CURRICULUM & SYLLABUS

CHOICE BASED CREDIT SYSTEM (CBCS)

FOR

BACHELOR OF TECHNOLOGY (B.Tech.)

(4 Year Undergraduate Degree Programme)

IN

COMPUTER SCIENCE & ENGINEERING WITH SPECIALIZATION IN CLOUD ENGINEERING & DEVOPS AUTOMATION IN ASSOCIATION WITH XEBIA
[w. e. f. 2021-2022]

FACULTY OF ENGINEERING AND TECHNOLOGY
SRM UNIVERSITY DELHI-NCR, SONEPAT
39, Rajiv Gandhi Education City, Sonepat
Haryana-131029

COURSE CURRICULUM

BACHELOR OF TECHNOLOGY

(COMPUTER SCIENCE & ENGINEERING WITH SPECIALIZATION IN CLOUD ENGINEERING & DEVOPS AUTOMATION IN ASSOCIATION WITH XEBIA)

DEGREE COURSE

PROGRAMME COURSES SRUCTURE SEMESTERWISE

<u>SEMESTER – I</u>

COURSE CODE	COURSE	CATEGORY	HOURS PER WEEK				CREDITS
			L	T	P	TOTAL HOURS	
21AS101	Engineering Mathematics-I	BAS	3	1	0	4	4
21AS102/ 21AS103	Engineering Physics / Engineering Chemistry	BAS	3	1	0	4	4
21EE101/ 21EC101	Basic Electrical Engineering / Basic Electronics Engineering	ES	3	0	0	3	3
21ME101/ 21CS101	Basic Mechanical Engineering / Fundamentals of Computer & C Programming	ES	3	0	0	3	3
21HS101/ 21HS102	Communicative English/ Indian Constitution & Polity	HSS	2	0	0	2	2
21CD101	DevOps Overview	PC	3	0	0	3	3
21AS152/ 21AS153	Engineering Physics Lab / Engineering Chemistry Lab	BAS	0	0	2	2	1
21EE151/ 21EC151	Basic Electrical Engineering Lab / Basic Electronics Engineering Lab	ES	0	0	2	2	1
21ME151/ 21CS151	Basic Mechanical Engineering Lab / C Programming Lab	ES	0	0	2	2	1
21HS151/ 21SE151	Communicative English Lab / NSS-Yoga-NCC	HSS	0	0	2	2	1
21ME152/ 21ME153	Mechanical Workshop Lab / Engineering Graphics & Design Lab	ES	0	0	2	2	1
TOTAL			**17**	**2**	**10**	**29**	**24**

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DEGREE COURSE

PROGRAMME COURSES SRUCTURE SEMESTERWISE

SEMESTER – II

COURSE CODE	COURSE	CATEGORY	HOURS PER WEEK				CREDITS
			L	T	P	TOTAL HOURS	
21AS0201	Engineering Mathematics-II	BAS	3	1	0	4	4
21AS0202/ 21AS0203	Engineering Physics/ Engineering Chemistry	BAS	3	1	0	4	4
21EE0201/ 21EC0201	Basic Electrical Engineering /Basic Electronics Engineering	ES	3	0	0	3	3
21ME0201/ 21CS0201	Basic Mechanical Engineering / Fundamentals of Computer & C Programming	ES	3	0	0	3	3
21HS0201/ 21HS0202	Communicative English/ Indian Constitution &Polity	HSS	2	0	0	2	2
21CD102	Source Code Management	PC	3	0	0	3	3
21AS0252/ 21AS0253	Engineering Physics Lab/Engineering Chemistry Lab	BAS	0	0	2	2	1
21EE0251/ 21EC0251	Basic Electrical Engineering Lab /Basic Electronics Engineering Lab	ES	0	0	2	2	1
21ME251/ 21CS251	Basic Mechanical Engineering Lab/ C Programming Lab	ES	0	0	2	2	1
21HS151/ 21SE151	Communicative English Lab/NSS-Yoga-NCC	HSS	0	0	2	2	1
21ME0251/ 21ME0253	Mechanical Workshop Lab / Engineering Graphics & Design Lab	ES	0	0	2	2	1
21CD112	Source Code Management Lab	P	0	0	2	2	1
TOTAL			**17**	**2**	**12**	**31**	**25**

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DEGREE COURSE

PROGRAMME COURSES SRUCTURE SEMESTERWISE

SEMESTER – III

| COURSE CODE | COURSE | CATEGORY | HOURS PER WEEK | | | | CREDITS |
			L	T	P	TOTAL HOURS	
XXX	Open Elective Course - I	OE	2	0	0	2	2
21AS301	Engineering Mathematics-III	BAS	3	1	0	4	4
21CS2003	Data Structures Using C	PC	3	0	0	3	3
21CS2005	Database Management Systems	PC	3	0	0	3	3
21CS2007	Computer Architecture & Organization	PC	3	1	0	4	4
21CD201	Development Automation	PC	3	0	0	3	3
21CS2111	Database Management Systems Lab	P	0	0	2	2	1
21CS2113	Data Structures Using C Lab	P	0	0	2	2	1
21CD215	Development Automation Lab	P	0	0	2	2	1
21CS0201	Essentials of Blockchain and IoT-Level–I	SEC	0	0	2	2	1
21SS351	Effective Communication Skills	SEC	0	0	2	2	1
TOTAL			**18**	**02**	**10**	**30**	**25**

NOTE: At the end of the semester, students will undergo a training and create a project which will be evaluated in the next semester (Live Project-I)

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DEGREE COURSE

PROGRAMME COURSES SRUCTURE SEMESTERWISE

SEMESTER – IV

COURSE CODE	COURSE	CATEGORY	L	T	P	TOTAL HOURS	CREDITS
XXX	Open Elective Course – II	OE	2	0	0	2	2
21CS2004	Theory of Computation	PC	3	1	0	4	4
21CS2006	Operating Systems	PC	3	0	0	3	3
21CS2008	Analysis and Design of Algorithms	PC	3	0	0	3	3
21CD202	Advanced Linux	PC	3	0	0	3	3
21CD204	Build and Release Management	PC	3	0	0	3	3
21SS452	Teamwork & Interpersonal Skills	SEC	0	0	2	2	1
21CS2114	Operating Systems Lab	P	0	0	2	2	1
21CS2118	Analysis and Design of Algorithms Lab	P	0	0	2	2	1
21CD212	Advanced Linux Lab	P	0	0	2	2	1
21CD214	Build and Release Management Lab	P	0	0	2	2	1
21CS0202	Artificial Intelligence and Machine Learning – Level- II	SEC	0	0	2	2	1
21CS0204	Live Project-I & Industrial Visit	LP**	1	0	0	1	1
TOTAL			**18**	**01**	**12**	**31**	**25**

NOTE: At the end of the semester, students will undergo a training and create a project which will be evaluated in the next semester (Live Project-II)

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DEGREE COURSE

PROGRAMME COURSES SRUCTURE SEMESTERWISE

SEMESTER – V

COURSE CODE	COURSE	CATEGORY	HOURS PER WEEK				CREDITS
			L	T	P	TOTAL HOURS	
21XXX	Open Elective Course – III	OE	3	0	0	3	3
21CD3xx	Professional Elective – I	PE	3	0	0	3	3
21CS3001	Compiler Design	PC	3	1	0	4	4
21CS3003	Computer Networks	ES	3	1	0	4	4
21CD301	Continuous Integration and Continuous Deployment	PC	3	0	0	3	3
21CD303	Agile Practices	PC	3	0	0	3	3
21SS553	Presentation & Speaking Skills	SEC	0	0	2	2	1
21CS3113	Computer Network Lab	P	0	0	2	2	1
21CS3117	Compiler Design Lab	P	0	0	2	2	1
21CD311	Continuous Integration and Continuous Deployment Lab	P	0	0	2	2	1
21CS0301	Design Thinking and Augmented Virtual Reality – Level-II&III	SEC	0	0	2	2	1
21CS0303	Live Project – II & Industrial Visit	LP**	0	0	2	2	1
TOTAL			**18**	**02**	**14**	**34**	**27**

NOTE: At the end of the semester, students will undergo a training and create a project which will be evaluated in the next semester (Live Project-III)

**** To be evaluated in current semester.**

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DEGREE COURSE

PROGRAMME COURSES SRUCTURE SEMESTERWISE

SEMESTER – VI

COURSE CODE	COURSE	CATEGORY	HOURS PER WEEK				CREDITS
			L	T	P	TOTAL HOURS	
21CS3002	Artificial Intelligence	PC	3	0	0	3	3
21CD302	Test Automation	PC	3	0	0	3	3
21CD304	Application Containerization	PC	3	0	0	3	3
21CD3xx	Professional Elective Course– II	PE	3	0	0	3	3
21CS3xxx	Professional Elective Course– III	PE	3	1	0	4	4
21BS301	Management and Organizational Behavior	HSS	3	0	0	3	3
21SS655	Professional Writing Skills	SEC	0	0	2	2	1
21CS3114	Artificial Intelligence lab	P	0	0	2	2	1
21CD312	Test Automation Lab	P	0	0	2	2	1
21CD314	Application Containerization Lab	P	0	0	2	2	1
21CS0302	Big Data Analytics, Tools and Technique - Level –III	SEC	0	0	2	2	1
21CS0304	Live Project – III & Industrial Visit	LP**	0	0	2	2	1
TOTAL			**18**	**01**	**12**	**31**	**25**

NOTE: At the end of the semester, students will undergo a training and create a project which will be evaluated in the next semester (Live Project-IV)

** To be evaluated in current semester.

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DEGREE COURSE

PROGRAMME COURSES SRUCTURE SEMESTERWISE

SEMESTER – VII

COURSE CODE	COURSE	CATEGORY	HOURS PER WEEK				CREDITS
			L	T	P	TOTAL HOURS	
21CD401	System Provisioning and Configuration Management	PC	3	0	0	3	3
21CD4xx	Professional Elective – IV	PE	3	0	0	3	3
21CS4003	Cloud Computing	PC	3	1	0	4	4
21CS4xxx	Professional Elective – V	PE	3	1	0	4	4
21SS756	Interpersonal Skills: Strategies	SEC	0	0	2	2	1
21CS4113	Cloud Computing Lab	P	0	0	2	2	1
21CS4115	Live Project – IV & Industrial Visit	LP	0	0	2	2	1
21CD411	System Provisioning and Configuration Management Lab	P	0	0	2	2	1
21CS4117	Minor Project	LP	0	0	8	8	4
TOTAL			12	02	16	30	22

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DEGREE COURSE
PROGRAMME COURSES SRUCTURE SEMESTERWISE

SEMESTER – VIII

COURSE CODE	COURSE	CATEGORY	HOURS PER WEEK				CREDITS
			L	T	P	TOTAL HOURS	
21CD402	System Monitoring	PC	3	0	0	3	3
21CD404	Applied DevOps	PC	3	0	0	3	3
21CD4xx	Professional Elective – VI	PE	3	0	0	3	3
21CS4114	Major Project	LP	0	0	24	24	12
TOTAL			**09**	**00**	**24**	**33**	**21**

LIST OF SKILL ENHANCEMENT COURSES

Subject Code	Course	Category	L	T	P	Credits
Technical Training						
21CS0201	Essentials of Blockchain and IoT-Level –I	SEC	0	0	2	1
21CS0202	Artificial Intelligence and Machine Learning – Level- II	SEC	0	0	2	1
21CS0301	Design Thinking and Augmented Virtual Reality –Level-II&III	SEC	0	0	2	1
21CS0302	Big Data Analytics, Tools and Technique-Level –III	SEC	0	0	2	1
Soft Skill						
21SS351	Effective Communication Skills	SEC	0	0	2	1
21SS452	Teamwork & Interpersonal Skills	SEC	0	0	2	1
21SS553	Presentation & Speaking Skills	SEC	0	0	2	1
21SS655	Professional Writing Skills	SEC	0	0	2	1
21SS756	Interpersonal Skills: Strategies	SEC	0	0	2	1

LIST OF OPEN ELECTIVE COURSES –

COURSES FROM OTHER TECHNICAL AREA & EMERGING FIELDS

Subject Code	Course	Category	L	T	P	C
Open Elective-I (OPEC -I)						
21FLGR301	German Language Phase-I	OE	2	0	0	2
21FLFR301	French Language Phase-I	OE	2	0	0	2
Open Elective-II (OPEC-II)						
21FLGR401	German Language Phase-II	OE	2	0	0	2
21FLFR401	French Language Phase-II	OE	2	0	0	2
Open Elective III (OPEC-III)						
SEC-FT-01	Entrepreneurship and New Venture Management	OE	3	0	0	3
21ESUG202	Sustainable Growth and Development	OE	3	0	0	3
21ESUG203	Waste Management	OE	3	0	0	3
21EC390	Microprocessor and Interfacing	OE	3	0	0	3

LIST OF PROFESSIONAL ELECTIVES

Subject Code	Course	Category	L	T	P	C
Professional Elective-I						
21CD321	Python Programming	PE	3	0	0	3
21CD323	Big Data Overview	PE	3	0	0	3
Professional Elective –II						
21CD322	Supervised Learning	PE	3	0	0	3
21CD324	Domain-Driven Approach to Design And Implement Microservices	PE	3	0	0	3
Professional Elective –III						
21CS3020	Distributed Operating System	PE	3	1	0	4
21CS3026	Grid Computing	PE	3	1	0	4
21CS3028	Object Oriented Analysis & Design	PE	3	1	0	4
21CS3030	Neural Networks & Fuzzy Logic	PE	3	1	0	4
21CS3032	Cyber Security	PE	3	1	0	4
21CS3036	Predictive Analytics	PE	3	1	0	4
21CS3038	Business Intelligence	PE	3	1	0	4
21CS3040	Internet of Things	PE	3	1	0	4
Professional Elective –IV						
21CD421	Digital Product Engineering and Design Thinking	PE	3	0	0	3
21CD423	Software Craftsmanship Overview	PE	3	0	0	3
Professional Elective –V						
21CS4019	Network Security & Cryptography	PE	3	1	0	4
21CS4023	Wireless Adhoc and Sensor Network	PE	3	1	0	4
21CS4035	Advanced Java Programming	PE	3	1	0	4
21CS4025	Data Warehousing & Data Mining	PE	3	1	0	4

21CS4027	Mobile Computing	PE	3	1	0	4
21CS4031	Open Source Software	PE	3	1	0	4
21CS4041	Advanced Internet of Things	PE	3	1	0	4
21CS4047	Advanced Block Chain	PE	3	1	0	4
Professional Elective –VI						
21CD422	Modern Architecture Patterns	PE	3	0	0	3
21CD424	Modern Web and Mobile Frameworks	PE	3	0	0	3

EVALUATION SCHEMES

The bifurcation of Continuous Evaluation (Internal) and End Semester Evaluation marks are as under:

S.No	Course	Continuous Evaluation (Internal)	End Semester
1	Professional (PC) : Theory	40	60
2	Professional Electives –Programme Specific Electives-Theory	40	60
3	Open Electives-Theory	40	60
4	Humanities & Social Sciences including Management Courses (HSS)-Theory	40	60
5	Practical /Workshop – Practical	60	40
6	Skill Enhancement Courses (SEC)	70	30
7	Technical Enhancement Courses (TEC)	70	30
8	Live Projects & Industry Visits (LP/IV) and Internship	60	40
9	Dissertation/Project	60	40