DEPARTMENT OF VITICULTURE AND FRUITGROWING
Study programme: VITICULTURE
DIPLOMA: MASTER OF AGRICULTURAL SCIENCES – **VITICULTURE**

CODE	I SEMESTER – FIRST YEAR			
	Compulsory course	**Credits**	**Classes**	**Total**
2ZF230112	Methods in scientific research work	8	3+2+2	216
2ZF212612	Physiology of grape vine	8	3+2+2	216
2ZF230212	Biostatistics	6	2+2+1	156
	Faculty elective course	4	2+1+1	120
	Faculty elective course	4	2+1+1	120
	Total:	30	12+8+7	828

CODE	II SEMESTER – FIRST YEAR			
	Compulsory course	**Credits**	**Classes**	**Total**
2ZF215112	Rootstocks and vine varieties	8	3+2+2	216
2ZF201812	Protection of grapevine 2	8	3+2+2	216
2ZF205312	Soil knowledge for grapevine growing	6	2+2+1	156
	Faculty elective course	4	2+1+1	120
	Faculty elective course	4	2+1+1	120
	Total:	30	12+8+7	828

CODE	III SEMESTER – SECOND YEAR			
	Compulsory course	**Credits**	**Classes**	**Total**
2ZF220312	Technologies on production and storage of table grapes	8	3+2+2	216
2ZF205412	Meliorative systems in viticulture	8	3+2+2	216
2ZF220212	Technologies for wine	8	2+2+1	156
	University elective course	6	2+2+1	156
	Total:	30	11+8+7	804

CODE	IV SEMESTER – SECOND YEAR			
	Compulsory course	**Credits**	**Classes**	**Total**
	Master's thesis	30	0+0+26	818
	Total:	30	0+0+26	818

CODE	***Faculty elective course I semester***			
2ZF215412	Designing of vineyards	4	2+1+1	120
2ZF220712	Grape preparations and products	4	2+1+1	120
2ZF215412	Training systems on vine	4	2+1+1	120
2ZF201512	Special herbology	4	2+1+1	120
	Faculty elective course II semester			
2ZF220912	Methods for analysis of grapes and wine	4	2+1+1	120
2ZF215612	Legislation in viticulture and winemaking	4	2+1+1	120
2ZF212712	Growing organic grapes	4	2+1+1	120
2ZF205512	Marketing and promotion of grapes and wine	4	2+1+1	120

Appendix No.3	Syllabus for the first, second and third cycle of study					
1.	**Course title**	**METHODS IN SCIENTIFIC RESEARCH WORK**				
2.	**Course code**	**2ZF230112**				
3.	**Study programme**	Viticulture				
4.	**Organizer of the study programme (faculty, institute, group)**	University "Goce Delcev"- Stip. Faculty of agriculture/Department of viticulture and fruitgrowing				
5.	**Level (first, second, third cycle)**	Second cycle				
6.	**Academic year / semester**	First year / I semester	7.	Number of ECTS credits	8	
8.	**Professor**	**Prof. Ilija Karov, PhD**				
9.	**Preconditions for course enrollment**	No				
10.	**Goals of the course programme:** Introduction to the basic rules and principles in science, the scientific research methods and characteristics that the scientific worker should possess.					
11.	**Content of the course programme:** **Content of lectures:** 1. Importance of scientific research 2. Selection of topic for scientific work, 3. Methodology of research 4. Literature and working hypothesis 5. Planning of experiment 6. Conducting of the experiment 7. Methodology and experimental technique of field experiment 8. An overview of important procedures in the experimental technique 9. Methodology and technique of conducting experiments in containers 10. Processing and displaying the results 11. Technique of writing master's, specialist and scientific papers and citing the literature 12. Preparation of a scientific paper for printing. **Content of exercises**: 1. Introduction 2. Setting the hypothesis 3. Studying the literature 4. Performing of experiment 5. Field trials 6. Laboratory experiments 7. Experiment in containers 8. Processing of the experimental results 9. Displaying obtained results 10. Literature citation, 11. Writing a scientific paper 12. Presenting a scientific paper.					
12.	**Methods of study:** lectures, theoretical and practical exercises, consultations, independent paper work, home learning, preparatory classes for exams and mid-term tests, consultations.					
13.	**Total amount of available time**	216 hours				
14.	**Distribution of the available time**	3+2+2				
15.	**Forms of teaching activities**	15.1.	Lectures - theoretical training	3		
		15.2.	Exercises (laboratory, auditory), workshops, outreach and teamwork	2		
16.	**Other forms of activities**	16.1.	Team projects	1		
		16.2.	Individual projects	1		
		16.3.	Individual study			
17.	**Forms of assessment**					
	17.1.	Exams (midterm exams, exam, electronic testing)	30			
	17.2.	Project activities (oral and written presentation)	50			
	17.3.	Other forms of studying activities	20			
18.	**Criteria for assessment (points / grade)**	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.	**Condition for getting a signature and taking the final exam**	60% of term activities, project activities and attending to lectures and discussions	
20.	**Language in which classes are conducted**	Macedonian	
21.	**Method of monitoring the quality of instruction**	Self-evaluation	

22. **Literature**

22.1. **Compulsory literature**

Ordinal No.	Author	Title	Publisher	Year
1.	Проф. д-р. Илија Каров, Асс. Билјана Ковачевиќ	Методи на научно истражувачката работа (скрипта)	УГД-Штип	2010
2.	Ketryn L. Allen	Study skills. A student survival guide. (translation of the Macedonian language)	Goce Delcev University, Stip	2010

22.2. **Additional literature**

Ordinal No.	Author	Title	Publisher	Year
1.	Dr. Slavko Borojevic	Metodologija eksperimentalnog naucnog rada	Radnicki Univerzitet “Radivoj Cirpanov“	1974

Appendix No.3	**Syllabus for the first, second and third cycle of study**				
1.	Course title	**Physiology of grape vine**			
2.	Course code	2ZF212612			
3.	Study programme	Grape vine production			
4.	Organizer of the study programme (faculty, institute, group)	University “Goce Delcev”- Stip. Faculty of agriculture/Department of viticulture and fruit growing			
5.	Level (first, second, third cycle)	Second cycle			
6.	Academic year / semester	First / I	7.	Number of ECTS credits	8
8.	Professor	Prof. Liljana Koleva-Gudeva, PhD			
9.	Preconditions for course enrollment	No			
10.	Goals of the course programme: The course aim is to familiarise students with life processes at the grape vine in its entire life cycle. Physiological processes occurring in the grape vine create organic matter and energy, which is energy on the survival of animal and plant life on earth.				
11.	Content of the course programme: **Content of the lectures:** Historical development of plant physiology. Phylogenetic tree of living organisms. Chemical composition of plants. Water balance: transpiration. Gutcion. Receive transport and function of mineral salts. Mechanism of Photosynthesis: Calvin cycle, C-3, C-4 and CAM photosynthesis. Photorespiration. Respiration: glycolysis, Krebs				

	cycle, pentose phosphate path, ß oxidation Glyoksilae cycle. Physiology of seeds and fruits. Physiology of stress. Phytohormones and growth regulators. Biosynthesis and catabolism of auxsyne, giberelyne, cytokinine, ABA and ethylene. Jasmonates. Brasinosteroides. Oligosaccharides. Polyamines.Secondary metabolism: phenols, alkaloids and therpene. Culture of plant cells and tissues in vitro. **Content of exercises (practical and laboratory):** Quantitative analysis of the basic components in plants. Free, hygroscopic and total water. Dry solids. Total minerals. Total organic matter. Quantitative analysis of nitrogen in plants. Protein. Cellulose. Starch. Oils. Photosynthesis: Isolation of chloroplasts. Quantitative analysis of photosynthetic pigments. Proving Phytohormones. Vegetative propagation of plants. Micro propagation in vitro of grape vine.				
12.	Methods of study: Lectures, Theoretical exercises, Laboratory exercises, E-learning, individual and team projects, consultations for the final exam, Final exam.				
13.	Total amount of available time		216 hours		
14.	Distribution of the available time		3 + 2 + 2		
15.	Forms of teaching activities	15.1.	Lectures - theoretical training		3
		15.2.	Exercises (laboratory, auditory), workshops, outreach and teamwork		2
16.	Other forms of activities	16.1.	Team projects		
		16.2.	Individual projects		2
		16.3.	Individual study		
17.	Forms of assessment				
	17.1.	Exams (midterm exams, exam, electronic testing)			30
	17.2.	Project activities (oral and written presentation)			50
	17.3.	Other forms of studying activities			20
18.	Criteria for assessment (points / grade)		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.	Condition for getting a signature and taking the final exam		60% of term activities, project activities and attending to lectures and discussions		
20.	Language in which classes are conducted		Macedonian		
21.	Method of monitoring the quality of instruction		Self-evaluation		

22.	Literature					
	22.1.	Compulsory literature				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Liljana Koleva Gudeva	Plant Physiology	UGD - Stip	2010
		2.	M.G. Mulins, A. Bucet. L.E. Vilijams	Biology of grape vine	Government Project translation of 500 scientific books	2010
	22.2.	Additional literature				

		Ordinal No.	Author	Title	Publisher	Year
		1.	Taiz L., Zeiger E.	Plant Physiology	Sunderland, Massachusetts, USA	2006
		2.	Ljubinka Culafic	Plant Physiology	NNK International	2003

Appendix No.3	**Syllabus for the first, second and third cycle of study**					
1.	**Course title**	**BIOSTATISTICS**				
2.	**Course code**	**2ZF230212**				
3.	**Study programme:**	**Viticulture**				
4.	**Organizer of the study programme (faculty, institute, group)**	University “Goce Delcev”- Stip. Faculty of agriculture/Department of viticulture and fruitgrowing				
5.	**Level (first, second, third cycle)**	Second cycle				
6.	**Academic year / semester**	Second year/ first semester	7.	**Number of ECTS credits**	6	
8.	**Instructor**	**Prof. Tatjana Atanasova Pacemska, PhD**				
9.	**Preconditions for course enrollment**					
10.	**Goals of the course programme**: Getting more detailed knowledge about the use of statistical methods in agricultural practice					
11.	**Content of the course programme**: **Content of lectures:** 1. Introduction to statistics (mathematics and statistics science) 2. Basic statistical techniques 3. Types of statistical methods 4. Data processing 5. Statistics, variability and distribution 6. Discrete equal distribution. 7. Elements of statistical conclusion. 8. T test and F test 9. Analysis of variance (ANOVA) 10. Factorial experiment, two factorial experiment 11. Linear regression and correlation 12. Experimental Design - practical application of methods in agricultural research. **Content of exercises:** 1. Mathematics and statistics science 2. The use of basic statistical techniques 3. Types of statistical methods 4. Practical ways of data processing 5. Statistics, variability and distribution 6. Discrete equal distribution. 7. Elements of statistical conclusion. 8. T test and F test 9. Analysis of variance (ANOVA) 10. Factorial experiment, two factorial experiment 11. Linear regression and correlation 12. Experimental Design - practical application of methods in agricultural research.					
12.	**Methods of study**: Lectures, theoretical and practice exercises, consultations; individual work; home learning; preparatory classes for exams and mid-term tests: consultation;					
13.	**Total amount of available time**	156 hours				
14.	**Distribution of the available time**	2+2+1				
15.	**Forms of teaching activities**	15.1.	Lectures - theoretical training	2		
		15.2.	Exercises (laboratory, auditory), workshops, outreach and teamwork	2		
16.	**Other forms of activities**	16.1.	Team projects	1		

		16.2.	Individual projects		-
		16.3.	Individual study		-

17.	**Forms of assessment**			
	17.1.	Exams (midterm exams, exam, electronic testing)		30
	17.2.	Project activities (oral and written presentation)		50
	17.3.	Other forms of studying activities		20
18.	**Criteria for assessment (points / grade)**		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.	**Condition for getting a signature and taking the final exam**		60% of term activities	
20.	**Language in which classes are conducted**		Macedonian	
21.	**Method of monitoring the quality of instruction**		Self-evaluation	

22.	**Literature**					
	22.1.	**Compulsory literature**				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Graham Currell, Antony Dowman	Essential mathematics and statistics for science		2009
		2.	Nelmut van Emden	Statistics for terrified biologists		2008
		3.	Calvin Dytham	Choosing and Using Statistics		2003

Appendix No.3	**Subject programme from second cycle studies**				
1.	Course title	**Rootstocks and vine varieties**			
2.	Course code	2ZF215112			
3.	Study programme**:**	Viticulture			
4.	Organizer of the study programme (faculty, institute, group)	University “Goce Delcev”- Stip. Faculty of agriculture/Department of viticulture and fruitgrowing			
5.	Degree (first cycle)	Second cycle			
6.	Academic year / semester	firs year/second semester	7.	Number of ECTS credits	8
8.	Professor	Associate Professor Violeta Dimovska, PhD			
9.	Preconditions for course enrollment	No			

10.	Goals of the course programme: Acquiring knowledge about the characteristics of rootstocks and grape varieties. Ability to select the layers and varieties suitable for the soil type, environmental conditions of a given wine region and choice of appropriate basis for a particular variety.			
11.	Content of the course programme: Systematic belonging to rootstock and grape varieties. 2. Characteristics of rootstock varieties. 3. Resistance of phylloxera. Resistance to nematodes. 4. Adaption. Durability of lime in the soil. 5. Tolerance to salt soil. 6. Ability for (rooting). 7 .Compatibility-base variety. 8. Agro-biological and technological characteristics of the varieties for the production of red vino.9. Knowledge of agro-biological and technological characteristics of the varieties producing withe wines. 10. Knowledge of agro-biological and technological features of table and seedless varieties. 11. Influence the ground on agro-biological and technological features of varieties.12.Testing health in selecting varieties-base (producing seedlings).			
12.	Methods of study: Lectures, Laboratory exercises, e-learning, individual and team projects, consultations			
13.	Total amount of available time		216	
14.	Distribution of the available time		3 +2 +2	
15.	Forms of teaching activities	15.1.	Lectures - theoretical training	3
		15.2.	Exercises (laboratory, auditory), workshops, outreach and teamwork	2
16.	Other forms of activities	16.1.	Team projects	1
		16.2.	Individual projects	1
		16.3.	Individual study	/

17.	Forms of assessment		
	17.1.	Exams (midterm exams, exam, electronic testing)	30
	17.2.	Project activities (oral and written presentation)	50
	17.3.	Other forms of studying activities	20

18.	Criteria for assessment (points / grade)	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.	Condition for getting a signature and taking the final exam	/ 60% of term activities or minimum 42 points from 2 midterm exams, project activities and attending to lectures and discussions	
20.	Language in which classes are conducted	Macedonian	
21.	Method of monitoring the quality of instruction	Self-evaluation	

22.	Literature					
	22.1.	Compulsory literature				
		Ordinal No.	Author	Title	Publisher	Year

		1.	Zvonimir Bozinovic	Ampelography (general chapter)	Agrinet DOO Skopje	2010
		2.	SlavicaTodic, Zoran Beslic	Production of Grape seedlings (chapter)	Dosije studio, Belgrade	2010
		3.	Avramov L. Zunic D.	Viticulture	Belgrade	2001
	22.2.	Additional literature				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Pierre Galet	Grape varieties and rootstock varieties (general chapter)	Oenoplurimedia	1998
		2.	INRA	Le catalogue des vignes cultivees en France	ENTAV-INRA	2007 2009

Appendix No.3	**Syllabus for the first, second and third cycle of study**				
1.	Course title	**Protection of grapevine 2**			
2.	Course code	2ZF201812			
3.	Study programme	Viticulture			
4.	Organizer of the study programme (faculty, institute, group)	University “Goce Delcev”- Stip. Faculty of agriculture/Department of viticulture and fruitgrowing			
5.	Level (first, second, third cycle)	Second cycle			
6.	Academic year / semester	First / second 2012/13	7.	Number of ECTS credits	8
8.	Professor	Prof. Sasa Mitrev Prof. Dusan Spasov, PhD			
9.	Preconditions for course enrollment	No			
10.	Goals of the course programme: Study the basic features of causers of diseases in grapevine, the occurrence of symptoms diagnosis and implementation of appropriate measures to protect				
11.	Content of the course programme: Lectures: 1. Plant protection against disease – plant quarantine, agro-technical measures. Prophylaxis and therapy, Mechanical measures to protect. 2. Physical measures, chemical means to protect. 3. Noninfectious diseases 4. Resistance of fungicides against fungi 5. Biological suppression of plant pathogens 6.Disadvantages vines - cause: abiotic factors 7.Protection measures for fungal diseases in grapevine (antraknosis of the vines, the weath rot grapes) 8. Measures to protect against fungal diseases of the grapevine – verticilium wilt, gray rot and black rot 9. Measures to prevent fungal diseases of the vine – eska, black cancer vine 10. Measures to prevent fungal disease in grapevine (ashtrays, burners, bacterial cancer) 11. Measures to protect from phytoplasmas of vines - Flavescence doree, Bois noir 12. Protection measures from viruses in grapevine - strain of infectious degeneration of grapevine, virus bending the leaves in grapevine. Exercises: 1. Application of the plant protection measures against disease – plant quarantine, agro-technical measures. Prophylaxis and therapy, Mechanical measures to protect. 2. Physical measures, chemical means to protect. 3. Noninfectious diseases 4. Resistance of fungicides against fungi 5. Biological suppression of plant pathogens 6.Disadvantages vines - cause: abiotic factors 7.Protection measures for				

	fungal diseases in grapevine (antraknosis of the vines, the withe rot grapes) 8. Measures to protect against fungal diseases of the grapevine – verticilium wilt, gray rot and black rot 9. Measures to prevent fungal diseases of the vine – eska, black cancer vine 10. Measures to prevent fungal disease in grapevine (ashtrays, burners, bacterial cancer) 11. Measures to protect from phytoplasmas of vines - Flavescence doree, Bois noir 12. Protection measures from viruses in grapevine - strain of infectious degeneration of grapevine, virus bending the leaves in grapevine.				
12.	Methods of study: Lectures, theoretic and field exercises, e-learning, individual and team projects, consultations.				
13.	Total amount of available time		216 hours		
14.	Distribution of the available time		3+2+2		
15.	Forms of teaching activities	15.1.	Lectures - theoretical training		3
		15.2.	Exercises (laboratory, auditory), workshops, outreach and teamwork		2
16.	Other forms of activities	16.1.	Team projects		1
		16.2.	Individual projects		0,5
		16.3.	Individual study		0,5
17.	Forms of assessment				
	17.1.	Exams (midterm exams, exam, electronic testing)			30
	17.2.	Project activities (oral and written presentation)			50
	17.3.	Other forms of studying activities			20
18.	Criteria for assessment (points / grade)		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.	Condition for getting a signature and taking the final exam		60% of term activities, project activities and attending to lectures and discussions		
20.	Language in which classes are conducted		Macedonian		
21.	Method of monitoring the quality of instruction		Self-evaluation		

22. Literature

22.1. Compulsory literature

Ordinal No.	Author	Title	Publisher	Year
1.	Пејчиновски Филип, Митрев Саша	Земјоделска фитопатологија - општ дел	UGD-Stip	2009
2.	Пејчиновски Филип, Митрев Саша	Земјоделска фитопатологија - специјален дел	UGD-Stip	2009
3.	Mirko S. Ivanovic Dragica M. Ivanovic	Bolesti vocaka I vinove loze I njihovo	Poljoprivredni fakultet Univerziteta	2005

				suzbijanje	u Beogradu	
	22.2.	Additional literature				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Momcilo Arsenijevic	Bakterioze biljaka	S Print Novi Sad	1997
		2.	Dragoljub Sutic	Viroze biljaka	nstitute za zastitu biljaka I zivotne sredine, Beograd	1995
		3.				

Appendix No.3	**Syllabus for the first, second and third cycle of study**				
1.	Course title	**Soil knowledge for grapevine growing**			
2.	Course code	2ZF205312			
3.	Study programme	Viticulture			
4.	Organizer of the study programme (faculty, institute, group)	University “Goce Delcev”- Stip, Faculty of Agriculture, Stip, Department of Viticulture and Fruit growing			
5.	Level (first, second, third cycle)	Second cycle			
6.	Academic year / semester	First / II	7.	Number of ECTS credits	6
8.	Professor	Prof. Blazo Boev, PhD			
9.	Preconditions for course enrollment	No			
10.	Goals of the course programme: The course programme aims to introduce the students to the soil science (pedology) in function of the winegrowing.				
11.	Content of the course programme: **Content of the lectures:** 1. Why is soil important in viticulture? 2. Soil preparation. 3. Nutrition of the grapevine. 4. Soil structure, Porosity, Aeration. 5. Soil water, Availability of water for the grapevine. 6. Interaction between roof crops, mulches and soil moisture. 7. Draining, rinsing and salinity control, Methods of irrigation in viticulture. 8. Living organisms in soil. 9. Organic viticulture. 10 Anthropogenic soils. 11. Rigosols (distribution, genesis, evolution and classification). 12. Rigosols (mechanical composition, physical, chemical, microbiological and productive properties). **Content of exercises (practical and laboratory):** 1. Soil examination phases (preparatory phase, field study, laboratory and final stage); 2. Determination of mechanical composition and hygroscopic moisture; 3. Determination of soil structure; 4. Determination of bulk and particle density and soil porosity; 5. Determination of soil plasticity; 6. Determination of soil pH; 7. Determination of carbonates content; 8. Determination of the active lime content in the soil; 9. Determination of the soil humus content; 10. Determination of the amount of adsorbed basic cations in noncarbonated soils according to the Kappen method; 11. Calculation of necessary amount of calcium carbonate for calcinations of acidic soils; 12. Calculation of necessary amount of gypsum for alkali soils.				
12.	Methods of study: Lectures, Theoretical exercises, Laboratory exercises, E-learning, individual and team projects, consultations for the final exam, Final exam.				
13.	Total amount of available time	156 hours			

14.	Distribution of the available time		2 + 2 +1	
15.	Forms of teaching activities	15.1.	Lectures - theoretical training	2
		15.2.	Exercises (laboratory, auditory), workshops, outreach and teamwork	2
16.	Other forms of activities	16.1.	Team projects	/
		16.2.	Individual projects	0.5
		16.3.	Individual study	0.5
17.	Forms of assessment			
	17.1.	Exams (midterm exams, exam, electronic testing)		30
	17.2.	Project activities (oral and written presentation)		50
	17.3.	Other forms of studying activities		20
18.	Criteria for assessment (points / grade)		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.	Condition for getting a signature and taking the final exam		60% of term activities, project activities and attending to lectures and discussions	
20.	Language in which classes are conducted		Macedonian	
21.	Method of monitoring the quality of instruction		Self-evaluation	

22. Literature

22.1. Compulsory literature

Ordinal No.	Author	Title	Publisher	Year
1.	Robert E. Withe	Understanding vineyard soils	Ars Lamina	2010
2.	Gjorgi Filipovski	Soils of the Republic of Macedonia Vol. Vi	MANU - Skopje	2004

22.2. Additional literature

Ordinal No.	Author	Title	Publisher	Year
1.	Gjorgi Filipovski	Pedology, fourth edition	UKIM - Skopje	1993

Appendix No.3	**Subject programme from second cycle studies**			
1.	Course title	**Technologies on production and storage of table grapes**		
2.	Course code	2ZF215212		
3.	Study programme**:**	Viticulture		
4.	Organizer of the study programme (faculty, institute, group)	University “Goce Delcev”- Stip. Faculty of agriculture/Department of viticulture and fruitgrowing		
5.	Degree (first cycle)	Second cycle		
6.	Academic year / semester	second year/third semester	7. Number of ECTS credits	8

8.	Professor		Associate Professor Violeta Dimovska, PhD	
9.	Preconditions for course enrollment		No	
10.	Goals of the course programme: Acquiring knowledge about the technologies of production of grapes. Acquisition of the opportunities and make the care of the individual varieties of grapes			
11.	A) Content of the course programme: .Introduction. 2. Conditions in production of grapes in the world and in our country. 3. Technologies in the production of grapes. 4. Chois of the size, variety and healthy planting material. 5. Usung of agro-technical measures. 6. Usung the ampelo-technical measures. 7. Determining the time and ways to harvest. 8. Packaging of grapes for processing and storage market. 9. Condition and ways to save on wine grapes. 10. Condition and ways to save on table grapes. 11. Ways to use the excess and the remainder from grapes.12.Organoleptic evaluation of grapes. B) Exercises: 1.Methods for determining the structure of the bunch and berry. 2. Methods for determining the mechanical properties of bunch and berry (transported). 3. Methods for determining the degree of maturity of the grapes. 4. Methods the organoleptic evaluation of grapes. 5. Techniques in green operations. 6. Techniques about the preparation and packaging of table grapes (for storage, directly to the market).			
12.	Methods of study: Lectures, Laboratory exercises, e-learning, individual and team projects, consultations			
13.	Total amount of available time		216	
14.	Distribution of the available time		3 +2 +2	
15.	Forms of teaching activities	15.1.	Lectures - theoretical training	3
		15.2.	Exercises (laboratory, auditory), workshops, outreach and teamwork	2
16.	Other forms of activities	16.1.	Team projects	/
		16.2.	Individual projects	1
		16.3.	Individual study	1
17.	Forms of assessment			
	17.1.	Exams (midterm exams, exam, electronic testing)		30
	17.2.	Project activities (oral and written presentation)		50
	17.3.	Other forms of studying activities		20
18.	Criteria for assessment (points / grade)		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.	Condition for getting a signature and taking the final exam		/ 60% of term activities or minimum 42 points from 2 midterm exams, project activities and attending to lectures and discussions	
20.	Language in which classes are conducted		Macedonian	
21.	Method of monitoring the quality of instruction		Self-evaluation	
22.	Literature			

ж	22.1.	Compulsory literature				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Zvonimir Bozinovic	Ampelography (general part)	Agrinet DOO Skopje	2010
		2.	Aleksandar Nakalamic, Nebojsa Markovic	General Viticulture (general part)	Faculty of agriculture Belgrade	2009
		3.	Fabio Mencarelli, Andrea Bellincontro	Grape-postharvest operation	Department of Food Science and Technology, University of Viterbo, Italy	2005
	22.2.	Additional literature				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Fazinic, N., Fazinic M.	Table grape varieties (general part)	Zadar	1990
		2.	Comision regulation (EC) N_0 912/2001, N_o 1221/2008	Oficial Jurnal of the European Communities. Laying down the marketing standard for table grape	ЕУ	1999, 2001, 2008

Appendix No.3	**Syllabus for the first, second and third cycle of study**				
1.	Course title	**Meliorative systems in viticulture**			
2.	Course code	2ZF205412			
3.	Study programme	Viticulture			
4.	Organizer of the study programme (faculty, institute, group)	University “Goce Delcev”- Stip, Faculty of Agriculture, Stip, Department of Viticulture and Fruit growing			
5.	Level (first, second, third cycle)	Second cycle			
6.	Academic year / semester	Second / III	7.	Number of ECTS credits	8
8.	Professor	Prof. Risto Gj. Kukutanov, PhD			
9.	Preconditions for course enrollment	No			
10.	Goals of the course programme: Acquiring knowledge about the basics ameliorative measures (irrigation and drainage) to maintain optimal water regime of the land, the interaction of soil, water and plant and application of various techniques to correct and rational irrigation to obtain higher yields.				
11.	Content of the course programme: Content of the lectures: 1. Basic conditions for the use of water and land as non-renewable resource. 2. Characteristic of irrigation and land drainage technical features of the devices. 3. Equipment of irrigation and drainage, allowing distribution or drainage. 4. Knowledge of				

	technical systems and parts for irrigation and spraying micro 5. The manner and procedure of distribution of certain amounts of water in different systems of cultivation in the vineyards. 6, 7. Control the operation and function of the irrigation system through GPS devices or system, as a particularly important factor in applying precise beginning, duration and end of the distribution of water. 8, 9. Basics of protection of land and water in terms of irrigation precise control of water consumption and energy. 10, 11. Fundamentals of application of fertirigation. 12 Current trends in the application of fertirigation worldwide. Content of exercises (practical and laboratory): 1. Intensity of rainfall, drought index and rainy factor. 2. Hydrostatic pressure, hydrodynamics. 3. Calculating the amount of water in soil, water flow in drainage channels. 4. Practical examples for determining the FWC, WP, TM and norms of irrigation. 5. Infiltration by the method of double cylinders. 6. Calculating the norm of irrigation through the water balance 7. Practical application of the technique of irrigation ditches, and overflow 8. Practical application of technique dozhdenje 9. Micro irrigation and its practical application 10. Fertirigation, practical examples 11. Techniques for sampling for water analysis 12. Analysis of examples for irrigation of vineyards.				
12.	Methods of study: Lectures, Theoretical exercises, Laboratory exercises, E-learning, individual and team projects, consultations for the final exam, Final exam.				
13.	Total amount of available time		156 hours		
14.	Distribution of the available time		2 + 2 +1		
15.	Forms of teaching activities	15.1.	Lectures - theoretical training	3	
		15.2.	Exercises (laboratory, auditory), workshops, outreach and teamwork	2	
16.	Other forms of activities	16.1.	Team projects	1	
		16.2.	Individual projects	1	
		16.3.	Individual study	/	
17.	Forms of assessment				
	17.1.	Exams (midterm exams, exam, electronic testing)	30		
	17.2.	Project activities (oral and written presentation)	50		
	17.3.	Other forms of studying activities	20		
18.	Criteria for assessment (points / grade)		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.	Condition for getting a signature and taking the final exam		60% of term activities, project activities and attending to lectures and discussions		
20.	Language in which classes are conducted		Macedonian		
21.	Method of monitoring the quality of instruction		Self-evaluation		

22.	Literature					
	22.1.	Compulsory literature				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Aco Gicev	Melioration and erosion protection	Data pons, Skopje	2003

		2.	Risto Gj. Kukutanov	Ameliorative systems in viticulture	Internal script	
	22.2.	Additional literature				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Dragovic Dj.	Irrigation of field crops	Institute of Field and Vegetable Crops, Novi Sad	2000

Appendix No.3	**Subject programme from second cycle studies**				
1.	Course title	Technologies for wine			
2.	Course code	2ZF220212			
3.	Study programme**:**	Viticulture			
4.	Organizer of the study programme (faculty, institute, group)	University “Goce Delcev”- Stip. Faculty of agriculture/Department of viticulture and fruitgrowing			
5.	Degree (first cycle)	Second cycle			
6.	Academic year / semester	second year/third semester	7.	Number of ECTS credits	8
8.	Professor	Professor George Micev, PhD			
9.	Preconditions for course enrollment	No			
10.	Goals of the course programme: Knowledge in Tech for the production of red wines, ranging from crushing the grapes, fermentation, pressing, machining wines clarification, filtration, stabilization, bottling and regulations that regulate the production of wine.				
11.	A) Content of the course programme: 1.Introduction, as wine industry in our country and the world. 2. Monitoring the quality and determination of harvest time. 3. Crush the grapes, treatment of grape pulp, yeasts, selected using 4. Application of enzyme preparations 5. Maceration 6. Fermentation and types fermentation. 7 clarification. Use, fining and filtration 8. Pressing 9. Filtration 10. Stabilization 11. Production of sparkling, dessert wines and liqueurs 12. Maturing of wine terms, putting the bottle B) Exercises: Transport the grapes to the winery; 2.Mashini for crushing the grapes, transport to the grape mash fermentation containers and treatments.2. Preparation, selected yeasts and use them. 3. Use of enzymes for the extraction of color. 4. Alcoholic fermentation. 5. Maceration. 6. Extrusion presses. 7. Clarification. 8. Filtering and filters. 9. Stabilization of wine. 10. Wine aging, ripening conditions and vessels.11. Packaging, labeling and bottling of wine. 12. Organoleptic evaluating wine.				
12.	Methods of study: Lectures, Laboratory exercises, e-learning, individual and team projects, consultations				
13.	Total amount of available time	216			
14.	Distribution of the available time	3 +2 +2			
15.	Forms of teaching activities	15.1.	Lectures - theoretical training	3	
		15.2.	Exercises (laboratory, auditory), workshops, outreach and teamwork	2	
16.	Other forms of activities	16.1.	Team projects	/	

		16.2.	Individual projects	1
		16.3.	Individual study	1

17.	Forms of assessment		
	17.1.	Exams (midterm exams, exam, electronic testing)	30
	17.2.	Project activities (oral and written presentation)	50
	17.3.	Other forms of studying activities	20

18.	Criteria for assessment (points / grade)	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.	Condition for getting a signature and taking the final exam	/ 60% of term activities or minimum 42 points from 2 midterm exams, project activities and attending to lectures and discussions	
20.	Language in which classes are conducted	Macedonian	
21.	Method of monitoring the quality of instruction	Self-evaluation	

22.	Literature					
	22.1.	Compulsory literature				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Karin Kovacevic	Technologies for wine	Zagreb	2006
	22.2.	Additional literature				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Milenko Blesic	Technologies for wine	Saraevo	2006
		2.	Mihail Petkov	Oenology	Skopje	2010
			Borimir Vojnoski	authorized lectures Wine production PPF	UGD-Stip	2011

Appendix No.3	**Subject programme from second cycle studies**	
1.	Course title	Designing of vineyards
2.	Course code	2ZF215412
3.	Study programme**:**	Viticulture
4.	Organizer of the study programme (faculty, institute, group)	University “Goce Delcev”- Stip. Faculty of agriculture/Department of viticulture and fruitgrowing
5.	Degree (first cycle)	Second cycle

6.	Academic year / semester	firs year/first semester	7.	Number of ECTS credits	4
8.	Professor	Associate Professor Violeta Dimovska, PhD			
9.	Preconditions for course enrollment	No			
10.	Goals of the course programme: Student to enable the collection and preparation of materials (pedological maps, climate data, data analysis of soil) necessary for construction of the project. Student to equip it self to be able to prepare an elaborate project to raise grape plants.				
11.	Content of the course programme: Climate and soil conditions. Structure-investment Vineyard. Location of new plantings. Choosing the sorting. Dimanic the boot. 2.Tehnological processes for raising plantation. Preparation the surface before planting. Measures to improve soil fertility. Ways of deep plowing soil. 3. Technical-tecnological solutions. Determining the distance of planting, direction and length of the lines. 4. Systems and support structures. 5. Selection of plant materijal. Preparation of seedlings. Time and ways of planting. 6. Sitting of the supporting structures. 7. Growing the young plantation in the first three years. 8.Technological processes in plantation in full yield. 9. Cutting, maintenance of soil, green cutting, nutrition, protection from disease and low temperatures, the grape harvest. 10. The total cost for regular production. Expected yields. 11. Means for raising plantation in the first three years.12. Total costs of raising grape plants including advisory services. B) Exercises: Making project based on the given element. Practical field performance based on finished project.				
12.	Methods of study: Lectures, Laboratory exercises, e-learning, individual and team projects, consultations				
13.	Total amount of available time	120			
14.	Distribution of the available time	2 +1 +1			
15.	Forms of teaching activities	15.1.	Lectures - theoretical training	2	
		15.2.	Exercises (laboratory, auditory), workshops, outreach and teamwork	/	
16.	Other forms of activities	16.1.	Team projects	0.5	
		16.2.	Individual projects	0.5	
		16.3.	Individual study	1	
17.	Forms of assessment				
	17.1.	Exams (midterm exams, exam, electronic testing)		30	
	17.2.	Project activities (oral and written presentation)		50	
	17.3.	Other forms of studying activities		20	
18.	Criteria for assessment (points / grade)	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.	Condition for getting a signature and taking the final exam	/ 60% of term activities or minimum 42 points from 2 midterm exams, project activities and attending to lectures and discussions			

20.	Language in which classes are conducted	Macedonian
21.	Method of monitoring the quality of instruction	Self-evaluation

22. Literature

Compulsory literature

Ordinal No.	Author	Title	Publisher	Year
1.	Vulic T., Sivcev B., Aleksic V., Rumi M., Urosevic M.	Elevation of the new plantations	University of Belgrade,Faculty of agriculture	2004
2.	Kuljancic, M	Viticulture	Prometej, Novi Sad	2007
3.	Milanov M. Martinovska Stojcevska A.	Expenses and calculations in agriculture	Faculty of agriculture	2002

Additional literature

Ordinal No.	Author	Title	Publisher	Year
1.	Avramov L.	Viticulture	Belgrade	1991
2.	Milosavljevic M	Biotechnical of vine	Research institute in agriculture	1998

Appendix No.3	**Syllabus for the first, second and third cycle of study**				
1.	Course title	**GRAPE PREPARATIONS AND PRODUCTS**			
2.	Course code	2ZF220712			
3.	Study programme	Viticulture			
4.	Organizer of the study programme (faculty, institute, group)	University “Goce Delčev” – Štup, Faculty of Agriculture, Department of viticulture and fruitgrowing			
5.	Level (first, second, third cycle)	Second cycle			
6.	Academic year / semester	First year/first semester	7.	Number of ECTS credits	4
8.	Professor	Associate Professor Violeta Dimovska, PhD Assistant Professor Violeta Ivanova-Petropulos, PhD			
9.	Preconditions for course enrollment	/			
10.	**Goals of the course programme**: Acquiring knowledge about the usage of grape as raw material in the manufacturing industry, types of processing and production technologies.				

11.	**Content of the course programme:** **Content of lectures**: 1. Introduction. Production of grapes in the world and in our country. Economic and technological value; 2. Types of processed 3. Juices and concentrated juices 4. Compotes, candies, jams and marmalades; 5. Wine (red, withe, table, quality, premium) 6. Special wines: Sparkling wine, Jerez/Xérès/Sherry wines, Liqueur wines or Fortified wines, Dessert wines, Aromatized wines or Vermouth; 7. Distillates: types of brandies; 8. Seeds oil and phenolic substances (tannins and anthocyanins); 9. Vinegar; 10. Wine sediment, tartaric acid; 11. Seeds phenolic extract; 12. Preparations used in cosmetics and confectionary industry. **Content of exercises**: 1. Determining the quality of raw materials; 2. Mechanical and chemical analysis of grapes; 3. Visit of a factory for production of beverages, soft drinks and other grape products. Introducing of technological processes; 4. Visit of a factory for production of alcohol and distillates; 5. Visit of a winery and introducing of wine technologies; 6. Visit of pharmaceutical company that manufactures grapes used in cosmetics; 7. Visit of factory for confectionery products; 8. Making a survey on the use of processed grapes within a category of users.			
12.	**Methods of study**: Lectures and laboratory exercises, consultations, individual and team projects; e-learning.			
13.	**Total amount of available time**		120	
14.	**Distribution of the available time**		2+1+1	
15.	**Forms of teaching activities**	15.1.	Lectures - theoretical training	2
		15.2.	Exercises (laboratory, auditory), workshops, outreach and teamwork	1
16.	**Other forms of activities**	16.1.	Team projects	-
		16.2.	Individual projects	0.5
		16.3.	Individual study	0.5

17.	**Forms of assessment**		
	17.1.	Exams (midterm exams, exam, electronic testing)	70
	17. 2	Project activities (oral and written presentation)	10
	17.3.	Other forms of studying activities	20

18.	**Criteria for assessment (points / grade)**	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.	**Condition for getting a signature and taking the final exam**	60% of term activities, project activities and attending to lectures and discussions
20.	**Language in which classes are conducted**	Macedonian
21.	**Method of monitoring the quality of instruction**	Self-evaluation

22.	**Literature**					
	22.1.	**Compulsory literature**				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Nikićević N., Tešević V	Spirits	Beograd	2008
		2.	Jovic S, Milisavljevic M	Grape and wine	Beograd	2004
	22.2.	Additional literature				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Göktürk Baydar N, Akkurt M	Oil content and oil quality properties of some grape seeds	*Turkish Jounal of Agriculture and Forestry* 25	2001
		2.	Cajkovic M	Cosmetology	Naklada Spal, Zagreb	2000

Appendix No.3	**Subject programme from second cycle studies**				
1.	Course title	Training systems on vine			
2.	Course code	2ZF215412			
3.	Study programme**:**	Viticulture			
4.	Organizer of the study programme (faculty, institute, group)	University “Goce Delcev”- Stip. Faculty of agriculture/Department of viticulture and fruitgrowing			
5.	Degree (first cycle)	Second cycle			
6.	Academic year / semester	firs year/first semester	7.	Number of ECTS credits	4
8.	Professor	Associate Professor Violeta Dimovska, PhD			
9.	Preconditions for course enrollment	No			
10.	Goals of the course programme: Acquiring knowledge about the current system of growing vines. Acquired knowledge to make the correct selection and establishment of an appropriate system for a particular breed / base of the genus Vitis.				
11.	Content of the course programme: 1.Basic factors that determine the breeding system. Agro-ecological conditions Agrobiological characteristics of the variety. Technological characteristics of the varieties. Second low systems. cordone. Zhupski. Form of range.				

	3. One-legged Guyot. Guyot two arms. Taper cordone. 4. Average high systems. Joaratska one-legged and two arms cordone. Modified roajatska one-legged cordone and two arms. 5.Kazanavljeva one-legged and two arms cordone. 6. Two arms asymmetric cordone with short and mixed cutting Roajatska with short cutting Kazanavljeva with mixed cutting. 7.Bordo-cordone with mixed cutting. Rhine way. 8. High systems. Systems vertical row. 9. System with hanging tendrils.10. Combined Systems-two row. 11.Trellis. 12.Ambrela. B) Exercises: He formation of different systems of cultivation of vines. 2.Adapttion. 3.Physiologicals and production characteristics of the varieties in different farming systems. 4. The system influence on phenology, vegetative potential, fertility and yield. 5. The system influence on the qualitative and quantitative properties change of grapes. 6.Influence the farming systems on variety resistance to various biotic and abiotic factors				
12.	Methods of study: Lectures, Laboratory exercises, e-learning, individual and team projects, consultations				
13.	Total amount of available time		120		
14.	Distribution of the available time		2 +1 +1		
15.	Forms of teaching activities	15.1.	Lectures - theoretical training		2
		15.2.	Exercises (laboratory, auditory), workshops, outreach and teamwork		1
16.	Other forms of activities	16.1.	Team projects		
		16.2.	Individual projects		0.5
		16.3.	Individual study		0.5
17.	Forms of assessment				
	17.1.	Exams (midterm exams, exam, electronic testing)			30
	17.2.	Project activities (oral and written presentation)			50
	17.3.	Other forms of studying activities			20
18.	Criteria for assessment (points / grade)		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.	Condition for getting a signature and taking the final exam		/ 60% of term activities or minimum 42 points from 2 midterm exams, project activities and attending to lectures and discussions		
20.	Language in which classes are conducted		Macedonian		
21.	Method of monitoring the quality of instruction		Self-evaluation		

22.	Literature					
	22.1.	Compulsory literature				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Petar Hristov	Viticulture-general part	MAKFORM	2002

		2.	Aleksandar Nakalamic, Nebojsa Markovic	General Viticulture	Faculty of agriculture Belgrade	2009
		3.	Zunic D.,Matijasevic S. Матијашевић С.	Training systems on vine	Belgrade	2004
	22.2.	Additional literature				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Nakalamic,.A	General Viticulture	Faculty of agriculture Belgrade	2001
		2.	Pool, Bob	**Training Systems for New York Vitis vinifera Vineyards**		2008

Appendix No.3	**Syllabus for the first, second and third cycle of study**				
1.	Course title	**Special herbology**			
2.	Course code	2ZF201512			
3.	Study programme	Viticulture			
4.	Organizer of the study programme (faculty, institute, group)	University “Goce Delcev”- Stip, Faculty of Agriculture, Stip, Department for viticulture and fruit production			
5.	Level (first, second, third cycle)	Second cycle			
6.	Academic year / semester	First / second 2012/13	7.	Number of ECTS credits	4
8.	Professor	Prof. Dragica Spasova, PhD			
9.	Preconditions for course enrollment	No			
10.	Goals of the course programme: The course aims to provide knowledge of the changes occurring in weed communities, proposing measures to prevent the occurrence and spread of weed vegetation in certain cultures.				
11.	Content of the course programme: Lectures: 1. Destruction of weeds: indirect (preventive) measures and direct measures 2. Chemical measures for the destruction of weeds 3. Destruction of weeds in crops with dense structure 4. Destruction of weeds in forage crops; 5. Destruction of weeds in industrial crops 6. Destruction of weeds in vegetables 7. Destruction of weeds in beds to produce seedlings of tomato, pepper, tomato, 8. Destruction of weeds in beds to produce seedlings of onions and leeks 9. Destruction of weeds in beds to produce seedlings of cabbage and cauliflower, 10. Destroying narrow leaf and broadleaf weeds in crops throughout the vegetation. 11. Destruction of weeds in vineyards and orchards: young plants (3 - 4) years 12. Destruction of weeds in vineyards and orchards: old plantations (aged 3-4 years). Exercises: 1. Introduction to the technique of performing experiments with field herbicides; 2. Introduction to the technique of performing laboratory experiments with herbicides. 3. Specifically to process harmful weeds in crops with dense structure 4. Specifically to process weeds in forage crops 5. Weeds in industrial cultures 6. Weed the garden: Fam. Solanaceae; 7. Weeds in vegetables: Fam Cucurbitaceae; 8. Weed				

	the garden: Fam. Brasicaceae; 9. Weed the garden: Fam. Apiaceae; 10. Narrow leaf weeds in broadleaf crops. 11. Weeds in vineyards 12. Weed in orchards.				
12.	Methods of study: Lectures, theoretic and field exercises, e-learning, individual and team projects, consultations.				
13.	Total amount of available time		120 hours		
14.	Distribution of the available time		2+1+1		
15.	Forms of teaching activities	15.1.	Lectures - theoretical training		2
		15.2.	Exercises (laboratory, auditory), workshops, outreach and teamwork		1
16.	Other forms of activities	16.1.	Team projects		0,5
		16.2.	Individual projects		0,5
		16.3.	Individual study		/
17.	Forms of assessment				
	17.1.	Exams (midterm exams, exam, electronic testing)			30
	17.2.	Project activities (oral and written presentation)			50
	17.3.	Other forms of studying activities			20
18.	Criteria for assessment (points / grade)		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.	Condition for getting a signature and taking the final exam		60% of term activities, project activities and attending to lectures and discussions		
20.	Language in which classes are conducted		Macedonian		
21.	Method of monitoring the quality of instruction		Self-evaluation; Periodical tests for students; survey.		
22.	Literature				
	22.1.	Compulsory literature			
		Ordinal No.	Author	Title	Publisher	Year
		1.	Kojić, M. Šinžar, B.	Korovi	Naucna knjiga, Beograd	1985
		2.	Kojić, M. Janji, V., Stepić, R.	Korovi I njihovo sizbijanje	IŠPJŽ "BIROGRAFIKA", Subotica	1996
		3.	Kovačevič, J.	Korovi u poljoprivredi	Nakladni zavod znanje Zagreb	1974
		4.	Костов, Т.	Хербологија	УКИМ, факултет за земјоделски науки и храна. Скопје	2006
	22.2.	Additional literature				

		Ordinal No.	Author	Title	Publisher	Year
		1.	Thomas J. M. Stephen C. Weller. Floyd M. Ashton	Weed science. Principles and practices	Printed in the United States of America	2002
		2.				
		3.				

Appendix No.3	**Syllabus for the first, second and third cycle of study**				
1.	Course title	**METHODS FOR ANALYSIS OF GRAPES AND WINE**			
2.	Course code	2ZF220912			
3.	Study programme	Viticulture			
4.	Organizer of the study programme (faculty, institute, group)	University “Goce Delčev” – Štup, Faculty of Agriculture, Department of Viticulture and Fruit growing			
5.	Level (first, second, third cycle)	Second cycle			
6.	Academic year / semester	First year/ second semester	7.	Number of ECTS credits	4
8.	Professor	Assistant Professor Violeta Ivanova-Petropulos, PhD			
9.	Preconditions for course enrollment	/			
10.	**Goals of the course programme**: Acquiring knowledge about the methods used for quality control of grapes and wine, as well as knowledge of the parameters that determine quality. Introduction to methods for analysis of the parameters responsible for the grape and wine.				
11.	**Content of the course programme:** **A) Content of lectures**: 1. Introduction to quality control of grapes and wines; 2. Analytical methods for quality control of grapes and wine. Safety in the laboratory; 3. Chemical composition of must; 4. Repairing the chemical composition of must; 5. Chemical composition of wine; 6. Alcohol, extract, pH and total acids, and methods for determination; 7. Volatile acids and methods for determination; 8. Sulfur dioxide and determination; 9. Carbohydrates and methods for determination; 10. CO_2, bitartrate and protein stability, methods for determination; 11. Other important parameters for quality control of wine and methods for determination; 12. Grape polyphenols ripeness and methods for determination; 13. Reagents and standards. **B) Content of exercises**: 1. Introduction to the parameters responsible for the grape and wine quality; 2. Introduction to methods for quality control of wine; 3. Safety in laboratory; 4. Determination of sugar content in must; 5. Correction of sugar, acidity and color of must; 6. Determination of alcohol and extract; 7. Determination of total acid and pH in wine; 8. Determination of volatile acids; 8. Determination of free and total SO_2; 9. Determination of reducing sugars in wine; 10. Determination of CO_2 and protein stability; 11. Determination of color; 12. Standardization of solutions.				
12.	**Methods of study**: Lectures and laboratory exercises, consultations, individual and team projects; e-learning.				
13.	**Total amount of available time**	120			
14.	**Distribution of the available time**	2+1+1			
15.	**Forms of teaching activities**	15.1.	Lectures - theoretical training	2	

		15.2.	Exercises (laboratory, auditory), workshops, outreach and teamwork	1
16.	**Other forms of activities**	16.1.	Team projects	0.5
		16.2.	Individual projects	-
		16.3.	Individual study	0.5

17.	**Forms of assessment**		
	17.1.	Exams (midterm exams, exam, electronic testing)	70
	17. 2	Project activities (oral and written presentation)	10
	17.3.	Other forms of studying activities	20

18.	**Criteria for assessment (points / grade)**	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.	**Condition for getting a signature and taking the final exam**	60% of term activities, project activities and attending to lectures and discussions		
20.	**Language in which classes are conducted**	Macedonian		
21.	**Method of monitoring the quality of instruction**	Self-evaluation		

22.	**Literature**					
	22.1.	**Compulsory literature**				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Jacobson J.L.	Introduction to Wine Laboratory Practices and Procedures	Springer	2008
		2.	Zoecklein B., Fugelsand K.C., Gump B.H., Nury F.S.	Wine analysis and production	Chapman & Hall, New York	1995
	22.2.	Additional literature				
		Ordinal	Author	Title	Publisher	Year

		No.				
		1.	Violeta Ivanova-Petropulos	Authorized lectures of Methods for analysis of grapes and wine, for the students at Faculty of Agriculture	UGD - Štip	2012

Appendix No.3	**Syllabus for the first, second and third cycle of study**				
1.	Course title	LEGISLATION IN VITICULTURE AND WINEMAKING			
2.	Course code	2ZF215612			
3.	Study programme	Viticulture			
4.	Organizer of the study programme (faculty, institute, group)	University “Goce Delčev” – Štip, Faculty of Agriculture, Department of viticulture and fruit growing			
5.	Level (first, second, third cycle)	Second cycle			
6.	Academic year / semester	Second year/second semester	7.	Number of ECTS credits	4
8.	Professor	Associate Professor Violeta Dimovska, PhD Assistant Professor Violeta Ivanova-Petropulos, PhD			
9.	Preconditions for course enrollment	/			
10.	**Goals of the course programme**: Acquiring knowledge about the usage of grape as raw material in the manufacturing industry, types of processing and production technologies.				
11.	**Content of the course programme:** 1. Meaning of cadastre for vineyards; 2. List of varieties. Recommended, permitted and prohibited; 3. Legal norms-conditions for production and trade with seedlings; 4. Method of production and control of raw materials and grape seedlings; 5. Standards for grape quality seedlings; 6. Standards for quality of table grapes for fresh consumption; 7. Introduction to the wine law. National strategy for wine development; 8. Wine production; 9. Market and trade with wine; 10. Classification of wines. Wines with geographic origin; 11. Description, designation and protection of wine; 12. Quality control. Rules for quality of wine.				
12.	**Methods of study**: Lectures and laboratory exercises, consultations, individual and team projects; e-learning.				
13.	**Total amount of available time**	120			
14.	**Distribution of the available time**	2+1+1			
15.	**Forms of teaching activities**	15.1.	Lectures - theoretical training	2	
		15.2.	Exercises (laboratory, auditory), workshops, outreach and teamwork	1	

16.	**Other forms of activities**	16.1.	Team projects	0.5
		16.2.	Individual projects	
		16.3.	Individual study	0.5

17.	**Forms of assessment**		
	17.1.	Exams (midterm exams, exam, electronic testing)	70
	17. 2	Project activities (oral and written presentation)	10
	17.3.	Other forms of studying activities	20

18.	**Criteria for assessment (points / grade)**	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.	**Condition for getting a signature and taking the final exam**	60% of term activities, project activities and attending to lectures and discussions		
20.	**Language in which classes are conducted**	Macedonian		
21.	**Method of monitoring the quality of instruction**	Self-evaluation		

22. **Literature**

22.1. **Compulsory literature**

Ordinal No.	Author	Title	Publisher	Year
1.	Official Gazette of RM No. 39/06, 89/08, 171/10	Law on Seeds and Seedlings	MZSV	2006, 2008, 2010
2.	Official Gazette of RM No. 103/09 (EU Directive 2002/53/EC)	Regulations for registration of variety in the National Variety List and keeping of National Variety List	MZSV	2009
3.	Official Gazette of RM No. 53	Wine low	MZSV	2011
4.	Official Gazette of RM No. 116/11	Regulation for trade with material for	MZSV	2011

			(EU Directive 68/193/EEC)	vegetative propagation of vine		
		5.	Official Gazette of RM No. 53/11	Wine low	MZSV	2010
	22.2.	Additional literature				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Official Gazette of RM No. 91/11 M	Regulation of the minimum standards for fruit and vegetables intended for processing and specific marketing standards for quality of fresh fruits and vegetables	MZSV	2011

Appendix No.3	**Syllabus for the first, second and third cycle of study**				
1.	**Course title**	**Growing organic grapes**			
2.	**Course code**	2ZF212712			
3.	**Study programme**	Viticulture			
4.	**Organizer of the study programme (faculty, institute, group)**	Faculty of Agriculture, University “Goce Delcev”-Stip, Department for viticulture and fruit growing			
5.	**Level (first, second, third cycle)**	Second cycle			
6.	**Academic year / semester**	First year/ second semester	7.	Number of ECTS credits	4
8.	**Professor**	Prof. Ljupco Mihajlov, PhD			
9.	**Preconditions for course enrollment**	No			
10.	**Goals of the course programme**: Students will be able to understand the techniques in production of grapes according to the standards of organic principles. Students will develop competences about specifics of conversion, certification and organic grapes growing according to the ruling Law and By-laws in the Republic of Macedonia.				
11.	**Content of the course programme**: ***Lectures***: (1) Introduction of the principles of growing organic grapes; (2) Legal status of organic grapes production; (3) Influence of organic growing principles on environment; (4) Standards and law in organic grapes production; (5) Conversion procedures in organic grapes growing; (6) Multi functionality of organic grapes growing; (7) Growing techniques and plant protection in organic grapes production; (8) Vine nutrition according to organic growing principles; (9) Bio pesticides and bio fertilizers in organic grapes growing; (10) Integral methods for protection in organic grapes production; (11) Certification in organic grapes growing; (12) Methods for development of organic grapes growing.				

	Practices: (1) Specifics of growing techniques in organic farming; (2) Pre-conditions for establishing organic grapes production; (3) Specifics in terrain preparation for organic grapes production; (4) Guidelines of organic grapes production; (5) Planting material and cultivars; (6) Conversion from conventional into organic grapes growing; (7) Training systems; (8) Specifics in growing table grapes cultivars; (9) Specifics in growing wine grapes cultivars; (11) Specifics of plant protection in organic grapes growing; (12) Visit to organic grapes production farm.				
12.	**Methods of study**: Lectures, theoretical and laboratory exercises, consultations, e-learning, individual and team projects, e-learning, prepare lecture for exams.				
13.	**Total amount of available time**		120 hours		
14.	**Distribution of the available time**		2+1+1		
15.	**Forms of teaching activities**	15.1.	Lectures - theoretical training	2	
		15.2.	Exercises (laboratory, auditory), workshops, outreach and teamwork	1	
16.	**Other forms of activities**	16.1.	Team projects	0.5	
		16.2.	Individual projects	/	
		16.3.	Individual study	0.5	
17.	**Forms of assessment**				
	17.1.	Exams (midterm exams, exam, electronic testing)		30	
	17.2.	Project activities (oral and written presentation)		50	
	17.3.	Other forms of studying activities		20	
18.	**Criteria for assessment (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.	**Condition for getting a signature and taking the final exam**		60% success level on all pre-exam activities		
20.	**Language in which classes are conducted**		Macedonian		
21.	**Method of monitoring the quality of instruction**		Self-evaluation		
22.	**Literature**				

Compulsory literature

	Ordinal No.	Author	Title	Publisher	Year
22.1.	1.	Expert group of Ministry of agriculture, forestry and water management, Republic of Macedonia	Guidelines for organic production	Ministry of agriculture, forestry and water management	2008
	2.	IFOAM	Basic standards organic	Overall Assembly	2006

				production and processing	of IFOAM, Basel Swiss	
		3.	Nic Lampin et all.	Manual to guide the organic farms OP	Government of the Republic of Macedonia, Project for translate of 500 books	2009
	22.2.	***Additional literature***				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Vasko Zlatkovski	Guides for organic grapes production	Ministry of agriculture, forestry and water management	2005
		2.	Borivoj Šarapatka, Jiri Urban et.al.	Organic agriculture	Ministry of Agriculture of the Czech Republic	2009
		3.				

Appendix No.3	**Subject programme from second cycle studies**				
1.	Course title	Marketing and promotion of grapes and wine			
2.	Course code	2ZF205512			
3.	Study programme	Viticulture			
4.	Organizer of the study programme (faculty, institute, group)	University “Goce Delcev”- Stip, Faculty of Agricultural - Department for viticulture and fruit growing			
5.	Level (first, second, third cycle)	Second cycle			
6.	Academic year / semester	Second year/ second semester	7.	Number of ECTS credits	4
8.	Professor	Ass. prof. Elenica Sofijanova, PhD			
9.	Preconditions for course enrollment	No			
10.	Goals of the course programme: Introduce the students with marketing access and marketing concept of wine and grapes production for all marketing activities and assortments.				
11.	Content of the course programme: A) *Content of lectures:* 1. Introduction, concept, definition and meaning of marketing; 2. Marketing - activities and marketing – concepts; 3. Product selection programme and agricultural assortment of grapes and wine; 4. Headlines way of selling grapes and wine; 5. Highlights priced grapes and wine; 6. Analysis of demand and supply of grapes and wine; 7. Mechanism and market organization of grapes and wine; 8. Market institutions in the supply of grapes and wine; 9. Market indicators and conditions of supply of grapes and wine; 10. World market for grapes and wine; 11.				

	Republic of Macedonia in the foreign - trade with grapes and wine; 12. Market research on grapes and wine; B) *Content of exercises:* 1. Basic principles, concepts and notions of marketing; 2. Use of marketing activities and concepts to promote a new product market (wine); 3. Tracking global turned selection of the best and sought after product; 4. Methods for determination the way of selling grapes and wine; 5. Development of methods for determining prices of grapes and wine; 6. Examples analysis of demand and supply of grapes and wine; 7. Functioning of mechanism and organization of the market of grapes and wine 8. Examining the market institutions in the supply of grapes and wine; 9. Development of indicators and market conditions the supply of grapes and wine; 10. Graphic displays of world producers grapes and wine; 11. Graphic display of the largest trade partners of Macedonia grapes and wine; 12. Case study research in a global market for grapes and Wine.				
12.	Methods of study: Lectures, Laboratory exercises, e-learning, individual and team projects, consultations.				
13.	Total amount of available time		120 hours		
14.	Distribution of the available time		2 +1 +1		
15.	Forms of teaching activities	15.1.	Lectures - theoretical training		2
		15.2.	Exercises (laboratory, auditory), workshops, outreach and teamwork		1
16.	Other forms of activities	16.1.	Team projects		1
		16.2.	Individual projects		
		16.3.	Individual study		
17.	Forms of assessment				
	17.1.	Exams (midterm exams, exam, electronic testing)			30
	17.2.	Project activities (oral and written presentation)			50
	17.3.	Other forms of studying activities			20
18.	Criteria for assessment (points / grade)		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.	Condition for getting a signature and taking the final exam		60% of term activities, project activities and attending to lectures and discussions		
20.	Language in which classes are conducted		Macedonian		
21.	Method of monitoring the quality of instruction		Self-evaluation, Periodic tests students; Survey		
22.	Literature				
	22.1.	Compulsory literature			
		Ordinal No.	Author	Title	Publisher	Year
		1.	Bosko Jakovski	Marketing	Economic Faculty - Skopje	1997

		2.	Tomin A., Gjorovic M.	Trzište i promet poljoprivrednih i agroindustriskij proizvoda	NIR „Zadruga“ Beograd.	2000
	22.2.	Additional literature				
		Ordinal No.	Author	Title	Publisher	Year
		1.	Filip Kotler and Geri Amstrong	Principles marketing	Academic press	2010