

## **Requirements for B.S. Degree in Computer Science**

### **Course Contents**

#### **Summary of Computer Science Degree Requirements**

<b>Category</b>	<b>Credit Hours</b>
Computing Core Courses	40
Computer Science – Core Courses	21
Computer Science - Technical Electives	18
Mathematics	15
Natural Sciences	06
Humanities and Social Sciences	30
Total Credit Hours	130

<b>(a) General Education Requirements (51 credit hours)</b>	<b>Credit Hours</b>
Mathematics	15
	MA 101 (Calculus I)
	MA 102 (Calculus II)
	MA 210 (Linear Algebra)
	MA 250 (Probability and Statistics)
	MA 310 (Numerical Analysis)
Natural Sciences	06
	NS 101 (Mechanics and Wave Motion)
	NS 103 (Electricity and Magnetism)
Humanities and Social Sciences	
English	09
	EN 101 (Writing Workshop)
	EN 201 (Communication Skills)
	EN 205 (Business and Technical Writing)
Humanities	13
	HM 150 (Islamic Studies I)
	HM 250 (Islamic Studies II)
	HM 260 (Arabic Language)
	Two electives*
Social Sciences	08
	SS 170 (Pakistan Studies)
	Two electives**
	51

\* The following courses are potential electives in the Humanities area:  
 Introduction to Islamic History, Introduction to Psychology, Introduction to Philosophy, Comparative Religions, English Literature, Urdu Literature, Chinese/French /German/Japanese Language

\*\* The following courses are potential electives in the Social Sciences area:  
 Introduction to Economics, Introduction to Social Sciences, Introduction to Political Science, Introduction to Management, Introduction to Sociology, History of Civilization

<b>(b) Core Courses in Computing (40 credit hours)</b>		<b>Credit Hours</b>
Introduction to Computing	CMP 100	3
Programming Fundamentals	CMP 140	3
Discrete Mathematics	CMP 200	4
Data Structures and Algorithms	CMP 210	3
Digital Logic Design	CMP 120	3
Digital Logic Design Lab	CMP 121	1
Computer Organization and Assembly Language	CMP 223	3
Computer Organization and Assembly Language Lab	CMP 224	1
Object Oriented Programming	CMP 240	3
Software Engineering	CMP 290	3
Operating Systems	CMP 320	3
Computer Networks	CMP 330	3
Computer Networks Lab	CMP 331	1
Database Systems	CMP 370	3
Object Oriented Analysis and Design	CMP 390	3
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		40
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<b>(c) Core Courses in Computer Science (21 credit hours)</b>		<b>Credit Hours</b>
Theory of Automata and Formal Languages	CS 211	3
Analysis of Algorithms	CS 310	3
Internet Programming	CS 340	3
Artificial Intelligence	CS 360	3
Systems Programming	CS 420	3
Capstone Project I	CS 490	3
Capstone Project II	CS 491	3
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		21
		<hr/>
<b>(d) Elective Courses in Computer Science (18 credit hours)</b>		<b>Credit Hours</b>
The following is a list of <u>sample</u> elective courses		
Advance Database	CS 371	3
Internetworking with UNIX TCP/IP	CS 430	3
Network Security	CS 431	3
Wireless Communications and Systems	CS 432	3
Programming Languages	CS 440	3
Compiler Construction	CS 443	3
Computer Graphics	CS 450	3
Human Computer Interaction	CS 451	3
Data Warehousing	CS 470	3
Data Mining	CS 471	3
Geographical Information System	CS 472	3
Project Management	CS 492	3
Design Patterns	CS 494	3

## Requirements for B.S. Degree in Computer Science

### Semester-wise Plan of Courses

#### Fall Semester

#### Spring Semester

#### First Year

CMP 100	Introduction to Computing	3	CMP 140	Programming Fundamentals	3
MA 101	Calculus I	3	CMP 120	Digital Logic Design	3
NS 101	Mechanics and Wave Motion	3	CMP 121	Digital Logic Design Lab	1
EN 101	Writing Workshop	3	MA 102	Calculus II	3
HM 150	Islamic Studies I	2	NS 103	Electricity and Magnetism	3
			SS x7x	Social Science Elective	3
		<b>14</b>			<b>16</b>

#### Second Year

CMP 200	Discrete Mathematics	4	CMP 210	Data Structures and Algorithms	3
CMP 223	Comp Org and Assembly Lang	3	CMP 290	Software Engineering	3
CMP 224	Comp Org and Assembly Lang Lab	1	CS 211	Theory of Auto. & For. Lang.	3
CMP 240	Object Oriented Programming	3	MA 250	Probability and Statistics	3
EN 201	Communication Skills	3	EN 205	Technical and Business Writing	3
HM 260	Arabic Language	3	HM 250	Islamic Studies II	2
		<b>17</b>			<b>17</b>

#### Third Year

CMP 320	Operating Systems	3	CMP 330	Computer Networks	3
MA 210	Linear Algebra	3	CMP 331	Computer Networks Lab	1
CMP 370	Database Systems	3	CMP 390	Object Oriented Analysis and Design	3
CS 310	Analysis of Algorithms	3	CS 360	Artificial Intelligence	3
MA 310	Numerical Analysis	3	CS 340	Internet Programming	3
HM x5x	Humanities Elective	3	CS xxx	Technical Elective	3
			SS 170	Pakistan Studies	2
		<b>18</b>			<b>18</b>

#### Fourth Year

CS 490	Capstone Project I	3	CS 491	Capstone Project II	3
CS 420	System Programming	3	CS xxx	Technical Elective	3
CS xxx	Technical Elective	3	CS xxx	Technical Elective	3
CS xxx	Technical Elective	3	CS xxx	Technical Elective	3
HM x5x	Humanities Elective	3	SS x7x	Social Science Elective	3
		<b>15</b>			<b>15</b>