

Bachelor of Science in Computer Science (BSCS) Scheme of Studies

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Bachelor of Science in Computer Science (BSCS)

Scheme of Studies

(Fall 2013)

Scheme of study of **BS Computer Science** (133 Cr. Hrs), applicable on all BSCS batches inducted in Fall 2013 semester. Upon the recommendation of Board of Studies and Board of Faculty, the Academic Council of the IIUI approved this scheme in its 73rd meeting held on Wednesday, 30th May 2018.

Degree Requirements (minimum 133 Credit hours)

Category	Grouping	Credit Hours	% of Total Courses
Computer Science Courses	Computing-Core Courses	43	62%
	Computer Science – Core Courses	18	
	Computer Science (Electives)*	21	
General Education Courses	University Required Courses (UR)	24	38%
	Other Courses*	27	
Total Credit hours		133	
*Minimum credit hours required from the course offered in the group			

Computer Science Courses

Computing-Core Courses (43 Credit Hours)

#	Code	Course Title	Cr. Hrs.
1	CS 102	Introduction to Computing	4
2	CS 111	Programming Fundamentals	4
3	CS 103	Object Oriented Programming	3
4	CS 291	Discrete Structures	3
5	CS 212	Data Structure and Algorithms	3
6	CS 223	Digital Logic and Design	3
7	CS 224	Operating Systems	4
8	CS 242	Introduction to Database Systems	4
9	SE 203	Introduction to Software Engineering	3
10	CS 372	Computer Communications and Networks	3
11	SE 431	Human Computer Interaction	3
12	CS 400	Senior Design Project	6

Computer Science – Core Courses (18 Credit Hours)

#	Code	Course Title	Cr. Hrs.
13	CS 322	Computer Organization and Assembly Language	3
14	CS 314	Theory of Automata & Formal Languages	3
15	CS 213	Design and Analysis of Algorithms	3
16	CS 451	Artificial Intelligence	3
17	CS 321	Computer Architecture	3
18	CS 411	Compiler Construction	3

Computer Science Elective Courses (Minimum 21 Credit hours)

Students of BSCS are required to pass a minimum of 21 credit hours from the courses given below. This is a tentative list and Department of CS & SE may offer other courses to students based on educational trends.

Code	Course Title	Cr. Hrs.
CS 443	Advance Database Management Systems	3
SE 241	Advanced Computer Programming	3
SE 301	Advanced Software Engineering	3
CS 452	Artificial Neural Networks	3
SE 452	Business Process Automation	3
IT 372	Communication Systems Design	3
IT 374	Communication Technologies	3
CS 361	Computer Graphics	3
CS 471	Data and Network Security	3
CS 371	Data Communication	3
CS 474	Data Security and Encryption	3
CS 341	Database Technologies	3
SE 432	Design Patterns	3
CS 491	Digital Signal Processing	3
SE 381	Distributed Application Development	3
SE 342	Distributed Computing	3
SE 343	Enterprise System Development	3
IT 442	Information Retrieval	3
MG 491	Information System Audit	3
IT 341	Information Systems	3
BI 391	Introduction to Bio-Informatics	3
CS 446	Introduction to Data Mining	3
IT 441	Introduction to Data Warehousing	3
CS 492	Introduction to Digital Image Processing	3
IT 373	Introduction to Information Security	3
SE 359	Introduction to Software Metrics	3
IT 451	Knowledge-Based Systems	3
CS 422	Microprocessor Interfacing	3
IT 332	Mobile Application Development	3
SE 321	Object Oriented Analysis and Design	3
CS 402	Operations Research	3
IT 391	Organizational Behaviour	3
CS 431	Principles of Programming Languages	3
CS 426	Real-Time Systems	3
CS 362	Simulation and Modelling	3
SE 481	Software Development Technologies	3
SE 361	Software Engineering Economics	3
SE 472	Software Testing	3

Code	Course Title	Cr. Hrs.
CS 421	System Programming	3
IT 481	Technology Management	3
CS 473	Telecommunication Systems	3
CS 401	Topics in Computer Science	3
IT 491	Topics in Information Technology	3
SE 491	Topics in Software Engineering	3
CS 331	Visual Programming	3
SE 341	Web Based Application Development	3
CS 432	Web Engineering	3
IT 333	Web Services	3
CS 472	Wireless Networks	3
IT 361	Multimedia Systems and Design	3
IT 181	Fundamentals of Information Technology	3
IT 371	Systems and Network Administration	3
IT 421	System Integration and Architecture	3
IT 471	Introduction to Network Security	3
IT 331	Web Systems and Technologies	3
SE 302	Software Construction	3
SE 331	Software Design and Architecture	3
SE 322	Formal Methods in Software Engineering	3
SE 461	Software Project Management	3
SE 471	Software Quality Engineering	3
SE 311	Software Requirements Engineering	3

General Education Courses

University Required Courses (24 credit hours)

#	Code	Course Title	Cr. Hrs
1	GC 101	Understanding Quran - I	3
2	GC 103	Understanding Quran - II	3
3	GC 102	English I (English Composition & Comprehension)	3
4	GC 104	English II (Communication Skills)	3
5	GC 105	Basics of Academic Writing	3
6	GC 106	Islamic World View & Civilization - I	3
7	GC 107	Islamic World View & Civilization – II	3
8	GC 109	Pakistani Culture & Society	3

Other courses (Minimum 27 Credit Hours)

Students of BSCS are required to pass a minimum of 27 credit hours from the courses given below. This is a tentative list and the Department of CS & SE may offer other courses to students based on educational trends.

Code	Course Title	Cr. Hrs
MATH 110	Calculus & Analytical Geometry	3
MATH 121	Linear Algebra	3
MATH 352	Multivariate Calculus	3
MATH 401	Numerical Computing	3
MATH 241	Differential Equation	3
ST 301	Probability & Statistics	3
GE 112	Professional & Ethical Issues	3
GC 191	Basic Electronics	3
GC 151	Introduction to Finance	3
GC 152	Introduction to Management	3
GC 204	Introduction to Sociology	3
GC 205	Introduction to Psychology	3
GC 131	Media Studies	3
GE 401	Entrepreneurship	3
GE 402	Industrial Seminar	1

Tentative Semester Wise Course Offering (BSCS)

Tentative course offering plan for BS Computer Science degree offered from Fall 2013 is given below in a semester wise format:

1st Semester

Course Code	Pre-Req	Course Title	Credit Hrs
CS 102	-	Introduction to Computing	4
MATH 110	-	Calculus & Analytical Geometry	3
GC 102	-	English I (English Composition & Comprehension)	3
GC 191	-	Basic Electronics	3
CS 291	-	Discrete Structures	3
Total Credit Hrs			16

2nd Semester

Course Code	Pre-Req	Course Title	Credit Hrs
CS 111	-	Programming Fundamentals	4
CS 223	GC 191	Digital Logic and Design	3
GC 104	-	English II (Communication Skills)	3
ST 301	-	Probability & Statistics	3
GC 101	-	Understanding Quran I	3
Total Credit Hrs			16

3rd Semester

Course Code	Pre-Req	Course Title	Credit Hrs
CS 103	CS 111	Object Oriented Programming	3
CS 242	-	Introduction to Database Systems	4
GC 105	-	Basics of Academic Writing	3
GC 103	-	Understanding Quran II	3
SE 203	SE 101	Introduction to Software Engineering	3
Total Credit Hrs			16

4th Semester

Course Code	Pre-Req	Course Title	Credit Hrs
CS 212	SE 101	Data Structure & Algorithms	3
CS 224	-	Operating System	4
GC 106	-	Islamic World View & Civilization-I	3
MATH 352	MATH 110	Multivariate Calculus	3
-	-	General Education Course	3
-	-	Elective – I	3
Total Credit Hrs			19

5th Semester

Course Code	Pre-Req	Course Title	Credit Hrs
CS 321	CS 223	Computer Architecture	3
CS 213	CS 212	Design and Analysis of Algorithms	3
-	-	General Education Course	3
MATH 121	-	Linear Algebra	3
GC 107	-	Islamic World View & Civilization-II	3
-	-	Elective – II	3
Total Credit Hrs			18

6th Semester

Course Code	Pre-Req	Course Title	Credit Hrs
CS 322		Computer Organization & Assembly Language	3
CS 314	CS 291	Theory of Automata & Formal Languages	3
CS 372	-	Computer Communications & Networks	3
-	-	Elective – III	3
-	-	Elective – IV	3
-	-	General Education Course	3
Total Credit Hrs			18

7th Semester

Course Code	Pre-Req	Course Title	Credit Hrs
CS 411	CS 314	Compiler Construction	3
CS 451		Artificial Intelligence	3
SE 431	-	Human Computer Interaction	3
-	-	Elective – V	3
-	-	Elective – VI	3
-	-	Elective – VII	3
Total Credit Hrs			18

8th Semester

Course Code	Pre-Req	Course Title	Credit Hrs
CS 400		Senior Design Project	6
GC 109	-	Pakistan Culture & Society	3
-	-	General Education Course	3
Total Credit Hrs			12

Bachelor of Science in Computer Science (BSCS)

Scheme of Studies

(2014 - 2017)

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Degree Requirements (minimum 134 Credit hours)

Category	Grouping	Credit Hours	% of Total Courses
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	Computer Science – Core Courses	18	
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General Education Courses	University Required Courses (UR)	24	38%
	Other Courses*	27	
Total Credit hours		134	
*Minimum credit hours required from the course offered in the group			

Computer Science Courses

Computing – Core Courses (44 Credit Hours)

#	Code	Course Title	Cr. Hrs.
1	CS 102	Introduction to Computing	4
2	CS 111	Programming Fundamentals	4
3	SE 101	Object Oriented Paradigm	4
4	CS 291	Discrete Structures	3
5	CS 212	Data Structure and Algorithms	3
6	CS 223	Digital Logic and Design	3
7	CS 224	Operating Systems	4
8	CS 242	Introduction to Database Systems	4
9	SE 203	Introduction to Software Engineering	3
10	CS 372	Computer Communications and Networks	3
11	SE 431	Human Computer Interaction	3
12	CS 400	Senior Design Project	6

Computer Science – Core Courses (18 Credit Hours)

#	Code	Course Title	Cr. Hrs.
13	CS 322	Computer Organization and Assembly Language	3
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Computer Science Elective Courses (Minimum 21 Credit hours)

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IT 374	Communication Technologies	3
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CS 371	Data Communication	3
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SE 342	Distributed Computing	3
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MG 491	Information System Audit	3
IT 341	Information Systems	3
BI 391	Introduction to Bio-Informatics	3
CS 446	Introduction to Data Mining	3
IT 441	Introduction to Data Warehousing	3
CS 492	Introduction to Digital Image Processing	3
IT 373	Introduction to Information Security	3
SE 359	Introduction to Software Metrics	3
IT 451	Knowledge-Based Systems	3
CS 422	Microprocessor Interfacing	3
IT 332	Mobile Application Development	3
SE 321	Object Oriented Analysis and Design	3
CS 402	Operations Research	3
IT 391	Organizational Behaviour	3
CS 431	Principles of Programming Languages	3
CS 426	Real-Time Systems	3
CS 362	Simulation and Modelling	3
SE 481	Software Development Technologies	3
SE 361	Software Engineering Economics	3
SE 472	Software Testing	3
CS 421	System Programming	3

Code	Course Title	Cr. Hrs.
IT 481	Technology Management	3
CS 473	Telecommunication Systems	3
CS 401	Topics in Computer Science	3
IT 491	Topics in Information Technology	3
SE 491	Topics in Software Engineering	3
CS 331	Visual Programming	3
SE 341	Web Based Application Development	3
CS 432	Web Engineering	3
IT 333	Web Services	3
CS 472	Wireless Networks	3
IT 361	Multimedia Systems and Design	3
IT 181	Fundamentals of Information Technology	3
IT 371	Systems and Network Administration	3
IT 421	System Integration and Architecture	3
IT 471	Introduction to Network Security	3
IT 331	Web Systems and Technologies	3
SE 302	Software Construction	3
SE 331	Software Design and Architecture	3
SE 322	Formal Methods in Software Engineering	3
SE 461	Software Project Management	3
SE 471	Software Quality Engineering	3
SE 311	Software Requirements Engineering	3

General Education Courses

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1	GC 101	Understanding Quran - I	3
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5	GC 105	Basics of Academic Writing	3
6	GC 106	Islamic World View & Civilization - I	3
7	GC 107	Islamic World View & Civilization – II	3
8	GC 109	Pakistani Culture & Society	3

Other courses (Minimum 27 Credit Hours)

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Code	Course Title	Cr. Hrs.
MATH 110	Calculus & Analytical Geometry	3
MATH 121	Linear Algebra	3
MATH 352	Multivariate Calculus	3
MATH 401	Numerical Computing	3
MATH 241	Differential Equation	3
ST 301	Probability & Statistics	3
GE 112	Professional & Ethical Issues	3
GC 191	Basic Electronics	3
GC 151	Introduction to Finance	3
GC 152	Introduction to Management	3
GC 204	Introduction to Sociology	3
GC 205	Introduction to Psychology	3
GC 131	Media Studies	3
GE 401	Entrepreneurship	3
GE 402	Industrial Seminar	1

Tentative Semester Wise Course Offering (BSCS)

Tentative course offering plan for BS Computer Science degree offered from Fall 2014-17 is given below in a semester wise format:

1st Semester

Course Code	Pre-Req	Course Title	Credit Hrs
CS 102	-	Introduction to Computing	4
MATH 110	-	Calculus & Analytical Geometry	3
GC 102	-	English I (English Composition & Comprehension)	3
GC 191	-	Basic Electronics	3
CS 291	-	Discrete Structures	3
Total Credit Hrs			16

2nd Semester

Course Code	Pre-Req	Course Title	Credit Hrs
CS 111	-	Programming Fundamentals	4
CS 223	GC 191	Digital Logic and Design	3
GC 104	-	English II (Communication Skills)	3
ST 301	-	Probability & Statistics	3
GC 101	-	Understanding Quran I	3
Total Credit Hrs			16

3rd Semester

Course Code	Pre-Req	Course Title	Credit Hrs
SE 101	CS 111	Object Oriented Paradigm	4
CS 242	-	Introduction to Database Systems	4
GC 105	-	Basics of Academic Writing	3
GC 103	-	Understanding Quran II	3
SE 203	SE 101	Introduction to Software Engineering	3
Total Credit Hrs			17

4th Semester

Course Code	Pre-Req	Course Title	Credit Hrs
CS 212	SE 101	Data Structure & Algorithms	3
CS 224	-	Operating System	4
GC 106	-	Islamic World View & Civilization-I	3
MATH 352	MATH 110	Multivariate Calculus	3
-	-	General Education Course	3
-	-	Elective – I	3
Total Credit Hrs			19

5th Semester

Course Code	Pre-Req	Course Title	Credit Hrs
CS 321	CS 223	Computer Architecture	3
CS 213	CS 212	Design and Analysis of Algorithms	3
-	-	General Education Course	3
MATH 121	-	Linear Algebra	3
GC 107	-	Islamic World View & Civilization-II	3
-	-	Elective – II	3
Total Credit Hrs			18

6th Semester

Course Code	Pre-Req	Course Title	Credit Hrs
CS 322	CS 223	Computer Organization & Assembly Language	3
CS 314	CS 291	Theory of Automata & Formal Languages	3
CS 372	-	Computer Communications & Networks	3
-	-	Elective – III	3
-	-	Elective – IV	3
-	-	General Education Course	3
Total Credit Hrs			18

7th Semester

Course Code	Pre-Req	Course Title	Credit Hrs
CS 411	CS 314	Compiler Construction	3
CS 451	CS 291	Artificial Intelligence	3
SE 431	-	Human Computer Interaction	3
-	-	Elective – V	3
-	-	Elective – VI	3
-	-	Elective – VII	3
Total Credit Hrs			18

8th Semester

Course Code	Pre-Req	Course Title	Credit Hrs
CS 400	-	Senior Design Project	6
GC 109	-	Pakistan Culture & Society	3
-	-	General Education Course	3
Total Credit Hrs			12