

International University of Sarajevo (IUS), Faculty of Engineering and Natural Sciences (FENS)													
First Cycle Curriculum - Genetics and Bioengineering (GBE)													
Academic Year: 2023-2024													
Click on the course code or title to see the syllabus.													
Semester I							Semester II						
Code	Title	Prerequisites	T	P	ECTS		Code	Title	Prerequisites	T	P	ECTS	
ELIT100	Academic English and Effective Communication		2	1	6		ELIT200	Critical Reading and Writing		2	1	6	
MATH101	Calculus I		3	2	6		MATH102	Calculus II	MATH101	3	2	6	
NS102	Physics		3	2	6		NS103	Biology		3	0	6	
NS104	General Chemistry		3	2	6		NS207	Organic Chemistry		3	2	6	
xxx	University Elective I See Table 1				3		NS112	Understanding Science and Technology		2	0	3	
xxx	Foreign Language Elective I See Table 1		0	2	3		xxx	Foreign Language Elective II See Table 1	For. Lang. Ele. I	0	2	3	
Semester Total = 30							Semester Total = 30						
Semester III							Semester IV						
Code	Title	Prerequisites	T	P	ECTS		Code	Title	Prerequisites	T	P	ECTS	
ENS205-6	Materials Science		3	1	6		BIO305	Biochemistry II	NS207	3	2	6	
MATH202	Differential Equations	MATH102	3	2	6		ENS213	Programming for Engineers (+)		3	2	6	
MATH203	Introduction to Probability and Statistics	MATH101	3	2	6		NS209	Genetics I		3	2	6	
NS202	Biochemistry I		3	2	6		xxx	University Elective II See Table 1				6	
NS205	Cell Biology		3	1	6		xxx	Free Elective I				6	
Semester Total = 30							Semester Total = 30						
Semester V							Semester VI						
Code	Title	Prerequisites	T	P	ECTS		Code	Title	Prerequisites	T	P	ECTS	
BIO301	Molecular Biology		3	0	6		BIO306	General Microbiology		3	2	6	
BIO303	Genetics II		3	0	6		BIO312	Techniques in Molecular Biology	BIO301	2	2	6	
BIO310	Bioinformatics	NS103	3	1	6		ENS309	Ethics in Engineering and Science		3	1	6	
ENS202	Thermodynamics	MATH102, NS102	3	2	6		xxx	Program Elective I See Table 2				6	
IE408	Project Management	Junior Standing	2	2	6		xxx	Program Elective II See Table 2				6	
Semester Total = 30							Semester Total = 30						
Semester VII							Semester VIII						
Code	Title	Prerequisites	T	P	ECTS		Code	Title	Prerequisites	T	P	ECTS	
BIO370	Work Placement / Internship	Junior Standing	0	14	6		BIO407	Protein Engineering	Senior Standing	3	1	6	
BIO415	Genetic Engineering	Senior Standing	3	0	6		xxx	Program Elective V See Table 2				6	
xxx	Free Elective II				6		xxx	Program Elective VI See Table 2				6	
xxx	Program Elective III See Table 2				6		xxx	Program Elective VII See Table 2				6	
xxx	Program Elective IV See Table 2				6		xxx	Program Elective VIII See Table 2				6	
Semester Total = 30							Semester Total = 30						
Abbreviations: T (Theory), P (Practice), ECTS credit							No. of Courses						
Total Credits Required for Graduation					240	Minimum ECTS Credits for Applied/Practical Component of the Curriculum					51		
Total Credits of Electives					75	Elective Ratio					31%		

Eight Program Electives are taken from Table 2.

Two University Electives for a total of 9 ECTS credits can be taken from Table 1: University Elective Courses List.

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

Two 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 2020 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 Elective Courses					
Code	Title	Prerequisites	T	P	ECTS
IUS Pool of 3 ECTS University Courses					
ARCH107	Understanding Art and Architecture		2	0	3
CS100	Computer Skills		0	2	3
CULT101	Understanding Cultural Encounters		2	0	3
ECON105	Understanding Business		2	0	3
ECON107	Python		1	1	3
ECON108	Matlab		1	1	3
HUM100	Social Responsibility and Sustainable Development		2	0	3
IBF105	Financial Literacy		2	0	3
IR100	Understanding the Contemporary World through Current Events		2	0	3
MAN105	Corporate Social Responsibility		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
TURK111	Spoken Turkish I *		0	2	3
BOS111	Spoken Bosnian I *		0	2	3
TURK112	Spoken Turkish II **	TURK111	0	2	3
BOS112	Spoken Bosnian II **	BOS111	0	2	3
IUS Pool of 6 ECTS University Elective Courses					
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
IBF205	Principles of International Business		3	0	6
LAW110	Introduction to Law I		3	0	6
LAW109	Law and Ethics		3	0	6
MAN102	Introduction to Management		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
SPS120	Critical Thinking		3	0	6
SPS150	World History		3	0	6
SOC102	Introduction to Sociology		3	0	6
VA121	History of Art I		3	0	6
* Scholarship students will take either TURK111 / BOS111					
** Scholarship students will take either TURK112 / BOS112					

TABLE 2: Program Elective Courses					
Code	Title	Prerequisites	T	P	ECTS
BIO308	Plant Structure and Physiology	Junior standing	3	0	6
BIO401	Biotechnology	Junior standing	3	0	6
BIO402	Molecular Evolution	Junior standing	3	1	6
BIO403	Plant Pathogenesis	Senior standing	3	1	6
BIO404	Agricultural Biotechnology	Senior standing	3	0	6
BIO405	Biological Data Analysis with Python	CS103 or ENS213	1	2	6
BIO408	Modeling and Simulation of Biomolecular Processes	Senior standing	3	0	6
BIO409	Immunology	NS205	3	0	6
BIO410	Ecology and environmental engineering	Junior standing	3	0	6
BIO411	Mammalian physiology	NS205	3	1	6
BIO412	Special Topics in Bioengineering	Senior standing	3	0	6
BIO413	Biostatistics	Junior standing	2	2	6
BIO414	Pharmaceutical Biotechnology	Senior standing	3	1	6
BIO416	Population Genetics	Junior standing	3	0	6
BIO417	Molecular Diagnostics	Senior standing	3	0	6
BIO418	Virology	Senior standing	3	0	6
BIO420	Biophysics	Senior standing	3	1	6
BIO422	Mechanism of Signal Transd	BIO301	3	2	6
BIO424	Introduction to Forensic Science	Junior standing	3	2	6
BIO425	Bioengineering Principles	Junior standing	3	0	6
BIO426	Bioethics	Junior standing	3	1	6
BIO427	Cell and Tissue Culture Engineering	Junior standing	3	2	6
BIO428	Structural Biology	Junior standing	3	0	6
ENS490	Graduation Project	Last Semester	2	0	6
PSY310	Introduction to Psychopharmacology	Junior standing	2	1	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 Cod	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	Junior Standing	6	
IE408	Project Management	Junior Standing	6	
ENS213/CS103	Progr. for Engineers or Intro. to Programming		6	**Computer Science (CS) Module
CS105	Advanced Programming	ENS213/CS103	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			

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