

Bachelor of Science in Software Engineering (BS SE) Curriculum Plan and Model

Category	No. of Courses	Credit Hours
Mandatory Courses	27	63
Common Optional	11	31
Core	13	37
Deficiency Course	2	6
Research Project	2	6
Total	55	143

Semester 1

S.No	Code	Title	Cr Hrs	Category	Pre-requisite
1	SEN102	Calculus and Analytical Geometry	3	Mandatory	None
2	SEN111	Introduction to Information And Communication Technology	3	Mandatory	None
3	SEN111	Introduction to Information And Communication Technology	1	Mandatory	None
4	HUM111	Functional English	3	Common Optional	None
5	HMT121	Islamic Studies	2	Mandatory	None
6	SEN101	Applied Physics	3	Mandatory	None
7	SEN101	Applied Physics (Lab)	1	Mandatory	None
8	ASC100	Pre-Calculus I	3	Deficiency	None
Total (16+3)			19		

Semester 2

S.No	Code	Title	Cr Hrs	Category	Pre-requisite
9	HUM112	Personal Development	3	Common Optional	None
10	HUM231	Communication Skills	3	Mandatory	None
11	SEN131	Programming Fundamentals	3	Mandatory	SEN111 Introduction to Information And Communication Technology
12	SEN131	Programming Fundamentals (Lab)	1	Mandatory	SEN111L Introduction to Information And Communication Technology (Lab)
13	SEN103	Linear Algebra and Differential Equations	3	Mandatory	SEN102 Calculus and Analytical Geometry
14	BUS231	Financial Accounting Principles	3	Common Optional	None
15	ASC101	Pre-Calculus II	3	Deficiency	ASC100 Pre-Calculus I
Total (16+3)			19		

Semester 3

S.No	Code	Title	Cr Hrs	Category	Pre-requisite
16	SEN231	Object Oriented Programming	3	Mandatory	SEN131 Programming Fundamentals

17	SEN231	Object Oriented Programming (Lab)	1	Mandatory	SEN131L Programming Fundamentals (Lab)
18	SEN201	Probability And Statistics	3	Common Optional	SEN102 Calculus and Analytical Geometry
19	HMT122	Pakistan Studies	2	Mandatory	None
20	SEN241	Discrete Structures	3	Mandatory	None
21	SSC231	World History	3	Common Optional	None
22	HUM233	Philosophy And Critical Thinking	3	Common Optional	None
		Total	18		

Semester 4

S.No	Code	Title	Cr Hrs	Category	Pre-requisite
23	SEN232	Data Structures And Algorithms	3	Mandatory	SEN231 Object Oriented Programming
24	SEN232	Data Structures And Algorithms (Lab)	1	Mandatory	SEN231L Object Oriented Programming (Lab)
25	HUM301	Sociology	3	Common Optional	None
26	HUM241	World Literature	3	Common Optional	None
27	SEN251	Software Engineering	3	Mandatory	SEN231 Object Oriented Programming
28	CSC333	Introduction to Python (Lab)	1	Common Optional	SEN111 Introduction to Information And Communication Technology
29	SEN221	Operating Systems	3	Mandatory	SEN231 Object Oriented Programming
30	SEN221L	Operating Systems (Lab)	1	Mandatory	SEN231L Object Oriented Programming (Lab)
		Total	18		

Semester 5

S.No	Code	Title	Cr Hrs	Category	Pre-requisite
31	SEN331	Database Management Systems	3	Mandatory	SEN231 Object Oriented Programming
32	SEN331	Database Management Systems (Lab)	1	Mandatory	SEN231L Object Oriented Programming (Lab)
33	HYM121	Academic & Professional Writing	3	Common Optional	None
34	SEN351	Software Construction	3	Core	SEN251 Software Engineering
35	SEN352	Human Computer Interaction	3	Core	SEN251 Software Engineering
36		Elective I	3	Core	None
		Total	16		

Semester 6

S.No	Code	Title	Cr Hrs	Category	Pre-requisite
37	SEN361	Data Communication & Computer Network	3	Mandatory	SEN221 Operating Systems
38	SEN361	Data Communication & Computer Network	1	Mandatory	SEN221L Operating Systems (Lab)
39		Elective II	3	Core	None
40	SEN354	Software Requirement Engineering	3	Core	None
41	SEN355	Web Engineering	3	Core	SEN251 Software Engineering
42	SEN355	Web Engineering (Lab)	1	Core	SEN251 Software Engineering
43	SEN455	Software Project Management	3	Mandatory	SEN251 Software Engineering
		Total	17		

Semester 7

S.No	Code	Title	Cr Hrs	Category	Pre-requisite
44	SEN451	Final Year Project I	3	Project	None
45		Elective III	3	Core	None
46	SEN452	Software Re-Engineering	3	Mandatory	SEN251 Software Engineering
47	SEN453	Software Quality Engineering	3	Mandatory	None
48		Software Engineering- Domain Support I	3	Core	None
49		Elective IV	3	Core	None
		Total	18		

Semester 8

S.No	Code	Title	Cr Hrs	Category	Pre-requisite
50	SEN454	Final Year Project II	3	Project	SEN451 Final Year Project I
51	SEN412	Information Security	3	Core	SEN361 Data Communication & Computer Networks
52	SEN456	Software Design & Architecture	3	Mandatory	SEN251 Software Engineering
53		Elective V	3	Core	None
54		Software Engineering- Domain Support II	3	Core	None
55	HUM232	Ethics And Social Responsibility	3	Common Optional	None
		Total	18		
		Total Credit Hours	143		

Elective Courses

S.No	Code	Course(s) Title	Cr Hrs
1	CSC336	Advanced Database Management Systems	3+0
2	CSC371	Digital Image Manipulation	3+0
3	CSC311	E-Business	3+0
4	CSC337	Web Programming Languages + Lab	3+1
5	CSC372	Digital Image Processing + Lab	3+1
6	CSC338	Visual Programming Languages + Lab	3+1
7	SEN358	Software Construction	3+0
8	SEN356	Software Requirement Engineering	3+0
9	CSC322	Robotics Programming + Lab	3+1
10	CSC362	Network Performance Management	3+0
11	CSC363	Network Security	3+0
12	CSC435	Mobile Application Development	3+0
13	SEN357	Software Evolution & Maintenance	3+0
14	CSC373	Computational Intelligence	3+0
15	CSC381	Computer Graphics & Animation + Lab	3+1
16	CSC436	Data Warehousing & Data Mining	3+0
17	CSC454	Enterprise Resource Planning	3+0
18	CSC474	Expert Systems	3+0
19	SEN455	Software Quality Assurance	3+0
20	SEN456	Enterprise Software Architecture	3+0
21	CSC475	Computer Vision	3+0
22	CSC463	Routing & Switching + Lab	3+1
23	CSC464	Wireless Communication + Lab	3+1
24	CSC465	Virtualization & Cloud Computing	3+0
25	CSC482	3D Modelling and Game Development + Lab	3+1
26	CSC466	Intranet Development	3+0
27	CSC312	Information Systems Audit	3+0
28	CSC476	Artificial Neural Networks	3+0
29	CSC477	Data Science	3+0
30	CSC478	Deep Learning	3+0
31	SEN457	Human Computer Interaction	3+0
32	CSC467	Internet of Things	3+0

33	CSC468	Software Defined Network + Lab	3+1
34	CSC469	Wireless Communication Networks	3+0
35	CSC437	Web Engineering + Lab	3+1
36	SEN458	Design Patterns	3+0
37	CSC423	FPGA Based System Design + Lab	3+1
38	CSC491	Bio Informatics	3+0
39	CSC424	Microprocessor Based Systems + Lab	3+1
40	CSC479	Machine Learning	3+0
41	CSC413	Technopreneurship	3+0
42	CSC445	Optimization Techniques	3+0
43	SEN359	Visual Software Analysis	3+0
44	SEN458	Management Information Systems	3+0
45	SEN459	Agent Based Software Engineering	3+0

Domain Support Courses

S. No.	Code	Course(s) Title	Cr Hrs
1	SEN413	Business Process Engineering	3+0
2	SEN450	Formal Methods in Software Engineering	3+0
3	CSC446	Operations Research	3+0
4	CSC443	Simulation and Modelling	3+0
5	CSC444	Stochastic Process	3+0