

International University of Sarajevo, Faculty of Engineering and Natural Sciences (FENS)
Undergraduate Curriculum - Genetics And Bioengineering Program (2018 - 2019)

Click on the course code or title to see the syllabus.

Semester I					
Code	Title	Prerequisites	T	P	ECTS
NS104	General Chemistry		3	2	6
MATH101	Calculus I		3	2	6
NS102	Physics		3	2	6
ELIT100	Academic English and Effective Communication		2	1	6
xxx	University Elective I See Table 1				3
xxx	Foreign Language Elective I See Table 1		2	0	3
Semester Total =					30

Semester III					
Code	Title	Prerequisites	T	P	ECTS
MATH202	Differential Equations	MATH102	3	2	6
NS205	Cell Biology		3	1	6
ENS205	Materials Science		3	1	6
MATH203	Introduction to Probability and Statistics	MATH101	3	2	6
NS202	Biochemistry I	NS207	3	2	6
Semester Total =					30

Semester V					
Code	Title	Prerequisites	T	P	ECTS
BIO310	Bioinformatics	NS103	3	1	6
BIO301	Molecular Biology		3	0	6
BIO303	Genetics II		3	0	6
	Program Elective I See Table 2				6
	Faculty Elective I See Table 3				6
Semester Total =					30

Semester VII					
Code	Title	Prerequisites	T	P	ECTS
BIO415	Genetic Engineering	Senior Standing	3	0	6
	Free Elective II				6
	Program Elective III See Table 2				6
	Program Elective IV See Table 2				6
BIO370	Work Placement / Internship	Junior Standing	0	14	6
Semester Total =					30

Abbreviations: T (Theory), P (Practice), ECTS credit					
Total Credits Required for Graduation					240
Total Credits of Electives					90

Semester II					
Code	Title	Prerequisites	T	P	ECTS
NS103	Biology		3	0	6
MATH102	Calculus II	MATH101	3	2	6
NS207	Organic Chemistry		3	2	6
ELIT200	Critical Reading and Writing		2	1	6
xxx	University Elective II See Table 1				3
xxx	Foreign Language Elective II See Table 1		2	0	3
Semester Total =					30

Semester IV					
Code	Title	Prerequisites	T	P	ECTS
NS209	Genetics I		3	2	6
ENS202	Thermodynamics	MATH102, NS102	3	2	6
ENS213	Programming for Engineers (+)	MATH101	3	2	6
BIO305	Biochemistry II	NS207	3	2	6
	University Elective III See Table 1				6
Semester Total =					30

Semester VI					
Code	Title	Prerequisites	T	P	ECTS
BIO312	Techniques in Molecular Biology	BIO301	2	2	6
BIO306	General Microbiology		3	2	6
	Free Elective I				6
	Program Elective II See Table 2				6
	Faculty Elective II See Table 3				6
Semester Total =					30

Semester VIII					
Code	Title	Prerequisites	T	P	ECTS
BIO407	Protein Engineering	Senior Standing	3	1	6
	Program Elective V See Table 2				6
	Program Elective VI See Table 2				6
	Program Elective VII See Table 2				6
	Program Elective VIII See Table 2				6
Semester Total =					30

No. of Courses					42
Minimum ECTS Credits for Applied/Practical Component of the Curriculum					51
Elective Ratio					38%

8 Program Electives are taken from Table 2. At most 2 graduate level courses in GBE can be taken as program elective with academic advisor's approval.

2 Faculty Elective courses are taken from Table 3. Other junior or senior level courses in FENS can be taken with academic advisor's approval.

3 University Electives for a total of 12 ECTS credits can be taken from Table 1: University Elective Courses List.

2 Language Elective courses are taken from the list of language courses provided (can not be the student's mother language).

2 Free Elective courses are taken from any faculty or program.

(+) CS103 Introduction to Programming can also be taken instead of ENS213. See Table 1.

This new curriculum is being implemented for the new freshman students who entered the freshman class in the year 2017 or after.

For the existing sophomore, junior and senior students, the Faculty Board will make plans for proper adaptation to the new curriculum.

In exceptional cases only, Faculty Council may make a decision for a student bypass a prerequisite for any course.

Work placement/internship is typically practiced in summer for a period of at least 25 work days, totalling at least 150 hours.

Junior standing: successfully completed at least 108 ECTS; Senior standing: successfully completed at least 168 ECTS.

Table 1: University Electives					
Code	Title	Prerequisites	T	P	ECTS
IUS Pool of 3 ECTS University Courses, AY 2017-2018					
ARCH107	Understanding Art and Architecture		2	0	3
CULT101	Understanding Cultural Encounters		2	0	3
ECON105	Understanding Politics, Economy and Management		2	0	3
NS111	Understanding Nature and Knowledge		2	0	3
NS112	Understanding Science and Technology		2	0	3
SPS140	Understanding Religion		2	0	3
	Foreign Language Elective I (&)		2	0	3
	Foreign Language Elective II (&)		2	0	3

IUS Pool of 6 ECTS University Courses, AY 2017-2018					
CS103	Introduction to Programming		3	2	6
ECON111	Introduction to Microeconomics		3	0	6
ECON112	Introduction to Macroeconomics		3	0	6
ELIT101	Introduction to Literature		2	1	6
ENS105	The Brain		3	0	6
IR101	Introduction to International Relations **		3	0	6
POLS102	Introduction to Political Science		3	0	6
PSY103	Introduction to Psychology		3	0	6
SPS103	Law and Ethics		3	0	6
SPS120	Critical Thinking		3	0	6
SOC102	Introduction to Sociology		3	0	6
VA121	History of Art I		3	0	6

(&) Scholarship students will take either Spoken Turkish I and II or Spoken Bosnian I and II. ** Equivalent to former IR102

Table 2: Program Electives			
Code	Title	Prerequisites	ECTS
BIO304	Structural Biology	Junior standing	6
BIO307	Bioengineering principles	Junior standing	6
BIO308	Plant Structure and Physiology	Junior standing	6
BIO309	Bioethics	Junior standing	6
BIO311	Biosensors	Junior standing	6
BIO313	Chemical Engineering	Junior standing	6
BIO314	Neuroanatomy	Junior standing	6
BIO315	Cell and tissue culture engineering	Junior standing	6
BIO320	Introduction to forensic science	Junior standing	6
BIO401	Biotechnology	Junior standing	6
BIO402	Molecular Evolution	Senior standing	6
BIO403	Plant Pathogenesis	Senior standing	6
BIO404	Agricultural Biotechnology	Senior standing	6
BIO406	Biomechanics	Senior standing	6
BIO408	Modeling and Simulation of Biomolecular Processes	Senior standing	6
BIO409	Immunology	NS205	6
BIO410	Ecology and environmental engineering	Junior standing	6
BIO411	Mammalian physiology	NS205	6
BIO412	Special Topics in Bioengineering	Senior standing	6
BIO414	Pharmaceutical Biotechnology	Senior standing	6
BIO416	Population Genetics	Senior standing	6
BIO417	Molecular Diagnostics	Senior standing	6
BIO418	Virology	Senior standing	6
BIO420	Biophysics	Senior standing	6
BIO422	Mechanism of Signal Transd	BIO301	6
BIO490	Graduation Project	Senior standing	6

Table 3: Faculty Electives for GBE							
Code	Title	Pre-requisites	ECTS	Code	Title	Prerequisites	ECTS
CS105	Advanced Programming	ENS213	6	MATH201	Linear Algebra	MATH101	6
CS302	Algorithms and Data Structures	CS105, MATH204	6	MATH204	Discrete Mathematics	MATH101	6
CS308	Software Engineering	CS105	6	MATH205	Numerical Analysis	MATH101	6
CS412	Web Application Development	CS105	6	MATH207	Vector Calculus	MATH101	6
CS306	Database management	CS105	6	MATH306	Statistical Modeling	MATH203	6
ENS201	Electromagnetism-I	MATH101	6	ME208	Dynamics and Vibrations	ENS209	6
ENS203	Electrical Circuits I	MATH101	6	ME304	Fluid Mechanics	MATH202	6
ENS206	Systems Modeling	MATH202	6	ME306	Heat and Mass Transfer	MATH202	6
ENS207	Engineering Graphics		6	IE301	Production Planning I	MATH203	6
ENS208	Introduction to Manufacturing Systems	MATH101	6	IE303	Operations Research I	MATH201	6
ENS209	Statics	MATH101	6	IE304	Operations Research II	IE303	6
ENS210	Computational Biology	ENS213	6	IE307	Quality and Reliability Engineering	Junior standing	6
ENS211	Signals and Systems	MATH102	6	IE408	Project Management	Senior standing	6
ENS221	Introduction to Engineering		6	EE201	Analog Electronics I	ENS203	6
ENS302	Engineering Optics	NS102	6	EE202	Electrical Circuits II	ENS203	6
NS203	Physical Chemistry	NS102, NS104	6	EE305	Instrumentation and Measurements	ENS203	6
NS211	Analytical Chemistry	NS104	6	EE311	Control System Design	ENS206	6
NS307	Introduction to Research Methods		6	EE321	Electrical Machines	EE202	6
				EE322	Power Systems	EE202	6

Pool of elective courses for the modules of Industrial Engineering (IE), Computer Science (CS) or Bioengineering (BE). The courses which are already required courses for GBE curriculum is shown as bold red color.

Course Code	Course Name	Prerequisite	ECTS	
MATH201	Linear Algebra		6	**Industrial Engineering (IE) Module
MATH306	Statistical Modelling	MATH203	6	
IE304	Operations Research II	IE303	6	
IE301	Production Planning I	MATH203	6	
IE307	Quality and Reliability Engineering		6	
IE408	Project Management		6	
ENS213/CS103	Progr. for Engineers or Intro. to Programming	MATH101	6	**Computer Science (CS) Module
CS105	Advanced Programming	ENS213	6	
MATH204	Discrete Mathematics	MATH101	6	
CS302	Algorithms and Data Structures	CS105, MATH204	6	
CS306	Database management	CS105	6	
	Any of the following courses:		6	
CS308	Software Engineering	CS105	6	**Bio-Engineering (BE) Module
CS412	Web App. Development	CS105	6	
ENS202	Thermodynamics	MATH102, NS102	6	
ENS203	Electrical Circuits I	MATH101	6	
ENS205	Material Science		6	
EE305	Instrumentation and Measurements	ENS203	6	
ME304	Fluid Mechanics	MATH202	6	
ME306	Heat and Mass Transfer	MATH202	6	
**Module	Courses that need to be completed for concentration for the respective field			
IE module	MATH306, IE303, IE304, IE301, IE307, IE408			
CS module	ENS213, CS105, MATH204, CS302, CS306, CS308 or CS412			
ME module	ENS202, ENS203, EE305, ENS205, ME304, ME306			