Faculty Applied IT, Machine Intelligence and Robotics

Undergraduate FIRST CYCLE OF STUDIES

Study program: Machine Intelligence and Robotics (MIR) 3 years

Active from academic 2018/2019

After completion of 3 years of studies, with 180 ECTS credits, students will get a degree of Bachelor of Engineering in Information Science and Technology in the field Machine Intelligence and Robotics.

MIR 3 years

Year I				
Semester I				
No.	Code	Course Name	No. of classes	ECTS
Core Courses				
1	11.3.F.1101.C	Introduction to Programming	3+2+2	6
2	11.1.F.1102.C	Mathematics 1	3+2	6
3	13.2.F.1103.C	Physics	3+2	6
4	11.9.F.1104.C	Discrete Mathematics	3+2	6
One Major Elective course				
5	Major Elective List		3+2	6
Year I				
Semester II				
No.	Code	Course Name	No. of classes	ECTS
1	11.3.F.1201.C	Object Oriented Programming	3+2+2	6
2	11.1.F.1202.C	Mathematics 2	3+2	6
3	11.3.F.1203.C	Script Programming	3+2	6
4	06.2.MIR.1201.MR	Introduction to electric circuits	3+2	6
One Major Elective course				
5	Major Elective List		3+2	6

Year II				
Semester III				
No.	Code	Course Name	No. of classes	ECTS
1	11.1.MIR.1301.MR	Mathematics 3	3+2	6
2	11.9.MIR.1302.MR	Digital Logic Circuits	3+2	6
3	11.3.MIR.1303.MR	Signals and systems	3+2	6
One Major Elective course				
4	Major Elective List		3+2	6
Elective				
5	1 Course from Minor Elective List		3+2	6

Year II				
Semester IV				
No.	Code	Course Name	No. of classes	ECTS
1	06.9.MIR.1401.MR	Basics of robotics	3+2	6
2	11.9.MIR.1402.MR	Microprocessors	3+2	6
3	11.9.MIR.1403.MR	Sensors and Actuators	3+2	6
One Major Elective course				
4	Major Elective List		3+2	6
Elective				
5	1 Course from Minor Elective List		3+2	6

Year III				
Semester V				
No.	Code	Course Name	No. of classes	ECTS
1	11.9.MIR.1501.MR	Control Theory 1	3+2	6
2	11.4.MIR.1502.MR	Artificial Intelligence	3+2	6
Two Major Elective courses				
3	Major Elective List		3+2	6
4	Major Elective List		3+2	6
Electives				
5	1 Course from Minor Elective List		3+2	6

Year III				
Semester VI				
No.	Code	Course Name	No. of classes	ECTS
1	11.2.MIR.1601.MR	Probability and Statistics	3+2	6
2	11.9.MIR.1602.MR	Programmable Logical Controllers	3+2	6
Two Major Elective courses				
3	Major Elective List		3+2	6
4	Major Elective List		3+2	6
Electives				
5	1 Course from Minor Elective List		3+2	6
				180

The first cycle of university studies recognizes the modules:

- C - mandatory (core),
- MR - mandatory specific to the faculty,
- MaE - elected from the scientific field of the faculty
- MiE - optional from other scientific areas.

List of Major Elective courses				
id	**code**	**Course**	**Weekly fund of hours**	**ECTS**
1	11.3.F.1x04.MaE	Algorithms and Data Structures 2	3+2	6
2	11.9.F.1x41.MaE	Digital Electronics	3+2	6
3	11.9.F.1x06.MaE	System Theory	3+2	6
4	11.9.F.1x39.MaE	Unified Modelling Language	3+2	6
5	11.3.F.1x05.MaE	Network Analysis and Synthesis	3+2	6
6	11.9.F.1x40.MaE	Network Information theory	3+2	6
7	11.9.F.1x02.MaE	Digital Communication	3+2	6
8	11.9.F.1x08.MaE	Electromagnetic Principles	3+2	6
9	11.9.F.1x30.MaE	Wireless Technology	3+2	6
10	11.3.F.1x01.MaE	Sensor Networks	3+2	6
11	11.9.F.1x09.MaE	Client/server system	3+2	6
12	11.9.F.1x31.MaE	Integrated Systems Design	3+2	6
13	11.3.F.1x14.MaE	Visual Programming	3+2	6
14	11.9.F.1x12.MaE	Advanced Algorithms	3+2	6
15	11.9.F.1x36.MaE	Distance Learning Systems	3+2	6

16	11.9.F.1x37.MaE	Game Theory	3+2	6
17	11.9.F.1x18.MaE	Optimization Theory	3+2	6
18	11.3.F.1x13.MaE	Antenna Theory	3+2	6
19	11.9.F.1x11.MaE	NoSQL Databases	3+2	6
20	11.9.F.1x21.MaE	Radio Network Planning	3+2	6
21	11.9.F.1x22.MaE	Wireless ad-hoc Networks	3+2	6
22	11.9.F.1x23.MaE	Optical Communication	3+2	6
23	11.9.F.1x15.MaE	RF Circuits for ICT	3+2	6
24	11.9.F.1x20.MaE	Embedded Systems	3+2	6
25	11.9.F.1x16.MaE	Sensor Networks	3+2	6
26	11.9.F.1x32.MaE	Web Design	3+2	6
27	11.3.F.1x24.MaE	Telecommunication Network Management	3+2	6
28	11.9.F.1x29.MaE	Natural Language Processing	3+2	6
29	11.9.F.1x17.MaE	Satellite Communications	3+2	6
30	11.3.F.1x25.MaE	Nanotechnology for ICT	3+2	6
31	11.9.F.1x03.MaE	Data Mining	3+2	6
32	11.9.F.1x33.MaE	Bioinformatics	3+2	6
33	11.9.F.1x26.MaE	Internet of things	3+2	6
34	11.9.F.1x27.MaE	Network Security	3+2	6
35	11.9.F.1x28.MaE	Data Security and Privacy	3+2	6
36	11.9.F.1x38.MaE	Wireless Network Security	3+2	6
37	11.3.F.1x34.MaE	Modern Functional Programming	3+2	6
38	11.3.F.1x35.MaE	Computer Architecture and Organization	3+2	6
39	11.9.F.1x42. MaE	Graph theory	3+2	6
40	11.9.F.1x19.MaE	Internet Technologies	3+2	6
41	11.9.F.1x07.MaE	Modelling and Simulations	3+2	6
42	09.0.F.xx55.MaE	Technical Communication 1	3+2	6
43	09.0.F.xx56.MaE	Technical Communication 2	3+2	6
44	11.1.F.1401.MaE	Numerical Methods	3+2	6
45	11.3.MIR.1401.MaE	3D Modelling and Animation	3+2	6
46	11.3.MIR.1402.MaE	Human-Computer Interaction	3+2	6
47	11.3.MIR.1403.MaE	Web Development	3+2	6
48	11.3.MIR.1404.MaE	Communication theory	3+2	6
49	11.3.MIR.1405.MaE	Digital signal processing	3+2	6
50	11.3.MIR.1406.MaE	Intoduction to multimedia computing	3+2	6
51	11.3.MIR.1407.MaE	Design and Analysis of Algorithms	3+2	6
52	11.3.MIR.1408.MaE	Operating systems	3+2	6
53	11.3.MIR.1501.MaE	Visualization	3+2	6
54	11.9.F.1502.MaE	Basics of electronics	3+2	6

55	11.3.MIR.1502.MaE	User Interface Design	3+2	6
56	11.3.MIR.1503.MaE	Information theory	3+2	6
57	11.3.MIR.1504.MaE	Wired networks	3+2	6
58	11.3.MIR.1505.MaE	Multimedia Information Systems	3+2	6
59	11.3.MIR.1506.MaE	Relational Databases	3+2	6
60	11.3.MIR.1507.MaE	Digital signal and image processing	3+2	6
61	11.3.MIR.1508.MaE	Introduction to Computer Graphics	3+2	6
62	11.3.MIR.1509.MaE	Algorithm and Data Structures	3+2	6
63	11.3.MIR.1510.MaE	Software Engineering	3+2	6
64	11.3.MIR.1601.MaE	Multimedia Project Management	3+2	6
65	11.9.MIR.1602.MaE	Stochastic Processes	3+2	6
66	11.3.MIR.1603.MaE	Pattern Recognition	3+2	6
67	11.3.MIR.1604.MaE	Communication systems	3+2	6
68	11.3.MIR.1605.MaE	Internet Programming	3+2	6
69	11.3.F.1701.MaE	Data, Information, and Knowledge Engineering	3+2	6
70	11.3.MIR.1701.MaE	Cross-platform development	3+2	6
71	11.9.MIR.1702.MaE	Cryptography	3+2	6
72	11.3.MIR.1703.MaE	Networking	3+2	6
73	11.3.MIR.1801.MaE	Computer Vision	3+2	6
74	11.3.MIR.1802.MaE	Introduction to Digital video and sound technology	3+2	6
75	11.3.MIR.1704.MaE	Cloud computing	3+2	6
76	11.3.MIR.1804.MaE	Cyber security	3+2	6
77	11.3.MIR.1805.MaE	Parallel programming	3+2	6
78	11.9.F.1801.MaE	Diploma Work	3+2	6
79	11.3.F.1802.MaE	Event driven programming	3+2	6
80	11.9.MIR.1803.MaE	Dynamic Databases	3+2	6

List of Minor Elective courses				
id	**code**	**Course**	**Weekly fund of hours**	**ECTS**
1	11.9.F.xx01.MiE	2D and 3D Modelling	3+2	6
2	11.9.F.xx02.MiE	3D Modelling of an Environment and Character	3+2	6
3	08.4.F.xx59.MiE	Archaeology	3+2	6
4	03.9.F.xx07.MiE	Classical Animation 1	3+2	6
5	03.9.F.xx08.MiE	Classical Animation 2	3+2	6
6	03.0.F.xx11.MiE	Digital Arts	3+2	6
7	14.3.F.xx12.MiE	Digital economy	3+2	6
8	15.9.F.xx13.MiE	Digital Media: Introduction	3+2	6

9	15.9.F.xx14.MiE	Digital society	3+2	6
10	09.9.F.xx15.MiE	Digital Storytelling	3+2	6
11	03.0.F.xx16.MiE	Drawing and Composition	3+2	6
12	03.0.F.xx17.MiE	Drawing and Perspective	3+2	6
13	04.9.F.xx18.MiE	E-business	3+2	6
14	04.9.F.xx19.MiE	E-commerce	3+2	6
15	13.2.F.xx09.MiE	E-Ethics	3+2	6
16	14.9.F.xx21.MiE	E-Gaming	3+2	6
17	14.9.F.xx22.MiE	E-Governance	3+2	6
18	15.1.F.xx23.MiE	E-Journalism	3+2	6
19	04.7.F.xx24.MiE	e-Marketing	3+2	6
20	15.9.F.xx25.MiE	E-Media	3+2	6
21	11.9.F.xx26.MiE	e-Platforms	3+2	6
22	07.2.F.xx33.MiE	Ecology	3+2	6
23	14.3.F.xx28.MiE	Economics	3+2	6
24	15.9.F.xx34.MiE	Electronic elections	3+2	6
25	09.2.F.xx35.MiE	English for Academic Purposes	3+2	6
26	04.9.F.xx03.MiE	Entrepreneurship	3+2	6
27	04.9.F.xx36.MiE	ERP systems	3+2	6
28	09.9.F.xx37.MiE	Fantastic Literature for game design	3+2	6
29	04.3.F.xx04.MiE	Financial Management	3+2	6
30	11.9.F.xx38.MiE	Game Interface Design	3+2	6
31	04.9.F.xx39.MiE	Innovation e-Business management and marketing	3+2	6
32	11.9.F.xx40.MiE	Interactive Design	3+2	6
33	04.9.F.xx05.MiE	IT Startups	3+2	6
34	10.9.F.xx41.MiE	Law and intellectual property	3+2	6
35	03.5.F.xx42.MiE	Digital Photography and Cinematography (Storytelling through the use of images)	3+2	6
36	03.5.F.xx43.MiE	Digital Photography and Cinematography (Storytelling through the use of images-postproduction)	3+2	6
37	03.0.F.xx44.MiE	Level Design 1	3+2	6
38	03.9.F.xx45.MiE	Level Design 2	3+2	6
39	03.0.F.xx46.MiE	Literature, Computer Games and Animations	3+2	6
40	09.0.F.xx47.MiE	Macedonian Language	3+2	6
41	04.0.F.xx06.MiE	Management	3+2	6
42	04.9.F.xx10.MiE	Management of Human Resources	3+2	6
43	04.7.F.xx20.MiE	Market Analysis	3+2	6
44	04.7.F.xx27.MiE	Marketing	3+2	6
45	03.9.F.xx48.MiE	Motion Design 1	3+2	6

46	03.9.F.xx49.MiE	Motion Design 2	3+2	6
47	10.6.F.xx29.MiE	Open government	3+2	6
48	04.9.F.xx30.MiE	Product Management	3+2	6
49	04.9.F.xx31.MiE	Project Management	3+2	6
50	09.9.F.xx32.MiE	Public Speaking	3+2	6
51	14.0.F.xx50.MiE	Social networks	3+2	6
52	11.9.F.xx51.MiE	Storytelling for Animation	3+2	6
53	11.3.F.xx52.MiE	Visual Communication and Graphics Design	3+2	6
54	04.9.F.xx53.MiE	e-Banking	3+2	6
55	10.6.F.xx54.MiE	e-Democracy	3+2	6
56	10.6.F.xx57.MiE	e-Diplomacy	3+2	6
57	09.0.F.xx58.MiE	Academic writing	3+2	6

Faculty Applied IT, Machine Intelligence and Robotics

Undergraduate FIRST CYCLE OF STUDIES

Study program: Machine Intelligence and Robotics (MIR) 4 years

Active from academic 2018/2019

After completion of 4 years of studies, with 240 ECTS credits, students will get a degree of Bachelor of Science in Information Science and Technology in the field Machine Intelligence and Robotics.

MIR 4 years

Year I				
Semester I				
No.	Code	Course Name	No. of classes	ECTS
Core Courses				
1	11.3.F.1101.C	Introduction to Programming	3+2+2	6
2	11.1.F.1102.C	Mathematics 1	3+2	6
3	13.2.F.1103.C	Physics	3+2	6
4	11.9.F.1104.C	Discrete Mathematics	3+2	6
One Major Elective course				
5	Major Elective List		3+2	6
Year I				
Semester II				
No.	Code	Course Name	No. of classes	ECTS
1	11.3.F.1201.C	Object Oriented Programming	3+2+2	6
2	11.1.F.1202.C	Mathematics 2	3+2	6
3	11.3.F.1203.C	Script Programming	3+2	6
4	06.2.MIR.1201.MR	Introduction to electric circuits	3+2	6
One Major Elective course				
5	Major Elective List		3+2	6

Year II				
Semester III				
No.	Code	Course Name	No. of classes	ECTS
1	11.1.MIR.1301.MR	Mathematics 3	3+2	6
2	11.9.MIR.1302.MR	Digital Logic Circuits	3+2	6
3	11.3.MIR.1303.MR	Signals and systems	3+2	6
One Major Elective course				
4	Major Elective List		3+2	6
Elective				
5	1 Course from Minor Elective List		3+2	6

Year II				
Semester IV				
No.	Code	Course Name	No. of classes	ECTS
1	06.9.MIR.1401.MR	Basics of robotics	3+2	6
2	11.9.MIR.1402.MR	Microprocessors	3+2	6
3	11.9.MIR.1403.MR	Sensors and Actuators	3+2	6
One Major Elective course				
4	Major Elective List		3+2	6
Elective				
5	1 Course from Minor Elective List		3+2	6

Year III				
Semester V				
No.	Code	Course Name	No. of classes	ECTS
1	11.9.MIR.1501.MR	Control Theory 1	3+2	6
2	11.4.MIR.1502.MR	Artificial Intelligence	3+2	6
Two Major Elective courses				
3	Major Elective List		3+2	6
4	Major Elective List		3+2	6
Electives				
5	1 Course from Minor Elective List		3+2	6

Year III				
Semester VI				
No.	Code	Course Name	No. of classes	ECTS
1	11.2.MIR.1601.MR	Probability and Statistics	3+2	6
2	11.9.MIR.1602.MR	Programmable Logical Controllers	3+2	6
Two Major Elective courses				
3	Major Elective List		3+2	6
4	Major Elective List		3+2	6
Electives				
5	1 Course from Minor Elective List		3+2	6

Year IV				
Semester VII				
No.	Code	Course Name	No. of classes	ECTS
1	11.9.MIR.1701.MR	Control Theory 2	3+2	6
2	11.3.MIR.1702.MR	Virtual and Augmented Reality	3+2	6
3	11.3.MIR.1703.MR	Communication Protocols	3+2	6
Two Major Elective courses				
4	Major Elective List		3+2	6
5	Major Elective List		3+2	6

Year IV				
Semester VIII				
No.	Code	Course Name	No. of classes	ECTS
1	11.9.MIR.1801.MR	Machine Learning	3+2	6
2	11.9.MIR.1802.MR	Automotive Control Systems	3+2	6
Two Major Elective courses				
3	Major Elective List		3+2	6
4	Major Elective List		3+2	6
5	11.9.F.1801.MaE	Diploma Work	3+2	6
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The first cycle of university studies recognizes the modules:

- C - mandatory (core),
- MR - mandatory specific to the faculty,
- MaE - elected from the scientific field of the faculty
- MiE - optional from other scientific areas.

List of Major Elective courses				
id	**code**	**Course**	**Weekly fund of hours**	**ECTS**
1	11.3.F.1x04.MaE	Algorithms and Data Structures 2	3+2	6
2	11.9.F.1x41.MaE	Digital Electronics	3+2	6
3	11.9.F.1x06.MaE	System Theory	3+2	6
4	11.9.F.1x39.MaE	Unified Modelling Language	3+2	6
5	11.3.F.1x05.MaE	Network Analysis and Synthesis	3+2	6
6	11.9.F.1x40.MaE	Network Information theory	3+2	6
7	11.9.F.1x02.MaE	Digital Communication	3+2	6
8	11.9.F.1x08.MaE	Electromagnetic Principles	3+2	6
9	11.9.F.1x30.MaE	Wireless Technology	3+2	6
10	11.3.F.1x01.MaE	Sensor Networks	3+2	6
11	11.9.F.1x09.MaE	Client/server system	3+2	6
12	11.9.F.1x31.MaE	Integrated Systems Design	3+2	6
13	11.3.F.1x14.MaE	Visual Programming	3+2	6
14	11.9.F.1x12.MaE	Advanced Algorithms	3+2	6
15	11.9.F.1x36.MaE	Distance Learning Systems	3+2	6
16	11.9.F.1x37.MaE	Game Theory	3+2	6
17	11.9.F.1x18.MaE	Optimization Theory	3+2	6
18	11.3.F.1x13.MaE	Antenna Theory	3+2	6
19	11.9.F.1x11.MaE	NoSQL Databases	3+2	6
20	11.9.F.1x21.MaE	Radio Network Planning	3+2	6
21	11.9.F.1x22.MaE	Wireless ad-hoc Networks	3+2	6
22	11.9.F.1x23.MaE	Optical Communication	3+2	6
23	11.9.F.1x15.MaE	RF Circuits for ICT	3+2	6
24	11.9.F.1x20.MaE	Embedded Systems	3+2	6
25	11.9.F.1x16.MaE	Sensor Networks	3+2	6
26	11.9.F.1x32.MaE	Web Design	3+2	6
27	11.3.F.1x24.MaE	Telecommunication Network Management	3+2	6

28	11.9.F.1x29.MaE	Natural Language Processing	3+2	6
29	11.9.F.1x17.MaE	Satellite Communications	3+2	6
30	11.3.F.1x25.MaE	Nanotechnology for ICT	3+2	6
31	11.9.F.1x03.MaE	Data Mining	3+2	6
32	11.9.F.1x33.MaE	Bioinformatics	3+2	6
33	11.9.F.1x26.MaE	Internet of things	3+2	6
34	11.9.F.1x27.MaE	Network Security	3+2	6
35	11.9.F.1x28.MaE	Data Security and Privacy	3+2	6
36	11.9.F.1x38.MaE	Wireless Network Security	3+2	6
37	11.3.F.1x34.MaE	Modern Functional Programming	3+2	6
38	11.3.F.1x35.MaE	Computer Architecture and Organization	3+2	6
39	11.9.F.1x42. MaE	Graph theory	3+2	6
40	11.9.F.1x19.MaE	Internet Technologies	3+2	6
41	11.9.F.1x07.MaE	Modelling and Simulations	3+2	6
42	09.0.F.xx55.MaE	Technical Communication 1	3+2	6
43	09.0.F.xx56.MaE	Technical Communication 2	3+2	6
44	11.1.F.1401.MaE	Numerical Methods	3+2	6
45	11.3.MIR.1401.MaE	3D Modelling and Animation	3+2	6
46	11.3.MIR.1402.MaE	Human-Computer Interaction	3+2	6
47	11.3.MIR.1403.MaE	Web Development	3+2	6
48	11.3.MIR.1404.MaE	Communication theory	3+2	6
49	11.3.MIR.1405.MaE	Digital signal processing	3+2	6
50	11.3.MIR.1406.MaE	Intoduction to multimedia computing	3+2	6
51	11.3.MIR.1407.MaE	Design and Analysis of Algorithms	3+2	6
52	11.3.MIR.1408.MaE	Operating systems	3+2	6
53	11.3.MIR.1501.MaE	Visualization	3+2	6
54	11.9.F.1502.MaE	Basics of electronics	3+2	6
55	11.3.MIR.1502.MaE	User Interface Design	3+2	6
56	11.3.MIR.1503.MaE	Information theory	3+2	6
57	11.3.MIR.1504.MaE	Wired networks	3+2	6
58	11.3.MIR.1505.MaE	Multimedia Information Systems	3+2	6
59	11.3.MIR.1506.MaE	Relational Databases	3+2	6
60	11.3.MIR.1507.MaE	Digital signal and image processing	3+2	6
61	11.3.MIR.1508.MaE	Introduction to Computer Graphics	3+2	6
62	11.3.MIR.1509.MaE	Algorithm and Data Structures	3+2	6
63	11.3.MIR.1510.MaE	Software Engineering	3+2	6
64	11.3.MIR.1601.MaE	Multimedia Project Management	3+2	6
65	11.9.MIR.1602.MaE	Stochastic Processes	3+2	6
66	11.3.MIR.1603.MaE	Pattern Recognition	3+2	6
67	11.3.MIR.1604.MaE	Communication systems	3+2	6

68	11.3.MIR.1605.MaE	Internet Programming	3+2	6
69	11.3.F.1701.MaE	Data, Information, and Knowledge Engineering	3+2	6
70	11.3.MIR.1701.MaE	Cross-platform development	3+2	6
71	11.9.MIR.1702.MaE	Cryptography	3+2	6
72	11.3.MIR.1703.MaE	Networking	3+2	6
73	11.3.MIR.1801.MaE	Computer Vision	3+2	6
74	11.3.MIR.1802.MaE	Introduction to Digital video and sound technology	3+2	6
75	11.3.MIR.1704.MaE	Cloud computing	3+2	6
76	11.3.MIR.1804.MaE	Cyber security	3+2	6
77	11.3.MIR.1805.MaE	Parallel programming	3+2	6
78	11.9.F.1801.MaE	Diploma Work	3+2	6
79	11.3.F.1802.MaE	Event driven programming	3+2	6
80	11.9.MIR.1803.MaE	Dynamic Databases	3+2	6

List of Minor Elective courses				
id	**code**	**Course**	**Weekly fund of hours**	**ECTS**
1	11.9.F.xx01.MiE	2D and 3D Modelling	3+2	6
2	11.9.F.xx02.MiE	3D Modelling of an Environment and Character	3+2	6
3	08.4.F.xx59.MiE	Archaeology	3+2	6
4	03.9.F.xx07.MiE	Classical Animation 1	3+2	6
5	03.9.F.xx08.MiE	Classical Animation 2	3+2	6
6	03.0.F.xx11.MiE	Digital Arts	3+2	6
7	14.3.F.xx12.MiE	Digital economy	3+2	6
8	15.9.F.xx13.MiE	Digital Media: Introduction	3+2	6
9	15.9.F.xx14.MiE	Digital society	3+2	6
10	09.9.F.xx15.MiE	Digital Storytelling	3+2	6
11	03.0.F.xx16.MiE	Drawing and Composition	3+2	6
12	03.0.F.xx17.MiE	Drawing and Perspective	3+2	6
13	04.9.F.xx18.MiE	E-business	3+2	6
14	04.9.F.xx19.MiE	E-commerce	3+2	6
15	13.2.F.xx09.MiE	E-Ethics	3+2	6
16	14.9.F.xx21.MiE	E-Gaming	3+2	6
17	14.9.F.xx22.MiE	E-Governance	3+2	6
18	15.1.F.xx23.MiE	E-Journalism	3+2	6
19	04.7.F.xx24.MiE	e-Marketing	3+2	6
20	15.9.F.xx25.MiE	E-Media	3+2	6
21	11.9.F.xx26.MiE	e-Platforms	3+2	6

22	07.2.F.xx33.MiE	Ecology	3+2	6
23	14.3.F.xx28.MiE	Economics	3+2	6
24	15.9.F.xx34.MiE	Electronic elections	3+2	6
25	09.2.F.xx35.MiE	English for Academic Purposes	3+2	6
26	04.9.F.xx03.MiE	Entrepreneurship	3+2	6
27	04.9.F.xx36.MiE	ERP systems	3+2	6
28	09.9.F.xx37.MiE	Fantastic Literature for game design	3+2	6
29	04.3.F.xx04.MiE	Financial Management	3+2	6
30	11.9.F.xx38.MiE	Game Interface Design	3+2	6
31	04.9.F.xx39.MiE	Innovation e-Business management and marketing	3+2	6
32	11.9.F.xx40.MiE	Interactive Design	3+2	6
33	04.9.F.xx05.MiE	IT Startups	3+2	6
34	10.9.F.xx41.MiE	Law and intellectual property	3+2	6
35	03.5.F.xx42.MiE	Digital Photography and Cinematography (Storytelling through the use of images)	3+2	6
36	03.5.F.xx43.MiE	Digital Photography and Cinematography (Storytelling through the use of images-postproduction)	3+2	6
37	03.0.F.xx44.MiE	Level Design 1	3+2	6
38	03.9.F.xx45.MiE	Level Design 2	3+2	6
39	03.0.F.xx46.MiE	Literature, Computer Games and Animations	3+2	6
40	09.0.F.xx47.MiE	Macedonian Language	3+2	6
41	04.0.F.xx06.MiE	Management	3+2	6
42	04.9.F.xx10.MiE	Management of Human Resources	3+2	6
43	04.7.F.xx20.MiE	Market Analysis	3+2	6
44	04.7.F.xx27.MiE	Marketing	3+2	6
45	03.9.F.xx48.MiE	Motion Design 1	3+2	6
46	03.9.F.xx49.MiE	Motion Design 2	3+2	6
47	10.6.F.xx29.MiE	Open government	3+2	6
48	04.9.F.xx30.MiE	Product Management	3+2	6
49	04.9.F.xx31.MiE	Project Management	3+2	6
50	09.9.F.xx32.MiE	Public Speaking	3+2	6
51	14.0.F.xx50.MiE	Social networks	3+2	6
52	11.9.F.xx51.MiE	Storytelling for Animation	3+2	6
53	11.3.F.xx52.MiE	Visual Communication and Graphics Design	3+2	6
54	04.9.F.xx53.MiE	e-Banking	3+2	6
55	10.6.F.xx54.MiE	e-Democracy	3+2	6
56	10.6.F.xx57.MiE	e-Diplomacy	3+2	6
57	09.0.F.xx58.MiE	Academic writing	3+2	6

Faculty of Applied IT, Machine Intelligence and Robotics

Undergraduate FIRST CYCLE OF STUDIES

Study program: Applied ICT (e-Government, e-Business, e-Culture) 3 years

Active from academic 2019/2020

After completion of 3 years of studies, with 180 ECTS credits, students will get a degree of Bachelor of Applied ICT (e-Government, e-Business, e-Culture).

Applied ICT (EEE) 3 years

Year I				
Semester I				
No.	Code	Course Name	No. of classes	ECTS
Core Courses				
1	11.3.F.1101.C	Introduction to Programming	3+2	6
2	04.0.AITMIR.1102.C	e-Management	3+2	6
3	08.9.AITMIR.1103.C	e-Ethics	3+2	6
4	10.9.AITMIR.1104.C	e-Democracy	3+2	6
One Major Elective course				
5	xx.x.X.xxxx.MaE	Major Elective List	3+2	6
Year I				
Semester II				
No.	Code	Course Name	No. of classes	ECTS
1	16.0.AITMIR.1207.C	e-Governance	3+2	6
2	04.9.AITMIR.1208.C	Project management	3+2	6
3	15.9.AITMIR.1209.C	Social networks	3+2	6
Two Major Elective courses				
4	xx.x.X.xxxx.MaE	Major Elective List	3+2	6
5	xx.x.X.xxxx.MaE	Major Elective List	3+2	6

Year II				
Semester III				
No.	Code	Course Name	No. of classes	ECTS
1	10.9.AITMIR.1313.C	Law in information technologies	3+2	6
2	04.9.AITMIR.1314.C	Electronic commerce	3+2	6
3	15.9.AITMIR.1315.C	e-Media	3+2	6
4	11.3.AITMIR.1316.C	Relational databases	3+2	6
One Major Elective course				
5	xx.x.X.xxxx.MaE	Major Elective List	3+2	6

Year II				
Semester IV				
No.	Code	Course Name	No. of classes	ECTS
1	10.9.AITMIR.1419.C	e-Crime	3+2	6
2	04.9.AITMIR.1420.C	e-Banking	3+2	6
3	15.9.AITMIR.1421.C	e-Journalism	3+2	6
Two Major Elective courses				
4	xx.x.X.xxxx.MaE	Major Elective List	3+2	6
5	xx.x.X.xxxx.MaE	Major Elective List		

Year III				
Semester V				
No.	Code	Course Name	No. of classes	ECTS
1	10.9.AITMIR.1525.C	Electronic elections	3+2	6
2	04.7.AITMIR.1526.C	e-Marketing	3+2	6
3	03.9.AITMIR.1527.C	e-Gaming	3+2	6
4	11.3.AITMIR.1528.C	Algorithms and data structures	3+2	6
One Major Elective course				
5	xx.x.X.xxxx.MaE	Major Elective List	3+2	6

Year III				
Semester VI				
No.	Code	Course Name	No. of classes	ECTS
1	10.9.AITMIR.1631.C	Negotiations and dispute solving	3+2	6
2	04.9.AITMIR.1632.C	e-Accounting	3+2	6
3	03.9.AITMIR.1633.C	3D animations and visual effects	3+2	6
Two Major Elective courses				
4	xx.x.X.xxxx.MaE	Major Elective List	3+2	6
5	xx.x.X.xxxx.MaE	Major Elective List	3+2	6
				180

The first cycle of university studies recognizes the modules:

- C - mandatory (core),
- MaE - elected from the scientific field of the faculty

List of Major Elective courses				
id	**code**	**Course**	**Weekly fund of hours**	**ECTS**
1	11.9.F.1x41.MaE	Digital Electronics	3+2	6
2	11.9.F.1x06.MaE	System Theory	3+2	6
3	11.9.F.1x39.MaE	Unified Modelling Language	3+2	6
4	11.3.F.1x05.MaE	Network Analysis and Synthesis	3+2	6
5	11.9.F.1x40.MaE	Network Information theory	3+2	6
6	11.9.F.1x02.MaE	Digital Communication	3+2	6
7	11.9.F.1x08.MaE	Electromagnetic Principles	3+2	6
8	11.9.F.1x30.MaE	Wireless Technology	3+2	6
9	11.3.F.1x01.MaE	Client/server system	3+2	6
10	11.9.F.1x09.MaE	Integrated Systems Design	3+2	6
11	11.9.F.1x31.MaE	Visual Programming	3+2	6
12	11.3.F.1x14.MaE	Advanced Algorithms	3+2	6
13	11.9.F.1x12.MaE	Distance Learning Systems	3+2	6
14	11.9.F.1x36.MaE	Game Theory	3+2	6
15	11.9.F.1x37.MaE	Optimization Theory	3+2	6
16	11.9.F.1x18.MaE	Antenna Theory	3+2	6
17	11.3.F.1x13.MaE	NoSQL Databases	3+2	6
18	11.9.F.1x11.MaE	Radio Network Planning	3+2	6
19	11.9.F.1x21.MaE	Wireless ad-hoc Networks	3+2	6
20	11.9.F.1x22.MaE	Optical Communication	3+2	6
21	11.9.F.1x23.MaE	RF Circuits for ICT	3+2	6

22	11.9.F.1x15.MaE	Embedded Systems	3+2	6
23	11.9.F.1x20.MaE	Systems based on knowledge	3+2	6
24	11.9.F.1x16.MaE	Sensor Networks	3+2	6
25	11.9.F.1x32.MaE	Web Design	3+2	6
26	11.3.F.1x24.MaE	Telecommunication Network Management	3+2	6
27	11.9.F.1x29.MaE	Natural Language Processing	3+2	6
28	11.9.F.1x17.MaE	Satellite Communications	3+2	6
29	11.3.F.1x25.MaE	Nanotechnology for ICT	3+2	6
30	11.9.F.1x03.MaE	Data Mining	3+2	6
31	11.9.F.1x33.MaE	Bioinformatics	3+2	6
32	11.9.F.1x26.MaE	Internet of things	3+2	6
33	11.9.F.1x27.MaE	Network Security	3+2	6
34	11.9.F.1x28.MaE	Data Security and Privacy	3+2	6
35	11.9.F.1x38.MaE	Wireless Network Security	3+2	6
36	11.3.F.1x34.MaE	Modern Functional Programming	3+2	6
37	11.3.F.1x35.MaE	Computer Architecture and Organization	3+2	6
38	11.9.F.1x42. MaE	Graph theory	3+2	6
39	11.9.F.1x19.MaE	Internet Technologies	3+2	6
40	11.9.F.1x07.MaE	Modelling and Simulations	3+2	6
41	09.0.F.xx55.MaE	Technical Communication 1	3+2	6
42	09.0.F.xx56.MaE	Technical Communication 2	3+2	6
43	11.1.F.1401.MaE	Numerical Methods	3+2	6
44	11.3.MIR.1401.MaE	3D Modelling and Animation	3+2	6
45	11.3.MIR.1402.MaE	Human-Computer Interaction	3+2	6
46	11.3.MIR.1403.MaE	Web Development	3+2	6
47	11.3.MIR.1404.MaE	Communication theory	3+2	6
48	11.3.MIR.1405.MaE	Digital signal processing	3+2	6
49	11.3.MIR.1406.MaE	Introduction to multimedia computing	3+2	6
50	11.3.MIR.1407.MaE	Design and Analysis of Algorithms	3+2	6
51	11.3.MIR.1408.MaE	Operating systems	3+2	6
52	11.3.MIR.1501.MaE	Visualization	3+2	6
53	11.9.F.1502.MaE	Basics of electronics	3+2	6
54	11.3.MIR.1502.MaE	User Interface Design	3+2	6
55	11.3.MIR.1503.MaE	Information theory	3+2	6
56	11.3.MIR.1504.MaE	Wired networks	3+2	6
57	11.3.MIR.1505.MaE	Multimedia Information Systems	3+2	6
58	11.3.MIR.1507.MaE	Digital signal and image processing	3+2	6
59	11.3.MIR.1508.MaE	Introduction to Computer Graphics	3+2	6
60	11.3.MIR.1510.MaE	Software Engineering	3+2	6
61	11.3.MIR.1601.MaE	Multimedia Project Management	3+2	6

62	11.9.MIR.1602.MaE	Stochastic Processes	3+2	6
63	11.3.MIR.1603.MaE	Pattern Recognition	3+2	6
64	11.3.MIR.1604.MaE	Communication systems	3+2	6
65	11.3.MIR.1605.MaE	Internet Programming	3+2	6
66	11.3.F.1701.MaE	Data, Information, and Knowledge Engineering	3+2	6
67	11.3.MIR.1701.MaE	Cross-platform development	3+2	6
68	11.9.MIR.1702.MaE	Cryptography	3+2	6
69	11.3.MIR.1703.MaE	Networking	3+2	6
70	11.3.MIR.1801.MaE	Computer Vision	3+2	6
71	11.3.MIR.1802.MaE	Introduction to Digital video and sound technology	3+2	6
72	11.3.MIR.1704.MaE	Cloud computing	3+2	6
73	11.3.MIR.1804.MaE	Cyber security	3+2	6
74	11.3.MIR.1805.MaE	Parallel programming	3+2	6
75	11.3.F.1802.MaE	Event driven programming	3+2	6
76	11.9.MIR.1803.MaE	Dynamic Databases	3+2	6
77	11.9.MIR.1402.MR	Microprocessors	3+2	6
78	11.3.MIR.1703.MR	Communication Protocols	3+2	6
79	11.3.MIR.1702.MR	Virtual and augmented reality	3+2	6
80	03.9.F.1xxx.MaE	Animated storytelling	3+2	6
81	09.9.F.1xxx.MaE	Creative writing	3+2	6
82	08.0.AITMIR.1104.MaE	Digital humanitarianism	3+2	6
83	04.9.AITMIR.1105.MaE	Digital Economy	3+2	6
84	03.9.AITMIR.1106.MaE	Digital Arts	3+2	6
85	14.9.AITMIR.1210.MaE	Digital Society	3+2	6
86	04.9.AITMIR.1211.MaE	Production process management	3+2	6
87	03.9AITMIR.1212.MaE	Graphic design	3+2	6
88	10.9.AITMIR.1316.MaE	e-Diplomacy	3+2	6
89	04.9.AITMIR.1317.MaE	Customer Relationship Management	3+2	6
90	03.9.AITMIR.1318.MaE	Web design	3+2	6
91	10.9.AITMIR.1422.MaE	Cyber security	3+2	6
92	04.9.AITMIR.1423.MaE	Business Law	3+2	6
93	03.9.AITMIR.1424.MaE	e-Entertainment	3+2	6
94	12.9.AITMIR.1528.MaE	e-Health	3+2	6
95	04.9.AITMIR.1529.MaE	Financial Mathematics	3+2	6
96	03.9.AITMIR.1530.MaE	Digital cinematography	3+2	6
97	10.9.AITMIR.1634.MaE	Open government	3+2	6
98	04.9.AITMIR.1635.MaE	Modeling business processes	3+2	6
99	03.9.AITMIR.1636.MaE	Digital processing of audio signals and music	3+2	6

11.2. Course Overview

Study Program: Machine Intelligence and Robotics

Year I				
Semester I				
No.	Code	Course		
Core courses			Total Numbers of Lecturers and Tutorials	EKTS Credits
1	11.3.F.1101.C	Programming 1	3+2	6
2	11.1.F.1102.C	Mathematics	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
Minor elective				
5	13.2.F.1101.MiE	Physics	3+2	6
Semester II				
No.	Code	Course		
Core				
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	06.0.MIR.1201.MR	Sensors and Electromechanical Converters	3+2	6
5	11.3.MIR.1202.MR	Automatic Reasoning and Search	3+2	6
Year II				
Semester III				
No.	Code	Course		
Core courses				
1	11.3.F.1301.C	Programming 3	3+2	6
2	11.3.F.1302.C	Database Systems 1	3+2	6
3	11.3.F.1303.C	Algorithms and Data Structures 1	3+2	6
4	11.3.MIR.1301.MR	Linear System Theory	3+2	6
Elective Course				
5	1 course from Minor Elective List		3+2	6

Semester IV				
No.	Code	Course		
Core courses				
1	11.3.F.1401.C	Database Systems 2	3+2	6
2	11.3.F.1402.C	Algorithms and Data Structures 2	3+2	6
3	11.2.F.1403.C	Wireless Networks	3+2	6
4	11.3.MIR.1401.MR	Control Theory	3+2	6
Minor Elective Course				
5	1 course from Minor Elective List		3+2	6

Year III				
Semester V				
No.	Code	Course		
Core Courses				
1	11.3.F.1501.C	Programming 4	3+2	6
2	11.9.MIR.1501.MR	Stochastic Processes	3+2	6
Major Elective Course				
3	1 course from Major Elective List		3+2	6
Minor Elective Course				
4	1 course from Minor Elective List		3+2	6
5	1 course from Minor Elective List		3+2	6
Semester VI				
No.	Code	Course		
Core Courses				
1	11.3.MIR.1601.MR	Probability and Statistics	3+2	6
2	11.9.MIR.1602.MR	Cognitive Science	3+2	6
Major Elective Course				
3	1 course from Major Elective List		3+2	6
Minor Elective Course				
4	1 course from Minor Elective List		3+2	6
5	1 course from Minor Elective List		3+2	6

Year IV				
Semester VII				
No.	Code	Course		
Core Course				
1	11.3.MIR.1701.MR	Artificial Intelligence	3+2	6
Two Major Elective Course				
2	1 course from Major Elective List		3+2	6
3	1 course from Major Elective List		3+2	6
Two Final Projects from Major Elective Course				
4	Final Project from MaE List		3+2	6
5	Final Project from MaE List		3+2	6
Semester VIII				
No.	Code	Course		
Core Courses				
1	11.3.F.1801.C	Advanced Algorithms	3+2	6
2	11.9.F.1802.C	Models and Simulations	3+2	6
Two Major Elective Course				
3	1 course from Major Elective List		3+2	6
4	1 course from Major Elective List		3+2	6
Final Project from Major Elective Course				
5	Final Project from Major Elective List		3+2	6

List of Minor Elective Courses

1	13.9.F.1101.MiE	**Physics**	3+2	6
2	03.0.F.1301.MiE	**Digital medium and Photography**	3+2	6
3	14.1.F.1302.MiE	**Political Sciences**	3+2	6
4	14.3.F.1303.MiE	**Economics**	3+2	6
5	08.0.F.1304.MiE	**Humanity 1**	3+2	6
6	03.6.F.1401.MiE	**History of Arts**	3+2	6
7	14.2.F.1402.MiE	**Sociology**	3+2	6
8	04.0.F.1403.MiE	**Management**	3+2	6
9	04.0.F.1404.MiE	**Entrepreneurship**	3+2	6
10	08.0.F.1405.MiE	**Humanity 2**	3+2	6
11	14.7.F.1501.MiE	**Anthropology**	3+2	6
12	04.7.F.1502.MiE	**Marketing**	3+2	6
13	13.9.F.1503.MiE	**Ecology**	3+2	6
14	16.0.F.1504.MiE	**Culture Heritage**	3+2	6
15	16.0.F.1506.MiE	**Military Sciences**	3+2	6
16	10.0.F.1507.MiE	**Ethics and IT Law**	3+2	6
17	14.7.F.1601.MiE	**Archeology**	3+2	6
18	04.9.F.1602.MiE	**E-business**	3+2	6
19	13.9.F.1603.MiE	**Geography information systems GIS**	3+2	6
20	15.3.F.1604.MiE	**Public Speaking**	3+2	6
21	03.0.F.1605.MiE	**Graphic design**	3+2	6
22	03.2.F.1606.MiE	**Music**	3+2	6
23	09.9.F.1607.MiE	**Macedonian Language**	3+2	6
24	13.9.F.1608.MiE	**Genetics**	3+2	6
25	03.3.F.1609.MiE	**Theatre**	3+2	6

List of Major Elective Courses

1	11.3.F.1x01.MaE	Client/server system	3+2	6
2	11.9.F.1x02.MaE	Cryptography	3+2	6
3	11.9.F.1x03.MaE	Data Mining	3+2	6
4	04.9.F.1x04.MaE	Project Management	3+2	6
5	11.9.F.1x05.MaE	Computer components	3+2	6
6	11.9.F.1x06.MaE	Systems Theory	3+2	6
7	11.9.F.1x07.MaE	Models and Simulations	3+2	6
8	11.9.F.1x08.MaE	Discrete mathematics 2	3+2	6
9	11.9.F.1x09.MaE	Integrated Systems Design	3+2	6
10	11.9.F.1x10.MaE	Digital Electronics	3+2	6
11	11.9.F.1x11.MaE	Digital Libraries	3+2	6

12	11.9.F.1x12.MaE	Distance Learning Systems	3+2	6
13	04.0.F.1x13.MaE	E-commerce	3+2	6
14	14.0.F.1x14.MaE	E-government	3+2	6
15	11.9.F.1x15.MaE	Embedded Systems	3+2	6
16	04.2.F.1x16.MaE	Innovation Technologies	3+2	6
17	04.9.F.1x17.MaE	Commercialization of Technologies and Entrepreneurship	3+2	6
18	11.9.F.1x18.MaE	Internet Programming	3+2	6
19	11.9.F.1x19.MaE	Internet Technologies	3+2	6
20	11.9.F.1x20.MaE	Knowledge Based Systems	3+2	6
21	11.9.F.1x21.MaE	Knowledge Management	3+2	6
22	11.9.F.1x22.MaE	Knowledge Systems	3+2	6
23	11.9.F.1x23.MaE	Engineering Management	3+2	6
24	11.3.F.1x24.MaE	Telecommunication Networks Management	3+2	6
25	04.2.F.1x25.MaE	Management of Technologies and Innovation	3+2	6
26	04.2.F.1x26.MaE	ICT Industry and Management	3+2	6
27	11.9.F.1x27.MaE	Microcomputers Systems	3+2	6
28	11.9.F.1x28.MaE	Modeling of Business Processes	3+2	6
29	11.9.F.1x29.MaE	Language Processing	3+2	6
30	11.9.F.1x30.MaE	Virtual Society	3+2	6
31	11.9.F.1x31.MaE	Visual Programming	3+2	6
32	11.9.F.1x32.MaE	Web Design	3+2	6
33	11.9.F.1x33.MaE	Bioinformatics	3+2	6
34	11.9.F.1x34.MaE	Security and Identity Management	3+2	6
35	11.9.F.1x35.MaE	Electric circles	3+2	6
36	11.9.F.1x36.MaE	Game Theory	3+2	6
37	11.9.F.1x37.MaE	Optimization Theory	3+2	6
38	11.9.F.1x38.MaE	Parallel data processing	3+2	6
39	11.9.F.1x39.MaE	UML designed models	3+2	6
40	11.9.F.1x40.MaE	Cloud Computing Technologies	3+2	6
41	11.9.F.1x41.MaE	Copyrights and technical ideas protection	3+2	6
42	11.9.F.1x42.MaE	Software engineering economics	3+2	6