13. COURSES OF STUDY AND SCHEME OF ASSESSMENT
B Sc COMPUTER SYSTEMS AND DESIGN **(2021 REGULATIONS)**
(TOTAL CREDITS TO BE EARNED: 137*)

Course Code	Course Title	Hours / Week			Credits	Prerequisites	Maximum marks			CAT
		L	T	P			CA	FE	Total	
I SEMESTER										
21X101	CALCULUS AND ITS APPLICATIONS	3	2	0	4		50	50	100	BS
21X102	COMBINATORICS	3	0	0	3		50	50	100	BS
21X103	C PROGRAMMING	4	0	0	4		50	50	100	PC
21X104	ANALOG AND DIGITAL ELECTRONICS	3	0	0	3		50	50	100	BS
21X105	ENGLISH	3	0	0	3		50	50	100	HS
21X106	C PROGRAMMING LABORATORY	0	0	4	2		100	-	100	PC
21X107	WEB DESIGN LABORATORY	0	0	4	2		100	-	100	PC
21X108	ANALOG AND DIGITAL ELECTRONICS LABORATORY	0	0	4	2		100	-	100	BS
21X209	PERSONALITY AND CHARACTER DEVELOPMENT	0	0	** Refer Sem 2 and footnote						MC
Total 30 hrs		**16**	**2**	**12**	**23**		**550**	**250**	**800**	
II SEMESTER										
21X201	LINEAR ALGEBRA	3	2	0	4	21X101	50	50	100	BS
21X202	DISCRETE MATHEMATICS	3	2	0	4	21X101, 21X102	50	50	100	BS
21X203	COMPUTER ARCHITECTURE	3	0	0	3	21X104	50	50	100	PC
21X204	DATA STRUCTURES	3	0	0	3	21X103	50	50	100	PC
21X205	OBJECT ORIENTED PROGRAMMING WITH C++	3	0	0	3	21X103	50	50	100	PC
21X206	PYTHON PROGRAMMING LABORATORY	0	0	4	2		100	-	100	PC
21X207	DATA STRUCTURES LABORATORY	0	0	4	2		100	-	100	PC
21X208	OBJECT ORIENTED PROGRAMMING WITH C++	0	0	4	2		100	-	100	PC
21X209	PERSONALITY AND CHARACTER DEVELOPMENT	0	0		MC		** Grade ---			MC
Total 31 hrs		**15**	**4**	**12**	**23**		**550**	**250**	**800**	

***** Indicated is the minimum number of credits to be earned by a student.
** Total 40 hrs in semesters I & II put together. Grade: Completed / Not Completed.

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		L	T	P			CA	FE	Total	
III SEMESTER										
21X301	PROBABILITY & STATISTICS	3	2	0	4	21X101	50	50	100	BS
21X302	DATABASE MANAGEMENT SYSTEMS	3	0	0	3	21X204, 21X202	50	50	100	PC
21X303	MICROPROCESSORS AND MICROCONTROLLER	3	2	0	4	21X104, 21X203	50	50	100	PC
21X304	OPERATING SYSTEMS	3	0	0	3	21X203, 21X204	50	50	100	PC
21X305	ADVANCED DATA STRUCTURES AND ALGORITHMS ANALYSIS	3	0	0	3	21X204	50	50	100	PC
21X306	DATABASE MANAGEMENT SYSTEM LABORATORY	0	0	4	2		100	-	100	PC
21X307	OPERATING SYSTEMS LABORATORY	0	0	4	2		100	-	100	PC
21X308	ADVANCED DATA STRUCTURES AND ALGORITHMS ANALYSIS LABORATORY	0	0	4	2		100	-	100	PC
Total 31 hrs		**15**	**4**	**12**	**23**		**550**	**250**	**800**	
IV SEMESTER										
21X401	COMPUTER NETWORKS	3	0	0	3	21X203, 21X206	50	50	100	PC
21X402	JAVA PROGRAMMING	3	0	0	3	21X205, 21X304	50	50	100	PC
21X403	SOFTWARE ENGINEERING	3	0	0	3	21X205	50	50	100	PC
21X404	SYSTEM SOFTWARE	3	2	0	4	21X202, 21X204	50	50	100	PC
21X405	OPTIMIZATION TECHNIQUES	3	2	0	4	21X201, 21X301	50	50	100	BS
21X406	COMMUNICATION SKILLS	0	0	4	2	21X105	100	-	100	HS
21X407	COMPUTER NETWORKS LABORATORY	0	0	4	2		100	-	100	PC
21X408	JAVA PROGRAMMING LABORATORY	0	0	4	2		100	-	100	PC
Total 31 hrs		**15**	**4**	**12**	**23**		**550**	**250**	**800**	

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		L	T	P			CA	FE	Total	
V SEMESTER										
21X501	MOBILE COMPUTING AND APPLICATION DEVELOPMENT	3	0	0	3	21X401, 21X402	50	50	100	PC
21X502	COMPUTER GRAPHICS AND MULTIMEDIA	3	0	0	3	21X201, 21X204	50	50	100	PC
21X503	MACHINE LEARNING	3	0	0	3	21X201, 21X301, 21X405	50	50	100	PC
21X0__	PROFESSIONAL ELECTIVE I	3	2	0	4		50	50	100	PE
21X0__	PROFESSIONAL ELECTIVE II	3	2	0	4		50	50	100	PE
21X504	MOBILE COMPUTING AND APPLICATION DEVELOPMENT LABORATORY	0	0	4	2		100	-	100	PC
21X505	COMPUTER GRAPHICS AND MULTIMEDIA LABORATORY	0	0	4	2		100	-	100	PC
21X506	MACHINE LEARNING LABORATORY	0	0	4	2		100	-	100	PC
Total 31 hrs		**15**	**4**	**12**	**23**		**550**	**250**	**800**	
VI SEMESTER										
21X601	DISTRIBUTED ENTERPRISE COMPUTING	3	2	0	4	21X401, 21X402	50	50	100	PC
21X602	SOFTWARE TESTING	3	2	0	4	21X403	50	50	100	PC
21X0__	PROFESSIONAL ELECTIVE I	3	2	0	4		50	50	100	PE
21X0O_	OPEN ELECTIVE I	3	2	0	4		50	50	100	OE
21X603	PROJECT WORK	**0**	**0**	**12**	**6**		50	50	100	EEC
Total 30 hrs		**12**	**8**	**10**	**22**		**550**	**250**	**800**	

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Course Code	Course Title	Hours / Week			Credits	Prerequisites	Maximum marks			CAT
		L	T	P			CA	FE	Total	
PROFESSIONAL ELECTIVE THEORY COURSES (Three to be opted)										
21X0A1	WEB SERVICES	3	2	0	4	21X601	50	50	100	PE
21X0A2	OPEN SOURCE SOFTWARE	3	2	0	4	21X107, 21X601	50	50	100	PE
21X0A3	ARTIFICIAL INTELLIGENCE	3	2	0	4	21X201, 21X301, 21X405	50	50	100	PE
21X0A4	DATA MINING	3	2	0	4	21X503	50	50	100	PE
21X0A5	NATURAL LANGUAGE PROCESSING	3	2	0	4	21X503	50	50	100	PE
21X0A6	DESIGN AND ANALYSIS OF ALGORITHMS	2	2	0	4	21X305, 21X405	50	50	100	PE
21X0A7	CLOUD COMPUTING	3	2	0	4	21X401, 21X402, 21X601	50	50	100	PE
21X0A8	DEEP LEARNING	3	2	0	4	21X503	50	50	100	PE
21X0A9	BIG DATA ANALYTICS	3	2	0	4	21X302, 21X305	50	50	100	PE
21X0AA	GRAPH THEORY	3	2	0	4	21X202, 21X301	50	50	100	PE
21X0AB	SOFTWARE PATTERNS	3	2	0	4	21X205, 21X403	50	50	100	PE
21X0AC	MODERN DATABASE MANAGEMENT SYSTEMS	2	2	0	4	21X302, 21X305	50	50	100	PE
21X0AD	EMBEDDED SYSTEM AND DESIGN	3	2	0	4	21X303	50	50	100	PE
21X0AE	INFORMATION RETRIEVAL AND WEB SEARCH	3	2	0	4	21X201, 21X301, 21X305	50	50	100	PE
21X0AF	AUGMENTED AND VIRTUAL REALITY	3	2	0	4	21X502	50	50	100	PE
21X0AG	COMPUTER VISION	3	2	0	4	21X502	50	50	100	PE
21X0AH	DEVOPS	3	2	0	4	21X403	50	50	100	PE

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Course Code	Course Title	Hours/Week			Credits	Prerequisites	Maximum marks			CAT
		L	T	P			CA	FE	Total	
OPEN ELECTIVE THEORY COURSES (One to be opted)										
21X0O1	CRYPTOGRAPHY	3	2	0	4	21X202, 21X301	50	50	100	OE
21X0O2	NUMERIC ANALYSIS	3	2	0	4	21X201, 21X202	50	50	100	OE
21X0O3	CYBER SECURITY	3	2	0	4	21X201, 21X301, 21X405	50	50	100	OE
21X0O4	ENTREPRENEURSHIP	3	2	0	4	21X209	50	50	100	OE
21X0O5	HUMAN COMPUTER INTERFACE DESIGN	3	2	0	4	21X402, 21X601	50	50	100	OE
21X0O6	INTERNET OF THINGS	3	2	0	4	21X303	50	50	100	OE
21X0O7	ENVIRONMENTAL SCIENCE AND GREEN COMPUTING	3	2	0	4		50	50	100	OE

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Labeling and Grouping of Courses

Humanities and Social Sciences (HS)				
Sl.No.	**Course Code**	**Course Title**	**L:P:T:C**	**Preferred Semester**
1.	21X102	ENGLISH	3:0:0:3	I
2	21X406	COMMUNICATION SKILLS	0:0:4:2	IV

Basic Sciences (BS)				
Sl. No.	**Course Code**	**Course Title**	**L:P:T:C**	**Preferred Semester**
1.	21X101	CALCULUS AND ITS APPLICATIONS	3:2:0:4	I
2.	21X102	COMBINATORICS	3:0:0:3	I
3.	21X105	ANALOG AND DIGITAL ELECTRONICS	3:0:0:3	I
4.	21X108	ANALOG AND DIGITAL ELECTRONICS LABORATORY	0:0:4:2	I
5.	21X201	LINEAR ALGEBRA	3:2:0:4	II
6.	21X202	DISCRETE MATHEMATICS	3:2:0:4	II
7.	21X301	PROBABILITY AND STATISTICS	3:2:0:4	III
8.	21X405	OPTIMIZATION TECHNIQUES	3:2:0:4	IV

Professional Core (PC)				
Sl.No.	**Course Code**	**Course Title**	**L:P:T:C**	**Preferred Semester**
1.	21X104	C PROGRAMMING	4:0:0:4	I
2.	21X106	C PROGRAMMING LABORATORY	0:0:4:2	I
3.	21X107	WEB DESIGN LABORATORY	0:0:4:2	I
4.	21X203	COMPUTER ARCHITECTURE	3:0:0:3	II
5.	21X204	DATA STRUCTURES	3:0:0:3	II
6.	21X205	OBJECT ORIENTED PROGRAMMING WITH C++	3:0:0:3	II
7.	21X206	PYTHON PROGRAMMING LABORATORY	0:0:4:2	II
8.	21X207	DATA STRUCTURES LABORATORY	0:0:4:2	II
9.	21X208	OBJECT ORIENTED PROGRAMMING WITH C++ LABORATORY	0:0:4:2	II
10.	21X302	DATABASE MANAGEMENT SYSTEMS	3:0:0:3	III
11.	21X303	MICROPROCESSORS AND MICROCONTROLLER	3:0:0:3	III
12.	21X304	OPERATING SYSTEMS	3:0:0:3	III
13.	21X305	ADVANCED DATA STRUCTURES AND ALGORITHMS ANALYSIS	3:0:0:3	III
14.	21X306	MICROPROCESSORS AND MICROCONTROLLER LABORATORY	0:0:4:2	III
15.	21X307	OPERATING SYSTEMS LABORATORY	0:0:4:2	III
16.	21X308	ADVANCED DATA STRUCTURES AND ALGORITHMS ANALYSIS LABORATORY	0:0:4:2	III
17.	21X401	COMPUTER NETWORKS	3:0:0:3	IV
18.	21X402	JAVA PROGRAMMING	3:0:0:3	IV
19.	21X403	SOFTWARE ENGINEERING	3:0:0:3	IV
20.	21X404	PRINCIPLES OF COMPILER DESIGN	3:0:0:4	IV
21.	21X405	OPTIMIZATION TECHNIQUES	3:2:0:4	IV
22.	21X407	COMPUTER NETWORKS LABORATOY	0:0:4:2	IV
23.	21X408	JAVA PROGRAMMING LABORATORY	0:0:4:2	IV
24.	21X501	MOBILE COMPUTING AND APPLICATION DEVELOPMENT	3:0:0:3	V
25.	21X502	COMPUTER GRAPHICS AND MULTIMEDIA	3:0:0:3	V
26.	21X503	MACHINE LEARNING	3:0:0:3	V
27.	21X504	MOBILE COMPUTING AND APPLICATION DEVELOPMENT LABORATORY	0:0:4:2	V
28.	21X505	COMPUTER GRAPHICS AND MULTIMEDIA LABORATORY	0:0:4:2	V
29.	21X506	MACHINE LEARNING LABORATORY	0:0:4:2	V
30.	21X601	DISTRIBUTED ENTERPRISE COMPUTING	3:2:0:4	VI
31.	21X602	SOFTWARE TESTING	3:2:0:4	VI

Employment Enhancement Courses (EEC)				
Sl.No.	**Course Code**	**Course Title**	**L:P:T:C**	**Preferred Semester**
1.	21X603	PROJECT WORK	0:0:12:6	VI

Professional Elective (PE)				
Sl.No.	**Course Code**	**Course Title**	**L:P:T:C**	**Preferred Semester**
1.	21X0A1	WEB SERVICES	3:2:0:4	V
2.	21X0A2	OPEN SOURCE SOFTWARE	3:2:0:4	V
3.	21X0A3	ARTIFICIAL INTELLIGENCE	3:2:0:4	VI
4.	21X0A4	DATA MINING	3:2:0:4	VI
5.	21X0A5	NATURAL LANGUAGE PROCESSING	3:2:0:4	VI
6.	21X0A6	DESIGN AND ANALYSIS OF ALGORITHMS	3:2:0:4	V
7.	21X0A7	CLOUD COMPUTING	3:2:0:4	V
8.	21X0A8	DEEP LEARNING	3:2:0:4	VI
9.	21X0A9	BIG DATA ANALYTICS	3:2:0:4	V
10.	21X0AA	GRAPH THEORY	3:2:0:4	V
11.	21X0AB	SOFTWARE PATTERNS	3:2:0:4	V
12.	21X0AC	MODERN DATABASE MANAGEMENT SYSTEMS	3:2:0:4	V
13.	21X0AD	EMBEDDED SYSTEM AND DESIGN	3:2:0:4	V
14.	21X0AE	INFORMATION RETRIEVAL AND WEB SEARCH	3:2:0:4	V
15.	21X0AF	AUGMENTED AND VIRTUAL REALITY	3:2:0:4	VI
16.	21X0AG	COMPUTER VISION	3:2:0:4	VI
17.	21X0AH	DEVOPS	3:2:0:4	V

OPEN ELECTIVES (OE)				
S.No.	**Course Code**	**Course Title**	**L:T:P:C**	**Preferred Semester**
1.	21X0O1	CRYPTOGRAPHY	3:2:0:4	VI
2.	21X0O2	NUMERIC ANALYSIS	3:2:0:4	VI
3.	21X0O3	CYBER SECURITY	3:2:0:4	VI
4.	21X0O4	ENTREPRENEURSHIP	3:2:0:4	VI
5.	21X0O5	HUMAN COMPUTER INTERFACE DESIGN	3:2:0:4	VI
6.	21X0O6	INTERNET OF THINGS	3 2 0 4	VI
7.	21X0O7	ENVIRONMENTAL SCIENCE AND GREEN COMPUTING	3:2:0:4	VI