

Distribution of courses per semesters and years

Study program: Communication networks and security

Year I				
Semester I				
#	Code	Name of course	Hours per week	ECTS
Compulsory				
1	11.3.F.1101.C	Programming 1	3+2	6
2	11.1.F.1102.C	Mathematics 1	3+2	6
3	11.9.F.1103.C	Discrete Mathematics	3+2	6
4	09.0.F.1104.C	Technical Communication 1	3+2	6
5	13.2.F.1105.C	Physics 1	3+2	6

Year I				
Semester II				
#	Code	Name of course	Hours per week	ECTS
Compulsory				
1	11.3.F.1201.C	Programming 2	3+2	6
2	11.1.F.1202.C	Mathematics 2	3+2	6
3	09.0.F.1203.C	Technical Communication 2	3+2	6
4	11.3.CNS.1201.MR	Network Architecture	3+2	6
5	11.3.CNS.1202.MR	Digital Signal Processing	3+2	6

Year II				
Semester III				
#	Code	Name of course	Hours per week	ECTS
Compulsory				
1	11.2.F.1301.C	Probability and Statistics	3+2	6
2	11.3.F.1302.C	Data Base Systems	3+2	6
3	11.3.F.1303.C	Algorithms and Data Structures	3+2	6
4	11.3.CNS.1301.MR	Communication Protocols	3+2	6
Electives				
5	1 course of MiE list		3+2	6

Year II				
Semester IV				
#	Code	Name of course	Hours per week	ECTS
Compulsory				
1	11.3.F.1401.C	Software Engineering	3+2	6
2	11.3.F.1402.C	Operating systems	3+2	6
3	11.3.F.1403.C	Programming 3	3+2	6
4	11.3.CNS.1401.MR	Wireless Technology	3+2	6
Electives				
5	1 course of MiE list		3+2	6

Year III				
Semester V				
#	Code	Name of course	Hours per week	ECTS
Compulsory				
1	11.3.F.1501.C	Programming 4	3+2	6
2	11.9.CNS.1501.MR	Stochastic Processes	3+2	6
Electives				
3	1 course of MaE list		3+2	6
4	1 course of MiE list		3+2	6
5	1 course of MiE list		3+2	6

Year III				
Semester VI				
#	Code	Name of course	Hours per week	ECTS
Compulsory				
1	11.2.F.1601.C	Descriptive and Inferential Statistics	3+2	6
2	11.9.CNS.1601.MR	Information theory (coding)	3+2	6
Electives				
3	1 course of MaE list		3+2	6
4	1 course of MiE list		3+2	6
5	1 course of MiE list		3+2	6

Year IV				
Semester VII				
#	Code	Name of course	Hours per week	ECTS
Compulsory				
1	11.9.F.1701.C	R&D Methods for Science and Engeneering	3+2	6
Electives				
2	11.9.F.1701.MaE*	Industrial Internship	3+2	6
3	1 course of MaE list		3+2	6
4	1 course of MaE list		3+2	6
5	11.9.F.1701.MiE	Final project	3+2	6

Year IV				
Semester VIII				
#	Code	Name of course	Hours per week	ECTS
Electives				
1	11.9.F.1801.MaE*	Industrial Internship	3+2	6
2	1 course of MaE list		3+2	6
3	1 course of MaE list		3+2	6
4	11.9.F.1802.MiE	Final project	3+2	6
5	11.9.F.1801.MiE	Final project	3+2	6

Major Electives – MaE List

1	11.3.CNS.1501.MaE	Server and Client Systems	3+2	6
2	11.9.CNS.1601.MaE	Information theory (cryptography)	3+2	6
3	11.9.F.1701.MaE*	Industrial Internship	3+2	6
4	11.9.CNS.1702.MaE	Data mining	3+2	6
5	04.9.CNS.1703.MaE	Project Management	3+2	6
6	11.9.F.1801.MaE*	Industrial Internship	3+2	6
7	11.9.CNS.1802.MaE	Software Agents	3+2	6
8	11.3.CNS.1803.MaE	Formal Methods for Computer Science	3+2	6
9	11.9.F.1x01.MaE	System theory	3+2	6
10	11.9.F.1x02.MaE	Chaos theory	3+2	6
11	11.9.F.1x03.MaE	Advanced algorithms	3+2	6
12	11.9.F.1x04.MaE	Advanced logic	3+2	6
13	11.9.F.1x05.MaE	Model checking	3+2	6
14	11.9.F.1x06.MaE	Discrete Mathematics 2	3+2	6
15	11.9.F.1x07.MaE	Advanced calculus	3+2	6
16	11.9.F.1x08.MaE	Design of integrated systems	3+2	6
17	11.9.F.1x09.MaE	Digital electronics	3+2	6
18	11.9.F.1x10.MaE	Digital libraries	3+2	6
19	11.9.F.1x11.MaE	Distance education	3+2	6
20	11.9.F.1x12.MaE	e-Business	3+2	6
21	11.9.F.1x13.MaE	e-Government	3+2	6
22	11.9.F.1x14.MaE	Embedded systems	3+2	6
23	11.9.F.1x15.MaE	Ethics and law for IT	3+2	6
24	11.9.F.1x16.MaE	Fundamentals of telecommunications	3+2	6
25	11.9.F.1x17.MaE	Geographical information systems	3+2	6
26	11.9.F.1x18.MaE	Health information systems	3+2	6
27	11.9.F.1x19.MaE	Information society fundamentals	3+2	6
28	11.9.F.1x20.MaE	Innovation technologies	3+2	6
29	11.9.F.1x21.MaE	Innovation and sustainable systems	3+2	6
30	11.9.F.1x22.MaE	Internet programming	3+2	6
31	11.9.F.1x23.MaE	Internet technologies	3+2	6
32	11.9.F.1x24.MaE	IT supported learning	3+2	6
33	11.9.F.1x25.MaE	Knowledge based systems	3+2	6
34	11.9.F.1x26.MaE	Knowledge management	3+2	6
35	11.9.F.1x27.MaE	Knowledge systems	3+2	6
36	11.9.F.1x28.MaE	Management of technical support	3+2	6
37	11.9.F.1x29.MaE	Management of virtual environments & visualization	3+2	6
38	11.9.F.1x30.MaE	Media and communications	3+2	6

39	11.9.F.1x31.MaE	Microcomputer systems	3+2	6
40	11.9.F.1x32.MaE	Modeling of business processes	3+2	6
41	11.9.F.1x33.MaE	Modeling of telecommunications	3+2	6
42	11.9.F.1x34.MaE	Natural language processing	3+2	6
43	11.9.F.1x35.MaE	Theory of traffic	3+2	6
44	11.9.F.1x36.MaE	Virtual society	3+2	6
45	11.9.F.1x37.MaE	Visual programming	3+2	6
46	11.9.F.1x38.MaE	Web design	3+2	6
47	11.9.F.1x39.MaE	Bioinformatics fundamentals	3+2	6
48	11.9.F.1x40.MaE	Next generation networks	3+2	6
49	11.9.F.1x41.MaE	Identity & Security Management	3+2	6
50	11.9.F.1x42.MaE	Network Security Architectures	3+2	6
51	11.9.F.1x43.MaE	Biomedical imaging	3+2	6
52	11.9.F.1x44.MaE	Biomedical instrumentation	3+2	6
53	11.9.F.1x45.MaE	Biomedical signal processing	3+2	6
54	11.9.F.1x46.MaE	Electrical circuits	3+2	6
55	11.9.F.1x47.MaE	Principles of biomedical engineering	3+2	6
56	11.9.F.1x48.MaE	Game theory	3+2	6
57	11.9.F.1x49.MaE	Information auditing	3+2	6
58	11.9.F.1x50.MaE	Optimization theory	3+2	6
59	11.9.F.1x51.MaE	Parallel computing	3+2	6
60	11.9.F.1x52.MaE	Applying UML patterns. Object oriented design	3+2	6
61	11.9.F.1x53.MaE	Cloud Computing Technologies	3+2	6
62	11.9.F.1x54.MaE	Patenting & Protecting Technical Ideas	3+2	6
63	11.9.F.1x55.MaE	Service Oriented Architectures	3+2	6
64	11.9.F.1x56.MaE	Software Engineering Economics	3+2	6
65	11.3.CSE.1501.MaE	Compiler Theory	3+2	6
66	11.9.CSE.1601.MaE	Data Base System II	3+2	6
67	11.4.CSE.1803.MaE	Artificial Intelligence	3+2	6
68	11.9.ISVMA.1501.MaE	Graph Theory	3+2	6
69	11.9.ISVMA.1601.MaE	Clustering	3+2	6
70	11.9.ISVMA.1802.MaE	Morphological Filters	3+2	6
71	11.9.ISVMA.1803.MaE	Image Processing	3+2	6
72	11.9.ITA.1501.MaE	Image and Signal Processing	3+2	6
73	11.4.ITA.1803.MaE	Artificial Intelligence	3+2	6
74	11.2.MIR.1501.MaE	Statistical Learning Systems	3+2	6
75	11.9.MIR.1601.MaE	Stochastic Processes	3+2	6

Minor Electives – MiE List

1	03.0.F.1301.MiE	Art	3+2	6
2	14.1.F.1302.MiE	Political Science	3+2	6
3	14.3.F.1303.MiE	Economics	3+2	6
4	08.0.F.1304.MiE	Humanities 1	3+2	6
5	03.6.F.1401.MiE	History of art	3+2	6
6	14.2.F.1402.MiE	Sociology	3+2	6
7	04.0.F.1403.MiE	Management	3+2	6
8	07.1.F.1404.MiE	Geography	3+2	6
9	08.0.F.1405.MiE	Humanities 2	3+2	6
10	08.4.F.1501.MiE	Archeology	3+2	6
11	04.7.F.1502.MiE	Marketing	3+2	6
12	13.9.F.1503.MiE	Physics (Electricity and Magnetism)	3+2	6
13	08.3.F.1505.MiE	History of art of Ohrid	3+2	6
14	16.0.F.1506.MiE	Military Science	3+2	6
15	13.9.F.1507.MiE	Physics (Waves and Optics)	3+2	6
16	13.9.F.1601.MiE	Environmental Physics	3+2	6
17	14.7.F.1602.MiE	Anthropology	3+2	6
18	04.9.F.1603.MiE	E-business	3+2	6
19	13.9.F.1604.MiE	Relativity and Quantum Physics	3+2	6
20	15.3.F.1605.MiE	Public Speaking	3+2	6
21	03.0.F.1606.MiE	Digital art and graphic design	3+2	6
22	11.9.F.1701.MiE	Final project	3+2	6
23	11.9.F.1802.MiE	Final project	3+2	6
24	11.9.F.1801.MiE	Final project	3+2	6
25	13.3.F.1x01.MiE	Conceptual physics	3+2	6
26	08.1.F.1x02.MiE	Philosophy	3+2	6
27	03.9.F.1x03.MiE	Drawing	3+2	6
28	03.9.F.1x04.MiE	Painting	3+2	6
29	09.9.F.1x05.MiE	English for Academic Purposes	3+2	6
30	09.9.F.1x06.MiE	Macedonian language	3+2	6
31	09.9.F.1x07.MiE	Linguistics	3+2	6
32	08.3.F.1x08.MiE	History of Africa	3+2	6
33	08.3.F.1x09.MiE	History of Asia	3+2	6
34	08.3.F.1x10.MiE	History of America	3+2	6
35	08.9.F.1x11.MiE	Ethnography	3+2	6
36	08.3.F.1x12.MiE	History of Europe	3+2	6
37	13.3.F.1x13.MiE	Introductory chemistry	3+2	6
38	13.3.F.1x14.MiE	Advanced chemistry	3+2	6
39	13.1.F.1x15.MiE	Introductory biology	3+2	6

40	13.1.F.1x16.MiE	Advanced biology	3+2	6
41	13.9.F.1x17.MiE	Geology	3+2	6
42	13.9.F.1x18.MiE	Neurophysiology	3+2	6
43	12.8.F.1x19.MiE	Medicine and medical technology	3+2	6
44	12.9.F.1x20.MiE	Pharmacology	3+2	6
45	13.9.F.1x21.MiE	Ecology	3+2	6
46	13.9.F.1x22.MiE	Genetics	3+2	6
47	09.9.F.1x23.MiE	Theatre	3+2	6
48	09.9.F.1x24.MiE	Poetry	3+2	6
49	09.9.F.1x25.MiE	Commercializing Technology, Venturing & Entrepreneurship	3+2	6