

CURRICULUM

**B.E. COMPUTER SCIENCE AND ENGINEERING
REGULATION 2020 (2021-2025 BATCH)**

SEMESTER I							
S No.	Course Code	Course	L/T/P	Contact hrs/week	Credits	Ext/Int	Category
THEORY CUM PRACTICAL							
1	21MA101	Engineering Mathematics I	2/1/2	5	4	50/50	BSC
2	21PH104	Physics	3/0/3	6	4.5	50/50	BSC
3	21EN101	Technical Communication Skills	2/0/2	4	3	50/50	HSMC
4	21IT101	Python Programming	3/0/2	5	4	50/50	ESC
5	21CS101	Application Development Practices	2/0/2	4	3	50/50	PCC
PRACTICAL							
6	21ME103	Engineering Practices Laboratory	0/0/3	3	1.5	40/60	ESC
MANDATORY COURSE							
7	21MC101	Mandatory Course I (Induction Programme)	Three weeks		0	0/100	MC
Total				27	20	700	

SEMESTER II							
S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
THEORY							
1	21GE201	Universal Human Values	3/0/0	3	3	60/40	HSMC
2	21CS201	C and Data Structures	3/0/0	3	3	60/40	PCC
THEORY CUM PRACTICAL							
3	21MA201	Engineering Mathematics II	2/1/2	5	4	50/50	BSC
4	21CH101	Engineering Chemistry	3/0/3	6	4.5	50/50	BSC
5	21EE111	Basics of Electrical and Electronics Engineering	3/0/2	5	4	50/50	ESC
PRACTICAL							
6	21ME111	Engineering Graphics	1/0/3	4	2.5	40/60	ESC
7	21CS202	Data Structures Laboratory	0/0/3	3	1.5	40/60	PCC
MANDATORY COURSE							
8	21MC102	Mandatory Course 2 (Environmental Sciences)	2/0/0	2	0	0/100	MC
Total				31	22.5	800	

SEMESTER III							
S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
THEORY							
1	21MA302	Mathematical Structures	3/1/0	4	4	60/40	BSC
THEORY CUM PRACTICAL							
2	21AD302	Analysis of Algorithms	3/0/2	5	4	50/50	PCC
3	21IT301	Web Development using React	3/0/2	5	4	50/50	PCC
4	21CS301	Operating Systems	3/0/2	5	4	50/50	PCC
5	21CS302	Java Programming	3/0/2	5	4	50/50	PCC
6	21CS303	Managing Data using RDBMS	3/0/2	5	4	50/50	PCC
MANDATORY COURSE							
7	21MCXXX	Mandatory Course 3	2/0/0	2	0	0/100	MC
Total				31	24	700	

SEMESTER IV							
S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
THEORY							
1	21CS401	Theory of Computation	3/1/0	4	4	60/40	PCC
2	21EC412	Digital Organization	3/0/0	3	3	60/40	ESC
3	21MA404	Random Variables and Statistics	3/1/0	4	4	60/40	BSC
4	21AD403	Cloud Computing	3/0/0	3	3	60/40	PCC
5	21IT402	Software Testing using Selenium	3/0/0	3	3	60/40	PCC
6	21CS402	Web Frameworks	3/0/0	3	3	60/40	PCC
PRACTICAL							
7	21CS403	Web Frameworks Laboratory	0/0/3	3	1.5	40/60	PCC
8	21AD404	Cloud Computing Laboratory	0/0/3	3	1.5	40/60	PCC
MANDATORY COURSE							
9	21MC1XX	Mandatory Course 4	2/0/0	2	0	0/100	MC
Total				28	23	900	

SEMESTER V							
S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
THEORY							
1	21XXXXX	Open Elective 1	3/0/0	3	3	60/40	OEC
2	21XXXXX	Professional Elective 1	3/0/0	3	3	60/40	PEC
3	21EC512	Microcontrollers and Embedded Systems	3/0/0	3	3	60/40	ESC
4	21CS502	Computer Networks	3/0/0	3	3	60/40	PCC
THEORY CUM PRACTICAL							
5	21CS501	Object Oriented Analysis and Design	3/0/2	5	4	50/50	PCC
PRACTICAL							
6	21CS504	Computer Networks Laboratory	0/0/3	3	1.5	40/60	PCC
7	21XXXXX	Professional Elective 2	0/0/6	6	3	40/60	PEC
PROJECT WORK							
8	21CS503	Mini Project	0/0/2	2	1	40/60	PW
MANDATORY COURSE							
9	21MC1XX	Mandatory Course 5	2/0/0	2	0	0/100	MC
Total				27	21.5	900	

SEMESTER VI							
S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
THEORY							
1	21CS0XX	Emerging Elective 1	3/0/0	3	3	60/40	EEC
2	21CS601	Principles of Compiler Design	3/0/0	3	3	60/40	PCC
3	21CS602	Cryptography and Network Security	3/0/0	3	3	60/40	PCC
4	21XXXXX	Professional Elective 3	3/0/0	3	3	60/40	PEC
5	21XXXXX	Professional Elective 4	3/0/0	3	3	60/40	PEC
6	21CS603	Artificial Intelligence	3/0/0	3	3	60/40	PCC
PRACTICAL							
7	21CS604	Compiler Design Laboratory	0/0/3	3	1.5	40/60	PCC
8	21CS605	Artificial Intelligence Laboratory	0/0/2	2	1	40/60	PCC
Total				23	20.5	800	

SEMESTER VII							
S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
THEORY							
1	21IT701	Computational Biology	3/0/0	3	3	60/40	ESC
2	21XXXXX	Open Elective 2	3/0/0	3	3	60/40	OEC
3	21CSXXX	Emerging Elective 2	3/0/0	3	3	60/40	EEC
4	21XXXXX	Professional Elective 5	3/0/0	3	3	60/40	PEC
5	21XXXXX	Professional Elective 6	3/0/0	3	3	60/40	PEC
6	21CS701	Internet of Everything	3/0/0	3	3	60/40	PCC
PRACTICAL							
7	21CS702	Internet of Everything Laboratory	0/0/3	3	1.5	40/60	PCC
EMPLOYABILITY ENHANCEMENT SKILLS							
8	21EES01	Employability Enhancement Skills			2	0/100	EES
Total				24	21.5	800	

SEMESTER VIII							
S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
PROJECT WORK							
1	21CS801	Project	0/0/24	24	12	40/60	PW
Total				24	12	100	

Humanities and Management Courses (6 credits)

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
1	21EN101	Technical Communication Skills	2/0/2	4	3	50/50	HSMC
2	21GE201	Universal Human Values	3/0/0	3	3	60/40	HSMC

Basic Science Courses (25 credits)

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
1	21MA101	Engineering Mathematics I	2/1/2	5	4	50/50	BSC
2	21PH104	Physics	3/0/3	6	4.5	50/50	BSC
3	21MA201	Engineering Mathematics II	2/1/2	5	4	50/50	BSC
4	21CH101	Engineering Chemistry	3/0/3	6	4.5	50/50	BSC
5	21MA302	Mathematical Structures	3/1/0	4	4	60/40	BSC
6	21MA404	Random Variables and Statistics	3/1/0	4	4	60/40	BSC

Engineering Science Courses (22 credits)

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
1	21IT101	Python Programming	3/0/2	5	4	50/50	ESC
2	21ME103	Engineering Practices Laboratory	0/0/3	3	1.5	40/60	ESC
3	21EE111	Basics of Electrical and Electronics Engineering	3/0/2	5	4	50/50	ESC
4	21ME111	Engineering Graphics	1/0/3	4	2.5	50/50	ESC
5	21EC412	Digital Organization	3/0/0	3	3	60/40	ESC
6	21EC512	Microcontrollers and Embedded Systems	3/0/0	3	3	60/40	ESC
7	21IT701	Computational Biology	3/0/0	3	3	60/40	ESC

Professional Core Courses (68 credits)

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
1	21CS101	Application Development Practices	2/0/2	4	3	50/50	PCC
2	21CS201	C and Data Structures	3/0/0	3	3	60/40	PCC
3	21CS202	Data Structures Laboratory	0/0/3	3	1.5	40/60	PCC
4	21AD302	Analysis of Algorithms	3/0/2	5	4	50/50	PCC
5	21IT301	Web Development using React	3/0/2	5	4	50/50	PCC
6	21CS301	Operating Systems	3/0/2	5	4	50/50	PCC
7	21CS302	Java Programming	3/0/2	5	4	50/50	PCC
8	21CS303	Managing Data using RDBMS	3/0/2	5	4	50/50	PCC
9	21CS401	Theory of Computation	3/1/0	4	4	60/40	PCC
10	21AD403	Cloud Computing	3/0/0	3	3	60/40	PCC
11	21AD405	Cloud Computing Laboratory	0/0/3	3	1.5	40/60	PCC
12	21IT402	Software Testing using Selenium	3/0/0	3	3	60/40	PCC
13	21CS402	Web Frameworks	3/0/0	3	3	60/40	PCC

14	21CS403	Web Frameworks Laboratory	0/0/3	3	1.5	40/60	PCC
15	21CS501	Object Oriented Analysis and Design	3/0/2	5	4	50/50	PCC
16	21CS502	Computer Networks	3/0/0	3	3	60/40	PCC
17	21CS504	Computer Networks Laboratory	0/0/3	3	1.5	40/60	PCC
18	21CS601	Principles of Compiler Design	3/0/0	3	3	60/40	PCC
19	21CS602	Cryptography and Network Security	3/0/0	3	3	60/40	PCC
20	21CS603	Artificial Intelligence	3/0/0	3	3	60/40	PCC
21	21CS605	Artificial Intelligence Laboratory	0/0/2	2	1	40/60	PCC
22	21CS604	Compiler Design Laboratory	0/0/3	3	1.5	40/60	PCC
23	21CS701	Internet of Everything	3/0/0	3	3	60/40	PCC
24	21CS702	Internet of Everything Laboratory	0/0/3	3	1.5	40/60	PCC

Mandatory Courses

S.No.	Course Code	Course Title	Category
1	21MC101	Induction Programme	MC
2	21MC102	Environmental Sciences	MC
3	21MC103	Soft Skills	MC
4	21MC104	Management Organizational Behaviour	MC
5	21MC105	General Aptitude	MC
6	21MC106	Life Skills and Ethics	MC
7	21MC107	Stress Management	MC
8	21MC108	Constitution of India	MC
9	21MC109	Essence of Indian Traditional Knowledge	MC
10	20MC110	Biology	MC

Professional Elective Courses (18 Credits)

S.No.	Course Code	Course	L	T	P	Credit	Ext/Int
Software Development							
1	21CS901	API development using MVC Architecture	3	0	0	3	60/40
2	21IT901	UI/UX Application development	3	0	0	3	60/40
3	21CS902	Cloud Services and Integration	3	0	0	3	60/40
4	21IT902	Cloud Infrastructure Management	3	0	0	3	60/40
5	21AD906	App Development	0	0	6	3	40/60
6	21IT905	Open Source Systems	3	0	0	3	60/40
7	21CS903	Software Project Management	3	0	0	3	60/40
8	21CS904	Software Quality Assurance	3	0	0	3	60/40
9	21CS905	Design of Software Agents	3	0	0	3	60/40
10	21CS906	Test Driven Software Development	3	0	0	3	60/40
Data Science and Computational Intelligence							
11	21CS911	Artificial Intelligence and Machine learning	3	0	0	3	60/40
12	21AD912	Statistics and Machine Learning	3	0	0	3	60/40
13	21IT911	NLP with predictive analysis	3	0	0	3	60/40
14	21CS912	Big Data Technologies	3	0	0	3	60/40
15	21IT913	Streaming Analytics	3	0	0	3	60/40
16	21CS913	Business Analytics	3	0	0	3	60/40
17	21CS914	Fundamentals of Data Science	3	0	0	3	60/40
18	21CS915	Knowledge Management Systems	3	0	0	3	60/40
19	21CS916	Social Network Mining and Analysis	3	0	0	3	60/40
20	21CS917	Computer Vision and Analysis	3	0	0	3	60/40
Networks and Security							
21	21IT921	Cyber Security	3	0	0	3	60/40
22	21AD921	Ethical hacking	3	0	0	3	60/40
23	21CS921	Cyber threats and vulnerabilities	3	0	0	3	60/40
24	21AD922	Ethical Hacking and Auditing frameworks	3	0	0	3	60/40
25	21CS922	Wireless and Mobile Adhoc Networks	3	0	0	3	60/40
26	21CS923	Fault Tolerant Computing	3	0	0	3	60/40
27	21IT924	Blockchain Technology	3	0	0	3	60/40
28	21CS924	Software defined networks	3	0	0	3	60/40
29	21CS925	Secure Software Systems	3	0	0	3	60/40
30	21CS926	Telecommunication and Switching Techniques	3	0	0	3	60/40

Emerging Elective Courses (6 Credits)

S.No.	Course Code	Course	L	T	P	Credit	Ext/Int
Emerging Elective Courses – Stream 1							
1	21CS008	Design of Dependable Systems	3	0	0	3	60/40
2	21CS009	Networked Cyber-Physical Systems	3	0	0	3	60/40
3	21CS010	Serverless Computing	3	0	0	3	60/40
Emerging Elective Courses – Stream 2							
4	21CS011	Malware Reverse Engineering	3	0	0	3	60/40
5	21CS012	Adaptive Intelligent Systems	3	0	0	3	60/40
6	21CS013	DevOps	3	0	0	3	60/40

Open Elective Courses offered by CSE

S.No.	Course Code	Course	L	T	P	Credit	Ext/Int
1	21CS001	Introduction to R Programming	3	0	0	3	60/40
2	21CS002	Software Product Development and Management	3	0	0	3	60/40
3	21CS003	Virtual Reality	3	0	0	3	60/40
4	21CS004	Network and Systems Security	3	0	0	3	60/40
5	21CS005	Green Computing	3	0	0	3	60/40
6	21CS006	Internet Marketing and E-Commerce	3	0	0	3	60/40
7	21CS007	Fundamentals of Java Programming	3	0	0	3	60/40
8	21CS008	Artificial Intelligence and Machine Learning Models	3	0	0	3	60/40
9	21CS009	Analysis of Algorithms	3	0	0	3	60/40

Value Added Courses

S.No.	Course Code	Course	Credit	Category
1	21VA200	Cassandra	1	VAC
2	21VA201	MongoDB	1	VAC

SCHEME OF CREDIT DISTRIBUTION – SUMMARY

S. No	Stream	Credits/Semester								Credits	AICTE Norms
		I	II	III	IV	V	VI	VII	VII I		
1	Humanities and Management Courses (HSMC)	3	3							6	12
2	Basic Science Courses (BSC)	8.5	8.5	4	4					25	24
3	Engineering Science Courses (ESC)	5.5	6.5		3	3		3		21	29
4	Professional Core Courses (PCC)	3	4.5	20	16	8.5	11.5	4.5		68	49
5	Professional Elective Courses (PEC)					6	6	6		18	18
6	Open Elective Courses (OEC)					3		3		6	12
7	Emerging Elective Courses (EEC)						3	3		6	
8	Project Work(PW)					1			12	13	15
9	Employability Enhancement Skills							2		2	
10	Mandatory Courses (MC)						-	-	-		Non credit
Total		20	22.5	24	23	21.5	20.5	21.5	12	165	
AICTE		17.5	20.5	23	22	21	22	18	15		159