FACULTY OF COMPUTING AND ENGINEERING SCIENCES

BS SOFTWARE ENGINEERING

The BS Software Engineering program at SZABIST is a full-time four year degree program comprising eight semesters with minimum of 130 credit hours. The degree program is designed around a set of courses pertaining to the principles of software analysis, design, architecture, development, testing, and maintenance techniques that are necessary to produce high-quality software systems. Some additional courses from the disciplines of Computer Science, Mathematics, Management Science, and Humanities are part of the degree program to develop a broader knowledge base of the students.

The BS Software Engineering program is offered through a trained and qualified faculty. It consists of 42 courses with a total of 130 credits hours. The maximum duration to complete the degree is six years.

BS (SOFTWARE ENGINEERING) COURSE PLAN (ROADMAP)

Sem.	Codes	Course Title	Cr.Hrs.		Pre-Req.
First Year					
First Semester					
1	CSC 1101	Calculus and Analytical Geometry	3, 0	3	-
	CSC 1102	English Composition and Comprehension	3, 0	3	-
	CSC 1103	Fundamentals of Programming	3, 0	3	-
	CSCL 1103	Lab: Fundamentals of Programming	0, 1	1	-
	CSC 1107	Applied Physics	2, 0	2	-
	CSCL 1107	Lab : Applied Physics	0, 1	1	-
	CSC 1108	Introduction to Computer Science	2, 0	2	-
	CSCL 1108	Lab: Introduction to Computer Science	0, 1	1	-
	CSC 1109	Pakistan Studies	2, 0	2	-
		Sub-total	18		
Second Semester					
2	CSC 1208	Object Oriented Programming Techniques	3, 0	3	CSC 1103
	CSCL 1208	Lab: Object Oriented Programming Techniques	0, 1	1	CSC 1103
	CSC 2101	Communication and Presentation Skills	3, 0	3	CSC 1102
	CSC 3109	Software Engineering	3, 0	3	-
	CSC 1201	Discrete Mathematical Structures	3, 0	3	-
	CSC 1209	Islamic Studies/ Humanities	2, 0	2	-
	SEC xxxx	University Elective-I	3, 0	3	-
		Sub-total	18		
Second Year					
Third Semester					
3	CSC 2102	Data Structures and Algorithms	3, 0	3	CSC 1208
	CSCL 2102	Lab: Data Structures and Algorithms	0, 1	1	CSC 1208
	SEC 2403	Software Requirement Engineering	3, 0	3	CSC 3109
	SEC 2103	Human Computer Interaction	3, 0	3	CSC 3109
	CSC 2206	Linear Algebra	3, 0	3	-
	SEC xxxx	University Elective-II	3, 0	3	-
		Sub-total	16		

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Sem.	Codes	Course Title	Cr.Hrs.		Pre-Req.
		Fourth **Semester**			
4	CSC 2205	Operating Systems	3, 0	3	CSC 2102
	CSCL 2205	Lab: Operating Systems	0, 1	1	CSC 2102
	CSC 2203	Database Systems	3, 0	3	CSC 2102
	CSCL 2203	Lab: Database Systems	0, 1	1	CSC 2102
	SEC 2404	Software Design and Architecture	2, 0	2	SEC 2403
	SECL 2404	Lab: Software Design and Architecture	0, 1	1	SEC 2403
	CSC 1206	Probability and Statistics	3, 0	3	-
	SEC xxxx	University Elective - III	3, 0	3	-
		Sub-total	**17**		
Third Year					
		Fifth Semester			
5	SEC 3604	Software Construction and Development	2, 0	2	SEC 2404
	SECL 3604	Lab: Software Construction and Development	0, 1	1	SEC 2404
	CSC 3205	Computer Networks and Data Communication	3, 0	3	-
	CSCL 3205	Lab: Computer Networks and Data Communication	0, 1	1	-
	CSC 1205	Technical and Business Writing	3, 0	3	CSC 2101
	SEC xxxx	SE Supporting -I	3, 0	3	-
	SEC xxxx	SE Supporting -II	3, 0	3	-
		Sub-total	**16**		
		Sixth Semester			
6	SEC 3608	Software Quality Engineering and Testing	3, 0	3	CSC 3109
	SEC 3617	Information Security	3, 0	3	-
	CSC 4102	Professional Practices	3, 0	3	-
	SEC 3607	Web Engineering	3, 0	3	-
	SEC xxxx	SE Elective - I	3, 0	3	-
	SEC 4xxx	SE Supporting - III	3, 0	3	-
		Sub-total	18		
Fourth Year					
		Seventh Semester			
7	SEC 3603	Software Project Management	3, 0	3	CSC 3109
	SEC 3606	Software Re-Engineering	3, 0	3	SEC 3604
	SEC xxxx	SE Elective -II	3, 0	3	-
	SEC xxxx	SE Elective - III	3, 0	3	-
	CSC 4105	Final Year Project - I	0, 3	3	CSC 2203, SEC 2404, SEC 3605
		Sub-total	**15**		
		Eighth Semester			
8	SEC xxxx	SE Elective — IV	3, 0	3	-
	SEC xxxx	SE Elective — V	3, 0	3	-
	CSC 4205	Final Year Project — II	0, 3	3	CSC 4105
	SEC xxxx	University Elective — IV	3, 0	3	-
		Sub-total	**12**		
Total				**130**	

CSC xxxx Mathematics deficiency course will be offered to those students who have limited mathematical background (if deemed necessary by relevant PM/HOD).

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SE Electives

SEC 4516 Artificial Intelligence
SEC 4537 Parallel and Distributed Computing
SEC 4515 Digital Image Processing
SEC 4528 Game Development
SEC 4532 Introduction to Cloud Computing
SEC 4543 Systems Programming
SEC 4544 Technopreneurship
SEC 3614 Computer Graphics
SEC 4514 Introduction to Data Science
SEC 4534 Modeling and Simulation
SEC 3612 Mobile Application Development
SEC 4521 Agent Based Software Engineering
SEC 4522 Big Data Analytics
SEC 4523 Computational Intelligence
SEC 4524 Computer Vision
SEC 4526 Design Patterns
SEC 4511 e-Commerce
SEC 4531 Information Systems Audit
SEC 4533 Management Information Systems
SEC 4535 Multimedia Communication
SEC 4536 Natural Language Processing
SEC 4538 Real Time Systems
SEC 4539 Semantic Web
SEC 4541 Software Engineering Economics
SEC 4542 Software Metrics
SEC 4545 Topics in Software Engineering
SEC 4518 Visual Programming
SEC 4525 Data Encryption and Security
SEC 4529 Global Software Development
SEC xxxx User Interface Design
SEC xxxx Introduction to Development and Operations

SE Supporting courses

SEC 4713 Digital Logic Design
SEC 4714 Business Process Engineering
SEC 4711 Formal Methods in Software Engineering
SEC 4712 Operations Research
SEC 4715 Stochastic Processes

UNIVERSITY ELECTIVES

SEC 3309 Organizational Behavior
SEC 3307 Foreign Languages
SEC 3308 Management Principles
SEC 3306 Sociology
SEC 3311 Psychology
SEC 3301 Introduction to Management
SEC 3302 Financial Accounting
SEC 3303 Human Resource Management

DISTRIBUTION OF CREDIT HOURS

Course Group		Cr. Hrs.	%
Computing	Core Courses	39	31%
Software Engineering	Core Courses	27	18%
	Electives	15	12%
	Supporting	9	7%
General Education		19	14%
University Electives		12	9%
Mathematics and Science Foundation		12	9%
Total		**130**	**100%**

Internship

The internship is scheduled at the end of third year. After completion of the six-week internship, all students are required to submit a comprehensive report, giving details of their experience and learning.

All courses may not be offered in every semester. Elective courses may vary from time to time. Alternative courses may be substituted as and when required.