1.	Course title	Introduction to Genetics Engineering	Introduction to Genetics Engineering							
2.	Course code	InIS-I-03	Ü							
3.	Study program	Intelligent Systems Engineering								
4.	Unit offering the course	FCSE								
5.	Undergraduate/master/PhD	Master								
6.	Year/semester 1(2)/spring/compulsory	7. ECTS: <b>6</b>	7. ECTS: <b>6</b>							
8.	Teacher(s)	Nevena Ackovska, Ana Madevska Bogdanov	Nevena Ackovska, Ana Madevska Bogdanova							
9.	Course prerequisites	None	None							
10.	Goals (competences): The subjects enables the students to understand the basics of genetics engineering. Although the methods used in genetics engineering are traditionally considered as related to biomedical sciences, in the last decade more scientists from other, classical engineering disciplines, are interested in obtaining specific characteristics using bio-principles. Upon completion of this course the students should be able to:  understand the methods for gene separation, both in laboratory conditions and in nature.  learn the basics of enzyme functioning in order to obtain wanted genetics information get introduced to the ethical issues of this modern engineering discipline.									
11.	Course content: <ul> <li>Gene organization</li> <li>Gene expression</li> <li>Genes and genomes</li> <li>DNA isolation</li> <li>Electrophoresis</li> <li>DNA sequencing</li> <li>Enzymes</li> <li>Host cells and vectors</li> <li>Genetic engineering</li> <li>Ethics and genetic engineering</li> </ul>									
12.	Teaching methods: Lectures supported by slide presentations, interactive lectures, trainings (using lab equipment and software packages), team work, case studies, invited guests and lectures, individual practical assignments presentations, seminar paper, e-learning (forums, consultations).									
13.	Total available time 6 ECTS x 30 hours = 180 hours									
14.	Distribution of the available time $30+30+40+40+40 = 180 \text{ hours}$									

16. Other activities					15.2.	Training (labs, problem solving), seminar and tea work	am	30 hours		
16.3.   Home work   40 hou	16.			16.1.	Project work		40 hours			
17.1   Tests   20 point   17.2   Seminar work/project (written or oral presentation)   70 point   17.3   Active participation   10 point   5 (five) ( from 60 to 68 points   5 (five) ( from 69 to 76 points   7 (seven) (1 from 77 to 84 points   8 (eight) (incomplete   10 points   1				16.2.	Self study		40 hours			
17.1.   Tests   20 point   17.2.   Seminar work/project (written or oral presentation)   70 point   17.3.   Active participation   10 point		16			16.3.	Home work	Home work			
17.2   Seminar work/project (written or oral presentation)   70 point		Gradin	g	<u>.</u>		•				
17.2   Seminar work/project (written or oral presentation)		T -					20 points			
18.   Grading criteria	17.	17.2. Seminar work/project (written or o				ral presentation) 70 poi		70 points		
18.   Grading criteria   From 60 to 68 points   6 (six) (1   from 69 to 76 points   7 (seven) (1   from 77 to 84 points   8 (eight) (1   from 85 to 92 points   9 (nine) (1   from 93 to 100 points   10 (ten) (1   from 93		17.3. Active participation					10 points			
Grading criteria    Final exam prerequisites   From 69 to 76 points   From 7 (seven) (1 from 77 to 84 points   8 (eight) (6 from 85 to 92 points   9 (nine) (1 from 93 to 100 points   10 (ten) (2 from 93 to 100 points   15.1 and 15.2						to 59 points				
1   Final exam prerequisites   From 77 to 84 points   S (eight) (eight) (eight) (eight) (from 85 to 92 points   9 (nine) (left) (from 93 to 100 points   10 (ten) (eight) (e		Grading criteria				from 60 to 68 points				
19. Final exam prerequisites   Successfully completed activities 15.1 and 15.2	10					from 69 to 76 points	` / `			
19.   Final exam prerequisites   Successfully completed activities 15.1 and 15.2     20.   Course   Inguage   Macedonian and English     21.   Quality assurance methods   Internal evaluation and student questionnaires	18.					from 77 to 84 points				
19. Final exam prerequisites  Course language  Macedonian and English  11. Quality assurance methods  Internal evaluation and student questionnaires  Literature  Compulsory  No. Authors  I M Desmond S. T. Nicholl  An Introduction to Genetic Engineering, University Press  22.1.  Compulsory  No. Gustav Joseph Victor  Nossal, Ross L. Coppe  Reshaping Life: Key Inversity Press  Engineering, 3rd Edition  Additional  No. Authors  Title  Publisher  Year  Additional  No. Authors  Title  Publisher  Year  Year  Additional  No. Authors  Title  Publisher  Year						from 85 to 92 points	9 (nine) (B			
20. Course language Macedonian and English  21. Quality assurance methods Internal evaluation and student questionnaires    Compulsory						from 93 to 100 points	10 (ten) (A)			
21. Quality assurance methods    Internal evaluation and student questionnaires	19.	Final e	xam pre	erequisites		Successfully completed activities 15.1 and 15.2				
Literature    Compulsory	20.	Course	Course language			Macedonian and English				
Compulsory   No.   Authors   Title   Publisher   Year	21.	Quality	ity assurance methods			Internal evaluation and student questionnaires				
No. Authors Title Publisher Year  1 M Desmond S. T. Nicholl An Introduction to Genetic Engineering, University Press  22.1.  2. Gustav Joseph Victor Reshaping Life: Key Issues in Genetic Engineering, 3rd Edition  Additional  No. Authors Title Publisher Year  22.2.  1		Literature								
22.1.  22.1.  22.1.    M Desmond S. T. Nicholl   An Introduction to Genetic Engineering,   Cambridge University Press		Compulsory								
22.1. Gustav Joseph Victor Reshaping Life: Key Nossal, Ross L. Coppe Issues in Genetic Engineering, 3rd Edition  Additional  No. Authors Title Publisher Year  2. 2. 1. 2. 2. 2. 2. 2. 2. 2. 3. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4.		22.1.	No.	Authors		Title	Publisher	Year		
22.1. Gustav Joseph Victor Reshaping Life: Key Nossal, Ross L. Coppe Issues in Genetic Engineering, 3rd Edition  Additional  No. Authors Title Publisher Year  2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3.			1	M Desmond S. T. Nic	holl	An Introduction to	Cambridge	2008		
2. Gustav Joseph Victor Reshaping Life: Key Issues in Genetic Engineering, 3rd Edition  Additional  No. Authors Title Publisher Year  22.2. 1. 2. 2.						Genetic Engineering,	_			
Nossal, Ross L. Coppe Issues in Genetic Engineering, 3rd Edition  Additional  No. Authors Title Publisher Year  22.2. 1			2	Gustay Joseph Victor		Reshaning Life: Key	Cambridge	2002		
Engineering, 3rd Edition  Additional  No. Authors Title Publisher Year  22.2. 1	22.		2.	•			_			
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