

STANDARD NOMENCLATURE FOR COMPUTER SCIENCE

The undergraduate degree program shall have the title of “**Bachelor of Science in Computer Science**” with the option of specializations in Artificial Intelligence, Software Engineering, and General Computing. The area of specializations accordingly shall be reflected clearly on the transcript

PROGRAM LEARNING OUTCOMES/GRADUATE ATTRIBUTES

Keeping in view the transformation from knowledge-based education philosophy to Outcome based education (OBE) system, the OBE model based on Seoul Accord has also been considered. Computing programs prepare students to attain educational objectives by ensuring that students demonstrate achievement of the following outcomes (derived from Graduate Attributes define by Seoul Accord www.seoulaccord.org).

S. No	Program Learning Outcomes (PLOs)	Computing Professional Graduate
1	Academic Education	To prepare graduates as computing professionals
2	Knowledge for Solving Computing Problems	Apply knowledge of computing fundamentals, knowledge of a computing specialization, and mathematics, science, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.
3	Problem Analysis	Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.
4	Design/ Development of Solutions	Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
5	Modern Tool Usage	Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.
6	Individual and Team Work	Function effectively as an individual and as a member or leader in diverse teams and in multi-disciplinary settings.
7	Communication	Communicate effectively with the computing community and with society at large about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.
8	Computing Professionalism and Society	Understand and assess societal, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice
9	Ethics	Understand and commit to professional ethics, responsibilities, and norms of professional computing practice
10	Life-long Learning	Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional

ELIGIBILITY CRITERIA

Higher Secondary School Certificate/A-levels (involving minimum 12 years of schooling) or an IBCC equivalent qualification with at least 50% marks and having studied Mathematics is the basic eligibility requirement for admission in all BS Computer Science Programs.

- The students who have not studied Mathematics at intermediate level have to pass deficiency courses of Mathematics (06 credits) in first year.

Furthermore, candidates may be required to pass an entry test conducted by the university or admission authority.

PROGRAM STRUCTURE OF BS COMPUTER SCIENCE

The degree program comprises a minimum of 08 regular semesters (04 years). Universities may offer courses consisting of a minimum of 132 credit hours provided that the total number of credit hours are reasonably set to achieve the Program Learning Outcomes.

Bachelor of Science in Computer Science Specialization in Artificial Intelligence

Areas	Credit Hours	Courses
Computing Core	48	14
Field Experience/Internship	3	1
Professional Certification	3	1
Capstone Project / FYP	6	2
Specialization Elective	24	8
Interdisciplinary/ Allied Courses	12	4
General Education Requirement	34+2	15+1
Totals	132	46

#	Sem #	Code	Pre-Reqs	Course Title	Dom	Cr hr
Computing Core (48/132) 14 Courses						
1	1	CSC-101		Programming Fundamentals		4 (3-3)
2	2	CSC-102	CSC-101	Object Oriented Programming		4 (3-3)
3	2	CSC-103		Database Systems		4 (3-3)
4	2	CSC-111		Digital Logic Design		4 (3-3)
5	3	CSC-201	CSC-102	Data Structures		4 (3-3)
6	3	CSC-202		Information Security		3 (2-3)
7	3	CSC-203		Artificial Intelligence		3 (2-3)
8	3	CSC-204		Computer Networks		3 (2-3)
9	3	CSC-205		Software Engineering		3 (3-0)
10	4	CSC-212	CSC-111	Computer Organization & Architecture		3 (2-3)
11	5	CSC-311		Operating Systems		4 (3-3)
12	6	CSC-402	CSC-201	Design and Analysis of Algorithms		3 (3-0)
13	4	CSC-302		Theory of Automata		3 (3-0)
14	6	CSC-355		Cloud Computing		3 (2-3)
Field Experience/Internship (3/132) 1 Course						
15	8	CSC-399		Field Experience		3 (3-0)
Professional Certification (3/132) 1 Course						
16	7	CSC-497		Professional Certification		3 (3-0)
Capstone Project / FYP (6/132) 2 Course						
17	7	CSC-498		Final Year Project I		2 (0-6)
18	8	CSC-499	CSC-498	Final Year Project II		4 (0-12)
Specialization Elective (24/132) 8 Courses						
19		CAI-261		Programming for AI		3 (2-3)
20		CAI-262	CSC-203	Machine Learning		3 (2-3)

21		CAI-361		Artificial Neural Networks & Deep Learning		3 (2-3)
22		CAI-265		Deep Learning		3 (2-3)
23		CAI-362		Knowledge representation and Reasoning		3 (2-3)
24		CAI-372		Generative AI		3 (2-3)
25		CAI-363		Computer Vision		3 (2-3)
26		CAI-364		Natural Language Processing		3 (2-3)
.		CAI-267		Data Mining		3 (2-3)
.		CAI-461	CAI-262	Reinforcement Learning		3 (2-3)
.		CAI-375		Optimization Techniques		3 (2-3)
.		CAI-376		Stochastic Processes		3 (2-3)
.		CAI-377		Machine learning Operations (MLOps)		3 (2-3)
.		CAI-378		Agentic AI		3 (2-3)
.		CAI-462		Speech Processing		3 (2-3)
.		CAI-369		Evolutionary Computing & Swarm Intelligence		3 (2-3)
.		CSC-251		Web Technologies		3 (2-3)
.		CSC-313		HCI & Computer Graphics		3 (2-3)
.		CSC-353		Mobile Application Development I		3 (2-3)
.		CSC-303	CSC-103	Advance Database Management Systems		3 (2-3)
.		CSC-314	CSC-311	Parallel & Distributed Computing		3 (2-3)
.		CSC-252	CSC-102	Advanced Programming		3 (2-3)
Interdisciplinary/ Allied Courses (12/132) 4 Courses						
27	1	MTH-101		Calculus and Analytical Geometry (Mandatory)		3 (3-0)
28	2	MTH-103	MTH-101	Linear Algebra (Mandatory)		3 (3-0)
29	3	STT-101		Probability & Statistics		3 (3-0)
30	5	MGT-335		Digital Marketing & E-Commerce		3 (3-0)
.		ECO-101		Economics		3 (3-0)
.		MGT-512		Organizational Behavior		3 (3-0)
.		CSC-382		Media and Information Literacy		3 (3-0)
.		CSC-383		E-Governance and ICT Policy		3 (3-0)
.		CSC-481		Technology Management		3 (3-0)
.		CSC-384		Financial Technology (FinTech) Fundamentals		3 (3-0)
.		CSC-385		Digital Media & Communication Studies		3 (3-0)
.		FMPE-580		Precision Agriculture		3 (2-3)
.		LWCE-601		GIS & Remote Sensing		2 (1-3)
.		CSC-480		Project Management		3 (3-0)
.		CSC-386		Educational Technology (EdTech)		3 (3-0)
General Education Requirement (34/132) 15 Course						
31	8	SSH-402		Arts & Humanities (Example: Professional Practices)		2 (2-0)
32	4	PHY-201		Natural Sciences (Example: Applied Physics)		3 (2-3)
33	7	SSH-301		Social Sciences (Example: Introduction to Management)		2 (2-0)
34	1	ENG-101		Functional English		3 (3-0)
35	4	ENG-201	ENG-101	Expository Writing		3 (3-0)
36	1	CSC-110		Quantitative Reasoning I (Example: Discrete Structures)		3 (3-0)
37	2	MTH-102	MTH-101	Quantitative Reasoning II (Example: Multivariable Calculus)		3 (3-0)
38	4	IS-201		Islamic Studies / Ethics		2 (2-0)
39	5	SSH-404		Ideology & Constitution of Pakistan		2 (2-0)
40	1	CSC-100		Applications of Information and Communication Technologies		3 (2-3)
41	6	SSH-401		Entrepreneurship		2 (2-0)
42	7	SSH-403		Civics and Community Engagement		2 (2-0)
43	1	SSH-303		Pakistan Studies		2 (2-0)
44	2	FQ-301		Fehm e Quran I		1 (0-3)
45	7	FQ-302		Fehm e Quran II		1 (0-3)

Govt of Punjab Requirement of Seerat Studies

Govt of Punjab Requirements						
46	2	SOS-302		Seerat Studies		2 (2-0)

Pre-Calculus Deficiency (for Pre-Medical Students)

Mathematics Deficiency as per NCEAC						
1	1	MTH-001		Pre-Calculus I		3 (3-0)
2	1	MTH-002		Pre-Calculus II		3 (3-0)

Semester wise Study Plan

Bachelor of Science in Computer Science Specialization in Artificial Intelligence

#	Code	Pre-Reqs	Course Title	Domain	Cr hr (Conthr)
Semester 1					
1	CSC-110		Discrete Structures (Quantitative Reasoning-I)	General Education	3 (3-0)
2	ENG-101		Functional English	General Education	3 (3-0)
3	CSC-100		Applications of Information and Communication Technologies	General Education	3 (2-3)
4	SSH-303		Pakistan Studies	General Education	2 (2-0)
5	CSC-101		Programming Fundamentals	Major	4 (3-3)
6	MTH-101		Calculus & Analytical Geometry (Interdisciplinary/Allied – I)	IDS	3 (3-0)
				Total Cr Hrs	18 (16-6)
Semester 2					
1	MTH-102	MTH-101	Multivariable Calculus(Quantitative Reasoning-II)	General Education	3 (3-0)
2	CSC-103		Database Systems	Major	4 (3-3)
3	SOS-302		Seerat Studies	General Education	2 (2-0)
4	FQ-301		Fehm-e-Quran – I	General Education	1 (0-3)
5	CSC-102	CSC-101	Object Oriented Programming	Major	4 (3-3)
6	CSC-111		Digital Logic Design	Major	4 (3-3)
7	MTH-103	MTH-101	Linear Algebra (Interdisciplinary/Allied – II)	IDS	3 (3-0)
				Total Cr Hrs	21 (17-12)
Semester 3					
1	CSC-204		Computer Networks	Major	3 (2-3)
2	CSC-202		Information Security	Major	3 (2-3)
3	CSC-203		Artificial Intelligence	Major	3 (2-3)
4	CSC-201	CSC-102	Data Structures	Major	4 (3-3)
5	CSC-205		Software Engineering	Major	3 (3-0)
6	STT-101		Probability & Statistics (Interdisciplinary/Allied – III)	IDS	3 (3-0)
				Total Cr Hrs	19 (15-12)
Semester 4					
1	CSC-302		Theory of Automata	Major	3 (3-0)
2			Elective-I	Elective	3 (2-3)
3	ENG-201	ENG-101	Expository Writing	General Education	3 (3-0)
4	IS-201		Islamic Studies	General Education	2 (2-0)
5			Elective-II	Elective	3 (2-3)
6	CSC-212	CSC-111	Computer Organization & Architecture	Major	3 (2-3)
				Total Cr Hrs	17 (14-9)
Semester 5					
1	PHY-201		Applied Physics (Natural Science)	General Education	3 (2-3)
2			Elective-III	Elective	3 (2-3)
3			Elective-IV	Elective	3 (2-3)
4	CSC-311		Operating Systems	Major	4 (3-3)
5	MGT-335		Digital Marketing & E-Commerce(Interdisciplinary/Allied – IV)	IDS	3 (3-0)
6	SSH-404		Ideology & Constitution of Pakistan	General Education	2 (2-0)
				Total Cr Hrs	18 (14-12)
Semester 6					
1	CSC-355		Cloud Computing	Major	3 (2-3)
2	CSC-402	CSC-201	Design & Analysis of Algorithms	Major	3 (3-0)
3			Elective-V	Elective	3 (2-3)
4			Elective-VI	Elective	3 (2-3)
5			Elective-VII	Elective	3 (2-3)
6	SSH-401		Entrepreneurship	General Education	2 (2-0)
				Total Cr Hrs	17 (13-12)
Semester 7					
1	CSC-498		Final Year Project I	Capstone Project	2 (0-6)
2			Elective-VIII	Elective	3 (2-3)
3	SSH-301		Introduction to Management(Social Science)	General Education	2 (2-0)
4	FQ-302		Fehm e Quran II	General Education	1 (0-3)
5	SSH-403		Civics and Community Engagement	General Education	2 (2-0)

6	CSC-497		Professional Certification	Certification	3 (3-0)
				Total Cr Hrs	13 (9-12)
Semester 8					
1	CSC-499	CSC-498	Final Year Project II	Capstone Project	4 (0-12)
2	CSC-399		Field Experience	Field Experience	3 (3-0)
3	SSH-402		Professional Practices(Arts & Humanities)	General Education	2 (2-0)
				Total Cr Hrs	9 (5-12)

Bachelor of Science in Computer Science Specialization in Software Engineering

Areas	Credit Hours	Courses
Computing Core	48	14
Field Experience/Internship	3	1
Professional Certification	3	1
Capstone Project / FYP	6	2
Specialization Elective	24	8
Interdisciplinary/ Allied Courses	12	4
General Education Requirement	34+2	15+1
Totals	132	46

#	Sem #	Code	Pre-Reqs	Course Title	Dom	Cr hr
Computing Core (48/132) 14 Courses						
1	1	CSC-101		Programming Fundamentals		4 (3-3)
2	2	CSC-102	CSC-101	Object Oriented Programming		4 (3-3)
3	2	CSC-103		Database Systems		4 (3-3)
4	2	CSC-111		Digital Logic Design		4 (3-3)
5	3	CSC-201	CSC-102	Data Structures		4 (3-3)
6	3	CSC-202		Information Security		3 (2-3)
7	3	CSC-203		Artificial Intelligence		3 (2-3)
8	3	CSC-204		Computer Networks		3 (2-3)
9	3	CSC-205		Software Engineering		3 (3-0)
10	4	CSC-212	CSC-111	Computer Organization & Architecture		3 (2-3)
11	5	CSC-311		Operating Systems		4 (3-3)
12	6	CSC-402	CSC-201	Design and Analysis of Algorithms		3 (3-0)
13	4	CSC-302		Theory of Automata		3 (3-0)
14	6	CSC-355		Cloud Computing		3 (2-3)
Field Experience/Internship(3/132) 1 Course						
15	8	CSC-399		Field Experience		3 (3-0)
Professional Certification(3/132) 1 Course						
16	7	CSC-497		Professional Certification		3 (3-0)
Capstone Project / FYP (6/132) 2 Course						
17	7	CSC-498		Final Year Project I		2 (0-6)
18	8	CSC-499	CSC-498	Final Year Project II		4 (0-12)
Specialization Elective (24/132) 8 Courses						
19		CSE-334		Software Requirement Engineering		3 (3-0)
20		CSE-322		Software Project Management		3 (3-0)
21		CSE-335		Software Quality and Testing		3 (2-3)
22		CSE-327		DevOps Principles and Practices		3 (2-3)
23		CSE-326		Software Re-Engineering		3 (2-3)
24		CSE-320		Software Design and Architecture		3 (3-0)
25		CSC-314	CSC-311	Parallel and Distributed Computing		3 (2-3)
26		CSE-321		Software Construction and Development		3 (2-3)
.		CSC-686		Human Computer Interaction		3 (2-3)
.		CSE-328		Formal Methods and Design		3 (3-0)
.		CSE-329		Cross-platform Application Development		3 (3-0)

.		CSE-330		Advanced Topics in Software Engineering		3 (2-3)
.		CAI-262	CSC-203	Machine Learning		3 (2-3)
.		CSE-331		Internet of Things and It's Applications		3 (2-3)
.		CSE-332		Green Software Engineering		3 (3-0)
.		CSC-251		Web Technologies		3 (2-3)
.		CSC-303	CSC-103	Advance Database Management Systems		3 (2-3)
.		CSC-353		Mobile Application Development 1		3 (2-3)
.		CSC-252	CSC-102	Advanced Programming		3 (2-3)
.		CSC-351	CSC-251	Web Engineering		3 (2-3)
.		CSC-313		HCI & Computer Graphics		3 (2-3)
.		CSC-312	CSC-302	Compiler Construction		3 (2-3)
.		CSC-354	CSC-202	Cyber Security		3 (2-3)
.		CAI-372		Generative AI		3 (2-3)

Interdisciplinary/ Allied Courses (12/132) 4 Courses

27	1	MTH-101		Calculus and Analytical Geometry (Mandatory)		3 (3-0)
28	2	MTH-103	MTH-101	Linear Algebra (Mandatory)		3 (3-0)
29	3	STT-101		Probability & Statistics		3 (3-0)
30	5	MGT-335		Digital Marketing & E-Commerce		3 (3-0)
.		ECO-101		Economics		3 (3-0)
.		MGT-512		Organizational Behavior		3 (3-0)
.		CSC-382		Media and Information Literacy		3 (3-0)
.		CSC-383		E-Governance and ICT Policy		3 (3-0)
.		CSC-481		Technology Management		3 (3-0)
.		CSC-384		Financial Technology (FinTech) Fundamentals		3 (3-0)
.		CSC-385		Digital Media & Communication Studies		3 (3-0)
.		FMPE-580		Precision Agriculture		3 (2-3)
.		LWCE-601		GIS & Remote Sensing		2 (1-3)
.		CSC-480		Project Management		3 (3-0)
.		CSC-386		Educational Technology (EdTech)		3 (3-0)

General Education Requirement (34/132) 15 Course

31	8	SSH-402		Arts & Humanities (Example: Professional Practices)		2 (2-0)
32	4	PHY-201		Natural Sciences (Example: Applied Physics)		3 (2-3)
33	7	SSH-301		Social Sciences (Example: Introduction to Management)		2 (2-0)
34	1	ENG-101		Functional English		3 (3-0)
35	4	ENG-201	ENG-101	Expository Writing		3 (3-0)
36	1	CSC-110		Quantitative Reasoning I (Example: Discrete Structures)		3 (3-0)
37	2	MTH-102	MTH-101	Quantitative Reasoning II (Example: Multivariable Calculus)		3 (3-0)
38	4	IS-201		Islamic Studies / Ethics		2 (2-0)
39	5	SSH-404		Ideology & Constitution of Pakistan		2 (2-0)
40	1	CSC-100		Applications of Information and Communication Technologies		3 (2-3)
41	6	SSH-401		Entrepreneurship		2 (2-0)
42	7	SSH-403		Civics and Community Engagement		2 (2-0)
43	1	SSH-303		Pakistan Studies		2 (2-0)
44	2	FQ-301		Fehm e Quran I		1 (0-3)
45	7	FQ-302		Fehm e Quran II		1 (0-3)

Govt of Punjab Requirement of Seerat Studies

Govt of Punjab Requirements						
46	2	SOS-302		Seerat Studies		2 (2-0)

Pre-Calculus Deficiency (for Pre-Medical Students)

Mathematics Deficiency as per NCEAC & Punjab Govt Requirement of Translation of Quran						
1	1	MTH-001		Pre-Calculus I		3 (3-0)
2	1	MTH-002		Pre-Calculus II		3 (3-0)

Semester wise Study Plan

Bachelor of Science in Computer Science

Specialization in Software Engineering

#	Code	Pre-Reqs	Course Title	Domain	Cr hr (Conthr)
Semester 1					
1	CSC-110		Discrete Structures (Quantitative Reasoning-I)	General Education	3 (3-0)
2	ENG-101		Functional English	General Education	3 (3-0)
3	CSC-100		Applications of Information and Communication Technologies	General Education	3 (2-3)
4	SSH-303		Pakistan Studies	General Education	2 (2-0)
5	CSC-101		Programming Fundamentals	Major	4 (3-3)
6	MTH-101		Calculus & Analytical Geometry (Interdisciplinary/Allied – I)	IDS	3 (3-0)
				Total Cr Hrs	18 (16-6)
Semester 2					
1	MTH-102	MTH-101	Multivariable Calculus(Quantitative Reasoning-II)	General Education	3 (3-0)
2	CSC-103		Database Systems	Major	4 (3-3)
3	SOS-302		Seerat Studies	General Education	2 (2-0)
4	FQ-301		Fehm-e-Quran – I	General Education	1 (0-3)
5	CSC-102	CSC-101	Object Oriented Programming	Major	4 (3-3)
6	CSC-111		Digital Logic Design	Major	4 (3-3)
7	MTH-103	MTH-101	Linear Algebra (Interdisciplinary/Allied – II)	IDS	3 (3-0)
				Total Cr Hrs	21 (17-12)
Semester 3					
1	CSC-204		Computer Networks	Major	3 (2-3)
2	CSC-202		Information Security	Major	3 (2-3)
3	CSC-203		Artificial Intelligence	Major	3 (2-3)
4	CSC-201	CSC-102	Data Structures	Major	4 (3-3)
5	CSC-205		Software Engineering	Major	3 (3-0)
6	STT-101		Probability & Statistics (Interdisciplinary/Allied – III)	IDS	3 (3-0)
				Total Cr Hrs	19 (15-12)
Semester 4					
1	CSC-302		Theory of Automata	Major	3 (3-0)
2			Elective-I	Elective	3 (2-3)
3	ENG-201	ENG-101	Expository Writing	General Education	3 (3-0)
4	IS-201		Islamic Studies	General Education	2 (2-0)
5			Elective-II	Elective	3 (2-3)
6	CSC-212	CSC-111	Computer Organization & Architecture	Major	3 (2-3)
				Total Cr Hrs	17 (14-9)
Semester 5					
1	PHY-201		Applied Physics (Natural Science)	General Education	3 (2-3)
2			Elective-III	Elective	3 (2-3)
3			Elective-IV	Elective	3 (2-3)
4	CSC-311		Operating Systems	Major	4 (3-3)
5	MGT-335		Digital Marketing & E-Commerce(Interdisciplinary/Allied – IV)	IDS	3 (3-0)
6	SSH-404		Ideology & Constitution of Pakistan	General Education	2 (2-0)
				Total Cr Hrs	18 (14-12)
Semester 6					
1	CSC-355		Cloud Computing	Major	3 (2-3)
2	CSC-402	CSC-201	Design & Analysis of Algorithms	Major	3 (3-0)
3			Elective-V	Elective	3 (2-3)
4			Elective-VI	Elective	3 (2-3)
5			Elective-VII	Elective	3 (2-3)
6	SSH-401		Entrepreneurship	General Education	2 (2-0)
				Total Cr Hrs	17 (13-12)
Semester 7					
1	CSC-498		Final Year Project I	Capstone Project	2 (0-6)
2			Elective-VIII	Elective	3 (2-3)
3	SSH-301		Introduction to Management(Social Science)	General Education	2 (2-0)

4	FQ-302		Fehm e Quran II	General Education	1 (0-3)
5	SSH-403		Civics and Community Engagement	General Education	2 (2-0)
6	CSC-497		Professional Certification	Certification	3 (3-0)
				Total Cr Hrs	13 (9-12)
Semester 8					
1	CSC-499	CSC-498	Final Year Project II	Capstone Project	4 (0-12)
2	CSC-399		Field Experience	Field Experience	3 (3-0)
3	SSH-402		Professional Practices(Arts & Humanities)	General Education	2 (2-0)
				Total Cr Hrs	9 (5-12)

Bachelor of Science in Computer Science Specialization in General Computing

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Computing Core	48	14
Field Experience/Internship	3	1
Professional Certification	3	1
Capstone Project / FYP	6	2
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Computing Core (48/132) 14 Courses						
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2	2	CSC-102	CSC-101	Object Oriented Programming		4 (3-3)
3	2	CSC-103		Database Systems		4 (3-3)
4	2	CSC-111		Digital Logic Design		4 (3-3)
5	3	CSC-201	CSC-102	Data Structures		4 (3-3)
6	3	CSC-202		Information Security		3 (2-3)
7	3	CSC-203		Artificial Intelligence		3 (2-3)
8	3	CSC-204		Computer Networks		3 (2-3)
9	3	CSC-205		Software Engineering		3 (3-0)
10	4	CSC-212	CSC-111	Computer Organization & Architecture		3 (2-3)
11	5	CSC-311		Operating Systems		4 (3-3)
12	6	CSC-402	CSC-201	Design and Analysis of Algorithms		3 (3-0)
13	4	CSC-302		Theory of Automata		3 (3-0)
14	6	CSC-355		Cloud Computing		3 (2-3)
Field Experience/Internship(3/132) 1 Course						
15	8	CSC-399		Field Experience		3 (3-0)
Professional Certification(3/132) 1 Course						
16	7	CS-497		Professional Certification		3 (3-0)
Capstone Project / FYP (6/132) 2 Course						
17	7	CSC-498		Final Year Project I		2 (0-6)
18	8	CSC-499	CSC-498	Final Year Project II		4 (0-12)
Specialization Elective (24/132) 8 Courses						
19		CSC-251		Web Technologies		3 (2-3)
20		CSC-252	CSC-102	Advanced Programming		3 (2-3)
21		CSC-351	CSC-251	Web Engineering		3 (2-3)
22		CSC-353		Mobile Application Development 1		3 (2-3)
23		CSC-303	CSC-103	Advance Database Management Systems		3 (2-3)
24		CSC-312	CSC-302	Compiler Construction		3 (2-3)
25		CSC-313		HCI & Computer Graphics		3 (2-3)
26		CSC-314	CSC-311	Parallel & Distributed Computing		3 (2-3)
.		CSC-354	CSC-202	Cyber Security		3 (2-3)
.		CSC-352		Numerical Analysis		3 (2-3)
.		CSE-335		Software Quality and Testing		3 (2-3)
.		CSC-451		Mobile Application Development 2		3 (2-3)
.		CAI-262	CSC-203	Machine Learning		3 (3-0)
.		CAI-361		Artificial Neural Networks & Deep Learning		3 (2-3)
.		CAI-363		Computer Vision		3 (2-3)
.		CAI-364		Natural Language Processing		3 (2-3)
.		CSC-372		Generative AI		3 (2-3)
Interdisciplinary/ Allied Courses (12/132) 4 Courses						
27	1	MTH-101		Calculus and Analytical Geometry (Mandatory)		3 (3-0)
28	2	MTH-103	MTH-101	Linear Algebra (Mandatory)		3 (3-0)

29	3	STT-101		Probability & Statistics		3 (3-0)
30	5	MGT-335		Digital Marketing & E-Commerce		3 (3-0)
.		ECO-101		Economics		3 (3-0)
.		MGT-512		Organizational Behavior		3 (3-0)
.		CSC-382		Media and Information Literacy		3 (3-0)
.		CSC-383		E-Governance and ICT Policy		3 (3-0)
.		CSC-481		Technology Management		3 (3-0)
.		CSC-384		Financial Technology (FinTech) Fundamentals		3 (3-0)
.		CSC-385		Digital Media & Communication Studies		3 (3-0)
		FMPE-580		Precision Agriculture		3 (2-3)
		LWCE-601		GIS & Remote Sensing		2 (1-3)
.		CSC-480		Project Management		3 (3-0)
.		CSC-386		Educational Technology (EdTech)		3 (3-0)

General Education Requirement (34/132) 15 Course

31	8	SSH-402		Arts & Humanities (Example: Professional Practices)		2 (2 -0)
32	4	PHY-201		Natural Sciences (Example: Applied Physics)		3 (2-3)
33	7	SSH-301		Social Sciences (Example: Introduction to Management)		2 (2 -0)
34	1	ENG-101		Functional English		3 (3-0)
35	4	ENG-201	ENG-101	Expository Writing		3 (3-0)
36	1	CSC-110		Quantitative Reasoning I (Example: Discrete Structures)		3 (3-0)
37	2	MTH-102	MTH-101	Quantitative Reasoning II (Example: Multivariable Calculus)		3 (3-0)
38	4	IS-201		Islamic Studies / Ethics		2 (2 -0)
39	5	SSH-404		Ideology & Constitution of Pakistan		2 (2 -0)
40	1	CSC-100		Applications of Information and Communication Technologies		3 (2-3)
41	6	SSH-401		Entrepreneurship		2 (2 -0)
42	7	SSH-403		Civics and Community Engagement		2 (2 -0)
43	1	SSH-303		Pakistan Studies		2 (2 -0)
44	2	FQ-301		Fehm e Quran I		1 (0 -3)
45	7	FQ-302		Fehm e Quran II		1 (0 -3)

Govt of Punjab Requirement of Seerat Studies

Govt of Punjab Requirements						
46	2	SOS-302		Seerat Studies		2 (2-0)

Pre-Calculus Deficiency (for Pre-Medical Students)

Mathematics Deficiency as per NCEAC						
1	1	MTH-001		Pre-Calculus I		3 (3-0)
2	1	MTH-002		Pre-Calculus II		3 (3-0)

**Semester wise Study Plan
Bachelor of Science in Computer Science
Specialization in General Computing**

#	Code	Pre-Reqs	Course Title	Domain	Cr hr (Cont-hr)
Semester 1					
1	CSC-110		Discrete Structures (Quantitative Reasoning-I)	General Education	3 (3-0)
2	ENG-101		Functional English	General Education	3 (3-0)
3	CSC-100		Applications of Information and Communication Technologies	General Education	3 (2-3)
4	SSH-303		Pakistan Studies	General Education	2 (2-0)
5	CSC-101		Programming Fundamentals	Major	4 (3-3)
6	MTH-101		Calculus & Analytical Geometry (Interdisciplinary/Allied – I)	IDS	3 (3-0)
				Total Cr Hrs	18 (16-6)
Semester 2					
1	MTH-102	MTH-101	Multivariable Calculus(Quantitative Reasoning-II)	General Education	3 (3-0)
2	CSC-103		Database Systems	Major	4 (3-3)
3	SOS-302		Seerat Studies	General Education	2 (2-0)

4	FQ-301		Fehm-e-Quran – I	General Education	1 (0-3)
5	CSC-102	CSC-101	Object Oriented Programming	Major	4 (3-3)
6	CSC-111		Digital Logic Design	Major	4 (3-3)
7	MTH-103	MTH-101	Linear Algebra (Interdisciplinary/Allied – II)	IDS	3 (3-0)
				Total Cr Hrs	21 (17-12)
Semester 3					
1	CSC-204		Computer Networks	Major	3 (2-3)
2	CSC-202		Information Security	Major	3 (2-3)
3	CSC-203		Artificial Intelligence	Major	3 (2-3)
4	CSC-201	CSC-102	Data Structures	Major	4 (3-3)
5	CSC-205		Software Engineering	Major	3 (3-0)
6	STT-101		Probability & Statistics (Interdisciplinary/Allied – III)	IDS	3 (3-0)
				Total Cr Hrs	19 (15-12)
Semester 4					
1	CSC-302		Theory of Automata	Major	3 (3-0)
2			Elective-I	Elective	3 (2-3)
3	ENG-201	ENG-101	Expository Writing	General Education	3 (3-0)
4	IS-201		Islamic Studies	General Education	2 (2-0)
5			Elective-II	Elective	3 (2-3)
6	CSC-212	CSC-111	Computer Organization & Architecture	Major	3 (2-3)
				Total Cr Hrs	17 (14-9)
Semester 5					
1	PHY-201		Applied Physics (Natural Science)	General Education	3 (2-3)
2			Elective-III	Elective	3 (2-3)
3			Elective-IV	Elective	3 (2-3)
4	CSC-311		Operating Systems	Major	4 (3-3)
5	MGT-335		Digital Marketing & E-Commerce(Interdisciplinary/Allied – IV)	IDS	3 (3-0)
6	SSH-404		Ideology & Constitution of Pakistan	General Education	2 (2-0)
				Total Cr Hrs	18 (14-12)
Semester 6					
1	CSC-355		Cloud Computing	Major	3 (2-3)
2	CSC-402	CSC-201	Design & Analysis of Algorithms	Major	3 (3-0)
3			Elective-V	Elective	3 (2-3)
4			Elective-VI	Elective	3 (2-3)
5			Elective-VII	Elective	3 (2-3)
6	SSH-401		Entrepreneurship	General Education	2 (2-0)
				Total Cr Hrs	17 (13-12)
Semester 7					
1	CSC-498		Final Year Project I	Capstone Project	2 (0-6)
2			Elective-VIII	Elective	3 (2-3)
3	SSH-301		Introduction to Management(Social Science)	General Education	2 (2-0)
4	FQ-302		Fehm e Quran II	General Education	1 (0-3)
5	SSH-403		Civics and Community Engagement	General Education	2 (2-0)
6	CSC-497		Professional Certification	Certification	3 (3-0)
				Total Cr Hrs	13 (9-12)
Semester 8					
1	CSC-499	CSC-498	Final Year Project II	Capstone Project	4 (0-12)
2	CSC-399		Field Experience	Field Experience	3 (3-0)
3	SSH-402		Professional Practices(Arts & Humanities)	General Education	2 (2-0)
				Total Cr Hrs	9 (5-12)