

Scheme of Study for Bachelor of Science in Computer Science

BS (CS)

4-Year program (8 Regular Semesters of 18 weeks each)

#	Category	# of Courses	Credit Hours
1	Computing Courses	14	51
	Core Courses (Comp-Core)	10	39
	Supporting Areas (Comp-Supp) <i>* Mathematics & Science Foundation</i>	4	12
2	Computer Science Courses	15	48
	CS Core Courses (CS-Core)	7	24
	CS Supporting Courses (CS-Supp)	3	9
	CS Elective Courses (CS-Elec)	5	15
3	General Education Courses (Gen-Edu)	7	19
4	University Electives (Univ-Elec)	4	12
	Total	40	130

Semester – I: (16 Credit Hours)

#	Course Code	Category	Course Title	Credit Hours	Prerequisites
1	CS-101	Comp-Core	Programming Fundamentals	4(3,1)	
2	CS-103	Gen-Edu	Intro to Info. & Comm. Technologies	3(2,1)	
3	EG-105	Gen-Edu	English Composition & Comprehension	3(3,0)	
4	MT-107	Comp-Supp	Calculus and Analytical Geometry	3(3,0)	
5	PH-109	Comp-Supp	Applied Physics	3(3,0)	

Semester – II: (17 Credit Hours)

#	Course Code	Category	Course Title	Credit Hours	Prerequisites
1	CS-102	Comp-Core	Object Oriented Programming	4(3,1)	Programming Fundamentals
2	CS-104	CS-Core	Digital Logic Design	4(3,1)	
3	EG-106	Gen-Edu	Communication & Presentation Skills	3(3,0)	
4	MT-108	CS-Supp	Multi-variate Calculus	3(3,0)	
5	*110	Univ-Elec	Univ Elective – I	3(3,0)	

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Semester – III: (17 Credit Hours)

#	Course Code	Category	Course Title	Credit Hours	Prerequisites
1	CS-201	Comp-Core	Discrete Structures	3(3,0)	
2	MT-203	Comp-Supp	Probability & Statistics	3(3,0)	
3	CS-205	Comp-Core	Data Structures and Algorithms	4(3,1)	
4	CS-207	Comp-Core	Operating Systems	4(3,1)	
5	CS-209	Comp-Core	Software Engineering	3(3,0)	

Semester – IV: (16 Credit Hours)

#	Course Code	Category	Course Title	Credit Hours	Prerequisites
1	CS-202	Comp-Core	Database Systems	4(3,1)	
2	CS-204	CS-Core	Design & Analysis of Algorithms	3(3,0)	Data Structures & Algorithms
3	CS-206	CS-Core	Theory of Automata	3(3,0)	
4	MT-208	Comp-Supp	Linear Algebra	3(3,0)	
5	*210	Univ-Elec	Univ Elective – II	3(3,0)	

Semester – V: (17 Credit Hours)

#	Course Code	Category	Course Title	Credit Hours	Prerequisites
1	CS-301	CS-Core	Computer Organization & Assembly Language	4(3,1)	
2	CS-303	Gen-Edu	Professional Practices	3(3,0)	
3	CS-305	Comp-Core	Computer Networks	4(3,1)	
4	CS-307	CS-Elec	CS Elective – I	3(2,1)	
5	MG-309	CS-Supp	Deferential Equations	3(3,0)	

Semester – VI: (16 Credit Hours)

#	Course Code	Category	Course Title	Credit Hours	Prerequisites
1	CS-302	CS-Core	Compiler Construction	3(3,0)	
2	CS-304	CS-Core	Artificial Intelligence	4(3,1)	Discrete Structures
3	EG-306	Gen-Edu	Technical & Business Writing	3(3,0)	
4	CS-308	CS-Elec	CS Elective – II	3(2,1)	
5	CS-310	CS-Supp	Numerical Computing	3(3,0)	

Semester -- VII: (14 Credit Hours)

#	Course Code	Category	Course Title	Credit Hours	Prerequisites
1	CS-401	CS Core	Parallel & Distributed Computing	3(3,0)	Operating Systems
2	CS-403	CS-Elec	CS Elective - III	3(3,0)	
3	CS-405	CS-Elec	CS Elective - IV	3(3,0)	
4	SS-407	Gen-Edu	Pakistan Studies	2(2,0)	
5	*409	Univ-Elec	University Elective - III	3(3,0)	

Semester – VIII: (17 Credit Hours)

#	Course Code	Category	Course Title	Credit Hours	Prerequisites
1	CS-402	Comp-Core	Information Security	3(3,0)	
2	CS-404	CS-Elec	CS Elective - V	3(3,0)	
3	SS-406	Gen-Edu	Islamic Studies/ Ethics	2(2,0)	
4	*408	Univ-Elec	University Elective - IV	3(3,0)	
5	CS-410	Comp-Core	Final Year Project	6(0,6)	

* Course numbers (e.g., 408 or SS) to be used for the respective course from the university elective course list.

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Study Scheme BS(CS)

Semester	Comp-Core	Comp-Supp (Math & Stat.)	CS-Core	CS-Supp	CS-Elec	Gen-Edu	Univ-Elec	Total (Cr. Hrs.)
1	4	3+3				3+3		16
2	4		4	3		3	3	17
3	3+4+3+4	3						17
4	4	3	3+3				3	16
5	4		4	3	3	3		17
6			3+4	3	3	3		16
7			3		3+3	2	3	14
8	3+6				3	2	3	17
Total	39	12	24	9	15	19	12	130
Total No of Course	10	4	7	3	5	7	4	40

Electives for BS (CS)

CS Elective Courses:

#	Category	Course Title	Credit Hours	Prerequisites
1	CS-Elec	Computer Graphics	2-1	Programming Fundamentals
2	CS-Elec	Digital Image Processing	2-1	Data Structures & Algorithm
3	CS-Elec	Visual Programming	2-1	Programming Fundamentals
4	CS-Elec	Distributed Computing	2-1	Operating Systems
5	CS-Elec	Network Security	3-0	Data Comm. & Networks
6	CS-Elec	Computer Vision	3-0	
7	CS-Elec	Systems Programming	2-1	Operating Systems
8	CS-Elec	Distributed Database Systems	2-1	Intro. to Database Systems
9	CS-Elec	Data Warehousing	3-0	Intro. to Database Systems
10	CS-Elec	Web Engineering	2-1	Programming Fundamentals
11	CS-Elec	Web Design and Development	2-1	Programming Fundamentals
12	CS-Elec	Artificial Neural Networks	2-1	Discrete Structures
13	CS-Elec	Expert Systems	2-1	Discrete Structures
14	CS-Elec	Fuzzy Logic System	2-1	Discrete Structures
15	CS-Elec	Operations Research	3-0	
16	CS-Elec	Network Programming	2-1	Data Comm. & Networks
17	CS-Elec	Wireless Networks	3-0	Data Comm. & Networks
18	CS-Elec	Telecommunication Systems	2-1	Data Comm. & Networks
19	CS-Elec	Mobile Computing	2-1	Data Comm. & Networks
20	CS-Elec	Mobile Application and Development	3-0	Programming Fundamentals
21	CS-Elec	Java Programming	2-1	Programming Fundamentals
22	CS-Elec	Android Programming	2-1	
23	CS-Elec	Cloud Computing	2-1	
24	CS-Elec	Cyber Security	3-0	
25	CS-Elec	Object-Oriented Analysis & Design	3-0	Intro to Software Engg
26	CS-Elec	Ethical Hacking	2-1	
27	CS-Elec	Social Computing	3-0	
28	CS-Elec	Computational Intelligence	3-0	Discrete Structures
29	CS-Elec	Multi-Agent Systems	3-0	Data Comm. & Networks
30	CS-Elec	Natural Language Processing	3-0	Discrete Structures
31	CS-Elec	Game Development	3-0	Object-Oriented Programming
32	CS-Elec	Logical Paradigms of Computing	3-0	Discrete Structures
33	CS-Elec	Principles of Programming Languages	3-0	Programming Fundamentals
34	CS-Elec	Formal Methods in Software Engineering	3-0	Discrete Structures
35	CS-Elec	Fundamentals of Data Mining	3-0	Intro to Database Systems
36	CS-Elec	Computer Architecture	3-0	

University Electives Courses:

#	Course Code	Category	Course Title	Credit Hours
1	MG	Univ-Elec	Financial Accounting	3-0
2	MG	Univ-Elec	Financial Management	3-0
3	MG	Univ-Elec	Human Resource Management	3-0
4	MG	Univ-Elec	Marketing	3-0
5	MG	Univ-Elec	Entrepreneurship	3-0
6	SS	Univ-Elec	Economics	3-0
7	SS	Univ-Elec	Philosophy	3-0
8	SS	Univ-Elec	Psychology	3-0
9	SS	Univ-Elec	International Relations	3-0
10	SS	Univ-Elec	Foreign/Regional Languages (French, German, Chinese, Japanese, Russian, Sindhi, Punjabi, Balochi, Pashto etc.)	3-0