

## ANNEX-A

### Course Outline for Proposed B.Sc. Software Engineering Curriculum

#### COURSES FOR FIRST YEAR

Total credit hours=134

Number of courses =44

##### 1<sup>st</sup> Semester

COURSE NO.	COURSE NAME	CREDIT HOURS	
		Part I	Part II
SE-101	Information and Communication Technologies	3	1
SE-102	Introduction to Software Engineering	3	0
MA-103	Calculus and Analytical Geometry	3	0
HU-104	Functional English	3	0
HU-105	Pakistan Studies	2	0
MDE-106	Occupational Health and Safety	1	0
<b>Total</b>		<b>15</b>	<b>1</b>
<b>Semester Total for Part-I &amp; II</b>		<b>16</b>	

##### 2<sup>nd</sup> Semester

COURSE NO.	COURSE NAME	CREDIT HOURS	
		Part I	Part II
MA-107	Applied Physics	3	0
SE-108	Discrete Structures	3	0
SE-109	Software Requirements Engineering	2	1
SE-110	Computer Programming	3	1
MA-111	Linear Algebra and Differential Equations	3	0
HU-112	Communication Skills	2	0
<b>Total</b>		<b>16</b>	<b>2</b>
<b>Semester Total for Part-I &amp; II</b>		<b>18</b>	
<b>Total for 1<sup>st</sup> Year</b>		<b>34</b>	

#### COURSES FOR 2<sup>nd</sup> YEAR

##### 3<sup>rd</sup> Semester

COURSE NO.	COURSE NAME	CREDIT HOURS	
		Part I	Part II
HU-201	Islamic Studies/Ethics	2	0
SE-202	Data Structures and Algorithm	3	1
MA-203	Numeric and Symbolic Computing	3	0
HU-204	Technical Writing and Presentation Skills	3	0
SE-205	Software Design and Architecture	3	1
<b>Total</b>		<b>14</b>	<b>2</b>
<b>Semester Total for Part-I &amp; II</b>		<b>16</b>	

**4<sup>th</sup> Semester**

COURSE NO.	COURSE NAME	CREDIT HOURS	
MA-206	Probability and Statistics	3	0
SE-207	Object Oriented Programming	3	1
SE-208	Database Systems	3	1
SS-209	Engineering Economics	3	0
SE-210	Operating Systems	3	1
<b>Total</b>		15	3
<b>Semester Total for Part-I &amp; II</b>		<b>18</b>	
<b>Total for 2<sup>nd</sup> Year</b>		<b>34</b>	

**COURSES FOR 3<sup>rd</sup> YEAR****5<sup>th</sup> Semester**

COURSE NO.	COURSE NAME	CREDIT HOURS	
		Part I	Part II
SE-301	Software Quality Engineering	3	1
MG-302	Entrepreneurship	2	0
SE-303	Formal Methods in Software Engineering	3	0
SE-304	Computer Networks	3	1
SE-305	Web Engineering	3	1
<b>Total</b>		14	3
<b>Semester Total for Part-I &amp; II</b>		<b>17</b>	

**6<sup>th</sup> Semester**

COURSE NO.	COURSE NAME	CREDIT HOURS	
SE-306	Design and Analysis of Algorithms	3	0
SE-307	Software Construction and Development	2	1
SE-308	Digital Image Processing	3	1
MDE-309	Embedded Systems	3	0
SE-xxx	SE Elective I	3	0
<b>Total</b>		14	2
<b>Semester Total for Part-I &amp; II</b>		<b>16</b>	
<b>Total for 3<sup>rd</sup> Year</b>		<b>33</b>	

**COURSES FOR FINAL YEAR****7<sup>th</sup> Semester**

COURSE NO.	COURSE NAME	CREDIT HOURS	
SE-401	Software Project Management	2	1
SE-402	Final Year Project-I	0	2
SE-403	Information Security	3	0
MG-404	Management and Marketing	2	0
SE-xxx	SE Elective II	3	0
SE-xxx	SE Elective III	3	0
<b>Total</b>		13	3
<b>Semester Total for Part-I &amp; II</b>		<b>16</b>	

**8<sup>th</sup> Semester**

COURSE NO.	COURSE NAME	CREDIT HOURS	
		Part I	Part II
SE-405	Human Computer Interaction	3	0
SE-406	Final Year Project II	0	4
SS-407	Civics and Community Engagement	0	2
MDE-408	Internet of Things	3	0
HU-409	Foreign Language	2	0
SE-xxx	SE Elective IV	3	0
<b>Total</b>		<b>11</b>	<b>6</b>
<b>Semester Total for Part-I &amp; II</b>		<b>17</b>	
<b>Total for Final Year</b>		<b>33</b>	
<b>Grand Total for Four Years</b>		<b>134</b>	

xxx means course number from the elective list below

**SOFTWARE ENGINEERING ELECTIVE COURSES**

COURSE NO.	COURSE TITLE
SE-X11	Software Testing
SE-X12	Real Time Systems
SE-X13	Machine Learning
SE-X14	Computer Vision
SE-X15	Wireless Networks
SE-X16	Advance Database Management System
SE-X17	Enterprise System Engineering
SE-X18	Data Security and Encryption
SE-X19	Design Patterns
SE-X20	Artificial Neural Networks
SE-X21	Software Metrics
SE-X22	Robotic Process Automation
SE-X23	Advance Software Technologies
SE-X24	Automata Theory & Formal Languages
SE-X25	Fault Tolerant and Survivable Systems
SE-X26	Financial and E-Commerce Systems
SE-X27	Multimedia Forensics
SE-X28	Semantic Web
SE-X29	Visual Programming
SE-X30	Multimedia Systems
SE-X31	Compiler Construction
SE-X32	Advance Operating Systems
SE-X33	Data Warehousing & Data Mining
SE-X34	Introduction to Bioinformatics
SE-X35	Agent Based Software Engineering
SE-X36	Big Data Analytics
SE-X37	Computer Graphics
SE-X38	E-Commerce
SE-X39	Game Application Development
SE-X40	Global Software Development
SE-X41	Information Systems Audit
SE-X42	Management Information Systems

SE-X43	Mobile Application Development
SE-X44	Multimedia Communication
SE-X45	Natural Language Processing
SE-X46	Systems Programming
SE-X47	Advanced Topics in Software Engineering
SE-X48	Deep Learning
SE-X49	High Performance Computing
SE-X50	Artificial Intelligence
SE-X51	Social Network Analysis
SE-X52	Data visualization
SE-X53	Distributed and Cloud Computing
SE-X54	Blockchain Technologies and Applications

X denotes 3 or 4