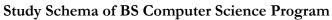


#### SUKKUR IBA UNIVERSITY

#### DEPARTMENT OF COMPUTER SCIENCE





Annexure – A

# Proposed Scheme of Studies for BS in Computer Science (Fall-2020—Spring-2024)

## Structure of BS (CS) Program

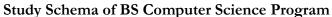
#### Areas Covered in BS CS program

	Credit		
Course Group	hours		
General Education	16		
University Electives	09		
Mathematics & Science Foundation	12		
Computing – Core	39		
Common courses 76 CH (63-13)			
Domain (CS)			
Domain Core (CS)	24		
Domain Supporting (CS)	09		
Domain Electives (CS)	21		
Domain courses (54 CH)			
TOTAL	130		



## SUKKUR IBA UNIVERSITY







#### • General Education

	General Education Courses (Credit Hours: 16)			
#	Code	Course Title	Credit Hours	Proposed Semester
1	HUM-101	Islamic Studies/Ethics	2 (2 + 0)	Semester-I
2	HUM-102	Pakistan Studies	2 (2 + 0)	Semester-I
3	ENG-101	English Composition & Comprehension	3 (3 + 0)	Semester-I
4	ENG-150	Communication and Presentation Skills	3 (3 + 0)	Semester-II
5	ENG-201	Technical Writing	3 (3 + 0)	Semester-IV
6	CSC-101	Introduction to Information and Communication Technology (ICT)	3 (2 + 1)	Semester-I
	Total 16			

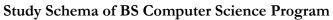
• University Elective Courses

University Elective Courses (Required Credit Hours: 09)			
#	Course Title	Credit Hours	
1.	Principles of Management	3 (3 + 0)	
2.	E-Business Management	3 (3 + 0)	
3.	Technology Entrepreneurship	3 (3 + 0)	
4.	Professional Practices	3 (3 + 0)	
5.	Financial Accounting	3 (3 + 0)	
6.	Research Methods in Computer Science	3 (3 + 0)	
7.	Management Information Systems	3 (3 + 0)	
8.	Organizational Behavior	3 (3 + 0)	
9.	Human Resource Management	3 (3 + 0)	



## SUKKUR IBA UNIVERSITY







University Elective Courses (Required Credit Hours: 09)		
10.	Financial Accounting	3 (3 + 0)
11.	Financial Management	3 (3 + 0)
12.	Principles of Marketing	3 (3 + 0)
13.	Introduction to Economics	3 (3 + 0)
14.	Psychology	3 (3 + 0)
15.	International Relations	3 (3 + 0)
16.	Foreign/Regional Language (French, German, Sindhi, Punjabi, Urdu etc.)	3 (3 + 0)
17.	Philosophy	3 (3 + 0)
18.	System Analysis & Design	3 (3 + 0)

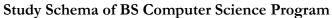
#### • Mathematics and Science Foundation:

	Mathematics and Science Foundation Courses (Credit Hours: 12)			
#	Code	Course Title	Credit Hours	Proposed Semester
1	PHY-150	Applied Physics	3 (2 + 1)	Semester-II
2	MTS-150	Calculus and Analytic Geometry	3 (3 + 0)	Semester-II
3	MTS-250	Linear Algebra	3 (3 + 0)	Semester-IV
4	MTS-302	Probability and Statistics	3 (3 + 0)	Semester-V
5	MTS-101	Precalculus	Non- Credit	Semester-I
	Total			



## SUKKUR IBA UNIVERSITY

## DEPARTMENT OF COMPUTER SCIENCE





Computing Core

	Computing Core Courses (Credit Hours: 39)			
#	Code	Course Title	Credit Hours	Proposed Semester
1	CSC-102	Programming Fundamentals	4 (3 + 1)	Semester-I
2	CSC-151	Discrete Structures	3 (3 + 0)	Semester-II
3	CSC-150	Object-Oriented Programming	4 (3 + 1)	Semester-II
4	CSC-201	Data Structures	4 (3 + 1)	Semester-III
5	SWE-201	Software Engineering	3 (3 + 0)	Semester-III
6	CSC-252	Operating Systems	4 (3 + 1)	Semester-IV
7	CSC-302	Computer Networks	4 (3 + 1)	Semester-V
8	CSC-251	Database Systems	4 (3 + 1)	Semester-IV
9	CSC-353	Information Security	3 (3 + 0)	Semester-VI
10	FYP-401	Project-I	3 (0 + 3)	Semester-VII
11	FYP-451	Project-II	3 (0 + 3)	Semester-VIII
		Total	39	

• Computer Science Core

	Computer Science Core Courses (Credit Hours: 24)			
#	Code	Course Title	Credit Hours	Proposed Semester
1	CSC-250	Computer Organization and Assembly Language	4 (3 + 1)	Semester-IV
2	CSC-352	Theory of Automata	3(3+0)	Semester-VI
3	CSC-351	Design and Analysis of Algorithms	3 (3 + 0)	Semester-VI
4	CSC-350	Artificial Intelligence	4 (3 + 1)	Semester-VI
5	CSC-402	Compiler Construction	3 (3 + 0)	Semester-VII
6	ESE-201	Digital Logic Design	4 (3 + 1)	Semester-III



## **SUKKUR IBA UNIVERSITY**



#### DEPARTMENT OF COMPUTER SCIENCE

Study Schema of BS Computer Science Program

7	CSC-452	Parallel & Distributed Computing	3 (3 + 0)	Semester-VIII
		Total	24	

#### • Computer Science SUPPORTING

	Computer Science SUPPORTING Courses (Credit Hours: 09)			
#	Code	Course Title	Credit Hours	Proposed Semester
1	MTS-201	Multivariate Calculus	3 (3 + 0)	Semester-III
2	MTS-301	Differential Equations	3 (3+0)	Semester-V
3	CSC-403	Graph Theory	3 (3 + 0)	Semester-VI
		Total	09	

## • Computer Science Elective

Computer Science ELECTIVE Courses (Required Credit Hours: 21)			
#	Course Title	Credit Hours	
1	Numerical Computing	3 (3 + 0)	
2	Computer Graphics and Animations	3 (2 + 1)	
3	Software Project and Quality Management	3 (3 + 0)	
4	Multimedia Technologies	3 (3 + 0)	
5	Grid Computing	3 (3 + 0)	
6	Broadband Communication Networks	3 (3 + 0)	
7	Error Correction and Coding Techniques	3 (3 + 0)	
8	Cloud Computing	3 (3 + 0)	



# SUKKUR IBA UNIVERSITY



## DEPARTMENT OF COMPUTER SCIENCE

Study Schema of BS Computer Science Program

Cor	Computer Science ELECTIVE Courses (Required Credit Hours: 21)			
#	Course Title	Credit Hours		
9	Mobile Application Development	3 (2 + 1)		
10	Emerging Trends in Computing	3 (3 + 0)		
11	Independent Study	3 (3 + 0)		
12	Soft Computing	3 (3 + 0)		
13	Machine Learning	3 (3 + 0)		
14	Scientific Computing	3 (3 + 0)		
15	Digital Signal Processing	3 (3 + 0)		
16	Computer Vision	3 (3 + 0)		
17	Data and Network Security	3 (3 + 0)		
18	Wireless Networks	3 (3 + 0)		
19	Social Computing	3 (3 + 0)		
20	Data Mining	3 (3 + 0)		
21	Expert Systems	3 (3 + 0)		
22	Artificial Neural Network	3 (3 + 0)		
23	Fuzzy Logic	3 (3 + 0)		
24	Computational Intelligence	3 (3 + 0)		
25	Multi Agent System	3 (3 + 0)		
26	Natural Language Processing	3 (3 + 0)		



# SUKKUR IBA UNIVERSITY



## DEPARTMENT OF COMPUTER SCIENCE

Study Schema of BS Computer Science Program

Computer Science ELECTIVE Courses (Required Credit Hours: 21)			
#	Course Title	Credit Hours	
27	Game Development	3 (3 + 0)	
28	Logical paradigms of computing	3 (3 + 0)	
29	Formal Methods for Software Engineering	3 (3 + 0)	
30	Visual Programming	3(2+1)	
31	Software Verification and Validation	3 (3 + 0)	
32	Web Engineering (CSC-352)	3 (2 + 1)	
33	Network Security and Cryptography	3 (3 + 0)	
34	Complex Networks	3 (3 + 0)	
35	Information System Audit and Control	3 (3 + 0)	
36	Object Oriented Analysis and Design	3 (2 + 1)	
37	Big Data Analytics	3 (3 + 0)	
38	Business Intelligence	3 (3 + 0)	
39	Sensing Technologies	3 (3 + 0)	
40	Introduction to Semantic Web	3 (3 + 0)	
41	Social Network Analysis	3 (3 + 0)	
42	Pervasive and Ubiquitous computing	3 (3 + 0)	
43	Data Warehousing	3 (3 + 0)	
44	Deep Learning	3 (3 + 0)	



# SUKKUR IBA UNIVERSITY



#### DEPARTMENT OF COMPUTER SCIENCE

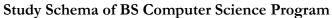
Study Schema of BS Computer Science Program

Computer Science ELECTIVE Courses (Required Credit Hours: 21)						
#	Course Title Credit Hours					
45	Blockchain	3 (3 + 0)				
46	Software Design & Architecture	3 (3 + 0)				
47	Human Computer Interaction	3 (3 + 0)				



## SUKKUR IBA UNIVERSITY

# DEPARTMENT OF COMPUTER SCIENCE





## Semester Wise Study Plan - BS Computer Science

## Semester I (Credit Hours: 14)

#	Code	Course Name	Category	Credit Hours	Pre- Requisite
1	CSC-101	Introduction to Information and Communication Technology (ICT)	General Education 1	3(2 + 1)	-NONE-
2	CSC-102	Programming Fundamentals	Computing Core 1	4 (3 + 1)	-NONE-
3	ENG-101	English Composition and Comprehension	General Education 2	3 (3 + 0)	-NONE-
4	MTS-101	Precalculus	Maths & Science 1	Non - Credit	-NONE-
5	HUM-101	Islamic Studies/Ethics	General Education 3	2 (2 + 0)	-NONE-
6	HUM-102	Pakistan Studies	General Education 4	2 (2 + 0)	-NONE-
_			Total Credit Hours	14	

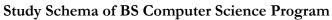
#### Semester II (Credit Hours: 16)

#	Code	Course Name	Category	Credit Hours	Pre- Requisite
1	CSC-150	Object-Oriented Programming	Computing Core 2	4 (3 + 1)	CSC-102
2	MTS-150	Calculus and Analytic Geometry	Maths & Science 2	3 (3 + 0)	MTS-101
3	ENG-150	Communication and Presentation Skills	General Education 5	3 (3 + 0)	None
4	CSC-151	Discrete Structures	Computing Core 3	3 (3 + 0)	-NONE-
5	PHY-150	Applied Physics	Maths & Science 3	3 (2 + 1)	-NONE-
			<b>Total Credit Hours</b>	16	_



## SUKKUR IBA UNIVERSITY

#### DEPARTMENT OF COMPUTER SCIENCE





## Semester III (Credit Hours: 17)

#	Code	Course Name	Category	Credit Hours	Pre- Requisite
1	CSC-201	Data Structures	Computing Core 4	4 (3 + 1)	CSC-102
2	ESE-201	Digital Logic Design	CS Core 1	4 (3 + 1)	-NONE
3	MTS-201	Multivariate Calculus	CS Support 1	3 (3 + 0)	MTS-150
4	SWE-201	Software Engineering	Computing Core 5	3 (3 + 0)	-NONE-
5	XXX-XXX	Uni – Elective – I	Uni – Elective 1	3 (3 + 0)	-NONE-
	Total Credit Hours				

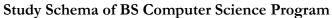
## Semester IV (Credit Hours: 18)

#	Code	Course Name	Category	Credit Hours	Pre- Requisite
1	CSC-250	Computer Architecture & Assembly Language	CS Core 2	4 (3 + 1)	ESE-201
2	CSC-251	Database Systems	Computing core 6	4 (3 + 1)	-NONE-
3	CSC-252	Operating Systems	Computing Core 7	4 (3 + 1)	-NONE-
4	MTS-250	Linear Algebra	Maths & Science 4	3 (3+0)	NONE-
5	ENG-201	Technical Writing	General Education 6	3 (3 + 0)	-NONE-
		18			



## SUKKUR IBA UNIVERSITY

### DEPARTMENT OF COMPUTER SCIENCE





## Semester V (Credit Hours: 19)

#	Code	Course Name	Category	Credit Hours	Pre- Requisite
1	xxx-xxx	CS Elective – I	CS Elective 1	3 (3 + 0)	-None-
2	MTS-301	Differential Equations	CS Support 2	3 (3 + 0)	MTS-150
3	MTS-302	Probability and Statistics	Maths & Science 5	3 (3 + 0)	-NONE-
4	xxx-xxx	Uni – Elective - II	Uni Elective 2	3 (3 + 0)	-NONE-
5	CSC-301	Computer Networks	Computing Core 8	4 (3 + 1)	-NONE-
6	xxx-xxx	CS – Elective II	CS Elective 2	3 (3 + 0)	-NONE-
	Total Credit Hours				

#### Semester VI (Credit Hours: 16)

#	Code	Course Name	Category	Credit Hours	Pre- Requisite
1	CSC-350	Artificial Intelligence	CS Core 3	4 (3 + 1)	-NONE-
2	CSC-351	Design and Analysis of Algorithms	CS Core 4	3 (3 + 0)	CSC-201
3	CSC-353	Information Security	Computing Core 9	3 (3 + 0)	-NONE-
4	CSC-352	Theory of Automata	CS Core 5	3 (3 + 0)	-CSC-151-
5	XXX-XXX	CS-Elective-IV	CS Elective 4	3 (3 + 0)	
	Total Credit Hours			16	



## SUKKUR IBA UNIVERSITY

# DEPARTMENT OF COMPUTER SCIENCE



Study Schema of BS Computer Science Program

#### **Semester VII (Credit Hours: 15)**

#	Code	Course Name	Category	Credit Hours	Pre- Requisite
1	CSC-402	Compiler Construction	CS Core 6	3 (3 + 0)	CSC-352
2	xxx-xxx	CS-Elective-III	CS Elective 3	3 (3 + 0)	
3	xxx-xxx	Uni – Elective - III	Uni Elective 3	3 (3 + 0)	-NONE-
4	CSC-403	Graph Theory	Computing Support 3	3 (3 + 0)	
5	FYP-401	Project-I	Computing Core 10	3 (0 + 3)	-NONE-
	Total Credit Hours 15				

#### **Semester VIII (Credit Hours: 15)**

#	Code	Course Name	Category	Credit Hours	Pre- Requisite
1	xxx-xxx	CS Elective-V	CS Elective 5	3 (3 + 0)	
2	XXX-XXX	CS Elective-VI	CS Elective 6	3 (3 + 0)	
3	xxx-xxx	CS-Elective-VII	CS Elective 7	3 (3 + 0)	
4	CSC-450	Parallel & Distributed Computing (Cloud Computing)	CS Core 7	3 (3 + 0)	CSC-251 CSC-301
5	FYP-451	Project-II	Computing Core 11	3 (0 + 3)	FYP-401
		15			