

**REPUBLIC OF NORTH MACEDONIA
GOCE DELCEV UNIVERSITY
FACULTY OF AGRICULTURE**



STUDY PROGRAMME PLANT BIOTECHNOLOGY

**Study programme: PLANT BIOTECHNOLOGY – 4 YEAR STUDY PROGRAMME
DIPLOMA: BSc in PLANT BIOTECHNOLOGY**

Study programme, I year, I semester

Code	Course	Credits	Classes	Total
2ZF105117	Chemistry	8	3+2+2	240
2ZF110117	Basic of plant production	8	3+2+2	240
2FI110112	Computer science	6	2+2+1	180
	Elective faculty course 1-1	4	2+1+1	120
	Elective faculty course 1-2	4	2+1+1	120
UGD102717	Sport and recreation*	*	0+0+2	*
Total:		30	12+8+9	900

List Nb.1-1 Elective (Faculty) courses (chose just 1 course)

Nb.	Code	Course	Credits	Classes	Total
1	2ZF105717	Meteorology	4	2+1+1	120
2	2ZF110717	Agroecology	4	2+1+1	120

List Nb.1-2 Elective (Faculty) courses (chose just 1 course)

Nb.	Code	Course	Credits	Classes	Total
1	2ZF130217	Biostatistic	4	2+1+1	120
2	4FF100817	English language A2.1	4	2+1+1	120

Study programme, I year, II semester

Code	Course	Credits	Classes	Total
2ZF110417	Botanic	8	3+2+2	240
2ZF105517	Pedology	6	2+2+1	180
2ZF106917	Basic concept of biochemistry	6	2+2+1	180
	One Elective (university) course II	4	0+0+1	120
	One Elective (faculty) course 2-1	4	2+1+1	120
2ZF130117	Practical work*	2	0+0+2	60
Total:		30	10+6+9	900

List Nb.2-1 Elective (Faculty) courses (chose just 1 course)

Nb.	Code	Course	Credits	Classes	Total
1	2ZF140117	Calculation	4	2+1+1	120
2	2ZF135117	Rural development	4	2+1+1	120

Study programme, II year, III semester

Code	Course	Credits	Classes	Total
2ZF105617	Mechanisation	8	3+2+2	240
2ZF114417	Plant physiology	8	3+2+2	240
2ZF110517	Genetics	6	2+2+1	180
	Elective faculty course	4	2+1+1	120
	Elective faculty course	4	2+1+1	120
Total:		30	12+8+7	900

List Nb. 3-1 Elective (Faculty) courses (chose just 1 course)

Nb.	Code	Course	Credits	Classes	Total
1	2ZF115217	Viticulture	4	2+1+1	120
2	2ZF110817	Grain plants	4	2+1+1	120

List Nb. 3-2 Elective (Faculty) courses (chose just 1 course)

Nb.	Code	Course	Credits	Classes	Total
1	2ZF110917	Industrial plants	4	2+1+1	120
2	2ZF111017	Tobacco and tobacco processing	4	2+1+1	120

Study programme, II year, IV semester

Code	Course	Credits	Classes	Total
2ZF110617	Plant breeding and seed production	8	3+2+2	240
2ZF120217	Microbiology	6	2+2+1	180
2ZF105217	Agrochemistry and plant nutrition	6	2+2+1	180
	One Elective (university) course II	4	0+0+1	120
	One Elective (faculty) course I	4	2+1+1	120
2ZF130117	Practical work*	2	0+0+2	60
Total:		30	9+7+8	900

List Nb. 4 Elective (Faculty) courses (chose just 1 course)

Nb.	Code	Course	Credits	Classes	Total
1	2ZF112817	Fruith growing	4	2+1+1	120
2	2ZF111117	Vegetable growing	4	2+1+1	120

Study programme, III year, V semester

Code	Course	Credits	Classes	Total
2ZF100517	Basic entomology	8	3+2+2	240
2ZF100117	Basic phytopathology	8	3+2+2	240
2ZF120117	Livestock breeding	6	2+2+1	180
	Elective faculty course	4	2+1+1	120
	Elective faculty course	4	2+1+1	120
Вкупно:		30	12+8+7	900

List Nb. 5-1 Elective (Faculty) courses (chose just 1 course)

Nb.	Code	Course	Credits	Classes	Total
1	2ZF110217	Tuber plants	4	2+1+1	120
2	2ZF111317	Fodder plants	4	2+1+1	120

List Nb.5-1 Elective (Faculty) courses (chose just 1 course)

Nb.	Code	Course	Credits	Classes	Total
1	2ZF111217	Alternative plants	4	2+1+1	120
2	2ZF111417	Decorative plants	4	2+1+1	120

Study programme, III year, VI semester

Code	Course	Credits	Classes	Total
2ZF110317	Organic production	8	3+2+2	240
2ZF105417	Agromenagement	6	2+2+1	180
2ZF105317	Melioration and irrigation	6	2+2+1	180
	One Elective (university) course II	4	0+0+4	120
	One Elective (faculty) course I	4	2+1+1	120
2ZF130117	Practical work*	2	0+0+2	60
Total:		30	9+7+11	900

List Nb.6 Elective (Faculty) courses (chose just 1 course)

Nb.	Code	Course	Credits	Classes	Total
1	2ZF120317	Anatomy and physiology of animals	4	2+1+1	120
2	2ZF120817	Process technology	4	2+1+1	120

Study programme, IV year, VII semester

Code	Course	Credits	Classes	Total
2ZF113517	Special selection	8	3+2+2	240
2ZF113617	Basics of plant biotechnology	8	3+2+2	240
2ZF113717	Culture of plant tissue and cells	6	2+2+1	180
	Elective faculty course	4	2+1+1	120
	Elective faculty course	4	2+1+1	120
Total:		30	12+8+7	900

List Nb. 7-1 Elective (Faculty) courses (chose just 1 course)

Nb.	Code	Course	Credits	Classes	Total
1	2ZF113817	Genetic resurs and biodiversity	4	2+1+1	120
2	2ZF113917	Modern plant selection	4	2+1+1	120

List Nb. 7-2 Elective (Faculty) courses (chose just 1 course)

Nb.	Code	Course	Credits	Classes	Total
1	2ZF114017	Basics GMO	4	2+1+1	120
2	2ZF114117	Plant biochemistry	4	2+1+1	120

Study programme, IV year, VIII semester

Code	Course	Credits	Classes	Total
2ZF114517	Biotechnology and biosecurity	6	2+2+1	180
2ZF101817	Protection at laboratory work	6	2+2+1	180
	One Elective (university) course II	4	0+0+4	120
	One Elective (faculty) course I	4	2+1+1	120
2ZF107017	<i>Practical work in plant protection</i>	4	0+0+4	120
Diplom work:		6	0+0+6	180
Total:		30	6+6+17	900

List Nb. 8 Elective (Faculty) courses (chose just 1 course)

Nb.	Code	Course	Credits	Classes	Total
1	2ZF121417	Quality control	4	2+1+1	120
2	2ZF114217	Special seed production	4	2+1+1	120

LIST OF UNIVERSITY COURSE

Code	LIST OF UNIVERSITY COURSE II, IV, VI and VIII semester			
	COURSE	Credits	Classes	Total
UGD100117	Macedonian literature and culture	4	0+0+4	120
UGD100217	Macedonian language and spelling	4	0+0+4	120
UGD100317	Ethics	4	0+0+4	120
UGD100417	History of Macedonia	4	0+0+4	120
UGD100517	Copyright	4	0+0+4	120
UGD100617	Tolerance and conflict resolution	4	0+0+4	120
UGD100717	Business Systems	4	0+0+4	120
UGD100817	Tourism industry	4	0+0+4	120
UGD100917	Entrepreneurship and Innovation	4	0+0+4	120
UGD101017	Management of self-development and behavior	4	0+0+4	120
UGD101117	Business Economics	4	0+0+4	120
UGD101217	Choral singing	4	0+0+4	120
UGD101317	Music and art	4	0+0+4	120
UGD101417	An Introduction to Film History	4	0+0+4	120
UGD101517	Dramaturgy	4	0+0+4	120
UGD101617	Basics of drawing	4	0+0+4	120
UGD101717	History of classical painting	4	0+0+4	120
UGD101817	Health promotion	4	0+0+4	120
UGD101917	Oral health and hygiene	4	0+0+4	120
UGD102017	Precious and semiprecious minerals	4	0+0+4	120
UGD102117	Earth science	4	0+0+4	120
UGD102217	Wildlife Science	4	0+0+4	120
UGD102317	Environmental Protection	4	0+0+4	120
UGD102417	Intelligent electronic components and devices	4	0+0+4	120
UGD102517	Experiment planning	4	0+0+4	120
UGD102617	History of clothing	4	0+0+4	120
UGD102717	Management and quality control	4	0+0+4	120
UGD102817	Computer sciences	4	0+0+4	120
UGD102917	Programming Basics	4	0+0+4	120

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SELECTION OF UNIVERSITY ELECTIVES

Selection of university electives is based on the "first reported first served" principle. The maximum number of students in a group who can attend one university elective is 120. One professor can have a maximum of two groups of students. Up to two teachers may be engaged in one university elective course.

SPECIFIC DESCRIPTORS

Study programme: **Plant biotechnology**

Cycle of qualification: **I cycle, 240 ECTS, VI A**

Type of descriptor	Description
Knowledge and understanding	<ul style="list-style-type: none">- Express knowledge and understanding in the field of agricultural biotechnology.- Have knowledge of the genetic specificity of certain plant species.- Be able to demonstrate an understanding of how to apply classical and modern biotechnological methods in modern plant selection.- Know the processes in seed production.- Ability to expand knowledge in expert and scientific fields of plant biotechnology.
Apply theoretical and practical knowledge	<ul style="list-style-type: none">- Apply knowledge and understanding in the field of plant biotechnology, selection and seed production for further work in practice.- Apply knowledge and understanding to create new genotypes and improve existing varieties of certain crops.- Have knowledge and understanding of relevant standards in the field of agricultural biotechnology.- Apply knowledge and understanding to solve practical problems in this field.
Appraisal ability	<ul style="list-style-type: none">- Reasonably reasoned in making appropriate conclusions from the entire processes in agricultural biotechnology and selection.- Ability to collect, evaluate, analyze and present information on relevant biotechnological data in agriculture.- Production, service and organizational operations in plant biotechnology have the capability to evaluate and calculate them in agricultural practice processes.
Communication skills	<p>Can communicate, inform and connect ideas, problems and solutions from different segments of agricultural production.</p> <ul style="list-style-type: none">- They reasonably explain attitudes in front of expert and non-expert public.- Practical skills to make recommendations for the use of appropriate biotechnological methods in agricultural production.- Take responsibility for teamwork, personal and / or group responsibility when presenting teamwork results.
Skills of learning	<ul style="list-style-type: none">- Defining the role in the field, and broader in society, based on knowledge and understanding.- Identifying the need to pursue further studies with a higher degree of autonomy.- Initiate autonomy in the presentation of knowledge.- Learns how to learn.

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