



SCHOOL OF
COMPUTER SCIENCE
& MATHEMATICS
KIMEP UNIVERSITY

BACHELOR OF SCIENCE IN COMPUTER SCIENCE (BSCS) - 6B06102

2024-2025



BSCS CURRICULUM

To earn the Bachelor of Science in Computer Science degree, students must complete 146 KIMEP credits or 240 ECTS. The following table illustrates the structure of the Program:

Category of courses	KIMEP credits	ECTS
General Education	36	56
Program Foundation	43	73
Program Specialization	63	103
Final Attestation	4	8
TOTAL	146	240

For General Education component please refer to "GENERAL EDUCATION REQUIREMENTS" part.

PROGRAM FOUNDATION COURSES (43 KIMEP CREDITS, 73 ECTS):

- (1) Program foundation required courses (37 KIMEP credits, 63 ECTS)
- (2) Program foundation elective courses (6 KIMEP credits, 10 ECTS)

Course Code	Course Title	KIMEP credits	ECTS	Prerequisite
Required Courses		37	63	
ENG/GEN1100	Academic English Speaking	3	5	ENG/GEN 1110
ENG/GEN1121	Academic Reading and Writing II	3	5	ENG0103 Academic Reading and Writing I
KAZ2101-2102 or RUS2101-2103	Professional Russian/Kazakh	2	3	RUS1302, RUS1304/RUS1306, RUS1308/RUS2001 KAZ1502 or KAZ1504/KAZ1506 or KAZ1508
SCS1101	Calculus I	4	7	A working knowledge of algebra and trigonometry is required
SCS1201	Calculus II	4	7	SCS1101 Calculus I with a minimum grade of C-
SCS1102	Physics I	3	5	SCS1101 Calculus I as a co-requisite or prerequisite, or permission of the instructor.
SCS1103	Physics I Lab	1	2	None
SCS1202	Physics II	3	5	SCS1102 Physics I
SCS1203	Physics II Lab	1	2	SCS1103 Physics I Lab
SCS2101 SCS2102 SCS2103 SCS2104	Chemistry I and Chemistry I Lab Or General Biology and General Biology Lab	4	7	None
SCS2105	Discrete Mathematics	3	5	None
SCS2203	Linear Algebra	3	5	SCS1101 Calculus I with a minimum grade of C-, or permission of the instructor.
SCS3101	Probability and Statistics	3	5	SCS1101 Calculus I with a minimum grade of C- or permission of the instructor. Elementary Statistics, or its equivalent, is highly recommended.

Course Code	Course Title	KIMEP credits	ECTS	Prerequisite
Elective Courses		6	10	
ECN2102	Principles of Macroeconomics	3	5	All required GE English courses
ECN2103	Principles of Microeconomics	3	5	All required GE English courses
GEN 1201	Mathematics for Business and Economics	3	5	None



GEN/ASC 2103.3	Introduction to Drama	3	5	None
GEN/ASC1623	Introduction to Theatre	3	5	None
GEN/ASC2209	Introduction to Fashion Design	3	5	None
GEN/ASC 2108.3	Introduction to Films	3	5	None
GEN/ASC 2102.3	Introduction to World Literature	3	5	None
GEN/ASC 1102	Mythology and Folklore	3	5	None
JMC/ASC 2126	Design Thinking for Innovation	3	5	None
GEN/ASC 2104.3	Digital Photography	3	5	None
GEN/CLP 2103	Introduction to Computer Science	3	5	None
GEN/ASC 3202	The History of Writing	3	5	None
GEN/ASC 2105	Drawing/Painting	3	5	None
GEN/ASC 2127	Kazakh Spirituality	3	5	None
GEN/ASC 2106.3	Art and Visual Culture	3	5	None
GEN/ASC 2107.3	Introduction to World Art History	3	5	None
ENG/GEN2100	Introduction to Creative Writing	3	5	ENG/GEN1121 Academic Reading and Writing II
GEN/ASC 2110.3	Transmedia: The Art of Contemporary Storytelling	3	5	None
GEN/ASC 2112.3	History of Social Media	3	5	None
GEN/ASC 2113.3	Globalization and Diversity: A World Regional Approach	3	5	None
GEN/ASC 2114.3	Cheating, Corruption, and Fraud in Society	3	5	None

PROGRAM SPECIALIZATION COURSES (63 CREDITS, 103 ECTS)

- (1) Program specialization required courses (45 KIMEP credits, 73 ECTS)
- (2) Required program elective group (9 KIMEP credits, 15 ECTS)
- (3) Free program elective courses (9 KIMEP credits, 15 ECTS)

Course Code	Course Title	KIMEP credits	ECTS	Prerequisite
Required Courses		45	73	
SCS2201	Introduction to Information Security and Ethics	3	5	None
SCS1104	Structured Programming 1	3	5	None
SCS1204	Structured Programming 2	3	5	SCS1104 Structured Programming 1
SCS2202	Object Oriented Programming	3	5	SCS1104 Structured Programming 1
SCS2106	Data Structures and Algorithms	3	5	SCS1104 Structured Programming 1
SCS3102	Introduction to Artificial Intelligence	3	5	None
SCS3201	Operating Systems	3	5	SCS3103 Computer Architecture
SCS3103	Computer Architecture	3	5	None
SCS3104	Computer Networks	3	5	None
SCS3202	Software Engineering	3	5	SCS2106 Data Structures and Algorithms
SCS3203	Distributed Computing	3	5	SCS3104 Computer Networks
SCS4101	Computer Graphics	3	5	None
SCS4102	Database Systems	3	5	SCS2106 Data Structures and Algorithms
SCS4201	Analysis of Algorithms	3	5	SCS2106 Data Structures and Algorithms
SCS4400	Internship	3	3	Fourth-year student in BSCS program

REQUIRED PROGRAM ELECTIVE GROUP (9 KIMEP CREDITS, 15 ECTS)

Choose 1 group, and complete all three courses within the selected group:

Course Code	Course Title	KIMEP credits	ECTS	Prerequisite
1.Data Analytics				
SCS4301	Machine Learning	3	5	SCS2203 Linear Algebra and SCS2105 Discrete Mathematics



SCS4302	Big Data Management and Analysis	3	5	None
SCS4303	Data Analysis and Visualization	3	5	None
2. Software Engineering				
SCS4401	Mobile Programming	3	5	SCS1104 Structured Programming 1
SCS4402	Advanced Software Engineering	3	5	SCS3202 Software Engineering
SCS4403	Web Applications	3	5	SCS2106 Data Structures and Algorithms or SCS1104 Structured Programming 1
3. Artificial Intelligence				
SCS4501	Computer Vision	3	5	None
SCS4502	Introduction to Deep Learning	3	5	None
SCS4503	Digital Image Processing	3	5	None
4. Cybersecurity				
SCS4601	Introduction to Cybersecurity	3	5	None
SCS4602	Network Traffic Analysis	3	5	SCS4601 Introduction to Cybersecurity
SCS4603	Infrastructure Security Technologies	3	5	SCS4601 Introduction to Cybersecurity

FREE PROGRAM ELECTIVES (9 KIMEP CREDITS, 15 ECTS)

Choose three courses from the following list.

Course Code	Course Title	KIMEP credits	ECTS	Prerequisite
SCS4301	Machine Learning	3	5	SCS2203 Linear Algebra and SCS2105 Discrete Mathematics
SCS4302	Big Data Management and Analysis	3	5	None
SCS4303	Data Analysis and Visualization	3	5	None
SCS4401	Mobile Programming	3	5	SCS1104 Structured Programming 1
SCS4402	Advanced Software Engineering	3	5	SCS3202 Software Engineering
SCS4403	Web Applications	3	5	SCS2106 Data Structures and Algorithms or SCS1104 Structured Programming 1
SCS4501	Computer Vision	3	5	None
SCS4502	Introduction to Deep Learning	3	5	None
SCS4503	Digital Image Processing	3	5	None
SCS4601	Introduction to Cybersecurity	3	5	None
SCS4602	Network Traffic Analysis	3	5	SCS4601 Introduction to Cybersecurity
SCS4603	Infrastructure Security Technologies	3	5	SCS4601 Introduction to Cybersecurity
SCS3205	Video Processing	3	5	None
SCS2301	Calculus III	4	7	Calculus II with a minimum grade of C- or permission of the instructor
SCS2101	Chemistry I	3	5	None
SCS3204	Chemistry II	3	5	SCS2101 Chemistry I
SCS2103	General Biology	3	5	None
ECN2083	Introduction to Statistics	3	5	GEN1201/ECN1201 (Not available to students who have credit for OPM2201 or STAT2101)
OPM3131	Introduction to Operations Management	3	5	IFS2402 Probability and Mathematical Statistics

FINAL ATTESTATION (4 KIMEP CREDITS, 8 ECTS)

Course Code	Course Title	KIMEP credits	ECTS	Prerequisite
Required Courses				
SCS3900	Project 1	1	2	Third-year student in the Bachelor of Science in Computer Science degree program
SCS3901	Project 2	1	2	
SCS4900	Project 3	1	2	
SCS4901	Project 4	1	2	