



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
<b>TOTAL</b>	<b>146</b>	<b>240</b>

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
<b>Required Courses</b>				
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.
<b>Elective Courses</b>				
	KIMEP-Wide Electives	6	10	



## 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
<b>Required Courses</b>				
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
<b>1.Data Analytics</b>				
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
<b>2.Software Engineering</b>				
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
<b>3.Artificial Intelligence</b>				
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
Required Courses				
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

### 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	