University of Information Science and Technology
"St. Paul the Apostle" – Ohrid

Faculty of Information Systems, Visualization, Multimedia and Animation

Undergraduate FIRST CYCLE OF STUDIES

Study program: **INFORMATION SYSTEMS, VISUALIZATION, DIGITAL, MULTIMEDIA AND ANIMATION TECHNOLOGY (ISVMA) - 4 years**

Active from academic 2023/2024 year

Four-year (240 EKTS) studies

Degree: Bachelor of Science in Information Technology, Information Systems, Visualization, Digital, Multimedia and Animation Technology

Acquired skills: programming and software development, algorithm design and data structures, database management, computer graphics and visualization, 3D modeling and animation, virtual and augmented reality, multimedia systems, web application development, user interface design, human-computer interaction, artificial intelligence and machine learning, distributed systems, visual arts and animation principles, project management, scientific research methodology.

ISVMA 4 years

Year I				
Semester I				
No.	Code	Course Name	No. of classes	ECTS
Core Courses				
1	ISVMA11M01	Introduction to Programming	3+2+2	6
2	ISVMA11M02	Discrete Mathematics	3+2	6
3	ISVMA11M03	Physics	3+2	6
4	ISVMA11M04	Mathematics 1	3+2	6
5	ISVMA11M05	English for Technical Communication 1	3+2	6
Year I				
Semester II				
No.	Code	Course Name	No. of classes	ECTS
1	ISVMA12M01	Object Oriented Programming	3+2+2	6
2	ISVMA12M02	Mathematics 2	3+2	6
3	ISVMA12M03	English for Technical Communication 2	3+2	6
4	ISVMA12M04	Multimedia Data Processing	3+2	6
Elective				
5	ISVMA12EXX	Course from Faculty elective list	3+2	6

Year II				
Semester III				
No.	Code	Course Name	No. of classes	ECTS
Core Courses				
1	ISVMA13M01	Script Programming	3+2	6
2	ISVMA13M02	Computer Graphics	3+2	6
3	ISVMA13M03	Databases 1	3+2	6
4	ISVMA13M04	Algorithms and Data Structures 1	3+2	6
Elective				
5	XXX13UXX	Course from University elective list	3+2	6

Year II				
Semester IV				
No.	Code	Course Name	No. of classes	ECTS
1	ISVMA14M01	Algorithms and Data Structures 2	3+2	6
2	ISVMA14M02	Network Technologies	3+2	6
3	ISVMA14M03	Web Development	3+2	6
Elective				
4	ISVMA14EXX	Course from Faculty elective list	3+2	6
5	XXX14UXX	Course from University elective list	3+2	6

Year III				
Semester V				
No.	Code	Course Name	No. of classes	ECTS
Core Courses				
1	ISVMA15M01	Multimedia Information Systems	3+2	6
2	ISVMA15M02	Probability and Statistics	3+2	6
3	ISVMA15M03	Modeling and Simulations	3+2	6
4	ISVMA15M04	Human-Computer Interaction	3+2	6
Elective				
5	XXX15UXX	Course from University elective list	3+2	6

Year III				
Semester VI				
No.	Code	Course Name	No. of classes	ECTS
1	ISVMA16M01	Data Visualization	3+2	6
2	ISVMA16M02	Databases 2	3+2	6
3	ISVMA16M03	User Interface Design	3+2	6
Elective				
4	ISVMA16EXX	Course from Faculty elective list	3+2	6
5	XXX16UXX	Course from University elective list	3+2	6

Year IV				
Semester VII				
No.	Code	Course Name	No. of classes	ECTS
Core Courses				
1	ISVMA17M01	Distributed Systems	3+2	6
2	ISVMA17M02	Multiplatform Programming	3+2	6
3	ISVMA17M03	Machine Learning	3+2	6
Elective				
4	ISVMA17EXX	Course from Faculty elective list	3+2	6
5	ISVMA17EXX	Course from Faculty elective list	3+2	6

Year IV				
Semester VIII				
No.	Code	Course Name	No. of classes	ECTS
1	ISVMA18M01	Entrepreneurship	3+2	6
2	ISVMA18M02	Virtual and Augmented Reality	3+2	6
3	ISVMA18M03	English for Academic Purposes	3+2	6
4	ISVMA18M04	Graduation Thesis	3+2	6
Elective				
5	ISVMA18EXX	Course from Faculty elective list	3+2	6
Total credits				240

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The first cycle of university studies recognizes the modules:

- C - mandatory (core courses),
- MaE - elected from the scientific field of the faculty
- MiE – elected from the university list of courses.

List of Faculty Elective courses					
id	**code**	**Course**	**Semester**	**Weekly fund of hours**	**ECTS**
1	ISVMA12E01	Logic Circuits and Digital Electronics	2	3+2	6
2	ISVMA12E02	Signals and Systems	2	3+2	6
3	ISVMA12E03	Digital Society	2	3+2	6
4	ISVMA14E01	Visual Arts and 3D Modeling	4	3+2	6
5	ISVMA14E02	Software Engineering	4	3+2	6
6	ISVMA14E03	Introduction to Robotics	4	3+2	6
7	ISVMA14E04	Legal Aspects of Computer Crime	4	3+2	6
8	ISVMA14E05	Social Networks	4	3+2	6
9	ISVMA14E06	E-Governance	4	3+2	6
10	ISVMA14E07	Graph Theory	4	3+2	6
11	ISVMA14E08	Theory of Communications	4	3+2	6
12	ISVMA16E01	Internet Programming	6	3+2	6
13	ISVMA16E02	Visual Arts and 3D Character Animation	6	3+2	6
14	ISVMA16E03	Operating Systems	6	3+2	6
15	ISVMA16E04	Information Systems Management	6	3+2	6
16	ISVMA16E05	Decision Making Methods	6	3+2	6
17	ISVMA16E06	Wireless Networks	6	3+2	6
18	ISVMA16E07	Information Theory	6	3+2	6
19	ISVMA16E08	Microprocessors	6	3+2	6
20	ISVMA16E09	Programmable Logic Controllers	6	3+2	6
21	ISVMA16E10	Stochastic Processes	6	3+2	6
22	ISVMA16E11	Numerical Methods	6	3+2	6
23	ISVMA16E12	Music and Mathematics	6	3+2	6
24	ISVMA17E01	Computer Organization and Architecture	7	3+2	6
25	ISVMA17E02	Digital Signal and Image Processing	7	3+2	6
26	ISVMA17E03	Data Engineering	7	3+2	6
27	ISVMA17E04	Digital Signal Processing	7	3+2	6
28	ISVMA17E05	Music Programming	7	3+2	6
29	ISVMA17E06	Artificial Intelligence	7	3+2	6
30	ISVMA17E07	Business Information Systems	7	3+2	6
31	ISVMA17E08	Optical and Wired Networks	7	3+2	6
32	ISVMA17E09	Cryptography	7	3+2	6
33	ISVMA17E10	Platform Engineering	7	3+2	6

34	ISVMA17E11	Linear Algebra	7	3+2	6
35	ISVMA17E12	Management Theory	7	3+2	6
36	ISVMA17E13	Mechatronics	7	3+2	6
37	ISVMA17E14	Economics of ERP Systems	7	3+2	6
38	ISVMA17E15	Cloud Data Processing	7	3+2	6
39	ISVMA17E16	Optimization Methods	7	3+2	6
40	ISVMA17E17	Internet of Things	7	3+2	6
41	ISVMA17E18	Wireless Mobile Systems	7	3+2	6
42	ISVMA17E19	Wireless Sensor Networks	7	3+2	6
43	ISVMA17E20	Digital Music	7	3+2	6
44	ISVMA18E01	Parallel Programming	8	3+2	6
45	ISVMA18E02	Data Science	8	3+2	6
46	ISVMA18E03	Video Art and Production	8	3+2	6
47	ISVMA18E04	Business Intelligence and Analytics	8	3+2	6
48	ISVMA18E05	Digital Management	8	3+2	6
49	ISVMA18E06	Offensive Security	8	3+2	6
50	ISVMA18E07	Blockchain Development	8	3+2	6
51	ISVMA18E08	Natural Language Processing	8	3+2	6
52	ISVMA18E09	Deep Learning	8	3+2	6

List of University courses

id	code	Course	Semester	Weekly fund of hours	ECTS
1	CSE13U01	Economy	3	3+2	6
2	CNS13U02	Digital Art	3	3+2	6
3	ICS13U03	E-Ethics	3	3+2	6
4	ICS13U04	E-Media	3	3+2	6
5	MIR13U05	Democracy and Technology	3	3+2	6
6	MIR13U06	Open Data	3	3+2	6
7	MIR13U07	Law in Information Technologies	3	3+2	6
8	MIR14U01	Business Law	4	3+2	6
9	CNS14U02	The Art of Graphic Design	4	3+2	6
10	CSE14U04	Digital Banking	4	3+2	6
11	CSE14U05	Accounting Information Systems	4	3+2	6
12	ICS14U06	E-Culture	4	3+2	6
13	ICS14U07	E-Journalism	4	3+2	6
14	MIR14U08	E-Diplomacy	4	3+2	6
15	CNS15U01	2D and 3D Techniques for Concept Art	5	3+2	6
16	CNS15U02	Introduction to New Media Art	5	3+2	6
17	CSE15U03	E-Commerce	5	3+2	6
18	CSE15U04	Financial Management	5	3+2	6
19	MIR15U05	Data Security and Privacy	5	3+2	6

20	ICS15U06	Animated Storytelling	5	3+2	6
21	ICS15U07	Intertextuality and Hypertextuality in e-Gaming	5	3+2	6
22	MIR15U08	Public Speaking	5	3+2	6
23	MIR15U09	Electronic Elections	5	3+2	6
24	CSE16U02	Digital Marketing	6	3+2	6
25	ICS16U03	Art and Creativity	6	3+2	6
26	ICS16U04	Creative Writing	6	3+2	6
27	MIR16U05	Negotiations and Dispute Resolution	6	3+2	6
28	MIR16U06	Open Government	6	3+2	6
29	ISVMA16U07	English for Special Purposes	6	3+2	6