DEPARTMENT OF PLANT PRODUCTION

Study programme: Biotechnology, plant breeding and seed production DIPLOMA: MASTER OF AGRICULTURAL SCIENCES – Biotechnology, plant breeding and seed production

CODE	I SEMESTER – FIRST YEAR			
	Compulsory course	Credits	Classes	Total
2ZF230112	Methods in scientific research work	8	3+2+2	216
2ZF211412	Genetics	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
2ZF211512	Plant physiology	8	3+2+2	216
2ZF211612	Plant breeding	8	3+2+2	216
2ZF201712	Phytopatology	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
2ZF211712	Seed production	8	3+2+2	216
2ZF211812	Plant biotechnology	8	3+2+2	216
2ZF205212	Methods in biochemical and physiological investigations	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			
2ZF211912	Cytogenetic	4	2+1+1	120
2ZF212012	Plant tissue culture	4	2+1+1	120
2ZF201912	Basics of phytopharmacy	4	2+1+1	120
2ZF212112	Eco physiology	4	2+1+1	120
	Faculty elective course II semester			
2ZF212212	Breeding of field crops	4	2+1+1	120
2ZF212312	Vine breeding	4	2+1+1	120
2ZF212412	Plant breeding in vegetable growing	4	2+1+1	120
2ZF212512	Special plant breeding	4	2+1+1	120

App No.3	•	first, s	econd and third cycle o	of study	
1.	Course title		METHODS IN SCIENTI	FIC RESEAR	CH WORK
2.	Course code		2ZF230112		
3.	Study programme		Biotechnology, plant bre	eding and se	ed production
4.	Organizer of the study		"Goce Delcev"University		
	programme (faculty, institu	ıte,	Agriculture, Stip, Depart	ment for plan	tand
	group)		environmental protection	n	
5.	Level (first, second, third c	ycle)	Second cycle		
6.	Academic year / semester		· · / · · · ·	Number of E	CTS 8
_				credits	
8.	Professor		Prof. Ilija Karov, PhD		
9.	Preconditions for course enrollment		No		
10.	Goals of the course prog science, the scientific resea				
	scientific worker.				
11.	Content of the course prog			alaatia ti	
	Content of lectures: 1. Impo				
	work 3. Methodology of res experiment 6. Conducting the				
	field experiment 8. An overvi		0,		
	Methodology and technique				
	displaying the results 11. Te				
	and citing the literature 12. P				
	Content of exercises: 1. Int				g the literature
	4. Performing of experiment				
	containers 8. Processing of	the exp	erimental results 9. Dis	playing obtair	ned results 10.
	Literature citation, 11. Writing				
12.	Methods of study: lectu				
	independent paper work, ho	me leai	rning, preparatory class	es for exams	and mid-term
10	tests, consultations.		040 h a una		
13. 14.	Total amount of available to Distribution of the available		216 hours		
14. 15.		15.1.	3+2+2	troining	2
15.	Forms of teaching activities	15.1.	Lectures - theoretical Exercises (laboratory,		3
		10.2.	workshops, outreach a		<u> </u>
			teamwork	inu -	
16.	Other forms of activities	16.1.	Team projects		1
10.		16.2.	Individual projects		1
		16.3.	Individual study		
17.	Forms of assessment				1
	17.1. Exams (midterm exar	-	•	30	
	17.2. Project activities (oral			50	
	17.3. Other forms of studying	•		20	
18.	Criteria for assessment (po	oints /	to 50 points	5 (five)	(F)
	grade)		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	- ((A)
19.			etting a signature	60% of term activities, pr		nd
			final exam	attending to lectures and	discussions	
20.	condu	ucted	hich classes are	Macedonian		
21.		od of mon truction	itoring the quality	Self-evaluation		
22.	Litera	ture				
		Compul	sory literature			
		Ordinal No.	Author	Title	Publisher	Year
	22.1.	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
		Addition	al literature			
		Ordinal No.	Author	Title	Publisher	Year
	22.2.	1.	Dr. Slavko Borojevic	Metodologija eksperimentalnog naucnog rada	Radnicki Univerzitet "Radivoj Cirpanov"	1974

App	endix No.3	Syllabus for t	he first, second a	nd t	hird cycle of study	
1.	Course tit	le	Genetics			
2.	Course co	de	2ZF211412			
3.	Study prog	gramme	Biotechnology, se	elect	ion and seed product	ion
4.	-	of the study e (faculty, institute,	Faculty of Agricul Stip, Department		, University "Goce De lant production	lcev"-
5.	Level (first	t, second, third cycle)	Second cycle			
6.	Academic	year / semester	First year/ first semester	7.	Number of ECTS credits	8
8.	Professor		Prof. Verica Ilieva	a, Ph	D	
9.	Preconditi enrollmen	ions for course t	No			
10.		the course programme ith the basic principles a				
11.	Lectures: Categories	f the course programme INHERITANCE AND V/ , groups and forms of i structure of genetic mate	ARIABILITY IN Pl nheritance. Cell a	as a	place of inherited of	changes.

12.	Mode Chron during enviro HYBR subse Codor (Mear genera Polypl variab genes their f INHEF extran organ pressu ENGII Pract Nume of ger freque inherit Metho Lectur	of action of genes and the nosomes. Number of child in the second	term cis romoso e of var and var d alleles at dom INTERS zation in petweer ANCE opulatio S (Type applying in inhe GENET m in po D HET IC PLA enetic m opulatio ons; Cor ts; Herit	aterial; Mendel's principle chromosome; Interspecies ons; Laws of large popul nponents of phenotypic va tability; Combinative ability exercises, consultations,	ween genes a Behavior of ch y. The impac anisms). INTE segregation in ntermediate ENUS) HYBF and propertie erility in disti ROPERTIES genes. Additive or detecting m ction). EXTR and mitochon oulation in tetic equilibriu CIPLES OF of genetics; I s hybridization ations; Equilit ariability; Gene y.	and cistrons. romosomes t of external ERSPECIES F1, F2 and inheritance. RIDIZATION s of the F1 nct hybrids. (Phenotypic ve activity of utations and ANUCLEAR drial DNA in autogamous m. Mutation GENETIC Linked traits, y; Frequency prium, Gene e systems in
13.		projects, prepare lecture amount of available tir		ams. 216 hours		
14.		bution of the available		3+2+2		
15.	Form	s of teaching	15.1.	Lectures - theoretical tra	aining	3
10.	activi		15.2.	Exercises (laboratory, a		2
				workshops, outreach an teamwork	d	
16.	Other	forms of activities	16.1.	Team projects		/
			16.2.	Individual projects		1
			16.3.	Individual study		1
17.		s of assessment	1	1		
	17.1.	Exams (midterm exam				30
	17.2.	Project activities (oral		• •		50
	17.3.	Other forms of studyin	-	ies		20
18.	Crite	ria for assessment (po	oints /	up to 50 points	5 (five) (F)	
		grade)		from 51 to 60 points	6 (six) (E)	
				from 61 to 70 points	7 (seven) (I	ור
				from 71 to 80 points from 81 to 90 points	8 (eight) (C) 9 (nine) (B)	
				from 91 to 100 points	10 (ten) (A)	
	1					

19.		ition for ge aking the f	etting a signa inal exam	ture	60% success lev	el on all pre-exam activities	6
20.	Langı condı		ich classes a	re	Macedonian		
21.	of ins	truction	toring the qua	ality	Self-evaluation, F Survey	Periodic tests for students,	
22.	Litera						
		Compuls	ory literature				
		Ordinal No.	Author		Title	Publisher	Year
	22.1.	1.	Cane Stojkovski, Sonja Ivanovska	Gene	etics	University "Ss. Cyril and Methodius, Skopje, Faculty of agriculture science and food	2002
		2.	Petrovska Dobrinka	Gene	etics	University "Ss. Cyril and Methodius, Skopje, Faculty of agriculture science and food	1993
		3.	Aleksandar Đokić	Plant	t genetic	Partenon, Beograd	2000
		Addition	al literature				
		Ordinal No.	Author		Title	Publisher	Year
		1.	Sonja Ivanovska, Ljupco Jankuloski, Mirjana Jankulovsk a	Colle gene	ection tasks of tics	University "Ss. Cyril and Methodius, Skopje, Faculty of agriculture science and food	2011
	22.2.	2.	Šurlan – Momirović, G., Rakonjac, V., Prodanović, S., Živanović, T.	Gene bree (scrip	•	University of Beograd, Faculty of Agriculture, Beograd	2007
		3.	Borojević Slavko, Borojević Katarina	Gene	etics	University of Novi Sad, Faculty of Agriculture,	1976
		4.	Ayala F., Kiger J.A.	Mode	ern genetics	The Benjamin/Cummings Publishing Company, Inc. Menlo Park, California	1984

5.	Borojević	Genes and	Forum, Novi Sad	1986
	Katarina	populations		
6.	Dimitrijević	Genetic modified	Novi Sad	2004
	M., Petrović	organisms		
	Sofija	Questions and		
		dilemmas		
7.	Dimitrijević	Genetics populations	Faculty of agriculture,	2005
	M., Petrović	Adaptability and	Novi Sad, Institute for	
	Sofija	genotype stability	crop field	
8.	Marinković	Genetics	Science book, Beograd	1982
	M., Tucić			
	N., Kekić V.			

Арр	endix No.3 Syllabus for the	111 31, 3		- , -				
1.	Course title		BIOSTATISTICS	\$				
2.	Course code		2ZF230212					
3.	Study programme:		Field crops					
4.	Organizer of the study		Department for p	lant	and e	environm	nental	
	programme (faculty, institu	ıte,	protection Facul	ty of	f Agric	ulture		
	group)		University "Goce	Del	cev"-	Stip.		
5.	Level (first, second, third c	ycle)	Second cycle					1
6.	Academic year / semester		Second year/	7.		ber of E	ECTS	6
			first semester		cred		·	l
8.	Instructor		Prof. Tatjana At	ana	sova	Pacems	ska, Pr	۱D
9.	Preconditions for course enrollment							
10.	Goals of the course progra statistical methods in agricult			taile	ed kno	wledge	for the	e use of
11.	Content of the course prog							
	Content of lectures:							
	1. Introduction to statistics (
	techniques 3. Types of statis							
	and distribution 6. Discrete e							
	T test and F test 9. Analys		•	,				
	factorial experiment 11. Line				n 12.	Experim	iental L	Jesign -
	practical application of metho	bas in a	gricultural resear	cn.				
	Content of exercises:		and 2 The upp of	fha	voio ot	otictical	toobni	au oo 2
	1. Mathematics and statistic							
	1. Mathematics and statistic Types of statistical method	s 4. P	ractical ways of	dat	ta pro	ocessing) 5. St	tatistics,
	1. Mathematics and statistic Types of statistical method variability and distribution 6	s 4. P . Discre	ractical ways of ete equal distribu	dat utior	ta pro n. 7. E	ocessing Element	i 5. St s of st	tatistics, tatistical
	1. Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F	s 4. P . Discre - test 9	ractical ways of ete equal distribu 9. Analysis of va	dat utior ariar	ta pro n. 7. E nce (A	ocessing Element ANOVA)	5. St s of st 10. F	tatistics, tatistical actorial
	1. Mathematics and statistic Types of statistical method variability and distribution 6	s 4. P . Discre - test sexperime	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u	dat utior ariar regre	ta pro n. 7. E nce (A essior	cessing Element NOVA) and c	5. St s of st 10. F correlat	tatistics, tatistical factorial tion 12.
12.	1. Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e	s 4. P . Discre - test sexperime	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u	dat utior ariar regre	ta pro n. 7. E nce (A essior	cessing Element NOVA) and c	5. St s of st 10. F correlat	tatistics, tatistical factorial tion 12.
12.	 Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and practical 	s 4. P . Discre = test 9 experime cal appl ctice ex	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u lication of method aercises, consulta	dat utior ariar regro <u>ls in</u> tion	ta pro n. 7. E nce (A essior agricu s; indi	Decessing Element ANOVA) a and c ultural re vidual w	5. Sf s of st 10. F correlat esearch vork; ho	tatistics, tatistical Factorial tion 12. n.
	 Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and pra- learning; preparatory classes 	s 4. P . Discre = test 9 experime cal appl ctice ex s for exa	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u lication of methoc vercises, consulta ams and mid-term	dat utior ariar regro <u>ls in</u> tion	ta pro n. 7. E nce (A essior agricu s; indi	Decessing Element ANOVA) a and c ultural re vidual w	5. Sf s of st 10. F correlat esearch vork; ho	tatistics, tatistical Factorial tion 12. n.
13.	1. Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and pra- learning; preparatory classes Total amount of available to	s 4. P . Discre - test s experime cal appl ctice ex for exa ime	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u lication of methoc ercises, consulta ams and mid-term 156 hours	dat utior ariar regro <u>ls in</u> tion	ta pro n. 7. E nce (A essior agricu s; indi	Decessing Element ANOVA) a and c ultural re vidual w	5. Sf s of st 10. F correlat esearch vork; ho	tatistics, tatistical Factorial tion 12. n.
13. 14.	 Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and pra- learning; preparatory classes Total amount of available ti Distribution of the available 	s 4. P . Discre - test s experime cal appl ctice ex s for exa ime e time	ractical ways of ete equal distribu 9. Analysis of va- ent 11. Linear u lication of method ercises, consulta ams and mid-term 156 hours 2+2+1	dat ution ariar regro <u>ls in</u> tion tes	ta pro n. 7. E nce (A ession agricu s; indi s; indi	ocessing Element ANOVA) a and c ultural re vidual w nsultatic	5. Sf s of st 10. F correlat esearch vork; ho on;	tatistics, tatistical Factorial tion 12. n.
13.	 Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and pra- learning; preparatory classes Total amount of available to Distribution of the available Forms of teaching 	s 4. P . Discre - test 9 experime cal appl ctice ex s for exa ime e time 15.1.	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u lication of method ercises, consulta ams and mid-term 156 hours 2+2+1 Lectures - theo	dat utior ariar regro <u>ls in</u> tion tes retic	ta pro n. 7. E nce (<i>A</i> ession agricu s; indi sts: co cal trai	ocessing Element: ANOVA) a and c ultural re vidual w nsultatic ning	5. Sf s of st 10. F correlat esearch vork; ho on; 2	tatistics, tatistical Factorial tion 12. n.
13. 14.	 Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and pra- learning; preparatory classes Total amount of available ti Distribution of the available 	s 4. P . Discre - test s experime cal appl ctice ex s for exa ime e time	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u lication of method ercises, consulta ams and mid-term 156 hours 2+2+1 Lectures - theo Exercises (labo	dat utior ariar regro ls in tion tes retio	ta pro n. 7. E essior agricu s; indi sts: co cal trai ry, aud	ocessing Element: ANOVA) a and c ultural re vidual w nsultatic ning	5. Sf s of st 10. F correlat esearch vork; ho on;	tatistics, tatistical Factorial tion 12. n.
13. 14.	 Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and pra- learning; preparatory classes Total amount of available to Distribution of the available Forms of teaching 	s 4. P . Discre - test 9 experime cal appl ctice ex s for exa ime e time 15.1.	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u lication of method ercises, consulta ams and mid-term 156 hours 2+2+1 Lectures - theo Exercises (labo workshops, out	dat utior ariar regro ls in tion tes retio	ta pro n. 7. E essior agricu s; indi sts: co cal trai ry, aud	ocessing Element: ANOVA) a and c ultural re vidual w nsultatic ning	5. Sf s of st 10. F correlat esearch vork; ho on; 2	tatistics, tatistical Factorial tion 12. n.
13. 14. 15.	 Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and pra- learning; preparatory classes Total amount of available ti Distribution of the available Forms of teaching activities 	s 4. P . Discre - test 9 cal appl ctice ex s for exa ime e time 15.1. 15.2.	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u lication of method arcises, consulta ars and mid-term 156 hours 2+2+1 Lectures - theo Exercises (labo workshops, outu teamwork	dat utior ariar regro ls in tion tes retio	ta pro n. 7. E essior agricu s; indi sts: co cal trai ry, aud	ocessing Element: ANOVA) a and c ultural re vidual w nsultatic ning	5. Sf s of st 10. F correlat esearch vork; ho on; 2 2 2	tatistics, tatistical Factorial tion 12. n.
13. 14.	 Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and pra- learning; preparatory classes Total amount of available to Distribution of the available Forms of teaching 	s 4. P . Discre - test 9 experime cal appl ctice ex s for exa ime e time 15.1.	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u lication of method ercises, consulta ams and mid-term 156 hours 2+2+1 Lectures - theo Exercises (labo workshops, out	dat utior ariar regro ls in tion tes retio	ta pro n. 7. E essior agricu s; indi sts: co cal trai ry, aud	ocessing Element: ANOVA) a and c ultural re vidual w nsultatic ning	5. Sf s of st 10. F correlat esearch vork; ho on; 2	tatistics, tatistical Factorial tion 12. n.
13. 14. 15.	 Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and pra- learning; preparatory classes Total amount of available ti Distribution of the available Forms of teaching activities 	s 4. P . Discre - test 9 experime cal appl ctice ex for exa ime e time 15.1. 15.2.	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u lication of method ercises, consulta ams and mid-term 156 hours 2+2+1 Lectures - theo Exercises (labo workshops, outr teamwork Team projects	dat utior ariar regro <u>ls in</u> ttion ttion tes retic retic	ta pro n. 7. E essior agricu s; indi sts: co cal trai ry, aud	ocessing Element: ANOVA) a and c ultural re vidual w nsultatic ning	5. Sf s of st 10. F correlat esearch vork; ho on; 2 2 2	tatistics, tatistical Factorial tion 12. n.
13. 14. 15.	 Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and pra- learning; preparatory classes Total amount of available ti Distribution of the available Forms of teaching activities 	s 4. P . Discre - test 9 cal appl ctice ex s for exa ime e time 15.1. 15.2.	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u lication of method arcises, consulta ars and mid-term 156 hours 2+2+1 Lectures - theo Exercises (labo workshops, outu teamwork	dat utior ariar regro <u>ls in</u> ttion ttion tes retic retic	ta pro n. 7. E essior agricu s; indi sts: co cal trai ry, aud	ocessing Element: ANOVA) a and c ultural re vidual w nsultatic ning	5. Sf s of st 10. F correlat esearch vork; ho on; 2 2 2	tatistics, tatistical Factorial tion 12. n.
13. 14. 15.	 Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and pra- learning; preparatory classes Total amount of available ti Distribution of the available Forms of teaching activities 	s 4. P . Discre - test 9 experime cal appl ctice ex for exa ime e time 15.1. 15.2.	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u lication of method ercises, consulta ams and mid-term 156 hours 2+2+1 Lectures - theo Exercises (labo workshops, outr teamwork Team projects	dation ariar regro tion tion retic rato reac	ta pro n. 7. E essior agricu s; indi sts: co cal trai ry, aud	ocessing Element: ANOVA) a and c ultural re vidual w nsultatic ning	5. Sf s of st 10. F correlat esearch vork; ho on; 2 2 2	tatistics, tatistical Factorial tion 12. n.
13. 14. 15.	 Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and pra- learning; preparatory classes Total amount of available ti Distribution of the available Forms of teaching activities 	s 4. P . Discre - test 9 experime cal appl ctice ex for exa ime time 15.1. 15.2. 16.1. 16.2.	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u lication of method ercises, consulta ams and mid-term 156 hours 2+2+1 Lectures - theo Exercises (labo workshops, outu teamwork Team projects Individual project	dation ariar regro tion tion retic rato reac	ta pro n. 7. E essior agricu s; indi sts: co cal trai ry, aud	ocessing Element: ANOVA) a and c ultural re vidual w nsultatic ning	i 5. St s of st correlat esearch vork; ho on; 2 2 2 1 -	tatistics, tatistical Factorial tion 12. n.
13. 14. 15.	 Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and pra- learning; preparatory classes Total amount of available ti Distribution of the available Forms of teaching activities Other forms of activities 	s 4. P . Discre- test 9 cal appl ctice ex for exa ime time 15.1. 15.2. 16.1. 16.2.	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u lication of method arcises, consulta ars and mid-term 156 hours 2+2+1 Lectures - theo Exercises (labo workshops, outu teamwork Team projects Individual project	dat utior ariar regro <u>ls in</u> tion tes retic rato reac	ta pro n. 7. E nce (/ ession agricu s; indi sts: co cal trai ry, auc h and	ocessing Element: ANOVA) a and c ultural re vidual w nsultatic ning	i 5. St s of st correlat esearch vork; ho on; 2 2 2 1 -	tatistics, tatistical Factorial tion 12. n.
13. 14. 15.	 Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and pra- learning; preparatory classes Total amount of available to Distribution of the available Forms of teaching activities Other forms of activities Forms of assessment 17.1. Exams (midterm examination of the available 17.2. Project activities (oral 	s 4. P . Discre- test 9 experime cal appl ctice ex for exa ime 15.1. 15.2. 16.1. 16.2. 16.3. ms, exa and wr	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u lication of method ercises, consulta ams and mid-term 156 hours 2+2+1 Lectures - theo Exercises (labo workshops, outr teamwork Team projects Individual project Individual study m, electronic test	dation ariar regro tion tion tion retic rato reac cts	ta pro n. 7. E nce (A ession agricu s; indi sts: co cal trai ry, auc h and	ocessing Element: ANOVA) a and c ultural re vidual w nsultatic ning ditory),	i 5. St s of st correlat esearch vork; ho on; 2 2 2 1 -	tatistics, tatistical Factorial tion 12. n.
13. 14. 15.	 Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and pra- learning; preparatory classes Total amount of available ti Distribution of the available Forms of teaching activities Other forms of activities Forms of assessment 17.1. Exams (midterm example) 	s 4. P . Discre- test 9 experime cal appl ctice ex for exa ime 15.1. 15.2. 16.1. 16.2. 16.3. ms, exa and wr	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u lication of method ercises, consulta ams and mid-term 156 hours 2+2+1 Lectures - theo Exercises (labo workshops, outr teamwork Team projects Individual project Individual study m, electronic test	dation ariar regro tion tion tion retic rato reac cts	ta pro n. 7. E nce (A ession agricu s; indi s; indi s; indi ts: co cal trai ry, auc h and agricu s; indi s; indi indi indi ; indi ; indi ; indi ; indi ; indi ; indi ind	ocessing Element: NOVA) a and c ultural re vidual w nsultatic ning ditory),	i 5. St s of st correlat esearch vork; ho on; 2 2 2 1 -	tatistics, tatistical Factorial tion 12. n.
13. 14. 15.	 Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and pra- learning; preparatory classes Total amount of available to Distribution of the available Forms of teaching activities Other forms of activities Forms of assessment 17.1. Exams (midterm examination of the available 17.2. Project activities (oral 	s 4. P . Discre- test 9 experime cal appl ctice ex for exa ime 15.1. 15.2. 16.1. 16.2. 16.3. ms, exa and wr	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u lication of method ercises, consulta ams and mid-term 156 hours 2+2+1 Lectures - theo Exercises (labo workshops, outr teamwork Team projects Individual project Individual study m, electronic test	dation ariar regro tion tion tion retic rato reac cts	ta pro n. 7. E nce (A ession agricu s; indi s; indi s; indi ts: co cal trai ry, auc h and agricu s; indi s; indi indi indi ; indi ; indi ; indi ; indi ; indi ; indi ind	ocessing Element: NOVA) a and c ultural re vidual w nsultatic ning ditory), ditory),	i 5. St s of st correlat esearch vork; ho on; 2 2 2 1 -	tatistics, tatistical Factorial tion 12. n.
13. 14. 15.	 Mathematics and statistic Types of statistical method variability and distribution 6 conclusion. 8. T test and F experiment, two factorial e Experimental Design - practic Methods of study: Lectures, theoretical and pra- learning; preparatory classes Total amount of available to Distribution of the available Forms of teaching activities Other forms of activities Forms of assessment 17.1. Exams (midterm examination of the available 17.2. Project activities (oral 	s 4. P . Discre- test 9 experime cal appl ctice ex for exa ime 15.1. 15.2. 16.1. 16.2. 16.3. ns, exa and wr ng activ	ractical ways of ete equal distribu 9. Analysis of va ent 11. Linear u lication of method ercises, consulta ams and mid-term 156 hours 2+2+1 Lectures - theo Exercises (labo workshops, outr teamwork Team projects Individual project Individual study m, electronic test	dation ariar regro tion tion tion retic rato reac cts	ta pro n. 7. E nce (A ession agricu s; indi sts: co cal trai ry, auc h and 3 5 2 2 2	ocessing Element: NOVA) a and c ultural re vidual w nsultatic ning ditory), ditory),	i 5. St s of st correlat esearch vork; ho on; 2 2 2 1 -	tatistics, tatistical Factorial tion 12. n.

				from 61 to 70 points	7 (seven) (D)		
				from 71 to 80 points	8 (eight) (0	C)		
				from 81 to 90 points	ts 9 (nine) (B)			
				from 91 to 100 points 10 (ten) (A)				
19.	Cond	ition for g	getting a signature	60% of term activities	6			
	and ta	aking the	final exam					
20.	Language in which classes are			Macedonian				
	conducted							
21.	Metho	od of mor	nitoring the	Self-evaluation				
	qualit	y of instr	uction					
22.	2. Literature							
		Compul	sory literature					
		Ordinal No.	Author	Title	Publisher	Year		
	22.1.	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		

App	Appendix No.3 Syllabus for the first, second and third cycle of study								
1.	Course title	Plant physiolog	ју						
2.	Course code	2ZF211512							
3.	Study programme	Biotechnology, genetics and plant selection							
4.	Organizer of the study	University "Goce	e De	lcev"- Stip, Faculty of	F				
	programme (faculty, institute,	Agriculture, Stip	, Pla	nt Production					
	group)								
5.	Level (first, second, third cycle)	Second cycle							
6.	Academic year / semester	First / II	7.	Number of ECTS	8				
				credits					
8.	Professor	Prof. Liljana Kol	eva-	Gudeva, PhD					
9.	Preconditions for course	No							
	enrollment								
10.	Goals of the course programme:								
	The course aims to acquaint stuc								
	cycle. Physiological processes oc				energy,				
	which is energy on the survival of		fe or	n earth.					
11.	Content of the course programme	:							
	Content of the lectures:								
	Historical development of plant								
	Chemical composition of plants								
	transport and function of mineral s								
	3, C-4 and CAM photosynthesis								
	cycle, pentose phosphate path, ß								
	fruits. Physiology of stress. Phyto								
	catabolism of auxsyne, giberely								
	Brasinosteroides. Oligosaccharic	•		•	onenois,				
	alkaloids and therpene. Culture of	plant cells and tiss	sues	in vilfo.					

			cises (practio					
					omponents in plants. Fr			
					Total organic matter.			
					ose. Starch. Oils. Pho			
	Phyto	hormones			rsis of photosynthet ation of plants. Micro pro		Proving	
12.		ds of stud						
					oratory exercises, E-lea	rning, individual a	nd team	
					al exam, Final exam.			
13.			available tim		216 hours			
14.			ne available ti	-	3+2+2			
15.	Forms	s of teachi	ng activities		Lectures - theoretical		3	
	15.2.			15.2.	Exercises (laboratory,		2	
					workshops, outreach a	and		
					teamwork			
16.	Other	forms of a	activities	16.1.	Team projects		_	
				16.2.	Individual projects		2	
				16.3.	Individual study			
17.		of asses						
	17.1.	Exams (midterm exar	ns, exa	m, electronic testing)		30	
	17.2.	Project activities (oral and wr			itten presentation)		50	
17.3. Other forms of studying activities				20				
18.	18. Criteria for assessment (points / to 50 points 5 (five) (F				5 (five) (F)			
	0.110		rade)		from 51 to 60 points	6 (six) (E)		
		9			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.	Condi	tion for ae	etting a signat	ure	60% of term activities,		and	
			inal exam		attending to lectures and discussions			
20.			ich classes a	re	Macedonian			
	condu							
21.	Metho instruc		toring the qua	ality of	Self-evaluation			
22.	Literat							
		Compuls	sory literature					
		Ordinal	Autho	r	Title	Publisher	Year	
	22.1.	No.			Diant Discrete l		0040	
	۲۲.۱۰	1.	Liljana Kole Gudeva		Plant Physiology	UGD - Stip	2010	
		2.	Mirko Spase Sonja Gadz		Plant Physiology	UKIM - Skopje	2009	
		Addition	al literature			- ·		
		Ordinal	Autho	r	Title	Publisher	Year	
	22.2.	No.						
		1.	Taiz L., Zeig	ger E.	Plant Physiology	Sunderland, Massachusetts,	2006	
L						USA		
		2.	Ljubinka Cu	llafic	Plant Physiology	NNK	2003	
						International		

Арр	endix No.3	Syllabus for the first,	secon study	d and third cycle	e of		
1.	Course title	Plant breeding	,				
2.	Course code	2ZF211612					
3.	Study programme	Biotechnology, selection	and se	ed production			
4.	Organizer of the study programme (faculty, institute, group)	Faculty of Agriculture, U Department of Plant proc			Stip,		
5.	Level (first, second, third cycle)	Second cycle					
6.	Academic year / semester	First year/ second semester	7.	Number of ECTS credits	8		
8.	Professor	Prof. Verica Ilieva, PhD Ass. prof. Dragica Spasova, PhD					
9.	Preconditions for course enrollment	No					
10.	the students with the ways and methods of plant breeding, their genetic basis, and the organization of plant breeding process, the procedure for application, approval and registration of newly created varieties.						
12.	Lectures: INTRODUCTION SELECTION AND OTHE RESOURCES (Concept and initial material in selection, C genetic vulnerability and ha conserving and maintain th resources); GENETIC BA POLINATION SPECIES; PF VARIETY IN SELECTION (D their genetic composition, BREEDING (Genetic basis hybridization, mutations, poly methods of selection in plan AND GENETIC PROFITS FI for resistance to disease and and drought, Selection for Selection for length of vege UTILIZATION OF HETEROZ (Scheme for plant breeding APPROVAL AND REGIST ORGANIC PRODUCTION (M Practices : Methods for of the results; Inheritance of the genetic variances; Cor Methods of study : Lectures, theoretical and lat and team projects, e-learning	, IMPORTANCE, SELEC R SCIENTIFIC DISCIP I meaning, Sources of ge oncept for gene pool in cu izard loss of plant genet e plant genetic resource SIS OF SELF-POLINA ROPRETY, GENOTYPE, efinition and importance o adaptability of the vari and theory, methods for ploidy, the application of b it breeding), SELECTION ROM PLANT BREEDING d insects, Selection for re resistance to low tempo etation period, Selection IS. ORGANIZATION OF F g process, Methods of the RATION OF NEW VAN Methods in organic plant bro of quantitative traits; nbinative abilities.	PLINES rmplass ultural s ic resc s, Varia TION PHEN f variety ety); M creatin of creatin of creatin (Selec sistance of qua PLANT ield tri RIETIE reeding elds; Heritab	; PLANT GEN m for plant breed pecies, The conce- purces, Procedure ability of plant ge AND NON SE OTYPE, ABOUT y, types of varietie AETHODS IN Pl ng genetic variab ology in plant bree ERTAIN PROPER tion for yield, Sele e to high tempera s, Loading resist lity); INBRIDING BREEDING PROC als), REGISTRAT S; SELECTION). Statistical an- pility and compo	ETIC ding - ept of es for enetic LF - THE s and LANT ility - eding, CTIES ection atures ance, AND CESS FION, FOR alysis nents		
13.	Total amount of available t		216 h	ours			
14.	Distribution of the available		3+2+2				

15.	Form	s of teach	ning	15.1	•	Lectures -		3		
	activit	ties				theoretical tra	aining			
				15.2	•	Exercises		2		
						(laboratory,				
						auditory),				
						workshops,				
						outreach and	3			
16.	Othor	forma of	activities	16.1		teamwork	to.	/		
10.	Other	ionns oi	activities			Team project		/		
				16.2. Individual pro		ojects	s 1			
				16.3		Individual stu	ıdy	1		
17.		s of asse	ssment							
	17.1.				ms (midterm exams, tronic testing)	exam,		30		
	17.2.				ect activities (oral ar	d written		50		
	17.2.				entation)		llen			
	17.3.				er forms of studying	activities		20		
18.		Criteria f	or assessme	ent (po	pints / grade)	up to 50	5 (f	ive) (F)		
					- ,	points		, , ,		
						from 51 to	6 (s	six) (E)		
						60 points				
				from 61 to	7 (s	seven) (D)				
						70 points				
						from 71 to	8 (6	8 (eight) (C)		
						80 points	0.("	9 (nine) (B)		
						from 81 to	9 (r	9 (nine) (B)		
						90 points from 91 to	10	10 (ten) (A)		
						100 points	10			
19.	Condi	tion for a	nettina a siar	nature	and taking the			l on all		
13.	final e		Jetting a sign	ature	and taking the	60% success level on all				
20.			hich classes	are o	onducted	pre-exam activities Macedonian				
	-	_			of instruction		<u> </u>	oriodio		
21.	wethe		intoring the t	quanty	or instruction	Self-evaluation tests for stud				
22.	Litera	ture						-		
		Compu	lsory literatu	re						
		Ordinal	Author		Title	Publishe	r	Year		
		No.								
		1.	Verica Ilieva	a	Plant breeding	University		2012		
					(general part),	"Goce				
	22.1.	textbook Delčev"- Štip,		tip,						
	۲۲.۱۰					Faculty of				
		2.	Dragios		Selection and seed	Agriculture		2011		
		۷.	Dragica Spasova		production - (no	"Goce		2011		
			Spasova		reviewed script)	Delčev"- Š	tin			
						Faculty of	up,			
						Agriculture	,			
L							;			

	3.	Cvetanka Najcevska	Selection and seed production (practicum)	University "Ss. Cyril and Methodius, Skopje, Faculty of agriculture science and food	1997
	4	Beljo, J.	Plant breading	Faculty of agriculture – Mostar	2006
	Additio	nal literature			
	Ordinal No.	Author	Title	Publisher	Year
	1.	Martinčić, J., Kozumplik, V.	Plant breading	Faculty of agriculture – Mostar	1996
22.2.	2.	Murphy, D.	Plant breeding and biotechnology:	Societal Context and the Future of Agriculture. Cambridge University. New York	2007
	3.	Lammerts van Bueren, E. T., Myers, J.R	Organic Crop Breeding	Wiley- Blackwell.	2012
	4		Principles of plant breeding	John Wiley	1999
	5	Borojević S.	Principles and Methods for plant breeding	Scientific Book, Belgrade	1992

Арр	endix No.3 Syllabus for the fi	rst, second and t	hird	cycle of study		
1.	Course title	PHYTOPATHO	LOG	(
2.	Course code	2ZF201712				
3.	Study programme	Biotechnology, production	sele	ction and seed		
4.	Organizer of the study	"Goce Delcev"University - Stip,				
	programme (faculty, institute, group)	Faculty of Agriculture, Stip, Department for plant production				
5.	Level (first, second, third cycle)	Second cycle				
6.	Academic year / semester	First / II semester	7.	Number of ECTS credits	4	
8.	Professor	Prof. Sasa Mitr	ev, P			
9.	Preconditions for course enrollment	No	•			
10.	Goals of the course programme diseases, symptoms and impleme	0		0		
11.	Content of the course programmed content of lectures:	ne:				

12.	import fungal Actino Parasi 9. Pat the dis Conte 1. Des pathog its m pathog bioche Deterr Polime Genet	ance of p pathoger mycetes: itic floweri hological sease 12. Int of exe cription o gens 3. De orphologi genicity o emical cha mination o erase cha ic basis o	lant diseases is 3. Prokario rickettsia, m ing plants 7. changes in si Plant resista rcises: f symptoms o etermination cal characto f bacteria; 7 aracteristics; f the virus typ in reaction; 1 <u>f host - paras</u>	s 2. Plar otes as c oolikuts, Sympton ick plant nce to p caused k of patho eristics; 7. Identi 8. Bree be using 1. Meth site inter	by pathogen microorgan genicity of fungi 4. Ident 5. Bacteria isolation fication of the type of ding characteristics of p ELISA test, 10. Modern ods for evaluating the in	iuses: Para bacteria a nas 5. Path nd parasitis changes in t isms 2. Isol ification of f n 6. Dete bacteria b ohytopathog methods of tensity of th	sitic dis ind moli nogen v m in pla the inter ation of ungi bas erminati ased or gen viru f identifi ne disea	eases, kuts 4. iruses; int life, nsity of fungal sed on on of n their ses 9. cation: use 12.
12.					hing, consultancy.		20010,1	naking
13.			of available t		156 hours			
14.					2+2+1			
15.		Forms of teaching 15.		15.1.	Lectures - theoretical t	raining	2	
	activit	ties		15.2.	Exercises (laboratory, a workshops, outreach a teamwork		2	
16.	Other	forms of	activities	16.1.	Team projects -			
				16.2.	Individual projects		1	
				16.3.	Individual study			
17.	Forms	s of asse	ssment					
	17.1.	Exams (midterm exa	ms, exa	m, electronic testing)	30		
	17.2.	,	· ·		ritten presentation) 50			
	17.3.		rms of studyi			20		
18.			essment (p	oints /	to 50 points	5 (five)	(F)	
	grade)		-	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)	
10	Condi	tion for a	ettine e		from 91 to 100 points	10 (ten)	(A)	-1
19.		ition for g	jetting a the fi	nal	60% of term activities, attending to lectures ar			d
	exam	ture anu	laking the h	nai	allending to rectures ar		115	
20.		iade in w	hich classes	s are	Macedonian			
20.	condu	-		o ui o	Macoachian			
21.			nitoring the		Self-evaluation			
		y of instr	-					
22.	Litera		sory literatu	Iro				
		-						
	22.1.	Ordinal No.	Author		Title	Publishe		Year
		1.	Проф. д-р.			УГД-Шт	ип	2007
			Пејчиновск	кии	Фитопатологија			
			Проф.		Општ дел			

		Д-р. Саша Митрев							
2.		Проф. д-р. Филип Пејчиновски и	Земјоделска Фитопатологија	УГД-Штип	2009				
		Проф. Д-р. Саша	Специјален дел						
		Митрев							
	3.	Митрев Саша, Емилија	Практикум по фитопатологија	УГД-Штип	2010				
		Костадиновска							
	Additional literature								
	Ordinal No.	Author	Title	Publisher	Year				
22.2.	1.	Babovic M.	Osnovi patologije biljaka	Poljoprivredni fakultet, Univerzitet u Beogradu	2003				
	2.	Lucas John Alexander	Plant pathology and plant pathogens	Oxford; Malden, Mass.	1998				

Арр	endix No.3 Syllabus for the second se	he first, second and third cycle of study				
1.	Course title	Seed production				
2.	Course code	2ZF211712				
3.	Study programme	Biotechnology, selection and seed production				
4.	Organizer of the study programme (faculty, institute, group)	Faculty of Agriculture, University "Goce Delcev"- Stip, Department of Plant production				
5.	Level (first, second, third cycle)	Second cycle				
6.	Academic year / semester	Second year/7.Number of ECTS8third semestercredits				
8.	Professor	Ass. prof. Dragica Spasova, PhD, Prof. Verica Ilieva, PhD				
9.	Preconditions for course enrollment	No				
10.	introduce students with the	duction, marketing, distribution, sales and				
11.	seed; 3. Chemical composition of s Agro-technical measures affecting affecting to seed production; 8. C quality; 10. Finishing and storage Marketing in seed production. Practices : 1. Technique of plow production; 3. Methods of samplin- evaluation of seed quality; 6. Testin	ne: on and task of seed production; 2. Morphology of seed; 4. Physiology of seed; 5. Ecology of seed; 6. to seed production; 7. Agro-technical measures hoice of variety and categories of seed; 9. Seed of seed; 11. Laboratory tests of seed quality; 12. wing; 2. Introduce with legislation in the seed g for seed quality; 4. Packing seed; 5. Laboratory ng the purity and type of the variety; 7. Testing the ain; 8. Introduce and practice work on field ground;				

					nishing seed product		10. Catego	ries of seed	
				ops; 12	 Control of seed cro 	ps.			
12.		ods of stu							
					y exercises, consult		s, e-learnin	g, individual	
					are lecture for exams				
13.			of available t		216 hours				
14.	Distri	bution of	the available	e time	3+2+2				
15.		s of teach	ning	15.1.				3	
	activi	ties		15.2.	Exercises (laboratory, auditory),			2	
					workshops, outreach and teamwork				
16.	Other	forms of	activities	16.1.	Team projects			1	
				16.0				1	
				16.2.	Individual projects			1	
				16.3.	Individual study	Individual study			
17.	Form	s of asse		1	J				
	17.1.				im, electronic testing)		30	
	,				ritten presentation)			50	
	17.3.		rms of studyir	•	vities			20	
18.	Criter	ia for as	sessment (po	oints /	up to 50 points		5 (five) (F)		
		g	rade)		from 51 to 60 point	s	6 (six) (E)		
					from 61 to 70 point	s	7 (seven)	(D)	
					from 71 to 80 point	s	8 (eight) (C	2)	
					from 81 to 90 point	from 81 to 90 points 9 (nine) (B			
					from 91 to 100 poir		10 (ten) (A		
19.			getting a sigr final exam	nature	60% success level on all pre-exam activities				
20.		lage in w	hich classes	are	Macedonian				
21.	Metho	od of mor	nitoring the		Self-evaluation, Periodic tests for students,				
		y of instr	uction		Survey				
22.	Litera	Literature							
	Compulsory literature								
		-							
		Ordinal	Isory literatu Author		Title		Publisher	Year	
		Ordinal No.	Author						
		Ordinal	Author Miodrag M.		Title Seed production	Ρι	Iblisher	Year 2005	
		Ordinal No.	Author			Pu DF	iblisher RAGANIC,		
	22.1	Ordinal No.	Author Miodrag M. Marić			Pu DF Be	Iblisher	2005	
	22.1.	Ordinal No. 1.	Author Miodrag M.		Seed production General seed	Pu DF Be	blisher RAGANIC, ograd stitute for		
	22.1.	Ordinal No. 1.	Author Miodrag M. Marić Milošević M Ćirović	.,	Seed production	Pu DF Be Ins	iblisher RAGANIC, eograd	2005	
	22.1.	Ordinal No. 1.	Author Miodrag M. Marić Milošević M Ćirović M., Mihaljev Dokić	.,	Seed production General seed	Pu DF Be Ins	iblisher RAGANIC, cograd stitute for Id crop,	2005	
	22.1.	Ordinal No. 1. 2.	Author Miodrag M. Marić Milošević M Ćirović M., Mihaljev Dokić P.	.,	Seed production General seed production	Pu DF Be Ins fie No	iblisher RAGANIC, cograd stitute for Id crop, ovi Sad	2005	
	22.1.	Ordinal No. 1.	Author Miodrag M. Marić Milošević M Ćirović M., Mihaljev Dokić	.,	Seed production General seed	Pu DF Be Ins fie No	iblisher RAGANIC, eograd stitute for Id crop, ovi Sad	2005	
	22.1.	Ordinal No. 1. 2.	Author Miodrag M. Marić Milošević M Ćirović M., Mihaljev Dokić P.	.,	Seed production General seed production	Pu DF Be Ins fie No Fa ag	blisher RAGANIC, ograd stitute for Id crop, ovi Sad culty of riculture	2005	
	22.1.	Ordinal No. 1. 2.	Author Miodrag M. Marić Milošević M Ćirović M., Mihaljev Dokić P.	., [,] I.,	Seed production General seed production	Pu DF Be fie No Fa ag Ba	iblisher RAGANIC, eograd stitute for Id crop, ovi Sad	2005	

	Ordin No.	al Autho	or	Title	F	Publisher		Year
	1.	Mladenovsk	ά, Τ .	Seed biology	Sko	opje	199	96
	2.							
	3.				-			
	endix No.3	Syllabus		e first, second a		I cycle of st	udy	
1.	Course title			Plant byotechno	ology			
2.	Course code			2ZF211812				
3. 4.	Study progra			Biotechnology, g				
4.	Organizer of programme (group)	faculty, institute	3	University "Goce Agriculture, Stip,				
5.		econd, third cyc	le)	Second cycle				
6.	Academic ye	ar / semester		Second / III 7. Number of ECTS 8 credits			8	
8.	B. Professor Prof. Liljana Koleva-Gudeva, PhD							
9.	Precondition	s for course		No				
10.	enrollment							
11.	Goals of the course programme: Learning the basic skills and knowledge of plant biotechnology and genetic engineering as drivers of modern refining plant and enrichment of plant genetic resources. Content of the course programme:							
	Content of th 1. Introduction Morphogene protoplast: is recombinant plasmid: stru- vectors. Content of ex 1. Laborator equipment for regulators. 4 tissues. 7 (0) dihaploids. 9	e lectures: on. Meaning an sis in vitro. 4 M olation and puri DNA. 8 Gene ucture and trans kercises (practio ry of Plant Bio or work and plan Preparation of Dbtaining therei	d object licro pro- fication etic traisfer. 10 cal and otechno t materion nutrien in proto A. 10 Qu	logy equipment ial. 3 Preparation it medium. 5 In v oplast. 8 Method uantification of the	natic em cation. 7 robacter nts. 11 and sp of nutrie vitro cult ds for	bryogenesis Genetic trar <i>ium tumefa</i> Viral DNA. bace. 2 Ste ent solutions cures. 6 Cult obtaining ha	s. 6 nsfor <i>ciens</i> 12 eriliza and ure aploi	Therein mation: s. 9 TI Genetic ation of growth of plant ds and
12.	Methods of s		I					
	Lectures, Th	eoretical exercis		oratory exercises		ning, individu	ial ai	nd team
				xam, Final exam.				
13.		t of available tim		216 hours				
14.		of the available ti	1	3+2+2				-
15.	Forms of tea	ching activities	<u>15.1.</u> 15.2.	Lectures - theo Exercises (labor workshops, outr teamwork	ratory, a	uditory),		3
16.	Other forms	of activities	16.1.	Team projects				
			16.2.	Individual project	cts			2
			16.3.	Individual study				
17.	Forms of ass				-			
	17.1. Exam	s (midterm exar	ns, exa	m, electronic test	ing)			30
	17.2. Proje	ct activities (oral	and wr	ritten presentatior	1)			50

	17.3.	Other fo	rms of studying activ	ities		20
18.	Crite	ria for ass	sessment (points /	to 50 points	5 (five) (F)	
		g	rade)	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.			etting a signature	60% of term activities,		nd
			inal exam	attending to lectures a	nd discussions	
20.	Langu condu		ich classes are	Macedonian		
21.	Metho instruc		toring the quality of	Self-evaluation		
22.	Literat	ture				
		Compuls	sory literature			
		Ordinal No.	Author	Title	Publisher	Year
	22.1.	1.	Liljana Koleva Gudeva	Plant Physiology	UGD - Stip	2010
		2.	George E.F.	Plant Propagation by tissue culture	Edingtin Wilts, England	1996
		Addition	al literature		-	
	22.2.	Ordinal No.	Author	Title	Publisher	Year
		1.	Bruss Alberst, at all.	Molecular Biology of the cell	Garland Science, NY USA	2002

Арр	endix No.3	Syllabus for the	ne first, second a	nd t	hird cycle of study		
1.	Course tit	le	Methods in biod investigations	cher	nical and physiolog	gical	
2.	Course co	ode	2ZF205212				
3.	Study pro	gramme	Biotechnology, s	elec	tion and seed produ	ction	
4.	Organizer	of the study	Department of p	lant	production Faculty o	f	
	programm group)	ne (faculty, institute,	Agriculture, Univ	ersi	ty "Goce Delcev"- St	ip	
5.	Level (firs	t, second, third cycle)	Second cycle				
6.	Academic	year / semester	First year/ third7.Number of ECTS8semestercredits				
8.	Professor		Prof. Rubin Gula Gudeva	ibos	ki, prof. Liljana Kolev	/a-	
9.	Precondit enrollmen	ions for course t	No				
10.	0. Goals of the course programme : Students are introduced to the basics of analytical methods for analysis, their function and their application in biochemical and physiological analysis					nical	
11.	Content o	f the course programm	e:				

12. 13. 14.	reprod specti of ch Electr Pract Deter in wa Metho lipids chrom Electr Metho Lectu consu	ducibility; roscopy; oromatogr ochemica <i>ices</i> : 1. mination ter with ods for lip extracted natograph ochemica ods of st res, Lat litations. amount	3. Quantur 5. ICP MS; 6 raphy; 9. Li al techniques Introductior of heavy meta UV VIS; 5. I ids extractior d from plant hy; 11. Volta al determinati udy:	n theory Method quid ch ; 12. Pot als in pla Determin a; 8. Elec s with H mmetric ion of tot ercises, time	trumental techniques; 2 for the atom structure is based on light absorption promatography; 10. Gase entiommetry and voltame etermination of heavy nts with ICP MS; 4. Deter nation of total phenolic of trophoresis-protein detect IPLC: 10. Determination determination of heav al antioxidative potential e-learning, individual 216 hours 3+2+2	e 4. At on; 7. U s chror metry. metals mination content ction; 9. n of pro y metal of plant	with AA with AA of heavy i with UV V Determina oteins with ls in plant extracts.	vrption heory y; 11. (S; 3. metals (IS; 6. tion of liquid
14.	Distri	button 0			5+2+2			
15.		ctivities we 15.2. Exercises (laboratory, auditory), workshops, outreach and 2 classing				lasses veekly lasses veekly		
16.	Other	forms o	f activities	teamwork 16.1. Team projects 1 class				
				16.2. 16.3.	Individual projects 1			veekly class veekly
17.	Form	- of ooo	essment					
17.	17.1.			ams, exa	m, electronic testing)			30
	17.2.		•		ritten presentation)			50
	17.3.		orms of study		,			20
18.	Crite	ria for as	sessment (p	oints /	up to 50 points	5(five) (F)	
		g	grade)		Interview Interview <t< th=""><th></th></t<>			
19.			getting a sig e final exam	gnature	60% of term activities, pattending to lectures an			nd
20.		uage in v	which classe	es are	Macedonian			
21.		od of mo y of inst	nitoring the ruction		Self-evaluation, anonyr	n polls		
22	Litera							
·		Compu	lsory literati	ure				
	22.1	Ordina I No.	Author		Title		Publishe r	Year

	1. 2.	Rubin Gulabosk i Semih	Instrumental methods, internal stuff available on <u>www.rubingulaboski.synthasite.com</u> Handbook of Food Analysis	UGD- Stip Taylor &	201 0 200
		Otles	Instruments, Taylor & Francis, Semih Otles (ed.) 2008. http://www.chipsbooks.com/hbfdinst.ht m	Francis	8
	3.				
	Additio	nal literatur	е		
	Ordina I No.	Author	Title	Publisher	Year
22.2	1.	Rubin Gulaboski	Authorized lectures in ppt format, available in free format on <u>www.rubingulaboski.synthasite.co</u> <u>m</u>	UGD	201 0
	2.				
	3.				

App	endix No.3 Syllabus for th	ne first, second and third cycle of study
1.	Course title	Cytogenetics
2.	Course code	2ZF211912
3.	Study programme	Biotechnology, selection and seed production
4.	Organizer of the study	Faculty of Agriculture, University "Goce Delcev"-
	programme (faculty, institute,	Stip, Department of Plant production
	group)	
5.	Level (first, second, third cycle)	Second cycle
6.	Academic year / semester	First year/ first 7. Number of ECTS 4
		semester credits
8.	Professor	Prof. Verica Ilieva, PhD
9.	Preconditions for course	No
	enrollment	
10.		The main objective of the course is to expand the
		osomes and the changes that may occur in the
	structure and number of chromoson	
11.	Content of the course programm	
	Lectures: Cellular distribution	N N
		nd genetic constancy); Cellular distribution and
	`	and genetic variability); Cellular
		etic effects by changing the normal processes of
		oution and inheritance (Reproductive cycle of some
		ular distribution and inheritance (Eukaryotic cells
		of inheritance (Poly and unifibrilar organization
		chromosomes. Morphology of chromosomes;
		omes; Molecular structure of chromosomes
		chromosomes. Replication of chromosomes);
		s (Replication in eukaryotes and viruses); Changes
	in the number of chromosomes; Ch	nanges in the structure of chromosomes.

	кагуоо in the	gramme; number of	Marking chi	romosor es; Cha	cytogenetic analysis; mes through mitosis nges in the structure of	and meiosis	; Ch	anges
12.	Metho Lectur	ods of stu es, theore	dy : etical and lal	boratory	 enations. exercises, consultatio re lecture for exams. 	ns, e-learning	ı, indi	vidual
13.			f available t		120 hours			
14.			the available	-	2+1+1			
15.	Forms	s of teach	ing	15.1.	Lectures - theoretical	training		2
	activi	ties		15.2.	Exercises (laboratory, workshops, outreach a 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	s of asses	ssment	1				
	17.1.	Exams (I	midterm exar	ns, exar	n, electronic testing)			30
	17.2.	Project a	ctivities (oral	and wri	itten presentation)			50
	17.3.	Other for	ms of studyir	ng activi	ties			20
18.	Criter		essment (po	oints /	up to 50 points	5 (five) (F)		
		gi	rade)	·	from 51 to 60 points	6 (six) (E)		
				-	from 61 to 70 points from 71 to 80 points	7 (seven) (8 (eight) (C	-	
				-	from 81 to 90 points	9 (nine) (B)		
				-	from 91 to 100 points	10 (ten) (A)		
19.			etting a sigr	nature	60% success level for		activiti	es
20.			final exam hich classes	are	Macedonian			
	condu							
21.		od of mon y of instru	itoring the		Self-evaluation, Periodic tests for students, Survey			
22.	Litera			l				
			sory literatu	re				
		Ordinal No.	Autho	or	Title	Publishe	•	Year
	22.1.	1.	Stevan Petr Mirjana Vuc	•	Cytogenetics	Faculty of agriculture, N Sad, Institute Field Crop		1992
		2.	Vladimir Spasojevic		Citogenetics	Scientific Boo Beograd	ok,	1978
		3.	Borojević Sl Borojević K		Genetics	University of Novi Sad, Faculty of agriculture		1976
		Additior	nal literature			<u> </u>		
	22.2.	Ordinal	Auth		Title	Publishe	r	Year

No.				
1.	Ayala F., Kiger J.A.	Modern genetics	The Benjamin/C ummings Publishing Company, Inc. Menlo Park, California	1984
2.	Borojević Katarina	Genes and populations	Forum, Novi Sad	1986
3.	Dimitrijević M., Petrović Sofija	Genetics population. Adaptability and genotype stability	Faculty of agriculture, Novi Sad, Institute for Field Crop	2005
4	Marinković M., Tucić N., Kekić V.	Genetics	Scientific Book, Beograd	1982

Арр	endix No.3 Syllabus for tl	he first, second and third cycle of study			
1.	Course title	Plant tissue culture			
2.	Course code	2ZF212012			
3.	Study programme	Biotechnology, genetics and plant selection			
4.	Organizer of the study	University "Goce Delcev"- Stip, Faculty of			
	programme (faculty, institute, group)	Agriculture, Stip, Plant Production			
5.	Level (first, second, third cycle)	Second cycle			
6.	Academic year / semester	First / I 7. Number of ECTS 4 credits credits			
8.	Professor	Prof. Liljana Koleva-Gudeva, PhD			
9.	Preconditions for course enrollment	No			
	widespread use of methods of plan aims to introduce a theoretical and plant cells and tissues in conditions				
11.	Second Physiology of developmen Direct and indirect organogenesis and stages of micro propagation. obtaining haploids and dihaploids. 11 Viral DNA. 12 Gene banks. Content of exercises (practical and 1. Laboratory culture of plant ti equipment for work and plant mate regulators. 4 Preparation of nutrier	tives of plant tissue culture under conditions in vitro. at. 3. Organogenesis - concept and significance. 4 5. Somatic organogenesis. 6 Definition, meaning 7 Free of viruses plant material. 8 Methods for 9 Therein protoplast. 10 Genetic transformations. d laboratory): ssues equipment and space. 2 Sterilization of erial. 3 Preparation of nutrient solutions and growth at medium. 5 Set up the seed for basal medium. 6. Iture of meristems. 8. Micro propagation. 9-12. In			
12.	Methods of study:	boratory exercises, E-learning, individual and team			

13.	Total	amount of	available tim	e	120 hours				
14.			ne available ti		2+1+1				
15.			ng activities	15.1.	Lectures - theoretical	training	2		
			ng dournoo	15.2.	Exercises (laboratory, auditory),		1		
					workshops, outreach a				
					teamwork				
16.	Other	forms of a	activities	16.1.	Team projects				
				16.2.	Individual projects		1		
				16.3.	Individual study				
17.	Forms	s of asses	sment		·				
	17.1.	Exams (midterm exar	ns, exa	m, electronic testing)		30		
	17.2.	Project a	activities (oral	and wr	itten presentation)		50		
	17.3.		rms of studyir		• •		20		
4.0			-	•			20		
18.	Crite		sessment (po	ints /	to 50 points	5 (five) (F)			
		g	rade)		from 51 to 60 points	6 (six) (E)			
					from 61 to 70 points	7 (seven) (
					from 71 to 80 points	8 (eight) (C			
					from 81 to 90 points	9 (nine) (B)			
19.	Condi	tion for ac			from 91 to 100 points	10 (ten) (A			
19.		condition for getting a signature 60% of term activities, project activities a attending to lectures and discussions							
20.			hich classes a	re	Macedonian		13		
20.	condu				Maccaoman				
21.			toring the qua	ality of	Self-evaluation				
	instru			,					
22.	Literat	ure			L				
		Compute	sory literature						
			-						
		Ordinal	Autho	r	Title	Publish	er Year		
	22.1.	No. 1.	Liljana Kole		Diant Dhysiology	UGD - Stip	2010		
	22.1.	1.	Gudeva	va	Plant Physiology	UGD - Stip	2010		
		2.	George E.F		Plant Propagation by	Edingtin W	/ilts, 1996		
			Coorgo E.i	•	tissue culture	England			
		Addition	al literature			0	I		
		Ordinal	Autho	r	Title	Publishe	r Year		
	22.2	No.	/ 0010	•	THUC				
	22.2.	1.	Bruss Alber	st, at	Molecular Biology of	Garland	2002		
			all.	,	the cell	Science, NY			
						USA			
L	1	1							

Арр	endix No.3 Syllabus for the fi	rst, second and third cycle of study
1.	Course title	BASICS OF PHYTOPHARMACY
2.	Course code	2ZF201912
3.	Study programme	Biotechnology, selection and seed production
4.	Organizer of the study	"Goce Delcev"University - Stip,
	programme (faculty, institute,	Faculty of Agriculture, Stip,
	group)	Department for plant production
5.	Level (first, second, third	Second cycle
	cycle)	

6.	Acade	emic year / semester		First / I semester	7.	Number of ECTS credit	c	4
8.	Profe	ssor		Prof. Ilija Karov	/, Ph[3	<u> </u>
9.		nditions for course		No	,			
	enroll							
10.	rules o	of the course progr of phytopharmacy, divis ticides, method of actio	sions of	pesticides, intro	oductio	on to biochem	ical p	
11.	 Contents of lectures: 1.Introduction and historical development of pesticides; 2. Classification of pesticides; 3. Forms of production of pesticides; 4. Toxicity of pesticides to man and animals; 5. Toxicity: parameters of toxicity, carenza, tolerance and phytotoxicity; 6. Resistance; 7. Fate of pesticides in the environment; 8. Movement of pesticides in plants; 9. Fungicides; 10. Insecticides; 11. Herbicides; 12. Antibiotics, rodenthicides, limacides, korvicides and acaricides; Content of exercises: 1. Pesticide formulation; 2. Physico-chemical properties of pesticides; 3. Legislation 4. Determination of maximum permitted concentration 5. Application of pesticides 6. Methods for determination of pesticide residues 7. Taking a sample for testing of pesticide residues in different samples, 8. Calibration of the apparatus work (GC / MS / MS); 9. Preparation of test sample: liquid-liquid extraction of pesticides from different samples, 10. Determination of pesticide residues in plant sample with GC; 11. Determination of pesticide residues in plant sample with GC; 11. Determination of pesticide residues in plant sample with GC; 11. Determination of pesticide residues in plant sample with GC; 11. 							
12.		ods of study: lectures, endent paper work, ho				cises, consult	ation	s, making
13.		amount of available t		120 hours	.у.			
14.		bution of the availabl		2+1+1				
15.		s of teaching	15.1.	. Lectures - theoretical training 2				
	activi	ties	15.2.	Exercises (labo workshops, out teamwork			1	
16.	Other	forms of activities	16.1.	Team projects			0,5	
			16.2.	Individual proje			0,5	
47			16.3.	Individual study	y			
17.	Form : 17.1.	s of assessment	me ovo	m electronic tor	ctina)	30		
		Exams (midterm exa			•			
	17.2.	Project activities (ora			on)	50		
	17.3.	Other forms of studyi	ng activ	vities		20		
18.	Criter grade	ia for assessment (po)	oints /	to 50 points from 51 to 60 p		5 (five) 6 (six)	(F (E	,
				from 61 to 70 p from 71 to 80 p from 81 to 90 p from 91 to 100	oints oints	7 (seven) 8 (eight) 9 (nine) 5 10 (ten)	([(C) (B) (A	
19.		tion for getting a ture and taking the fi	nal	60% of term ac attending to lec	tivitie	s, project acti	vities	/
20.		uage in which classes	s are	Macedonian				

21.		od of mor y of instr	itoring the uction	Self-evaluation				
22.	Litera	ture						
		Compul	sory literature					
		Ordinal No.	Author	Title	Publisher	Year		
	22.1.	1.	Проф д-р. Бранко Балтовски	Фитофармација	Наша книга, Скопје	1981		
		2.	Проф. д-р. Филип Пејчиновски и Проф. Д-р. Саша Митрев	Општа Фитопатологија	УГД-Штип	2007		
		3.	Milan Maceljski	Fitofarmacija (opći dio)	Sveučilište u Zagrebu	1967		
			Radmila Šovljanski, Zlata Klokočar Šmit, Sanja Lazić	Praktikum iz Opšte Fitofarmacije	Poljoprivredni fakultet, Novi Sad	2002		
		Addition	nal literature					
		Ordinal No.	Author	Title	Publisher	Year		
	22.2.	1.	Milan Maceljski, Bogdan Cvjetkovic, Jasminka I. Barcic, Zvonimir Ostojic	Prirucnik iz zastite bilja	Tiskara MDZagreb	1997		

Арр	endix No.3	Syllabus for the	ne first, second a	nd t	hird cycle of study	
1.	Course title	е	Eco physiology	of	plants	
2.	Course co	de	2ZF212112			
3.	Study prog	gramme	Biotechnology, genetics and plant selection			
4.	Organizer	of the study	University "Goce	e Del	lcev"- Stip, Faculty of	
	programm	e (faculty, institute,	Agriculture, Stip,	Pla	nt Production	
	group)					
5.	Level (first	, second, third cycle)	Second cycle			
6.	Academic	year / semester	First / I 7. Number of ECTS 4			4
					credits	
8.	Professor		Prof. Liljana Kole	eva-	Gudeva, PhD	
9.	Precondition	ons for course	No			
	enrollment					
10.		ne course programme:				
		e aims to acquaint stude				
		depending on environm				
		connects the living co				ding on
		ntal conditions, through	positive and negat	ive i	impacts.	
11.		the course programme:				
		the lectures:			.	
		n. Life processes in pla				
		of minerals. Water balance	•	nent	and the environment	. Plants
		o stress. Physiology of re				
	Content of	exercises (practical and	d laboratory):			

	water. transp	Pumping	water. Dry s	olids. T 2 conte	omponents in plants. Fr Total minerals. Chloral fl ent in the atmosphere fro	luorescence. Assii om environmental	milation point of	
			om the strong		Surviving the cold. Me	echanism of evolu	utionary	
12.		ds of stud		ymetai	5.			
12.	Lectu	res, Theor	etical exercis		oratory exercises, E-lea xam, Final exam.	rning, individual ar	nd team	
13.			available tim		120 hours			
14.	Distrib	oution of th	ne available ti	me	2 + 1 + 1			
15.	Forms	s of teachi	ng activities	15.1.	Lectures - theoretical	training	2	
		15.2.			Exercises (laboratory, workshops, outreach a teamwork		1	
16.	Othor	forms of a		16.1.				
10.	Other	101115 01 6	activities	16.2.	Team projects Individual projects		1	
				16.3.	Individual study		I	
17.	Forme	s of asses	smant	10.3.	individual study			
17.	17.1.			ns eva	m, electronic testing)		30	
					.			
	17.2.	Project a	activities (oral	and wr	ritten presentation)		50	
	17.3.	Other fo	rms of studyir	ng activ	ities		20	
18.	Crite	eria for ass	sessment (po	ints /	to 50 points	5 (five) (F)		
			rade)		from 51 to 60 points	6 (six) (E)		
		Ũ	,		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.		tion for ge aking the f	etting a signat inal exam	ure	60% of term activities, project activities and attending to lectures and discussions			
20.		lage in wh	iich classes a	re	Macedonian			
21.	Metho instruc		toring the qua	ality of	Self-evaluation			
22.	Literat	ture						
		Compuls	ory literature					
		Ordinal	Autho		Title	Publisher	Year	
		No.		•				
	22.1.	1.	Liljana Kole [.] Gudeva	va	Plant Physiology	UGD - Stip	2010	
	<u> </u>	2.	Volter Larcer		Plant Eco Physiology	Government Project – translation of 500 scientific books	2009	
		Addition	al literature					
	22.2.	Ordinal No.	Autho	r	Title	Publisher	Year	
	<i>∠∠.</i> ∠.	1.	Taiz L., Zeiç	ger E.	Plant Physiology	Sunderland, Massachusetts, USA	2006	

		2.	Ljubinka Cu	lafic	Plant Physiology		INK nternational	2003	
Δnn	endix N	03	Syllabi	us for th	ne first, second an				
<u>. 1.</u>		se title	Oynabe	<u>13 101 11</u>	Breeding of field				
2.		se code			2ZF212212	01003			
3.		progran	nme		Biotechnology, selection and seed production				
0.	olday	program			Biotoonnology, ool	100001			
4.	Orgar	nizer of th	ne studv		Faculty of Agricult	ure. Ur	niversitv "Goce D	elcev"-	
			aculty, institu	ıte,	Stip, Department of				
	group	•					•		
5.	Level	(first, se	cond, third c	ycle)	Second cycle				
6.	Academic year / semester				First year/	7. Nu	umber of ECTS	4	
					second	cr	edits		
					semester				
8.	Profe				Prof. Verica Ilieva,	, PhD			
9.					No				
10	enroll						. ,	· · ·	
10.	Goals		the cou					urse is	
					knowledge of			U U	
			erent field crop		s and improving	and	maintaining of	existing	
11.			course prog						
					, oats, rye, rice, coi	rn sov	heans sunflowed		
	l altalta		a origin hotai	nical orid	ain and system of r		ion: initial materi:		
					gin and system of p				
	select	ion and u	sage, method	ls of sele	ection, methods of	selection	on and an exami		
	select plant l	ion and u preeding,	sage, method selection to ir	ls of sele mprove i	ection, methods of a individual propertie	selections, seed	on and an examined production).	nation of	
	select plant l Pract	ion and u preeding, ices : Sel	sage, method selection to ir lection of wh	ls of sele nprove i neat, ba	ection, methods of a individual propertie arley, oats, rye, r	selections, seed rice, c	on and an exami d production). orn, soybean, s	nation of sunflower,	
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12.	select plant l Pract poppy of ass	ion and u preeding, ices : Sel r, alfalfa (sage, method selection to ir lection of wh laboratory me selected mate	ls of sele mprove i neat, ba ethods fo	ection, methods of a individual propertie arley, oats, rye, r	selections, seed rice, c	on and an exami d production). orn, soybean, s	nation of sunflower,	
12.	select plant l Pract poppy of ass Metho Lectur	ion and u preeding, ices : Sel , alfalfa (<u>essment</u> ods of stu res, theor	sage, method selection to ir lection of wh laboratory me <u>selected mate</u> Jdy : etical and lab	ls of sele mprove i neat, ba ethods fo erial).	ection, methods of individual propertie arley, oats, rye, r or assessment of s exercises, consulta	selections, seed rice, conselected	on and an exami d production). orn, soybean, s d material, polish	nation of sunflower, methods	
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13.	select plant I Practa poppy of ass Metho Lectur team Total	ion and u preeding, <i>ices</i> : Sel , alfalfa (<u>essment</u> ods of stu res, theor projects, e <u>amount</u>	sage, method selection to ir lection of wh laboratory me selected mate udy: etical and lab e-learning, pre of available ti	ls of sele mprove i neat, ba ethods fo erial). poratory epare leg ime	ection, methods of individual propertie arley, oats, rye, r or assessment of s exercises, consulta cture for exams.	selections, seed rice, conselected	on and an exami d production). orn, soybean, s d material, polish	nation of sunflower, methods	
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<u>13.</u> 14.	select plant l Pract poppy of ass Metho Lectur team Total Distri	ion and u preeding, <i>ices</i> : Sel , alfalfa (<u>essment</u> ods of stu res, theor projects, e <u>amount</u> of bution of	sage, method selection to ir lection of wh laboratory me selected mate udy: etical and lab e-learning, pre of available ti the available	ls of sele mprove i neat, ba ethods fo erial). poratory epare leo ime e time	ection, methods of individual propertie arley, oats, rye, r or assessment of s exercises, consult cture for exams. 120 hours 2+1+1	selections, seed	on and an examin d production). orn, soybean, s d material, polish e-learning, indiv	nation of sunflower, methods ridual and	
13.	select plant l Pract poppy of ass Metho Lectur team Total Distri	ion and u preeding, ices: Sel , alfalfa (essment ods of stu projects, e amount of bution of s of teacl	sage, method selection to ir lection of wh laboratory me selected mate udy: etical and lab e-learning, pre of available ti the available	Is of sele mprove i neat, ba ethods fo erial). poratory epare lea ime e time 15.1.	ection, methods of individual propertie arley, oats, rye, r or assessment of s exercises, consult cture for exams. 120 hours 2+1+1 Lectures - theore	selections, seed rice, co selected rations,	on and an examin d production). orn, soybean, s d material, polish e-learning, indiv	nation of sunflower, methods ridual and	
<u>13.</u> 14.	select plant l Pract poppy of ass Metho Lectur team Total Distri	ion and u preeding, ices: Sel , alfalfa (essment ods of stu projects, e amount of bution of s of teacl	sage, method selection to ir lection of wh laboratory me selected mate udy: etical and lab e-learning, pre of available ti the available	ls of sele mprove i neat, ba ethods fo erial). ooratory epare leo ime e time	ection, methods of individual propertie arley, oats, rye, r or assessment of s exercises, consulta cture for exams. 120 hours 2+1+1 Lectures - theore Exercises (labora	selections, seed rice, conselected rations, etical tratory, a	on and an examined production). orn, soybean, sod material, polish e-learning, indiversity raining	nation of sunflower, methods ridual and	
<u>13.</u> 14.	select plant l Pract poppy of ass Metho Lectur team Total Distri	ion and u preeding, ices: Sel , alfalfa (essment ods of stu projects, e amount of bution of s of teacl	sage, method selection to ir lection of wh laboratory me selected mate udy: etical and lab e-learning, pre of available ti the available	Is of sele mprove i neat, ba ethods fo erial). poratory epare lea ime e time 15.1.	ection, methods of individual propertie arley, oats, rye, r or assessment of s exercises, consult cture for exams. 120 hours 2+1+1 Lectures - theore Exercises (labora workshops, outre	selections, seed rice, conselected rations, etical tratory, a	on and an examined production). orn, soybean, sod material, polish e-learning, indiversity raining	nation of sunflower, methods ridual and	
<u>13.</u> 14. 15.	select plant l Pract poppy of ass Metho Lectur team Total Distri	ion and u preeding, <i>ices</i> : Sel , alfalfa (<u>essment</u> ods of stu res, theor projects, e <u>amount of</u> bution of s of teacl ties	sage, method selection to ir lection of wh laboratory me <u>selected mate</u> Jdy: etical and lab e-learning, pre of available ti the available hing	Is of sele mprove i neat, ba ethods fo erial). poratory epare lea ime e time 15.1. 15.2.	ection, methods of individual propertie arley, oats, rye, r or assessment of s exercises, consult cture for exams. 120 hours 2+1+1 Lectures - theore Exercises (labora workshops, outre teamwork	selections, seed rice, conselected rations, etical tratory, a	on and an examined production). orn, soybean, sod material, polish e-learning, indiversity raining	nation of sunflower, methods ridual and	
<u>13.</u> 14.	select plant l Pract poppy of ass Metho Lectur team Total Distri	ion and u preeding, <i>ices</i> : Sel , alfalfa (<u>essment</u> ods of stu res, theor projects, e <u>amount of</u> bution of s of teacl ties	sage, method selection to ir lection of wh laboratory me selected mate udy: etical and lab e-learning, pre of available ti the available	Is of sele mprove i neat, ba ethods fo erial). poratory epare lea ime e time 15.1.	ection, methods of individual propertie arley, oats, rye, r or assessment of s exercises, consult cture for exams. 120 hours 2+1+1 Lectures - theore Exercises (labora workshops, outre	selections, seed rice, conselected rations, etical tratory, a	on and an examined production). orn, soybean, sod material, polish e-learning, indiversity raining	nation of sunflower, methods ridual and	
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13. 14. 15. 16. 17.	select plant l Pract poppy of ass Metho Lectur team Total Distri Forma activity Other 17.1. 17.2.	ion and u preeding, ices: Sel , alfalfa (essment ods of stu res, theor projects, e amount of bution of s of teach ties forms of Exams (Project a Other fo ria for as	sage, method selection to ir lection of wh laboratory me selected mate udy: etical and lab e-learning, pre of available ti the available f activities f activities	Is of selemprove in the the the the the the the tern in the tern is the tern in the tern is the tern i	ection, methods of a individual propertie arley, oats, rye, r or assessment of s exercises, consulta cture for exams. 120 hours 2+1+1 Lectures - theore Exercises (labora workshops, outre teamwork Team projects Individual project Individual study n, electronic testing tten presentation) ties	selections, seed at a selection selected at a selected at	on and an examined production). orn, soybean, so	nation of sunflower, methods ridual and 	
13. 14. 15. 16. 17.	select plant l Pract poppy of ass Metho Lectur team Total Distri Forma activity Other 17.1. 17.2.	ion and u preeding, ices: Sel , alfalfa (essment ods of stu res, theor projects, e amount of bution of s of teach ties forms of Exams (Project a Other fo ria for as	sage, method selection to ir lection of wh laboratory me selected mate udy: etical and lab e-learning, pre of available ti the available f activities (midterm exan activities (oral rms of studyin sessment (p	Is of selemprove in the the the the the the the tern in the tern is the tern in the tern is the tern i	ection, methods of a individual propertie arley, oats, rye, r or assessment of s exercises, consulta cture for exams. 120 hours 2+1+1 Lectures - theore Exercises (labora workshops, outre teamwork Team projects Individual project Individual study n, electronic testing tten presentation) ties up to 50 points	selections, seed rice, criselected rice, criselected rations, relected rations, relevant rations, rations, rations, rations, rations, rations, rations, rations, rations, rati	on and an examined production). orn, soybean, so dimaterial, polish e-learning, indiversity indindex indiversity indiversity indiversity indiversity indiversity i	nation of sunflower, methods ridual and 	

				from 81 to 90 point	s	9 (nine) (B)	
				from 91 to 100 poir		10 (ten) (A)	
19.			jetting a signature final exam	60% success level			tivities
20.	Langı condı		hich classes are	Macedonian			
21.		od of mor truction	nitoring the quality	Self-evaluation, Pe Survey	riodic	tests for stuc	lents,
22.	Litera	ture					
		Compul	lsory literature				
		Ordinal No.	Author	Title	F	Publisher	Year
		1.	Verica Ilieva Natalija Markova	Plant breeding and seed production - (no reviewed script)	"Goo Štip,	ersity ce Delčev"- Faculty of culture	2012
	22.1.	2.	Cvetanka Najcevska	Plant breeding and seed production - (practicum)	Cyril Meth Skop of ag	nodius, oje, Faculty griculture nce and	1997
		3.	Martinčić, J., Kozumplik, V.	Plant breeding		ulty of culture eb	1996
		4		Breeding of field crops	Blac Ame Iowa USA	, I,	2006
		Additio	nal literature				
		Ordinal No.	Author	Title	F	Publisher	Year
	22.2.	1.	Mladenovski, T.	Certification of seeds from plants for fiber production, oil and sugar	Bigo	s, Skopje	2007
		2.	Mladenovski, T.	Production seeds from plants for feeding cattle	Alph Skop		2006
		3.	Mladenovski, T.	Seed production		isher house janic, grad	2005

Appe	endix No.3	Subject programme from first cycle studies
1.	Course title	Vine breeding
2.	Course code	2ZF212312
3.	Study programme:	Biotechnology, plant breeding and seed production

4.	Organ	nizer of the study progra	mme	University "Goce Delcev"- Stip, Faculty of					
		ty, institute, group)		agriculture /Depa					ruit
	(iadai	(y, montato, group)		growing					an
5.	Deare	e (first cycle)		First cycle					
5. 6.				first	7.	NI	umber of ECT	2	4
0.	Acade	emic year / semester			1.			5	4
				year/second		cre	edits		
				semester					
8.	Profe			Prof. Violeta Dim	iovsk	ka, F	Ph.D		
9.	Preco	nditions for course		No					
	enroll	ment							
10.	Goals	Goals of the course programme:							
		g knowledge for the g		characteristic ar	nd m	etho	ods in selection	on a	nd their
		e in creating grape vine				•			
11.		ent of the course program							
		oduction, definition, imp		of the coloction	hack	aro	und and gath	orod	roculto
		stematic of the grape vi							
		y, clone. 3. Meaning (Im							
		arieties. 4. Introduction							
		ion process. 6. Species							
		tic basis in the selection							
	quant	itative and qualitative	propert	ies, change of t	the r	num	ber of chrom	050	mes. 9.
	Spont	aneous and induced m	utations	s. 10. Methods in	the s	sele	ction. Individu	al ar	nd mass
	select	tion of foundations and	varietie	es. 11. Clone sel	ectio	on o	f substrates a	ind v	/arieties
).Methods of creating ne							
		ion and induced mutation							.,
12.		ods of study:							
12.		res, Laboratory exercise	ما۔م مد	arning individual	and	toai	m projects co	ncul	tations
13.		amount of available time		120	anu	ica		nsui	
14.		oution of the available tin		2 +1 +1					
14.	Distric	buttion of the available th	ne	2 + 1 + 1					
	_								
		· · · · · · · · · · · · · · · · · · ·	4 = 4			1.4			
15.	⊢orms	s of teaching activities	15.1.	Lectures - theo					2
15.	Form	s of teaching activities	15.1. 15.2.	Exercises (labo	rator	y, a	uditory),		2
15.	Form	s of teaching activities			rator	y, a	uditory),		2
15.	Form	s of teaching activities		Exercises (labo	rator	y, a	uditory),		2
15. 16.		s of teaching activities forms of activities		Exercises (labo workshops, out teamwork	rator	y, a	uditory),		2 /
		-	15.2.	Exercises (labo workshops, out	rator	y, a	uditory),		/
		-	15.2.	Exercises (labo workshops, out teamwork	rator react	y, a	uditory),		/
		-	15.2. 16.1.	Exercises (labo workshops, out teamwork Team projects	rator react	y, a	uditory),		/
		-	15.2. 16.1.	Exercises (labo workshops, out teamwork Team projects Individual project	rator react	y, a	uditory),		/
		-	15.2. 16.1. 16.2.	Exercises (labo workshops, out teamwork Team projects	rator react	y, a	uditory),		/
	Other	-	15.2. 16.1. 16.2.	Exercises (labo workshops, out teamwork Team projects Individual project	rator react	y, a	uditory),		/
16.	Other	forms of activities	15.2. 16.1. 16.2. 16.3.	Exercises (labo workshops, out teamwork Team projects Individual project Individual study	rator react cts	y, a	uditory),		/ 1 1 /
16.	Other	forms of activities	15.2. 16.1. 16.2. 16.3.	Exercises (labo workshops, out teamwork Team projects Individual project Individual study	rator react cts	y, a	uditory),		/
16.	Other Forms 17.1	forms of activities s of assessment Exams (midterm exam	15.2. 16.1. 16.2. 16.3.	Exercises (labo workshops, out teamwork Team projects Individual project Individual study	rator reach cts ng)	y, a	uditory),		/ 1 1 / 30
16.	Other	forms of activities	15.2. 16.1. 16.2. 16.3.	Exercises (labo workshops, out teamwork Team projects Individual project Individual study	rator reach cts ng)	y, a	uditory),		/ 1 1 /
16.	Other Forms 17.1 17.2	forms of activities s of assessment Exams (midterm exam Project activities (oral	15.2. 16.1. 16.2. 16.3. ns, exar and wri	Exercises (labo workshops, out teamwork Team projects Individual project Individual study n, electronic testin tten presentation)	rator reach cts ng)	y, a	uditory),		/ 1 / 30 50
16.	Other Forms 17.1	forms of activities s of assessment Exams (midterm exam	15.2. 16.1. 16.2. 16.3. ns, exar and wri	Exercises (labo workshops, out teamwork Team projects Individual project Individual study n, electronic testin tten presentation)	rator reach cts ng)	y, a	uditory),		/ 1 1 / 30
16.	Other Forms 17.1 17.2 17.3	forms of activities s of assessment Exams (midterm exam Project activities (oral Other forms of studyin	15.2. 16.1. 16.2. 16.3. ns, exar and wri g activir	Exercises (labo workshops, out teamwork Team projects Individual project Individual study n, electronic testin tten presentation)	rator reach cts ng)	y, a	uditory),		/ 1 / 30 50
16.	Other Forms 17.1 17.2 17.3	forms of activities s of assessment Exams (midterm exam Project activities (oral	15.2. 16.1. 16.2. 16.3. ns, exar and wri g activir	Exercises (labo workshops, out teamwork Team projects Individual project Individual study n, electronic testin tten presentation)	rator reach cts ng)	y, a	uditory),		/ 1 / 30 50
16.	Other Forms 17.1 17.2 17.3	forms of activities s of assessment Exams (midterm exam Project activities (oral Other forms of studyin eria for assessment (po	15.2. 16.1. 16.2. 16.3. ns, exar and wri g activir	Exercises (labo workshops, out teamwork Team projects Individual project Individual study n, electronic testin tten presentation) ties to 50 points	rator reach cts ng)	y, a h an	uditory), d 5(five) (F)		/ 1 / 30 50
16.	Other Forms 17.1 17.2 17.3	forms of activities s of assessment Exams (midterm exam Project activities (oral Other forms of studyin	15.2. 16.1. 16.2. 16.3. ns, exar and wri g activir	Exercises (labo workshops, out teamwork Team projects Individual project Individual study n, electronic testin tten presentation) ties to 50 points from 51 to 60 points	rator reach cts ng)	y, a n an	uditory), d 5(five) (F) 6(six) (E)		/ 1 / 30 50
16.	Other Forms 17.1 17.2 17.3	forms of activities s of assessment Exams (midterm exam Project activities (oral Other forms of studyin eria for assessment (po	15.2. 16.1. 16.2. 16.3. ns, exar and wri g activir	Exercises (labo workshops, out teamwork Team projects Individual project Individual study n, electronic testin tten presentation) ties to 50 points from 51 to 60 points from 61 to 70 points	rator reach cts ng)) oints oints	y, a n an	uditory), d 5(five) (F) 6(six) (E) 7(seven) (D		/ 1 / 30 50
16.	Other Forms 17.1 17.2 17.3	forms of activities s of assessment Exams (midterm exam Project activities (oral Other forms of studyin eria for assessment (po	15.2. 16.1. 16.2. 16.3. ns, exar and wri g activir	Exercises (labo workshops, out teamwork Team projects Individual project Individual study n, electronic testin tten presentation) ties to 50 points from 51 to 60 points from 61 to 70 points from 71 to 80 points	rator reach cts ng)) oints oints oints	y, a h an	uditory), d 5(five) (F) 6(six) (E) 7(seven) (D 8(eight) (C)))	/ 1 / 30 50
16.	Other Forms 17.1 17.2 17.3	forms of activities s of assessment Exams (midterm exam Project activities (oral Other forms of studyin eria for assessment (po	15.2. 16.1. 16.2. 16.3. ns, exar and wri g activir	Exercises (labo workshops, out teamwork Team projects Individual project Individual study n, electronic testin tten presentation) ties to 50 points from 51 to 60 points from 61 to 70 points	rator reach cts ng) oints oints oints oints	y, a h an	uditory), d 5(five) (F) 6(six) (E) 7(seven) (D))	/ 1 / 30 50

19.		tion for ge Iking the fi	tting a signature nal exam	/ 60% of term activities or minimum 42 points from 2 midterm exams, project activities and attending to lectures and discussions			
20.	Langu condu		ich classes are	N	lacedonian		
21.	Metho instruc		toring the quality of	S	Self-evaluation		
22.	Literat	ture					
		Compuls	ory literature				
		Ordinal No.	Author	Title		Publisher	Year
		1.	Miladin Soskic 1980		reeding of fruits and ine	University in Belgrade	1994
	22.1.	2.	I.Pejkic		reeding of fruits and ine	University in Belgrade	1980
		3.	Dzevat Jarebica and Mirsad Kurtovic		reednig of fruits and ine	EDIS-Saraevo	1997
		Additiona	al literature				
	22.2.	Ordinal No.	Author		Title	Publisher	Year
	<i>LL.L</i> .	1.	Edi Maletic, Jasminka Kontic, Ivan Pejic		Vitis vinifera (separate chapters)	School book, Zagreb	2008

Арр	endix No.3	Syllabus for t	he first, second a	nd t	hird cycle of study			
1.	Course tit	le	Plant breeding in	veg	etable growing			
2.	Course co	de	2ZF212412					
3.	Study pro	gramme:	Biotechnology, pl	lant l	preeding and seed pr	oduction		
4.	Organizer	of the study	University "Gocel	Delc	ev"- Stip, Faculty of			
	programm	e (faculty, institute,	Agriculture, Depa	artme	ent for Plant production	on		
	group)							
5.	Level (firs	t, second, third cycle)	First cycle					
6.	Academic	year / semester	First year/ 7. Number of ECTS			4		
			second		credits			
			semester					
8.	Instructor		Prof. Dragica Spasova, PhD					
9.	Preconditi	ions for course	/					
	enrollmen							
10.		he course programme: [·]						
		tics and selection in the s						
		egetable crops, propagat		ce tl	hrough seed producti	on per		
		nethods in separate vege						
11.		f the course programme						
		of the lectures: 1.Metho						
		us, xenogamous. 2. Me						
		on. 3. Methods for the crea						
		. 4. Methods for the cre						
		or the creation of new ge						
		eae. 7. Root vegetables, f						
	vegetables	, fam. Solanaceae 9.Fruit	vegetables, fam. (Juci	irbitaceae. 10. Proce	dure with		

12.	Biotect Contect elite p (mass xenog Applic for pla 12.Sta Metho Lectur work;	tion 2. Pre- blants. 4. and indiv amous cre ation of m atistical pre- ods of stu- res, theore learning h	n the selection exercises: 1 eparation of se Laboratory an vidual plant bi ops 7. Individu nethods for pla ng; 10.Experim occessing of the idy: etical and prac	. Signif eeds fo alysis reeding al plan at bree nental f e result tical ex eparate	neterozys in certain vege ficance of initial material r sowing and sowing tech of selected plants. 5. Me g). 6. Individual plant bre the breeding in crops with v eding at separate plants. S field (technique of plannin ts. ercises, consultations, ma ory classes and mid-term 120 hours	for plant bree inique 3. Field ethods for plan eding at autog egetative repro 9. Hybridization g) 11. Setting aking independ	ding and its selection of mt breeding jamous and oduction. 8. n as method of field trials	
14.			the available		2+1+1			
15.				15.1.		aining	2	
10.	0			15.2.		uditory),	1	
16.	Other	Other forms of activities 16.1			Team projects		/	
				16.2.	Individual projects		0,5	
	16.3.			16.3.	Individual study		0,5	
17.	Form	s of asse	ssment					
	17.1.	Exams (midterm exam	s, exar	n, electronic testing)			
		Success	fully implemer	nted lab	/ theoretical exercises		50	
	17.2.	Project a	activities (oral a	and wri	tten presentation)		20	
	17.3.	Other for	rms of studying	g activi	ties	10		
18.	Criter	ia for ass	essment (poi	nts /	to 50 points	5(five) (F)		
	grade)			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)		
	0	41.0		- 1	from 91 to 100 points	10(ten) (A)		
19.		_	jetting a signa	ature	/ 60% of term activities		•	
	and ta	aking the	final exam		from 2 midterm exams, attending to lectures an		5 anu	
20.	Langu condu	-	hich classes	are	Macedonian			
21.			nitoring the qu	uality	Self-evaluation			
		truction						
22.	Litera	ture						
		Compuls	sory literature					
		Ordinal No.	Author		Title	Publisher	Year	
	22.1.	1.	Verica Ilieva		Plant breeding, textbook	UGD-Stip	2012	
		2.	Dragica Spa	sova	Plant breeding and seed production – Peer reviewed script	UGD - Stip	2012	

	3.	Beljo, J.	Oplemenjivanje bilja	Agronomski fakultet – Mostar	2006
	4.	Cvetanka Naj;evska	Селекција на растенијата со семепроизводство (практикум)	УКИМ, Земјоделски факултет. Скопје	1997
	Addition	al literature	· · · · · ·	·	
	Ordinal No.	Author	Title	Publisher	Year
22.2.	1.	Мартинčиć, Ј., Козумплик, В.	Оплемењивање биља, Загреб.	Poljoprivredni fakultet -Osijek, Agronomski fakultet - Zagreb	1996
	2.	Marić, M. Miodrag	Semenarstvo	Izdavačka kuća DRAGANIĆ, Beograd	2005
	3.				

Appendix No.3 Syllabus for the first, second				hird cycle of study			
1.	Course title	Special plant bre	edin	g			
2.	Course code	2ZF212512					
3.	Study programme:			breeding and seed pr	oduction		
4.	Organizer of the study			ev"- Stip, Faculty of			
	programme (faculty, institute,	Agriculture, Depa	artme	ent for Plant production	on		
	group)						
5.	Level (first, second, third cycle)		1	I			
6.	Academic year / semester	First year/	7.	Number of ECTS	4		
		second		credits			
_		semester					
8.	Instructor	Prof. Dragica S	pasc	ova, PhD			
9.	Preconditions for course	/	/				
40	enrollment		:- 1-	formilioning students			
10.	Goals of the course programm						
	principles of seed production in second	eparate cultures. ce	rear	crops, industrial crop	s, lorage		
11.	Content of the course program	no [.]					
	Content of the lectures: 1. Seed		s (Tri	ie cereals) 2. Seed ni	roduction		
	in cereals (millet cereals) 3. G		•	<i>,</i>			
	cultivation 4. Seed production in						
	beans) 5. General characteristics						
	industrial crops (sunflower, oilsee			• •			
	varieties 8. Seed production in pe	rennial forage crops	s, fan	n. Fabaceae (alfalfa,	sainfoin)		
	9. Seed production in annual spec	cies of fam. Fabace	ae (\	/etches); 10. Seed pi	roduction		
	in annual species of fam. Poaceae				s of fam.		
	Poaceae; 12. Characteristics and						
	Content of the exercises: 1. Visit	0 1					
	Introduction to the details of seed			U U			
	crops of cereals (millet cereals) 4.						
	cereals 5. Visiting the plots with se			-			
	of the seed production of stews	7. Visiting the plot	ts w	ith perennial forage	crops 8.		

	plots v annua centre	with annual I forage cl s for sepa	al forage crop rops 11. Visitin arate cultures.	s 10. I	d production of perennial for ntroduction to the details hishing centres for certain	of the seed pro	duction of	
12.		ods of stu es, theore	-	tical ex	ercises, consultations, ma	aking independe	nt seminar	
	work;	learning h	ome; exam pr	eparate	ory classes and mid-term	tests.		
13.			of available tir	-	120 hours			
14.			the available		2+1+1		2	
15.		s of teach	ning	15.1.		Lectures - theoretical training		
	activi	ties		15.2.	Exercises (laboratory, a workshops, outreach ar teamwork		1	
16.	Other	forms of	activities	16.1.	Team projects		/	
				16.2.	Individual projects		0,5	
		16.3. Individual study				0,5		
17.	Form	s of asses	ssment	•	•	1		
	17.1.	Exams (midterm exam	is, exar	m, electronic testing)		30	
		Success	fully implemer	nted lab	o / theoretical exercises		50	
	17.2.		<i>y</i> 1		itten presentation)		20	
	17.3.	Other for	rms of studying	g activi	ties			
18.	Crite	ria for as	sessment (po	- ints/	to 50 points	5(five) (F)		
	•••••		rade)		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.			jetting a signa	ature	/ 60% of term activities			
	and ta	aking the	final exam		from 2 midterm exams, project activities and			
	_				attending to lectures and discussions			
20.	Langı condı		hich classes	are	Macedonian			
21.		od of mor truction	nitoring the qu	uality	Self-evaluation			
22.	Litera				•			
		Compuls	ory literature					
		Ordinal	Author		Title	Publisher	Year	
		No. 1.	Miodrag M. N	Marić	Semenarstvo	Izdavačka	2005	
					Comonaroteo	kuća	2000	
						DRAGANIĆ,		
	22.1.					Beograd		
	<u> </u>	2.	Grupa autora	a	Tehnologija proizvodnje	Društvo	1996	
					semena	selekcionara		
						l semenara		
						Srbije, Janus,		
		3.	Gatarić Đ.		<u>Siomonoratica</u>	Beograd	1000	
		٦.	Galanc D.		Sjemenarstvo	Poljoprivredni fakultet Banja	1999	
L						ranullet Dalija		

					Luka	
		4.	Lekić, S.	Zivotna sposobnost semena	Društvo selekcionara I semenara Srbije, Janus, Beograd	2003
		Additional literature				
	22.2.	Ordinal No.	Author	Title	Publisher	Year
		1.	Бабамов, Л.	Семепроизводство	Скопје	1971
		2.				
		3.				