

International University of Sarajevo, Faculty of Engineering and Natural Sciences (FENS)											
Undergraduate Curriculum -Artificial Intelligence and Data Engineering Program											
Academic Year: 2023-2024											
Click on the course code or title to see its 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	CS105	Advanced Programming	CS103	3	2	6
CS103	Introduction to Programming		3	2	6	AID101	Fundamentals of Data Science		3	2	6
xxx	University Elective I	See Table 1	3	2	6	MATH201	Linear Algebra	MATH101	3	2	6
ENS101	Introduction to Engineering		2	1	3	xxx	University Elective II	See Table 1			3
xxx	Foreign Language Elective I		0	2	3	xxx	Foreign Language Elective II	For. Lang. Ele. 1	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
MATH203	Introduction to Probability and Statistics	MATH101	3	2	6	MATH306	Statistical Modeling	MATH203	3	2	6
MATH204	Discrete Mathematics	MATH101	3	2	6	CS417	Introduction to Data Mining		3	2	6
AID201	Programming for Data Science	CS103	3	2	6	CS207	Analysis of Algorithms		3	2	6
CS206	Data Structures	CS105	3	2	6	CS306	Database Management	CS105	3	2	6
xxx	Faculty Elective I	See Table 2			6	xxx	Faculty Elective II	See Table 2			6
Semester Total = 30					Semester Total = 30						
Semester V					Semester VI						
Code	Title	Prerequisites	T	P	ECTS	Code	Title	Prerequisites	T	P	ECTS
CS412	Web Application Development	CS105	3	2	6	AID302	Optimization for Data Science		3	2	6
EE418	Introduction to Machine Learning		3	2	6	AID304	Big Data Analytics		3	2	6
xxx	Free Elective I				6	CS404	Artificial Intelligence	(CS103 or AID201) and MATH201	3	1	6
IE408	Project Management	(Junior Standing)	2	2	6	ENS309	Ethics in Engineering and Sciences		3	1	6
xxx	Program Elective I	See Table 3			6	xxx	Program Elective II	See Table 3			6
Semester Total = 30					Semester Total = 30						
Semester VII					Semester VIII						
Code	Title	Prerequisites	T	P	ECTS	Code	Title	Prerequisites	T	P	ECTS
AID401	Deep Learning	CS404	3	2	6	xxx	Free Elective II				6
xxx	Program Elective III (Senior standing)	See Table 3	3	2	6	AID402	Applied Data Engineering		3	2	6
CS370	Work placement/Internship		0	14	6	xxx	Program Elective VI (Senior standing)	See Table 3			6
xxx	Program Elective IV (Senior standing)	See Table 3			6	xxx	Program Elective VII (Senior standing)	See Table 3			6
xxx	Program Elective V (Senior standing)	See Table 3			6	ENS490	Graduation Project (Senior standing)	Last Semester	0	4	6
Semester Total = 30					Semester Total = 30						
Abbreviations: T (Theory), P (Practice), ECTS credit											
Total Credits Required for Graduation											
Total Credits of Electives											
No. of Courses											
Min. ECTS Credits for Applied/Practical Component of the Curriculum											
Elective Ratio											
IMPORTANT NOTES TO CSE STUDENTS											
University elective courses and 2 Foreign language elective courses (different from native language of students) are taken from the pool of University Elective Courses, see Table 1.											
2 Faculty Elective courses are taken from the pool of Faculty Elective Courses, see Table 2. Faculty elective courses may be selected from other FENS programmes with the approval of Program Coordinator.											
6 Program Electives are taken from the pool of Program Elective courses, see Table 3. Two Program elective courses may be selected from other FENS programmes (including FENS graduate level courses) with the approval of Program Coordinator.											
2 Free elective courses are taken from any faculty. It is strongly recommended that the students take MAN303 Entrepreneurship and Small Business Management.											
Junior standing: student has successfully completed at least 108 ECTS. Senior standing: student has successfully completed at least 168 ECTS.											
The curriculum is applicable to students who entered the freshman class in the year 2023-2024 or after.											
In exceptional cases only, Faculty Council may make a decision for a student to bypass a prerequisite for a course.											
Work placement/Internship is typically practiced in summer for a period of at least 25 work days, totalling at least 150 hours											

Table 1: University Electives					
Code	Title	Prerequisites	T	P	ECTS
<b>University Electives (3 ECTS)</b>					
ARCH107	Understanding Art and Architecture		2	0	3
BIO100	Introduction to Bioengineering		3	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
<b>Language Elective Subpool</b>					
xxx	Foreign Language Elective I (&)		0	2	3
xxx	Foreign Language Elective II (&)	For. Lang. Ele. 1	0	2	3
<b>(&amp;) Scholarship students will take either Turkish Language I and II or Bosnian Language I and II.</b>					
<b>University Electives (6 ECTS)</b>					
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
IR101	Introduction to International Relations		3	0	6
LAW109	Law and Ethics		3	0	6
LAW110	Introduction to Law I		3	0	6
MAN102	Introduction to Management		3	0	6
NS102	Physics		3	2	6
NS103	Biology		3	0	6
NS104	General Chemistry		3	2	6
POLS102	Introduction to Political Science		3	0	6
PSY103	Introduction to Psychology		3	0	6
SOC102	Introduction to Sociology		3	0	6
SPS120	Critical Thinking		3	0	6
SPS150	World History		3	0	6
VA121	History of Art I		3	0	6
<b>Table 2: Faculty Electives</b>					
Code	Title	Prerequisites	ECTS		
EE325	Embedded Systems	CS103	6		
EE331	Introduction to Communication Systems	MATH102	6		
EE405	Software Engineering Project		6		
EE406	Hardware Engineering Project		6		
EE435	Microprocessors-I		6		
ENS203	Electrical Circuits I	MATH101	6		
ENS205	Materials Science		6		
ENS207	Engineering Graphics		6		
ENS209	Statics	MATH101	6		
MATH102	Calculus II	MATH101	6		
MATH202	Differential Equations	MATH102	6		
MATH207	Vector Calculus	MATH101	6		
MATH209	Discrete Mathematics II	MATH204	6		
NS209	Genetics I		6		
IE303	Operations Research I	MATH201	6		
IE307	Quality and Reliability Engineering	Junior Standing	6		
<b>Faculty Electives may be selected from other FENS programs with the approval of Program Coordinator.</b>					

Table 3: Program Electives			
Code	Title	Prerequisites	ECTS
AID403	IoT Fundamentals	CS103 or AID201	6
AID404	Business Intelligence		6
AID405	Natural Language Processing		6
BIO310	Bioinformatics	NS103 or Program Coordinator's Approval	6
BIO405	Biological Data Analysis with Python	ENS213 / CS103	6
CS299	Social, Legal, and Ethical Issues in Computing		6
CS303	Digital Design		6
CS305	Programming Languages	CS105	6
CS304	Computer Architecture	CS105	6
CS307	Operating Systems	CS304	6
CS308	Software Engineering	CS105	6
CS313	Theory of Computation	MATH204 and CS105	6
CS310	Human Computer Interaction	CS105	6
CS402	Introduction to Design of Compilers	CS105 and MATH204	6
CS403	Distributed Systems	CS307	6
CS405	Computer Graphics	CS302 and MATH201	6
CS413	Developing the Interactive Web	CS105	6
CS414	Computer Vision	CS103 and MATH201	6
CS415	Pattern Recognition	MATH201	6
CS416	Cryptography	CS302 and MATH204	6
CS420	Network Programming	CS105 and SE308	6
CS421	Architecture and Implementation of Database Management Systems	CS306	6
CS422	Wireless Mobile Networks	SE308	6
CS423	Parallel Computing	CS302 and CS307	6
CS426	Software Engineering II	CS308	6
CS427	Computer and Network Security	CS307 and SE308	6
CS428	Principles of Quantum Computing		6
CS429	Cybersecurity Essentials		6
CS498	Special Topics in Computer Science I		6
CS499	Special Topics in Computer Science II		6
EE437	Introduction to Robotics	Senior Standing	6
MAN461	Management Information Systems	MAN102	6
SE211	Software Construction	CS103	6
SE302	Software Testing and Maintenance	CS105 and MATH204	6
SE304	Tools and Methods of CASE Technologies	CS105	6
SE308	Communication Systems and Networks	CS105	6
SE322	Software Requirements Analysis	SE211 or CS105	6
SE403	Development of Science and Technology	CS105	6
SE404	Psycho Cibernetics	CS105	6
SE407	Software Quality Management	SE211 or CS105	6
SE423	Automatics and Robotics	CS105	6
<b>2 Program Electives may be selected from other FENS programs (including FENS graduate level courses) with the approval of Program Coordinator.</b>			

Last Update: 26.06.2023  
Senate Decision, 26.06.2023, IUS-SENAT 11-1831/2023