

Requirements for B.S. Degree in Software Engineering **Course Contents**

Summary of Software Engineering Degree Requirements

Category	Credit Hours
Computing Core Courses	40
Software Engineering – Core Courses	27
Software Engineering - Technical Electives	12
Mathematics	12
Natural Sciences	06
Humanities and Social Sciences	33
Total Credit Hours	130

(a) General Education Requirements (51 credit hours)	Credit Hours																																																			
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;"></td> <td>MA 101 (Calculus I)</td> <td></td> </tr> <tr> <td></td> <td>MA 102 (Calculus II)</td> <td></td> </tr> <tr> <td style="vertical-align: top;">Mathematics</td> <td>MA 210 (Linear Algebra)</td> <td style="text-align: right; vertical-align: top;">12</td> </tr> <tr> <td></td> <td>MA 250 (Probability and Statistics)</td> <td></td> </tr> <tr> <td style="vertical-align: top;">Natural Sciences</td> <td>NS 101 (Mechanics and Wave Motion)</td> <td style="text-align: right; vertical-align: top;">06</td> </tr> <tr> <td></td> <td>NS 103 (Electricity and Magnetism)</td> <td></td> </tr> <tr> <td colspan="3">Humanities and Social Sciences</td> </tr> <tr> <td style="vertical-align: top;">English</td> <td>EN 101 (Writing Workshop)</td> <td></td> </tr> <tr> <td></td> <td>EN 201 (Communication Skills)</td> <td style="text-align: right; vertical-align: top;">09</td> </tr> <tr> <td></td> <td>EN 205 (Business and Technical Writing)</td> <td></td> </tr> <tr> <td style="vertical-align: top;">Humanities</td> <td>HM 150 (Islamic Studies I)</td> <td></td> </tr> <tr> <td></td> <td>HM 250 (Islamic Studies II)</td> <td style="text-align: right; vertical-align: top;">13</td> </tr> <tr> <td></td> <td>HM 260 (Arabic Language)</td> <td></td> </tr> <tr> <td></td> <td>Two electives*</td> <td></td> </tr> <tr> <td style="vertical-align: top;">Social Sciences</td> <td>SS 170 (Pakistan Studies)</td> <td style="text-align: right; vertical-align: top;">11</td> </tr> <tr> <td></td> <td>Three electives**</td> <td></td> </tr> <tr> <td></td> <td></td> <td style="text-align: right; border-top: 1px solid black; border-bottom: 3px double black;">51</td> </tr> </table>		MA 101 (Calculus I)			MA 102 (Calculus II)		Mathematics	MA 210 (Linear Algebra)	12		MA 250 (Probability and Statistics)		Natural Sciences	NS 101 (Mechanics and Wave Motion)	06		NS 103 (Electricity and Magnetism)		Humanities and Social Sciences			English	EN 101 (Writing Workshop)			EN 201 (Communication Skills)	09		EN 205 (Business and Technical Writing)		Humanities	HM 150 (Islamic Studies I)			HM 250 (Islamic Studies II)	13		HM 260 (Arabic Language)			Two electives*		Social Sciences	SS 170 (Pakistan Studies)	11		Three electives**				51	
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* 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) Core Courses in Computing (40 credit hours)		Credit Hours
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
		40

(c) Core Courses in Software Engineering (27 credit hours)		Credit Hours
Analysis of Algorithms	SE 310	3
Enterprise System Development	SE 342	3
Software Requirements Engineering	SE 390	3
Software Design and Architecture	SE 391	3
Human Computer Interaction	SE 451	3
Software Project Management	SE 492	3
Software Quality Assurance	SE 493	3
Capstone Project I	SE 490	3
Capstone Project II	SE 491	3
		27

(d) Elective Courses in Software Engineering (12 credit hours) Credit Hours
The following is a list of sample elective courses

Theory of Automata and Formal Languages	CS 211	3
Artificial Intelligence	CS 360	3
Advance Databases	CS 371	3
Network Security	CS 431	3
Compiler Construction	CS 443	3
Programming Languages	CS 440	3
Computer Graphics	CS 450	3
Data Warehousing	CS 470	3
Data Mining	CS 471	3
Internet Programming	SE 340	3
System Programming	SE 420	3
Internetworking with UNIX TCP/IP	SE 430	3
Visual Programming	SE 441	3
Software Development Technologies	SE 442	3
Semantic Web	SE 461	3
Geographical Information System	SE 472	3
Design Patterns	SE 495	3

Requirements for B.S. Degree in Software Engineering

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
	14		16

Second Year

CMP 200 Discrete Mathematics	4	CMP 210 Data Structures and Algorithms	3
CMP 240 Object Oriented Programming	3	CMP 290 Software Engineering	3
CMP 223 Comp Org and Assembly Lang	3	MA 210 Linear Algebra	3
CMP 224 Comp Org and Assembly Lang Lab	1	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
	17		17

Third Year

CMP 320 Operating Systems	3	CMP 330 Computer Networks	3
CMP 370 Database Systems	3	CMP 331 Computer Networks Lab	1
CMP 390 OO Analysis and Design	3	SE 392 Software Design and Architecture	3
SE 310 Analysis of Algorithm	3	SE 342 Enterprise System Development	3
SE 391 Software Requirements Engineering	3	SE xxx Technical Elective	3
HM x5x Humanities Elective	3	SS 170 Pakistan Studies	2
		SS x7x Social Science Elective	3
	18		18

Fourth Year

SE 490 Capstone Project I	3	SE 491 Capstone Project II	3
SE 492 Software Project Management	3	SE xxx Technical Elective	3
SE 493 Software Quality Assurance	3	SE xxx Technical Elective	3
SE 451 Human Computer Interaction	3	SE xxx Technical Elective	3
HM x5x Humanities Elective	3	SS x7x Social Science Elective	3
	15		15