

CURRICULUM

**B.E. COMPUTER SCIENCE AND ENGINEERING
REGULATION 2020**

SEMESTER I							
S No.	Course Code	Course	L/T/P	Contact hrs/week	Credits	Ext/Int	Category
THEORY CUM PRACTICAL							
1	20MA101	Engineering Mathematics I	2/1/2	5	4	40/60	BSC
2	20PH104	Physics	3/0/3	6	4.5	40/60	BSC
3	20EN101	Technical Communication Skills	2/0/2	4	3	40/60	HSMC
4	20IT101	Python Programming	3/0/2	5	4	40/60	ESC
5	20CS101	Application Development Practices	2/0/2	4	3	40/60	PCC
PRACTICAL							
6	20ME103	Engineering Practices Laboratory	0/0/3	3	1.5	40/60	ESC
MANDATORY COURSE							
7	20MC101	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	20GE201	Universal Human Values	3/0/0	3	3	50/50	HSMC
2	20CS201	C and Data Structures	3/0/0	3	3	50/50	PCC
THEORY CUM PRACTICAL							
3	20MA201	Engineering Mathematics II	2/1/2	5	4	40/60	BSC
4	20CH101	Engineering Chemistry	3/0/3	6	4.5	40/60	BSC
5	20EE111	Basics of Electrical and Electronics Engineering	3/0/2	5	4	40/60	ESC
PRACTICAL							
6	20ME111	Engineering Graphics	1/0/3	4	2.5	40/60	ESC
7	20CS202	Data Structures Laboratory	0/0/3	3	1.5	40/60	PCC
MANDATORY COURSE							
8	20MC102	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	20IT301	Computer Architecture	3/0/0	3	3	50/50	PCC
THEORY CUM PRACTICAL							
2	20MA302	Mathematical Structures	2/1/2	5	4	40/60	BSC
3	20EC311	Digital Logic and Design	3/0/2	5	4	40/60	ESC
4	20CS301	C++ and Advanced Data Structures	3/0/2	5	4	40/60	PCC
5	20CS302	Operating Systems	3/0/2	5	4	40/60	PCC
6	20IT302	Software Engineering and Management	3/0/2	5	4	40/60	HSMC
PRACTICAL							
MANDATORY COURSE							
7	20MC1XX	Mandatory Course 3	2/0/0	2	0	0/100	MC
Total				30	23	700	

SEMESTER IV							
S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
THEORY							
1	20CS401	Database Management Systems	3/0/0	3	3	50/50	PCC
2	20IT402	Design and analysis of algorithms	3/0/0	3	3	50/50	PCC
3	20CS402	Theory of Computation	3/0/0	3	3	50/50	PCC
THEORY CUM PRACTICAL							
4	20MA404	Random Variables and Statistics	2/1/2	5	4	40/60	BSC
5	20CS403	Web Technology	3/0/2	5	4	40/60	PCC
6	20CS404	Object Oriented Programming using Java	3/0/2	5	4	40/60	PCC
PRACTICAL							
7	20CS405	Database Management Systems Laboratory	0/0/3	3	1.5	40/60	PCC
MANDATORY COURSE							
8	20MC1XX	Mandatory Course 4	2/0/0	2	0	0/100	MC
Total				29	22.5	800	

SEMESTER V							
S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
THEORY							
1	20CS9XX	Professional Elective 1	3/0/0	3	3	50/50	PEC
2	20CS9XX	Professional Elective 2	3/0/0	3	3	50/50	PEC
3	20XXXXX	Open Elective 1	3/0/0	3	3	50/50	OEC
THEORY CUM PRACTICAL							
4	20EC511	Microcontrollers and Embedded Systems	3/0/2	5	4	40/60	ESC
5	20CS501	Object Oriented Analysis and Design	3/0/2	5	4	40/60	PCC
6	20CS502	Computer Networks	3/0/2	5	4	40/60	PCC
PROJECT WORK							
7	20CS503	Mini Project	0/0/2	2	1	40/60	PW
MANDATORY COURSE							
8	20MC1XX	Mandatory Course 5	2/0/0	2	0	0/100	MC
Total				28	22	800	

SEMESTER VI							
S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
THEORY							
1	20CS601	Principles of Compiler Design	3/0/0	3	3	50/50	PCC
2	20CS602	Cryptography and Network Security	3/0/0	3	3	50/50	PCC
3	20CS9XX	Professional Elective 3	3/0/0	3	3	50/50	PEC
4	20CS9XX	Professional Elective 4	3/0/0	3	3	50/50	PEC
5	20CS0XX	Emerging Elective 1	3/0/0	3	3	50/50	EEC
THEORY CUM PRACTICAL							
6	20CS603	Artificial Intelligence	3/0/2	5	4	40/60	PCC
PRACTICAL							
7	20CS604	Compiler Design Laboratory	0/0/3	3	1.5	40/60	PCC
Total				23	20.5	700	

SEMESTER VII							
S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
THEORY							
1	20IT401	Computational Biology	3/0/0	3	3	50/50	ESC
2	20CS701	Internet of Everything	3/1/0	4	4	50/50	ESC
3	20CS9XX	Professional Elective 5	3/0/0	3	3	50/50	PEC
4	20CS9XX	Professional Elective 6	3/0/0	3	3	50/50	PEC
5	20XXXXX	Open Elective 2	3/0/0	3	3	50/50	OEC
6	20CS0XX	Emerging Elective 2	3/0/0	3	3	50/50	EEC
PRACTICAL							
7	20CS702	Internet of Everything Laboratory	0/0/3	3	1.5	40/60	ESC
EMPLOYABILITY ENHANCEMENT SKILLS							
8	20EES01	Employability Enhancement Skills			2	0/100	EES
Total				25	22.5	800	

SEMESTER VIII							
S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
PROJECT WORK							
1	20CS801	Project	0/0/24	24	12	40/60	PW
Total				24	12	100	

Humanities and Management Courses (10 credits)

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
1	20EN101	Technical Communication Skills	2/0/2	4	3	40/60	HSMC
2	20GE201	Universal Human Values	3/0/0	3	3	50/50	HSMC
3	20IT302	Software Engineering and Management	3/0/2	5	4	40/60	HSMC

Basic Science Courses (25 credits)

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
1	20MA101	Engineering Mathematics I	2/1/2	5	4	40/60	BSC
2	20PH104	Physics	3/0/3	6	4.5	40/60	BSC
3	20MA201	Engineering Mathematics II	2/1/2	5	4	40/60	BSC
4	20CH101	Engineering Chemistry	3/0/3	6	4.5	40/60	BSC
5	20MA302	Mathematical Structures	2/1/2	5	4	40/60	BSC
6	20MA404	Random Variables and Statistics	2/1/2	5	4	40/60	BSC

Engineering Science Courses (28.5credits)

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
1	20IT101	Python Programming	3/0/2	5	4	40/60	ESC
2	20EE111	Basics of Electrical and Electronics Engineering	3/0/2	5	4	40/60	ESC
3	20ME103	Engineering Practices Laboratory	0/0/3	3	1.5	40/60	ESC
4	20ME111	Engineering Graphics	1/0/3	4	2.5	40/60	ESC
5	20EC311	Digital Logic and Design	3/0/2	5	4	40/60	ESC
6	20IT401	Computational Biology	3/0/0	3	3	50/50	ESC
7	20EC511	Microcontrollers and Embedded Systems	3/0/2	5	4	40/60	ESC
8	20CS701	Internet of Everything	3/1/0	4	4	50/50	ESC
9	20CS702	Internet of Everything Laboratory	0/0/3	3	1.5	40/60	ESC

Professional Core Courses (56.5 credits)

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
1	20CS101	Application Development Practices	2/0/2	4	3	40/60	PCC
2	20CS201	C and Data Structures	3/0/0	3	3	50/50	PCC
3	20CS202	Data Structures Laboratory	0/0/3	3	1.5	40/60	PCC
4	20IT301	Computer Architecture	3/0/0	3	3	50/50	PCC
5	20CS301	C++ and Advanced Data Structures	3/0/2	5	4	40/60	PCC
6	20CS302	Operating Systems	3/0/2	5	4	40/60	PCC
7	20CS401	Database Management Systems	3/0/0	3	3	50/50	PCC
8	20IT402	Design and analysis of algorithms	3/0/0	3	3	50/50	PCC
9	20CS402	Theory of Computation	3/0/0	3	3	50/50	PCC
10	20CS403	Web Technology	3/0/2	5	4	40/60	PCC
11	20CS404	Object Oriented Programming using Java	3/0/2	5	4	40/60	PCC
12	20CS405	Database Management Systems Laboratory	0/0/3	3	1.5	40/60	PCC
13	20CS501	Object Oriented Analysis and Design	3/0/2	5	4	40/60	PCC
14	20CS502	Computer Networks	3/0/2	5	4	40/60	PCC
15	20CS601	Principles of Compiler Design	3/0/0	3	3	50/50	PCC
16	20CS602	Cryptography and Network Security	3/0/0	3	3	50/50	PCC
17	20CS603	Artificial Intelligence	3/0/2	5	4	40/60	PCC
18	20CS604	Compiler Design Laboratory	0/0/3	3	1.5	40/60	PCC

Mandatory Courses

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

Professional Elective Courses

S.No.	Course Code	Course	L	T	P	Credit	Ext/Int
Networks and Security							
1	20CS901	Wireless Networks	3	0	0	3	50/50
2	20CS902	Fault Tolerant Computing	3	0	0	3	50/50
3	20CS903	Quantum Computing	3	0	0	3	50/50
4	20CS904	Game Theory	3	0	0	3	50/50
5	20CS905	High Performance Computing	3	0	0	3	50/50
6	20CS906	Real Time Systems	3	0	0	3	50/50
7	20CS907	Cyber Forensics	3	0	0	3	50/50
8	20CS908	Software Defined Networks	3	0	0	3	50/50
9	20IT902	Distributed Systems	3	0	0	3	50/50
Software Development							
10	20CS911	Mobile Application Development	3	0	0	3	50/50
11	20CS912	Building Enterprise Applications	3	0	0	3	50/50
12	20CS913	User Experience Design	3	0	0	3	50/50

13	20CS914	Human Computer Interaction	3	0	0	3	50/50
14	20CS915	Elements of Software Construction	3	0	0	3	50/50
15	20CS916	Performance Engineering of Software Systems	3	0	0	3	50/50
16	20CS917	Secure Software Systems	3	0	0	3	50/50
17	20IT922	Web Applications using Java	3	0	0	3	50/50
18	20IT923	Open-Source Systems	3	0	0	3	50/50
Artificial Intelligence and Advanced computing							
19	20CS921	Speech and Natural Language Processing	3	0	0	3	50/50
20	20CS922	Digital Image Processing	3	0	0	3	50/50
21	20CS923	Data Science	3	0	0	3	50/50
22	20CS924	Information Retrieval	3	0	0	3	50/50
23	20CS925	Design patterns and design thinking	3	0	0	3	50/50
24	20CS926	Business Analytics	3	0	0	3	50/50
25	20EC922	Soft Computing	3	0	0	3	50/50
26	20IT911	Deep Learning Technology	3	0	0	3	50/50
27	20IT914	Block Chain Technology	3	0	0	3	50/50
28	20IT916	Cognitive Science and Analytics	3	0	0	3	50/50

Emerging Elective Courses

S.No.	Course Code	Course	L	T	P	Credit	Ext/Int
Emerging Elective Courses – Stream 1							
1	20CS007	Selenium Automation Testing	3	0	0	3	50/50
2	20CS008	Networked Cyber-Physical Systems	3	0	0	3	50/50
3	20CS009	Serverless Computing	3	0	0	3	50/50
Emerging Elective Courses – Stream 2							
1	20CS010	Malware Reverse Engineering	3	0	0	3	50/50
2	20CS011	Adaptive Intelligent Systems	3	0	0	3	50/50
3	20CS012	DevOps	3	0	0	3	50/50

Open Elective Courses offered by CSE

S.No.	Course Code	Course	L	T	P	Credit	Ext/Int
1	20CS001	R Programming	3	0	0	3	50/50
2	20CS002	Software Product Development and Management	3	0	0	3	50/50
3	20CS003	Virtual Reality	3	0	0	3	50/50
4	20CS004	Network Security	3	0	0	3	50/50
5	20CS005	Green Computing	3	0	0	3	50/50
6	20CS006	Internet Marketing and E-Commerce	3	0	0	3	50/50
7	20CS013	Fundamentals of Java Programming	3	0	0	3	50/50

SCHEME OF CREDIT DISTRIBUTION – SUMMARY

S. No	Stream	Credits/Semester								Credits	AICTE Norms
		I	II	III	IV	V	VI	VII	VIII		
1.	Humanities and Management Courses (HSMC)	3	3	4						10	12
2.	Basic Science Courses (BSC)	8.5	8.5	4	4					25	24
3.	Engineering Science Courses (ESC)	5.5	6.5	4		4		8.5		28.5	29
4.	Professional Core Courses (PCC)	3	4.5	11	18.5	8	11.5			56.5	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	23	22.5	22	20.5	22.5	12	165	
AICTE		17.5	20.5	23	22	21	22	18	15		159