Bachelor of Science in Software Engineering Program

For Fall-2022 and Onwards

Department of Creative Technology
Faculty of Computing and Artificial Intelligence
Air University, Islamabad

1. List of courses with their Streams/Clusters

		Software Engineering (0)
1	SE100	Software Engineering
2	SE301	Software Re-Engineering
3	SE302	Software Engineering Economics
4	SE303	Management Information Systems
5	SE304	Agent Based Software Engineering
6	SE405	Formal Methods in Software Engineering
7	SE406	Topics in Software Engineering
		Software Requirement And Design analysis(1)
8	SE210	Software Requirements Engineering
9	SE211	Human Computer Interaction
10	SE212	Software Design & Architecture
11	SE313	Software Construction & Development
		Project and Process management(2)
12	SE420	Business Process Engineering
13	SE421	Software Project Management
14	SE423	Global Software Development
		Software Development(3)
15	SE330	Web Engineering
16	SE331	Computer Graphics
17	SE332	E-Commerce
18	SE333	Visual Programming
19	SE334	Game Application Development
20	SE335	Systems Programming
21	SE336	Mobile Application Development
		Software Testing and Deployment(4)

22	SE340	Software Quality Engineering
23	SE341	Simulation and Modeling
24	SE342	Software Metrics
		Intelligent systems(5)
25	SE350	Stochastic Processes
26	SE351	Operations Research
27	SE352	Artificial Intelligence
28	SE454	Natural Language Processing
29	SE453	Semantic Web
30	SE463	Cloud Computing
31	SE464	Big Data Analytics
		Information Security(6)
32	SE360	Data Encryption and Security
33	SE361	Secure Software Development
34	SE362	Information Systems Audit
		Networks and Communication(7)
35	SE370	Multimedia Communication
36	SE471	Real Time Systems

Software Engineering Supporting Courses

	Course Title	Credit hours
SE420	Business Process Engineering	3-0-3
SE405	Formal Methods in Software Engineering	3-0-3
SE351	Operations Research	3-0-3
SE341	Simulation and Modeling	3-0-3
SE350	Stochastic Processes	3-0-3
	Total (Any THREE of the above)	**9 Cr Hours**

Software Engineering Elective Courses

(More Courses may be added to this list)

Course Title	Credit hours	
SE304	3-0-3	Agent Based Software Engineering
SE464	3-0-3	Big Data Analytics
SE463	3-0-3	Cloud Computing
SE331	3-0-3	Computer Graphics
SE360	3-0-3	Data Encryption and Security
SE332	3-0-3	E-Commerce
SE334	3-0-3	Game Application Development
SE423	3-0-3	Global Software Development
SE362	3-0-3	Information Systems Audit
SE303	3-0-3	Management Information Systems
SE336	3-0-3	Mobile Application Development
SE370	3-0-3	Multimedia Communication
SE454	3-0-3	Natural Language Processing
SE471	3-0-3	Real Time Systems
SE453	3-0-3	Semantic Web
SE302	3-0-3	Software Engineering Economics
SE342	3-0-3	Software Metrics
SE335	3-0-3	Systems Programming
SE406	3-0-3	Topics in Software Engineering
SE333	3-0-3	Visual Programming
Total (Any Five of the above)	15	

BS-Software Engineering Scheme of Studies

Semester Plan

Bachelor of Science in Software Engineering Program for Fall-2022 and Onwards

Semester - I

Code	Course Title	Non-medical Credit Hours	Medical Credit hours	Pre-requisite
CS180	Introduction to Info. & Comm. Technologies	2-0-2	2-0-2	
CS180L	Introduction to Information & Communication Technologies Lab	0-1-1	0-1-1	
CS111	Programming Fundamentals	3-0-3	3-0-3	
CS111L	Programming Fundamentals Lab	0-1-1	0-1-1	
EL100	Reading and Writing Skills	3-0-3	3-0-3	
MA113	Pre-calculus	N/A	2-0-2	
HU124	Islamic Studies and Ethics	2-0-2	2-0-2	
MA114	Foundational Mathematics	N/A	4-0-4	
Credit Hours=12		10-2-12	16-2-18	

Semester - II

Code	Course Title	Credit Hours	Pre-requisite
CS112	Object Oriented Programming	3-0-3	CS111.CS111L
CS112L	Object Oriented Programming Lab	0-1-1	CS111
EL200	Communication & Presentation Skills	3-0-3	EL100
SE100	Software Engineering	3-0-3	
MA110	Calculus & Analytical Geometry	3-0-3	
MA216	Discrete Structures	3-0-3	
HU125	Pakistan Studies & Global perspectives	2-0-2	
Credit Hours=18		17-1-18	

BS-Software Engineering Scheme of Studies

Semester - III

Code	Course Title	Credit Hours	Pre-requisite
CS214	Data Structures & Algorithms	3-0-3	CS112.CS112L
CS214L	Data Structures & Algorithms Lab	0-1-1	CS112
SE210	Software Requirement Engineering	3-0-3	SE100
MA301	Probability and Statistics	3-0-3	
PH109	Physics	3-0-3	
SE211	Human Computer Interaction	3-0-3	
Credit Hours=16		15-1-16	

Semester - IV

Code	Course Title	Credit Hours	Pre-requisite
SEXXX	SE Supporting –I (Stochastic Processes)	3-0-3	
CS230	Database Systems	3-0-3	CS214, CS214L
CS230L	Database Systems Lab	0-1-1	CS214
CS225	Operating System	3-0-3	CS214, CS214L
CS225L	Operating System Lab	0-1-1	CS214
SE212	Software Design & Architecture	2-0-2	SE210
SE212L	Software Design & Architecture Lab	0-1-1	
MA201	Linear Algebra	3-0-3	M110
Credit Hours=17		14-3-17	

Semester - V

Code	Course Title	Credit Hours	Pre-requisite
SE313	Software Construction and Development	2-0-2	SE212, SE212L
SE313L	Software Construction and Development Lab	0-1-1	SE212
SEXXX	SE Supporting –II (Formal Methods in Software Engineering)	3-0-3	
SEXXX	SE-Elective-I	3-0-3	
SEXXX	SE-Elective-II	3-0-3	
SE330	Web Engineering	3-0-3	
HU/BAXXX	University Elective-I	3-0-3	
Credit Hours=18		17-1-18	

BS-Software Engineering Scheme of Studies

Semester - VI

Code	Course Title	Credit Hours	Pre-requisite
CS360	Computer Networks	3-0-3	
CS360L	Computer Networks Lab	0-1-1	
SE340	Software Quality Engineering	3-0-3	SE100
SEXXX	SE-Elective-III	3-0-3	
SEXXX	SE Elective – IV	3-0-3	
EL400	Technical & Business Writing	3-0-3	EL200
SE497	Final Year Project – I	0-1-1	List A
Credit Hours=17		15-2-17	

Semester - VII

Code	Course Title	Credit	Pre-requisite
SE421	Software Project Management	3-0-3	SE100
SE301	Software Re-Engineering	3-0-3	SE313/ SE313L
SEXXX	SE Elective – V	3-0-3	
SEXXX	SE Supporting – III (Business Process Engineering)	3-0-3	
SE498	Final Year Project – II	0-2-2	SE497
HU/BAXXX	University Elective-II	3-0-3	
Credit Hours=17		15-2-17	

Semester - VIII

Code	Course Title	Credit	Pre-requisite
CS270	Professional Practices	3-0-3	
HU414	Social Services	1-0-1	
CY406	Information Security	3-0-3	
SE499	Final Year Project – III	0-3-3	SE498
HUXXX	University Elective-III (Foreign Language)	2-0-2	
HUXXX	University Elective – IV	3-0-3	
Credit Hours=15		12-3-15	

Total Credits = 130

List A

Code	Course Title	Credit Hours	Prerequisite
CS214	Data Structures & Algorithms	(3-0-3)	CS112, CS112L
CS214L	Data Structures & Algorithms Lab	(0-1-1)	CS112
SE100	Software Engineering	3-0-3	
SE210	Software Requirement Engineering	3-0-3	SE100

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SE212	Software Design & Architecture	2-0-2	SE210
SE212L	Software Design & Architecture Lab	0-1-1	SE210
SE313	Software Construction and Development	2-0-2	SE212, SE212L
SE313L	Software Construction and Development Lab	0-1-1	SE212