

Bachelor of Science in Software Engineering (BSSE)

Scheme of Studies

(2013 - 2017)

Scheme of study of BS Software Engineering (134 Cr. Hrs), applicable on all BSSE batches inducted in Fall 2013 semester and onwards (updated in Fall 2017). Upon the recommendation of Board of Studies and Board of Faculty, the Academic Council of the IUI approved this scheme in its 73rd meeting held on Wednesday, 30th May 2018.

Degree Requirements (minimum 134 Credit hours)

Category	Grouping	Credit Hours	% of Total Courses
Software Engineering Courses	Computing-Core Courses	44	62%
	Software Engineering Core Courses	18	
	Software Engineering Electives*	21	
General Education Courses	University Required Courses (UR)	24	38%
	Other Courses*	27	
Total Credit hours		134	

*Minimum credit hours required from the course offered in the group

Software Engineering Courses

Computing Core Courses (44 Credit Hours)

#	Code	Course Title	Cr. Hrs.
1	CS 102	Introduction to Computing	4
2	CS 111	Programming Fundamentals	4
3	SE 101	Object Oriented Paradigm	4
4	CS 291	Discrete Structures	3
5	CS 212	Data Structure and Algorithms	3
6	CS 223	Digital Logic and Design	3
7	CS 224	Operating Systems	4
8	CS 242	Introduction to Database Systems	4
9	SE 203	Introduction to Software Engineering	3
10	CS 372	Computer Communications and Networks	3
11	SE 431	Human Computer Interaction	3
12	SE 400	Senior Design Project	6

Software Engineering – Core Courses (18 Credit Hours)

#	Code	Course Title	Cr. Hrs.
13	SE 302	Software Construction	3
14	SE 311	Software Requirements Engineering	3
15	SE 331	Software Design And Architecture	3
16	SE 471	Software Quality Engineering	3
17	SE 461	Software Project Management	3
18	SE 322	Formal Methods in Software Engineering	3

Software Engineering Elective Courses (Minimum 21 Credit hours)

Student of BSSE are required to pass a minimum of 21 credit hours from the courses given below. This is a tentative list and Department of CS & SE may offer other course to students based on educational trends.

Code	Course Title	Cr. Hrs.
CS 443	Advance Database Management Systems	3
SE 241	Advanced Computer Programming	3
SE 301	Advanced Software Engineering	3
CS 452	Artificial Neural Networks	3
SE 452	Business Process Automation	3
IT 372	Communication Systems Design	3
IT 374	Communication Technologies	3
CS 361	Computer Graphics	3
CS 471	Data and Network Security	3
CS 371	Data Communication	3
CS 474	Data Security and Encryption	3
CS 341	Database Technologies	3
SE 432	Design Patterns	3
CS 491	Digital Signal Processing	3
SE 381	Distributed Application Development	3
SE 342	Distributed Computing	3
SE 343	Enterprise System Development	3
IT 442	Information Retrieval	3
MG 491	Information System Audit	3
IT 341	Information Systems	3
BI 391	Introduction to Bio-Informatics	3
CS 446	Introduction to Data Mining	3
IT 441	Introduction to Data Warehousing	3
CS 492	Introduction to Digital Image Processing	3
IT 373	Introduction to Information Security	3
SE 359	Introduction to Software Metrics	3
IT 451	Knowledge-Based Systems	3
CS 422	Microprocessor Interfacing	3
IT 332	Mobile Application Development	3
SE 321	Object Oriented Analysis and Design	3
CS 402	Operations Research	3
IT 391	Organizational Behaviour	3
CS 431	Principles of Programming Languages	3
CS 426	Real-Time Systems	3
CS 362	Simulation and Modelling	3
SE 481	Software Development Technologies	3
SE 361	Software Engineering Economics	3
SE 472	Software Testing	3
CS 421	System Programming	3
IT 481	Technology Management	3
CS 473	Telecommunication Systems	3
CS 401	Topics in Computer Science	3
IT 491	Topics in Information Technology	3
SE 491	Topics in Software Engineering	3
CS 331	Visual Programming	3
SE 341	Web Based Application Development	3

Code	Course Title	Cr. Hrs.
CS 432	Web Engineering	3
IT 333	Web Services	3
CS 472	Wireless Networks	3
CS 451	Artificial Intelligence	3
CS 411	Compiler Construction	3
CS 321	Computer Architecture	3
CS 322	Computer Organization and Assembly Language	3
CS 314	Theory of Automata & Formal Languages	3
CS 213	Design and Analysis of Algorithms	3
IT 361	Multimedia Systems and Design	3
IT 181	Fundamentals of Information Technology	3
IT 371	Systems and Network Administration	3
IT 421	System Integration and Architecture	3
IT 471	Introduction to Network Security	3
IT 331	Web Systems and Technologies	3

General Education Courses

University Required Courses (24 Credit Hours)

#	Code	Course Title	Cr. Hrs.
1	GC 101	Understanding Quran I	3
2	GC 102	English I (English Composition & Comprehension)	3
3	GC 103	Understanding Quran II	3
4	GC 104	English II (Communication Skills)	3
5	GC 105	Basics Of Academic Writing	3
6	GC 106	Islamic World View & Civilization – I	3
7	GC 107	Islamic World View & Civilization – II	3
8	GC 109	Pakistani Culture & Society	3

Other courses (Minimum 27 Credit Hours)

Student of BSSE are required to pass a minimum of 27 credit hours from the courses given below. This is tentative list and Department of CS & SE may offer other courses to students based on educational trends.

Code	Course Title	Cr. Hrs
MATH 110	Calculus & Analytical Geometry	3
MATH 121	Linear Algebra	3
MATH 352	Multivariate Calculus	3
MATH 401	Numerical Computing	3
MATH 241	Differential Equation	3
ST 301	Probability & Statistics	3
GE 112	Professional & Ethical Issues	3
GC 191	Basic Electronics	3
GC 151	Introduction to Finance	3
GC 152	Introduction to Management	3
GC 204	Introduction to Sociology	3
GC 205	Introduction to Psychology	3
GC 131	Media Studies	3
GE 401	Entrepreneurship	3
GE 402	Industrial Seminar	1

Tentative Semester Wise Course Offering (BSSE)

Tentative course offering plan for BS Software Engineering degree offered from Fall 2013-17 is given below in a semester wise format:

1st Semester

Course Code	Pre-Req	Course Title	Cr Hrs.
CS 102	-	Introduction to Computing	4
MATH 110	-	Calculus & Analytical Geometry	3
GC 102	-	English I (English Composition & Comprehension)	3
GC 191	-	Basic Electronics	3
CS 291	-	Discrete Structures	3
Total Credit Hrs.			16

2nd Semester

Course Code	Pre-Req	Course Title	Cr Hrs.
CS 111	-	Programming Fundamentals	4
CS 221	GC 191	Digital Logic and Design/Computer Organization	3
GC 104	-	English II (Communication Skills)	3
ST 301	-	Probability & Statistics	3
GC 101	-	Understanding Quran I	3
Total Credit Hrs.			16

3rd Semester

Course Code	Pre-Req	Course Title	Cr Hrs.
SE 101	CS 111	Object Oriented Paradigm	4
MATH 352	MATH 110	Multivariate Calculus	3
GC 105	-	English-III (Basics of Academic Writing)	3
GC 103	-	Understanding Quran II	3
SE 203	SE 101	Introduction to Software Engineering (SE-I)	3
Total Credit Hrs.			16

4th Semester

Course Code	Pre-Req	Course Title	Cr Hrs.
CS 242	CS 212	Introduction to Database Systems	4
CS 372	-	Computer Communications & Networks	3
CS 212	CS 103	Data Structure & Algorithms	3
GC 106	-	Islamic World View & Civilization-I	3
-	-	General Education Course	3
SE 302	SE 203	Software Construction	3
Total Credit Hrs.			19

5th Semester

Course Code	Pre-Req	Course Title	Cr Hrs.
SE 322	-	Formal Methods in Software Engineering	3
CS 224	-	Operating System	4
MATH 121	-	Linear Algebra	3
GC 107	-	Islamic World View & Civilization-II	3
-	-	Elective – I	3
-	-	Elective – II	3
Total Credit Hrs.			19

6th Semester

Course Code	Pre-Req	Course Title	Cr Hrs.
SE 331	-	Software Design and Architecture	3
SE 471	-	Software Quality Assurance	3
SE 311	-	Software Requirements Engineering	3
-	-	General Education Course	3
-	-	Elective – III	3
-	-	Elective – IV	3
Total Credit Hrs.			18

7th Semester

Course Code	Pre-Req	Course Title	Cr Hrs.
SE 461	SE 202	Software Project Management	3
SE 431	-	Human Computer Interaction	3
-	-	General Education Course	3
-	-	Elective – V	3
-	-	Elective – VI	3
-	-	Elective – VII	3
Total Credit Hrs.			18

8th Semester

Course Code	Pre-Req	Course Title	Cr Hrs.
SE 400		Software Project	6
GC 109	-	Pakistan Culture & Society	3
-	-	General Education Course	3
Total Credit Hrs.			12