 to 60 points	6 (six)	E	
	from 61 to 70 points	7 (seven)	D	
	from 71 to 80 points	8 (eight)	C	
	from 81 to 90 points	9 (nine)	B	
	from 91 to 100 points	10 (ten)	A	
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.			
20. Language in which lectures are held	Macedonian			
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys			
22. Literature				
22.1. Compulsory literature				

	No.	Author/s	Title	Publisher	Year
	1.	Ризовска Атанасовска Ј.	Урбано шумарство	Интерна скрипта	2013
	2.	Cecil Konijnendijk · Kjell Nilsson · Thomas B. Randrup · Jasper Schipperijn	Urban Forests and Trees	Berlin	2005
22.2.	**Additional literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Hall P	Cities of tomorrow: an intellectual history of urban planning and design in the 20th century	Oxford	1996
	2.	Forrest M, Konijnendijk CC, Randrup TB	Research and development in urban forestry in Europe	Luxembourg	1999

1. Title of course	Foresters pedology with petrography 2		
2. Code	2053		
3. Study program	Forestry Landscaping and improvement of the environment		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Kole Vasilevski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introducing the students with the characteristics of the forest soils in Macedonia and their significance for the forestry. Competence to apply new knowledge in practice.			
11. Course content Teaching material covers the following topics: Definition and characteristics of the soils, Creation of the mineral and organic component of the soil, Geological substrate, Classification of the subsoil, Influence of compact rocks on pedogenesis, Influence of the sediment substrate on pedogenesis, Mineralogical composition of the clay in the geological substrate and its importance on pedogenesis, Pedogenetic factors and its influence on genesis and evolution of the soils, Soil characteristics, Genesis, evolution and morphology of the soils, Classification of soils and classification systems, Literature.			
12. Learning methods Teaching is conducted in the form of lecture, lab exercises, consultations, training and field exercises.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	6 (3+3) / 90		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points	
	17.2. Active participation in classes	up to 30 points	
	17.3. Final exam	up to 40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian (optional English)		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22.	Literature					
	22.1.	**Compulsory literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Филиповски, Ѓ.	Класификација на почвите во РМ	МАНУ – Скопје	2006
		2.	Филиповски, Ѓ.	Почвите во Македонија, том I, II и III	МАНУ – Скопје	1995
	22.2.	**Additional literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Филиповски, Ѓ.	Педологија, Второ и преработено издание	УКИМ – Скопје	1974
		2.	Vasilevski, K.	E-materials of Pedology with petrography	UKIM FoF (auth. e-lect.)	2009

1. Title of course	Protection of green areas			
2. Code	ШФ2055			
3. Study program	Landscaping and improvement of the environment			
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje			
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate			
6. Semester: 9 (summer semester)	**7. Number of ECTS:** 6			
8. Lecturer: Prof. Dr. Nikola Nikolov				
9. Preconditions for enrollment of the subject	none			
10. Course objectives (competences) The basic aim of the subject is to prepare the students in the field of protection of green areas, more precisely how to recognize the causers and damages with abiotic, biotic and anthropogenic character. As an ultimate goal is introducing students to measures of protection against above mentioned factors.				
11. Course content Introduction; Damages caused by abiotic factors, diagnosis and measures of protection; Damages caused by biotic factors, diagnosis and measures of protection; Damages caused by anthropogenic factor, diagnosis and measures of protection.				
12. Learning methods Theoretical lectures and practical exercises in classroom and field, and via consultations.				
13. Total available time (duration of course)	180 hours			
14. Distribution of the available time	3+3			
15. Teaching activities	15.1. Lectures (theory)			45 hours
	15.2. Practice (laboratory, auditory), seminars, team work			45 hours
16. Other forms of activities	16.1. Project tasks			30 hours
	16.2. Individual tasks			30 hours
	16.3. Home learning			30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points		
	17.2. Active participation in classes	up to 30 points		
	17.3. Final exam	up to 40 points		
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F	
	from 51 to 60 points	6 (six)	E	
	from 61 to 70 points	7 (seven)	D	
	from 71 to 80 points	8 (eight)	C	
	from 81 to 90 points	9 (nine)	B	
	from 91 to 100 points	10 (ten)	A	
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2. 17.1 min 15 points; 17.2 min 15 points; 17.3 min 21 points			
20. Language in which lectures are held	Macedonian (optional English)			
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys			
22. Literature				
22.1. Compulsory literature				

	No.	Author/s	Title	Publisher	Year
	1.	Z. Vajda	Заштита шума	Загреб	**1984**
	2.	Staners D. And Bourdeau P	EUROPE'S ENVIRONMENT-The Dobrish Assessment	Copenhagen	**1995**
	3.				
22.2.	**Additional literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Влаткович, S.	Животна средина и функција шума	Беолград	**2001**
	2.				

1. Title of course	Landscape design		
2. Code	ШФ2057		
3. Study program	Landscape design		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Vlatko Andonovski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Styles and principles in the design of green spaces. Capacity for practical application in greening and horticulture.			
11. Course content Principles and styles in landscape design: physical (morphological) characteristics of a plant, shape, texture, color, unity of design, simplicity and repetition, diversity, emphasis, balance, line, sequence, rhythm, creating focal points, application of the principles of design. Functional use of the landscape design: balancing structural and plant shapes, texture and architecture, plants selection and their use. Process of landscape design: definition of areas in the landscape, combining structural elements with plants, landscape plan, computers in landscape design.			
12. Learning methods Lectures, auditory exercises, project work, consultations, independent work.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		30 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 20 points	
	17.2. Active participation in classes	up to 20 points	
	17.3. Final exam	up to 60 (2x30/60) points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian (optional English)		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22. Literature

22.1. Compulsory literature

No.	Author/s	Title	Publisher	Year
1.	В. Андоновски	Пејзажно и Дизајн во Зелените Површини	ШФ-Скопје	2005
2.	J. Брукс	Дизајн Врта	Лондон, ВБ	2001

22.2. Additional literature

No.	Author/s	Title	Publisher	Year
1.	L.G. Hanebaum	Landscape Design	New Jersey, USA	2002
2.	N.K. Booth, J.E. Hiss	Residential Landscape Architecture	Barnes&Noble, USA	2011

1. Title of course	Raising and care of green areas, 2		
2. Code	ШФ2058		
3. Study program	Landscaping and improvement of the environment		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Nikolcho Velkovski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introduction to techniques for raising the green areas and their further care. Ability to apply them in practice.			
11. Course content Introduction, Green areas and environment, Specificity of natural conditions, Development of plants in urban environments and their characteristics, Divisions and categories of green areas, Elements of green areas, Functions of green areas, Techniques for raising green areas, Raising of systems of green areas, Preparatory works for raising green areas, Agro technical preparation of the terrain, Clearing, Underground installations Plant protection during work, Monitoring of project documentation, Planning of the terrain and preservation of fertile soil layer, Construction of objects, Preparation for planting, Selection of planting material, Planting and sowing, Norms for planting, Time for planting, Storage of seedlings, Transport and preparation of seedlings for planting, Processing soil for planting, Technique for planting, Transplanting, Care of green areas, Irrigation, Spraying, soil cultivation, Mulching, Feeding, Cleaning of weeds , Protection from extreme temperatures, Trimming and shaping, Care of special categories of greenery, Raising and care of hedges, Promotion and care of rockeries, Promotion and care of vertical greenery, Promotion and care of greenery around the streets and quays, Care of indoor greenery, Calendar and care plan, Tools, machines, and accessories for raising and care of green areas,			
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work, and via consultations.			
13. Total available time (duration of course)	160 hours		
14. Distribution of the available time	5 (3+2) / 75		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		30 hours
16. Other forms of activities	16.1. Project tasks		40 hours
	16.2. Individual tasks		25 hours
	16.3. Home learning		20 hours
17. Assignments and grading	17.1. Seminar work / project	up to 20 points	
	17.2. Active participation in classes	up to 20 points	
	17.3. Final exam	up to 60 (2x30/60) points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final	Fulfillment of activities from 15.1 and 15.2.		

	exam					
20.	**Language in which lectures are held**			Macedonian		
21.	**Methods of monitoring the quality of teaching**			Internal evaluations and surveys		
22.	**Literature**					
	22.1.	**Compulsory literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Н. Велковски	Подигнување и нега на зелени површини, скрипта	ШФ-Скопје	**2013**
		2.	Н. Антанасијевиќ	Подизање и неговање зелених површина	ШФ-Белград	**2007**
	22.2.	**Additional literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Т. Ѓеорѓиев	Подигање и одржување на зелени површини	ПД-Скопје	**1991**
		2.	Т. Бунушевац	Гајење зелених површина	ШФ-Белград	**1959**

1. Title of course	Urban dendrology 2				
2. Code	ШФ2061				
3. Study program	Landscaping and improvement of the environment				
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje				
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate				
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6				
8. Lecturer: Full Prof. Dr. Jane Acevski (Asst. Prof. Dr. Bojan Simovski, appointed since 2016/2017)					
9. Preconditions for enrollment of the subject	none				
10. Course objectives (competences) Ornamental trees, shrubs and vines of both native and exotic urban dendroflora, with special emphasis on varieties and forms used in urban spaces and their adaptive ability (ecology and pollution resilience).					
11. Course content Ornamental and horticultural native and exotic species and varieties of Gymnosperms / Coniferous plants (Gymnospermae); Ornamental native and exotic species and varieties of Angiosperms / Flowering plants (Angiospermae).					
12. Learning methods Theoretical classes, field lectures, visit of nurseries, arboreta, green houses and alpine houses, public (community) and private green spaces, and via consultations.					
13. Total available time (duration of course)	180 hours				
14. Distribution of the available time	3+3				
15. Teaching activities	15.1. Lectures (theory)	45 hours			
	15.2. Practice (laboratory, auditory), seminars, team work	45 hours			
16. Other forms of activities	16.1. Project tasks	30 hours			
	16.2. Individual tasks	30 hours			
	16.3. Home learning	30 hours			
17. Assignments and grading	17.1. Seminar work / project	up to 30 points			
	17.2. Active participation in classes	up to 30 points			
	17.3. Final exam	up to 40 points			
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F		
	from 51 to 60 points	6 (six)	E		
	from 61 to 70 points	7 (seven)	D		
	from 71 to 80 points	8 (eight)	C		
	from 81 to 90 points	9 (nine)	B		
	from 91 to 100 points	10 (ten)	A		
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.				
20. Language in which lectures are held	Macedonian (optional English)				
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys				
22. Literature					
22.1.	**Compulsory literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**

	1.	Џеков С.	Дендрологија (одбрани поглавја)	УКИМ-ШФС, Скопје	1988
	2.	Vukićević E.	Dekorativna dendrologija	Univerzitet u Beogradu, Beograd	1982
	3.	Idžojtić M.	Dendrologija – list (одбрани поглавја)	Sveučilište u Zagrebu, Šumarski fakultet, Zagreb	2009
22.2.	**Additional literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Acevski J., Simovski B.	E-materials of Urban dendrology	UKiM FoF (auth. e-lect.)	2014
	2.	Royal Horticultural Society	Encyclopedia of Gardening	Dorling Kindersley Ltd., London	2002
	3.	Samuelson L. J., Hogan M. E.	Forest trees, a guide to the Eastern United States	Pearson Education Inc., New York	2006
	4.	World Wide Web			

1. Title of course	Phytopathology in horticulture		
2. Code	ШФ2064		
3. Study program	Landscaping and improvement of the environment		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Kiril Sotirovski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introduction to the most important plant pathogens on foliar decorative and floral decorative plant species, as well as with methods and means of their control.			
11. Course content Epidemiology, ecology and biology of pathogens. Control methods of economically and environmentally most important diseases of plants used for landscaping, exterior and interior purposes. Use of keys for determination of pathogens. Soil pathogens, powdery mildews, rusts, antacnoses (*Colletotrichum orchidearum*, *Gloeosporium liriodendri*), foliar diseases, and other specific pathogens of foliar and floral decorative plants (*Aloe, Agloanema, Anthurium, Aphelandra, Calladium, Cissus, Coleus, cordyline, Dieffenbachia, Dioanaea, Dracaena, Drechslera, Epipremium, Ficus, Fittonia, Hedera, Peperomia, Rosa, Sanseveria, Syngonium*, etc.), of bushes and of trees. Most important bacterial diseases on foliar and floral decorative plants (CMV, TMV, BmoV, DMV, Tradescantia Mosaic Virus, TSWV, INSV).			
12. Learning methods Lectures, auditory classes, consultations, individual work.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	30 points	
	17.2. Activities and participation in classes	30 points	
	17.3. Final exam	40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Condition for signature: Fulfilment of activities 15.1 and 15.2		
20. Language in which lectures are held	Macedonian (optional English)		
21. Methods of monitoring the quality of teaching	-internal evaluation -questionnaire		

22.	Literature					
	22.1.	Compulsory literature				
		No.	Author/s	Title	Publisher	Year
		1.	Jones, R.K., Benson, D.M.	Diseases of woody ornamentals and trees in nurseries	APS Press	2001
		2.	Agrios, G. R.	Plant pathology	Elsevier Academic Press	2005
	22.2.	Additional literature				
		No.	Author/s	Title	Publisher	Year

1. Title of course	Park architecture 2				
2. Code	ШФ2066				
3. Study program	Landscaping and improvement of the environment				
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje				
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate				
6. Semester: 9, winter semester	**7. Number of ECTS:** 6				
8. Lecturer: Full Prof. Dr. Jasminka Rizovska Atanasovska					
9. Preconditions for enrollment of the subject	None				
10. Course objectives (competences) Introduction to park architecture elements as essential elements of every park and open green space.					
11. Course content The role and place of the architectural elements in parks and green areas. Water elements in designing green areas. Specific elements and components as part of park compositions. Classification of elements that are essential for designing green areas. Zones of park territory.					
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work, and via consultations.					
13. Total available time (duration of course)	180 hours				
14. Distribution of the available time	6 (3+3) / 90				
15. Teaching activities	15.1. Lectures (theory)	45 hours			
	15.2. Practice (laboratory, auditory), seminars, team work	45 hours			
16. Other forms of activities	16.1. Project tasks	30 hours			
	16.2. Individual tasks	30 hours			
	16.3. Home learning	30 hours			
17. Assignments and grading	17.1. Seminar work / project	up to 30 points			
	17.2. Active participation in classes	up to 30 points			
	17.3. Final exam	up to 40 (2x20/40) points			
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F		
	from 51 to 60 points	6 (six)	E		
	from 61 to 70 points	7 (seven)	D		
	from 71 to 80 points	8 (eight)	C		
	from 81 to 90 points	9 (nine)	B		
	from 91 to 100 points	10 (ten)	A		
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.				
20. Language in which lectures are held	Macedonian				
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys				
22. Literature					
22.1.	**Compulsory literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**

	1.	Ризовска Атанасовска Ј.	Одбрани поглавја од цвеќарството	Интерна скрипта	2009
	2.	Бјанкини Ф., Пантано А.	Се' за цвеќето	Македонска книга. Скопје	1985
22.2.	**Additional literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Procter N.	Perennials.	Salamander books Ltd. London	1988
	2.	Kraljevskodrustvo za hortikulturu	Biljkeicvece	Mladinskaknjiga. Beograd	2005

1. Title of course	Planning and designing of green areas			
2. Code	ШФ2067			
3. Study program	Greening and improvement of the environment			
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje			
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate			
6. Semester: 9, winter semester	**7. Number of ECTS:** 6			
8. Lecturer: Full Prof. Dr. Jasminka Rizovska Atanasovska				
9. Preconditions for enrollment of the subject	None			
10. Course objectives (competences) To introduce the students with the technics and ways of designing the green areas like parks, gardens and other free open spaces in the cities using up to date methods.				
11. Course content The development of systems of green areas in the city. Planning and classification of the types of green systems in the cities. Factors that affects the creation of the system of green areas. Technics of designing open green spaces. Classification of the green areas. Creating and designing of various types of objects in the process of landscape designing.				
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work, and via consultations.				
13. Total available time (duration of course)	180 hours			
14. Distribution of the available time	6 (3+3) / 90			
15. Teaching activities	15.1. Lectures (theory)			45 hours
	15.2. Practice (laboratory, auditory), seminars, team work			45 hours
16. Other forms of activities	16.1. Project tasks			30 hours
	16.2. Individual tasks			30 hours
	16.3. Home learning			30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points		
	17.2. Active participation in classes	up to 30 points		
	17.3. Final exam	up to 40 (2x20/40) points		
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F	
	from 51 to 60 points	6 (six)	E	
	from 61 to 70 points	7 (seven)	D	
	from 71 to 80 points	8 (eight)	C	
	from 81 to 90 points	9 (nine)	B	
	from 91 to 100 points	10 (ten)	A	
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.			
20. Language in which lectures are held	Macedonian			
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys			
22. Literature				

22.1.	**Compulsory literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Ризовска Атанасовска Ј.	Планирање и проектирање на зелени површини	Интерна скрипта	2009
	2.	Вујковиќ Љ., Нечак М., Вујичиќ Д.	Техника пејзажног проjектовања	Београд	2003
22.2.	**Additional literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Фомина Л.	Основи на парковото искуство	Софија	1988
	2.	John Brookes	Garden Design	London	2002

1. Title of course	Botany 2				
2. Code	ШФ2069				
3. Study program	Landscaping and improvement of the environment				
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje				
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate				
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6				
8. Lecturer: Full Prof. Dr. Jane Acevski (Asst. Prof. Dr. Bojan Simovski, appointed since 2016/2017)					
9. Preconditions for enrollment of the subject	Urban dendrology 2 (enrolled as major)				
10. Course objectives (competences) Plant cytology, histology and morpho-anatomy plant correlation, detailed physiological processes in plants, systematics and taxonomy, advanced plant ecology.					
11. Course content Plant cell and cell cycle. Plant tissues. Plant organs. Pollination. Fertilization. Colonization by seed, fruit and vegetative organs. Photosynthesis (assimilation). Breathing (dissimilation). Water regime. Growth. Plant tropisms. Ecologic plant groups and their diversity. Correlation between plant morphology and ecology. Distribution. Taxonomy. Eco-physiological resilience of plants.					
12. Learning methods Interactive lectures and exercises, guided observation of specimens of various plant tissues; Determination of specific characteristics in certain plant groups using herbarium exemplars; Field research, and via consultations.					
13. Total available time (duration of course)	180 hours				
14. Distribution of the available time	3+3				
15. Teaching activities	15.1. Lectures (theory)	45 hours			
	15.2. Practice (laboratory, auditory), seminars, team work	45 hours			
16. Other forms of activities	16.1. Project tasks	30 hours			
	16.2. Individual tasks	30 hours			
	16.3. Home learning	30 hours			
17. Assignments and grading	17.1. Seminar work / project	up to 30 points			
	17.2. Active participation in classes	up to 30 points			
	17.3. Final exam	up to 40 points			
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F		
	from 51 to 60 points	6 (six)	E		
	from 61 to 70 points	7 (seven)	D		
	from 71 to 80 points	8 (eight)	C		
	from 81 to 90 points	9 (nine)	B		
	from 91 to 100 points	10 (ten)	A		
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.				
20. Language in which lectures are held	Macedonian (optional English)				
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys				
22. Literature					
22.1. Compulsory literature					
No.	**Author/s**	**Title**	**Publisher**	**Year**	

	1.	Групче Р.	Ботаника (одбрани поглавја)	Студентски збор, Скопје	1994
	2.	Mišić Lj., Lakušić R.	Livadske biljke	Zavod za udžbenike i nastavna sredstva, Sarajevo / Beograd	1990
	3.	Šilić Č.	Šumske zeljaste biljke	Zavod za udžbenike, Sarajevo / Školjska knjiga, Zagreb / Vuk Karadžić, Beograd	1977
	4.	Šilić Č.	Planinske biljke	Zavod za udžbenike i nastavna sredstva, Sarajevo / Beograd	1982
22.2.	**Additional literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Acevski J., Simovski B.	E-materials of Botany	UKiM FoF (auth. e-lect.)	2014
	2.	Мицевски К.	Флора на (С)Р. Македонија 1(1-6)	МАНУ, Скопје	1985, 1993, 1995, 1998, 2001, 2005
	3.	Мулев М.	Екологија на растенијата	Алфа 94 М. А., Скопје	2003
	4.	World Wide Web			

1. Title of course	Agroforestry silvicultural practices		
2. Code	ШФ2072		
3. Study program	Landscaping and improvement of the environment		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Nikolcho Velkovski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introduction to agroforestry silvicultural practices. Capacity for their application.			
11. Course content Introduction, Definition and importance, Agroforestry potentials, Agro-ecosystems, Differences between natural ecosystems and agro-ecosystems, Needs and conditions of developing agroforestry practices, Selection of species, forest and fruit trees, suitable agricultural crops for agroforestrysilvicultural practices Application ofagroforestry practices,Agroforestry systems and cultivation of forest trees and agricultural plants, Agroforestry systems and cultivation of forest trees and animal species, use of fertilizers-fertilization in order to increase productivity, Change of crops, Impact of agroforestry silvicultural practices, benefits from the application of agroforestry silvicultural practices, Protective and silvicultural measures Application of machinery, tools and equipment, facilities and infrastructure to perform agroforestry silvicultural practices.			
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work, and via consultations.			
13. Total available time (duration of course)	160 hours		
14. Distribution of the available time	5 (3+2) / 75		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		30 hours
16. Other forms of activities	16.1. Project tasks		40 hours
	16.2. Individual tasks		25 hours
	16.3. Home learning		20 hours
17. Assignments and grading	17.1. Seminar work / project	up to 20 points	
	17.2. Active participation in classes	up to 20 points	
	17.3. Final exam	up to 60 (2x30/60) points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22.	**Literature**					
	22.1.	**Compulsory literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	И. Маринов & В. Стипцов & Ф. Генова	Агролесовдъство	БПС- СофиЯ	**2003**
		2.	М. Якимов & В. Стипцов & К.Калмуков & Е. Александрова & И. Йоновска	Агролесовдъство	BSFP- СофиЯ	**2003**
		3.	Й. Станчева & К. Петкова & С. Банчева & М. Брошилова & К. Брошилов & Н. Цветкова	Агролесовдъство	ИК РУТА-СофиЯ	**2004**
	22.2.	**Additional literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Г. Костов & В. Стипцов	Учебно помагало по Обшолесовдъство	БШПГ-СИЛВИКА-СофиЯ	**2004**
		2.	П. Григорова Костадинова и др.	АгроекологиЯ и управување на агроекосистемите	ПССЕ-СофиЯ	**2003**

1. Title of course	High mountain vegetation		
2. Code	2073		
3. Study program	Landscaping and improvement of the environment		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Kole Vasilevski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introducing the characteristics of high mountain grasslands and their importance. Competence to apply new knowledge in practice.			
11. Course content Introduction, Vegetation research methods, Vegetation on limestone rocks, Vegetation on silicate rocks, High mountain swamp vegetation, High grass vegetation, Vegetation of shallow limestone soils, Mountain pastures vegetation on acidic soils, Vegetation of hilly pastures, Vegetation of meadows, Pastures management, Planning and inventory of pastures, Classification of pastures, Grazing capacity, Estimation of pasture exploitation, Grazing management, Structural improvements of pastures.			
12. Learning methods Teaching is conducted in the form of lecture, lab exercises, consultations, training and field exercises.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	6 (3+3) / 90		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points	
	17.2. Active participation in classes	up to 30 points	
	17.3. Final exam	up to 40 points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian (optional English)		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22. Literature

Compulsory literature

	No.	Author/s	Title	Publisher	Year
22.1.	**1.**	Vasilevski, K.	E-materials of High Mountain Vegetation	UKiM FoF (auth. e-lect.)	2014
	2.	Мицевски, К.	Високопланинска вегетација	МАНУ, Скопје	1994
	3.	Miskovic, B.	Krmno bilje	MKPF, Beograd	1986

Additional literature

	No.	Author/s	Title	Publisher	Year
22.2.	**1.**	Grbic, S., Eric, P., Vuckovic, S., Cupic, B., Radisav, D., Ivanoski, P., Prentovic, T., Gataric, Nedovic, B.	Unapredjenje proizvodnje kreme na prirodnim travnjacima	USPF, Sarajevo	2005
	2.	Ивановски, П.	Фуражно производство	УКИМ ФЗНХ, Скопје	2000
	3.	Wenger, K.	Шумарство (прирачник)	АП Скопје	2010

1. Title of course	History of park architecture 2			
2. Code	ШФ2076			
3. Study program	Landscaping and improvement of the environment			
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje			
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate			
6. Semester: 9, winter semester	**7. Number of ECTS:** 6			
8. Lecturer: Full Prof. Dr. Jasminka Rizovska Atanasovska				
9. Preconditions for enrollment of the subject	None			
10. Course objectives (competences) History of park architecture and the use of the elementsessential for designing parks and gardens through the years. Image and composition of parks and gardens have changed through years.				
11. Course content History of park architecture from the first ancient civilizations of Egypt, Assyria, Babylon, Ancient Greece and Rome Empire through middle age and period of monastery gardens continuing to periods of renaissance and baroque in Italy, Spain, France, Austria, Germany and landscape designed parks and gardens in GreatBritain and other European countries till today.				
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work, and via consultations.				
13. Total available time (duration of course)	180 hours			
14. Distribution of the available time	6 (3+3) / 90			
15. Teaching activities	15.1. Lectures (theory)			45 hours
	15.2. Practice (laboratory, auditory), seminars, team work			45 hours
16. Other forms of activities	16.1. Project tasks			30 hours
	16.2. Individual tasks			30 hours
	16.3. Home learning			30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points		
	17.2. Active participation in classes	up to 30 points		
	17.3. Final exam	up to 40 (2x20/40) points		
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F	
	from 51 to 60 points	6 (six)	E	
	from 61 to 70 points	7 (seven)	D	
	from 71 to 80 points	8 (eight)	C	
	from 81 to 90 points	9 (nine)	B	
	from 91 to 100 points	10 (ten)	A	
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.			
20. Language in which lectures are held	Macedonian			
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys			
22. Literature				

22.1.	**Compulsory literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Ризовска Атанасовска Ј.	Историја на парковска уметност 2	Интерна скрипта	2009
	2.	Enge T. O., Shroer C F.	Garden Architecture in Europe	London	1992
22.2.	**Additional literature**				
	No.	**Author/s**	**Title**	**Publisher**	**Year**
	1.	Hrdlicka Z.,	The art of Japanese gardening	Prague	1989
	2.	Анастасијевиќ Н.	Подизање и неговање зелених површина	Београд	2007

1. Title of course	Selected chapters from floriculture		
2. Code	ШФ2077		
3. Study program	Landscaping and improvement of the environment		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9, winter semester	**7. Number of ECTS:** 6		
8. Lecturer: Full Prof. Dr. Jasminka Rizovska Atanasovska			
9. Preconditions for enrollment of the subject	None		
10. Course objectives (competences) Introduction of floral elements important for landscape design. Floral plants have their specific place when composing green area.			
11. Course content The history of introduction and raising up floral plants in Europe and in our country. Classification of the floral plants according their use. Annual and perennials that can be used in free open spaces and parks. Floral compositions.			
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work, and via consultations.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	6 (3+3) / 90		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		45 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 30 points	
	17.2. Active participation in classes	up to 30 points	
	17.3. Final exam	up to 40 (2x20/40) points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22.	Literature					
	22.1.	**Compulsory literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Ризовска Атанасовска Ј.	Одбрани поглавја од цвеќарството	Интерна скрипта	2009
		2.	Бјанкини Ф., Пантано А.	Се' за цвеќето	Македонска книга. Скопје	1985
	22.2.	**Additional literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Procter N.	Perennials.	Salamander books Ltd. London	1988
		2.	Kraljevsko drustvo za hortikulturu	Biljke i cvece	Mladinska knjiga. Beograd	2005

1. Title of course	Basics of bonsai techniques		
2. Code	ШФ2078		
3. Study program	Landscape design		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Vlatko Andonovski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Presentation of the art of aesthetic miniaturization of trees by growing them in pots. Introduction to techniques for creation of miniature trees - bonsai techniques and their application in modern landscaping.			
11. Course content Historical background, styles of bonsai techniques, styles according to position and characteristics of stem, styles according to position (exposure) of root, styles with multiple stems, source material, planting and transplanting, care of plants, irrigation, shaping dwarf trees, wire forming, tools, place of storage, and winter collection. The latest developments in the art of bonsai, Japanese School of bonsai, Chinese School of bonsai.			
12. Learning methods Lectures, auditory exercises, project work, consultations, independent work.			
13. Total available time (duration of course)	180 hours		
14. Distribution of the available time	3+3		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		30 hours
16. Other forms of activities	16.1. Project tasks		30 hours
	16.2. Individual tasks		30 hours
	16.3. Home learning		30 hours
17. Assignments and grading	17.1. Seminar work / project	up to 20 points	
	17.2. Active participation in classes	up to 20 points	
	17.3. Final exam	up to 60 (2x30/60) points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian (optional English)		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22. Literature

22.1. Compulsory literature

No.	Author/s	Title	Publisher	Year
1.	В. Андоновски	Основи на бонсаи техника	ШФ-Скопје	2005
2.	А. Вилхелм	Патуљасто дрвеће у посудама	ШФ-Загреб	1998

22.2. Additional literature

No.	Author/s	Title	Publisher	Year
1.	H. Tomlinson	The Complete Book of Bonsai	Bowker, USA	2014
2.	C. Coussins	Bonsai School	Kerswell, USA	2008

1. Title of course	Lawns		
2. Code	ШФ2081		
3. Study program	Landscaping and improvement of the environment		
4. Organizer of the study program	UKiM Faculty of Forestry in Skopje		
5. Degree (undergraduate, postgraduate, doctoral)	Postgraduate		
6. Semester: 9 (winter semester)	**7. Number of ECTS:** 6		
8. Lecturer: Prof. Dr. Nikolcho Velkovski			
9. Preconditions for enrollment of the subject	none		
10. Course objectives (competences) Introduction to techniques for raising green areas and their further care. Ability to apply them in practice.			
11. Course content Introduction, Terms and importance of lawns, Classification of lawns, Ways of formation of lawns Preparatory work for raising of grasslands, Grasses, Selection of species for raising the lawn, Grass seeds, Norms for planting, sowing the seeds, Care of lawns, Watering, Mowing, Fertilization, Weed protection, Restoration and repair of neglected lawns, Measures for care and the extension of the life and functionality of lawns, Annual program care for lawns.			
12. Learning methods Theoretical classes, assignments, preparation of seminar works, individual presentation (.ppt) and paper work, and via consultations.			
13. Total available time (duration of course)	160 hours		
14. Distribution of the available time	5 (3+2) / 75		
15. Teaching activities	15.1. Lectures (theory)		45 hours
	15.2. Practice (laboratory, auditory), seminars, team work		30 hours
16. Other forms of activities	16.1. Project tasks		40 hours
	16.2. Individual tasks		25 hours
	16.3. Home learning		20 hours
17. Assignments and grading	17.1. Seminar work / project	up to 20 points	
	17.2. Active participation in classes	up to 20 points	
	17.3. Final exam	up to 60 (2x30/60) points	
18. Evaluation criteria (points / grade)	up to 50 points	5 (five)	F
	from 51 to 60 points	6 (six)	E
	from 61 to 70 points	7 (seven)	D
	from 71 to 80 points	8 (eight)	C
	from 81 to 90 points	9 (nine)	B
	from 91 to 100 points	10 (ten)	A
19. Conditions for signature (verification of attendance of classes) and final exam	Fulfillment of activities from 15.1 and 15.2.		
20. Language in which lectures are held	Macedonian (optional English)		
21. Methods of monitoring the quality of teaching	Internal evaluations and surveys		

22.	Literature					
	22.1.	**Compulsory literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Н. Велковски	Тревници, скрипта	ШФ-Скопје	**2013**
		2.	Н. Антанасијевиќ	Подизање и неговање зелених површина	ШФ-Белград	**2007**
	22.2.	**Additional literature**				
		No.	**Author/s**	**Title**	**Publisher**	**Year**
		1.	Т. Ѓеорѓиев	Подигање и одржување на зелени површини	ПД-Скопје	**1991**
		2.	Т. Бунушевац	Гајење зелених површина	ШФ-Белград	**1959**