

BS (CS)

Specialization in General Computing

Course Group	Credit Hours	Min No of Courses
General Education	19	7
University Electives	12	4
Mathematics & Science Foundation	12	4
Computing Core	39	11
Computer Science Core	24	7
CS Supporting	9	3
CS Electives (Domain Electives)	15	5
TOTAL	130	39

General Education Courses

Course Code	Pre-Requisite	Course Title	Credit Hours
CS-300		Introduction to Information & Communication Technologies	3(2-3)
ENG-305		English Composition & Comprehension	3(3-0)
ENG-325	ENG-305	Communication & Presentation Skills	3(3-0)
ENG-315		Technical & Business Writing	3(3-0)
IS-302		Islamic Studies/ Ethics	2(2-0)
SSH-302		Pakistan Studies	2(2-0)
SSH-307		Professional Practices	3(3-0)
		Total	19

University Elective Courses

Course Code	Pre-Requisite	General Education Courses	Credit Hours
MGT-322		Financial Accounting	3(3-0)
MGT-351		Introduction to Marketing	3(3-0)
MGT-411		Introduction to Management	3(3-0)
MGT-515		Introduction to Human Resource Management	3(3-0)
MGT-444		Digital Entrepreneurship	3(3-0)
SSH-304		International Relations	3(3-0)
SSH-308		Personal Grooming & Character Development	2(2-0)
		Total (Any Four of the above)	12

Mathematics and Science Foundation Courses

Course Code	Pre-Requisite	Course Title	Credit Hours
MTH-310		Calculus & Analytical Geometry	3(3-0)
MTH-435	MTH-310	Linear Algebra	3(3-0)
STT-500		Statistics & Probability	3(3-0)
MTH-415	MTH-310	Differential Equations	3(3-0)
		Total	12-0

Computing Core Courses

Course Code	Pre-Requisite	Course Title	Credit Hours
CS-323		Programming Fundamentals	4(3-3)
CS-335		Discrete Structures	3(3-0)
CS-423	CS-323	Object Oriented Programming	4(3-3)
CS-400		Database Systems	4(3-3)
CS-443	CS-323	Data Structures & Algorithms	4(3-3)
CS-497		Information Security	3(3-0)
CS-577		Computer Networks	4(3-3)
CS-583		Operating System	4(3-3)
CS-453		Software Engineering	3(3-0)
CS-698		Final Year Project-I	2(0-04)
CS-699	CS-698	Final Year Project-II	4(0-08)
		Total	39

Computer Science Core Courses

Course Code	Pre-Requisite	Course Title	Credit Hours
CS-636	CS-536	Compiler Construction	3(2-3)
CS-530	CS-430	Computer Organization & Assembly Language	4(3-3)
CS-430		Digital Logic Design	4(3-3)
CS-542	CS-443	Analysis of Algorithms	3(3-0)
CS-687		Parallel & Distributed Computing	3(2-3)
CS-632	CS-423	Artificial Intelligence	4(3-3)
CS-536	CS-335	Theory of Automata & Formal Languages	3(3-0)
		Total	24

Computer Science Supporting

Course Code	Pre-Requisite	Course Title	Credit Hours
PHY-403		Applied Physics	3(3-0)
CS-572	MTH-310	Numerical Analysis	3(2-3)
MTH-315		Multivariable Calculus	3(3-0)
		Total	09

CS Electives Courses

Course Code	Pre-Requisite	Course Title	Credit hours
CS-432	CS-423	Modern Programming Languages	3(2-3)
CS-532		Computer Architecture	3(3-0)
CS-553	CS-453	Object Oriented Analysis & Design	3(2-3)
CS-575	CS-323	Computer Graphics	3(2-3)
CS-566		Web Technologies	3(2-3)
CS-597		Cyber Security	3(3-0)
CS-601	CS-400	Data Base Administration & Management	4(3-3)
CS-666	CS-566	Web Engineering	3(2-3)
CS-685		Human Computer Interaction	3(2-3)
CS-682		System Programming	3(2-3)
CS-692	CS-423	Visual Programming	3(2-3)
CS-693		Mobile Application Development	3(2-3)
CS-695	CS-423	Theory of Programming Language	3(2-3)
		Total (Any Five of the Above)	15

Semester-I

Course Code	Pre-Requisite	Course Title	Credit hours
CS-300		Introduction to Information & Communication Technologies	3(2-3)
CS-323		Programming Fundamentals	4(3-3)
IS-302		Islamic Studies/ Ethics	2(2-0)
MTH-310		Calculus & Analytic Geometry	3(3-0)
ENG-305		English Composition & Comprehension	3(3-0)
		Total	15(13-2)

Semester-II

Course Code	Pre-Requisite	Course Title	Credit hours
CS-423	CS-323	Object Oriented Programming	4(3-3)
CS-400		Database Systems	4(3-3)
MTH-435	MTH-310	Linear Algebra	3(3-0)
STT-500		Probability & Statistics	3(3-0)
ENG-325	ENG-305	Communication & Presentation Skills	3(3-0)
CS-335		Discrete Structures	3(3-0)
		Total	20(18-2)

Semester-III

Course Code	Pre-Requisite	Course Title	Credit hours
CS-443	CS-323	Data Structures & Algorithms	4(3-3)
CS-453		Software Engineering	3(3-0)
CS-632	CS-423	Artificial Intelligence	4(3-3)
CS-430		Digital Logic Design	4(3-3)
MTH-415	MTH-310	Differential Equations	3(3-0)
		Total	18(15-3)

Semester-IV

Course Code	Pre-Requisite	Course Title	Credit hours
CS-577		Computer Networks	4(3-3)
CS-530	CS-430	Computer Organization & Assembly Language	4(3-3)
CS-542	CS-443	Analysis of Algorithms	3(3-0)
PHY-403		Applied Physics	3(3-0)
CS-583		Operating System	4(3-3)
		Total	18(15-3)

Semester-V

Course Code	Pre-Requisite	Course Title	Credit hours
CS-536	CS-335	Theory of Automata & Formal Languages	3(3-0)
CS-572	MTH-310	Numerical Analysis	3(2-3)
		CS Elective-1	3(3-0)
		CS Elective-2	3(3-0)
		University Elective-1	3(3-0)
		Total	15(14-1)

Semester-VI

Course Code	Pre-Requisite	Course Title	Credit hours
CS-687		Parallel & Distributed Computing	3(2-3)
CS-636	CS-536	Compiler Construction	3(2-3)
		CS Elective-3	3(3-0)
		CS Elective-4	3(3-0)
		University Elective-2	3(3-0)
		Total	15(13-2)

Semester-VII

Course Code	Pre-Requisite	Course Title	Credit hours
CS-698		Final Year Project-I	2(0-04)
CS-497		Information Security	3(3-0)
ENG-315		Technical & Business Writing	3(3-0)
MTH-315		Multivariable Calculus	3(3-0)
		University Elective-3	3(3-0)
		CS Elective-5	3(3-0)
		Total	17(15-2)

Semester-VIII

Course Code	Pre-Requisite	Course Title	Credit hours
CS-699	CS-698	Final Year Project-II	4(0-8)
SSH-307		Professional Practices	3(3-0)
SSH-302		Pakistan Studies	2(2-0)
		University Elective-4	3(3-0)
		Total	12(8-1)

BS (CS)

Specialization in Artificial Intelligence

Course Group	Credit Hours	Min No of Courses
General Education	19	7
University Electives	9	3
Mathematics & Science Foundation	15	5
Computing Core	39	11
Computer Science Core	18	5
AI Core (Domain Core)	18	6
AI Electives (Domain Electives)	12	4
TOTAL	130	41

General Education Courses

Course Code	Pre-Requisite	Course Title	Credit Hours
CS-300		Introduction to Information & Communication Technologies	3(2-3)
ENG-305		English Composition & Comprehension	3(3-0)
ENG-325	ENG-305	Communication & Presentation Skills	3(3-0)
ENG-315		Technical & Business Writing	3(3-0)
IS-302		Islamic Studies/ Ethics	2(2-0)
SSH-302		Pakistan Studies	2(2-0)
SSH-307		Professional Practices	3(3-0)
		Total	19

University Elective Courses

Course Code	Pre-Requisite	General Education Courses	Credit hours
MGT-322		Financial Accounting	3(3-0)
MGT-351		Introduction to Marketing	3(3-0)
MGT-411		Introduction to Management	3(3-0)
MGT-515		Introduction to Human Resource Management	3(3-0)
MGT-444		Digital Entrepreneurship	3(3-0)
SSH-304		International Relations	3(3-0)
SSH-308		Personal Grooming & Character Development	2(2-0)
		Total	09

Mathematics and Science Foundation Courses

Course Code	Pre-Requisite	Course Title	Credit hours
MTH-310		Calculus & Analytical Geometry	3(3-0)
MTH-435	MTH-310	Linear Algebra	3(3-0)
STT-500		Statistics & Probability	3(3-0)
MTH-415	MTH-310	Differential Equations	3(3-0)
PHY-403		Applied Physics	3(3-0)
		Total	15

Computing Core Courses

Course Code	Pre-Requisite	Course Title	Credit hours
CS-323		Programming Fundamentals	4(3-3)
CS-335		Discrete Structures	3(3-0)
CS-423	CS-323	Object Oriented Programming	4(3-3)

CS-400		Database Systems	4(3-3)
CS-443	CS-323	Data Structures & Algorithms	4(3-3)
CS-497		Information Security	3(3-0)
CS-577		Computer Networks	4(3-3)
CS-583		Operating System	4(3-3)
CS-453		Software Engineering	3(3-0)
CS-698		Final Year Project-I	2(0-04)
CS-699	CS-698	Final Year Project-II	4(0-08)
		Total	39

Computer Science Core Courses

Course Code	Pre-Requisite	Course Title	Credit Hours
CS-632	CS-423	Artificial Intelligence	4(3-3)
CS-430		Digital Logic Design	4(3-3)
CS-542	CS-443	Analysis of Algorithms	3(3-0)
CS-530	CS-430	Computer Organization & Assembly Language	4(3-3)
CS-687		Parallel & Distributed Computing	3(2-3)
		Total	18

Artificial Intelligence Core Courses

Course Code	Pre-Requisite	Course Title	Credit Hours
CS-403	CS-632	Programming for Artificial Intelligence	3(2-3)
CS-404		Machine Learning	3(2-3)
CS-405		Artificial Neural Networks	3(2-3)
CS-406		Knowledge Representation & Reasoning	3(3-0)
CS-515		Computer Vision	3(2-3)
CS-516		Natural Language Processing	3(3-0)
		Total	18

Artificial Intelligence Electives Courses

Course Code	Pre-Requisite	Course Title	Credit Hours
STT-502		Advance Statistics	3(3-0)
CS-536	CS-335	Theory of Automata & Formal Languages	3(3-0)
CS-407		Data Mining	3(2-3)
CS-408		Deep Learning	3(3-0)
CS-517		Speech Processing	3(3-0)
CS-518		Reinforcements Learning	3(3-0)
CS-519		Fuzzy Systems	3(3-0)
CS-520		Evolutionary Computing	3(3-0)
CS-521		Swarm Intelligence	3(3-0)
CS-522		Agent Based Modeling	3(3-0)
CS-523		Knowledge Based Systems	3(3-0)
		Total (Any Four of the Above)	12

Semester-I

Course Code	Pre-Requisite	Course Title	Credit hours
CS-300		Introduction to Information & Communication Technologies	3(2-3)
CS-323		Programming Fundamentals	4(3-3)
IS-302		Islamic Studies / Ethics	2(2-0)
MTH-310		Calculus & Analytic Geometry	3(3-0)
ENG-305		English Composition & Comprehension	3(3-0)
		Total	15(13-2)

Semester-II

Course Code	Pre-Requisite	Course Title	Credit hours
CS-423	CS-323	Object Oriented Programming	4(3-3)
CS-400		Database Systems	4(3-3)
MTH-435	MTH-310	Linear Algebra	3(3-0)
STT-500		Probability & Statistics	3(3-0)
ENG-325	ENG-305	Communication & Presentation Skills	3(3-0)
CS-335		Discrete Structures	3(3-0)
		Total	20(18-2)

Semester-III

Course Code	Pre-Requisite	Course Title	Credit hours
CS-443	CS-323	Data Structures & Algorithms	4(3-3)
CS-453		Software Engineering	3(3-0)
CS-632	CS-423	Artificial Intelligence	4(3-3)
CS-430		Digital Logic Design	4(3-3)
MTH-415	MTH-310	Differential Equations	3(3-0)
		Total	18(15-3)

Semester-IV

Course Code	Pre-Requisite	Course Title	Credit hours
CS-577		Computer Networks	4(3-3)
CS-530	CS-430	Computer Organization & Assembly Language	4(3-3)
CS-542	CS-443	Analysis of Algorithms	3(3-0)
PHY-403		Applied Physics	3(3-0)
CS-583		Operating System	4(3-3)
		Total	18(15-3)

Semester-V

Course Code	Pre-Requisite	Course Title	Credit hours
CS-403	CS-632	Programming for Artificial Intelligence	3(2-3)
CS-405		Artificial Neural Networks	3(2-3)
CS-404		Machine Learning	3(2-3)
		AI Elective-1	3(3-0)
		AI Elective-2	3(3-0)
		University Elective-1	3(3-0)
		Total	18(15-3)

Semester-VI

Course Code	Pre-Requisite	Course Title	Credit hours
CS-687		Parallel & Distributed Computing	3(2-3)
CS-515		Computer Vision	3(2-3)
CS-516		Natural Language Processing	3(3-0)
		AI Elective-3	3(3-0)
		University Elective-2	3(3-0)
		Total	15(12-3)

Semester-VII

Course Code	Pre-Requisite	Course Title	Credit hours
CS-698		Final Year Project-I	2(0-2)
CS-497		Information Security	3(3-0)
ENG-315		Technical & Business Writing	3(3-0)
CS-406		Knowledge Representation & Reasoning	3(3-0)
		AI Elective-4	3(3-0)
		Total	14(12-2)

Semester-VIII

Course Code	Pre-Requisite	Course Title	Credit hours
CS-699	CS-698	Final Year Project-II	4(0-8)
SSH-307		Professional Practices	3(3-0)
SSH-302		Pakistan Studies	2(2-0)
		University Elective-3	3(3-0)
		Total	12(8-4)