



# HINDUSTHAN INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai,  
Accredited with "A" Grade by NAAC and Accredited by NBA (Aero, CSE, ECE & Mech., IT MBA)  
Valley Campus, Pollachi Main Road, Coimbatore 641 032.



## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### B.E. COMPUTER SCIENCE AND ENGINEERING

#### REGULATIONS - 2020

#### CHOICE BASED CREDIT SYSTEM

##### SEMESTER I

S. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
<b>THEORY</b>								
1	20MA201	Engineering Mathematics-I	BSC	4	3	1	0	4
2	20PH201	Engineering Physics	BSC	3	3	0	0	3
3	20CY201	Engineering Chemistry	BSC	3	3	0	0	3
4	20EN101	Technical English-I	HSMC	3	3	0	0	3
5	20CS301	Python Programming	ESC	3	3	0	0	3
<b>PRACTICALS</b>								
6	20PC201	Physics and Chemistry Laboratory	BSC	4	0	0	4	2
7	20CS302	Python Programming Laboratory	ESC	4	0	0	4	2
8	20MC801	Universal Human Values and Healthy Practices	MC	2 Weeks				
9	20TP701	Soft Skills & Aptitude - I	EEC	2	0	0	2	1
<b>TOTAL</b>				<b>26</b>	<b>15</b>	<b>1</b>	<b>10</b>	<b>21</b>

##### SEMESTER II

S. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
<b>THEORY</b>								
1	20MA202	Engineering Mathematics-II	BSC	4	3	1	0	4
2	20EN102	Technical English-II	HSMC	3	3	0	0	3

3	20PH202	Physics of Materials	BSC	3	3	0	0	3
4	20ME301	Engineering Graphics	ESC	3	3	0	0	3
5	20CS424	Java Fundamentals	PCC	3	3	0	0	3
<b>PRACTICALS</b>								
6	20CS425	Java Laboratory	PCC	4	0	0	4	2
7	20ME302	Engineering Practice Laboratory	ESC	4	0	0	4	2
8	20TP702	Soft Skills & Aptitude – II	EEC	2	0	0	2	1
<b>TOTAL</b>				<b>26</b>	15	1	10	<b>21</b>

### SEMESTER III

S. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
<b>THEORY</b>								
1	20MA204	Discrete Mathematics	BSC	4	3	1	0	4
2	20EC304	Digital Principles and Systems Design	ESC	3	3	0	0	3
3	20CS402	Clean Coding and Devops	PCC	4	2	0	2	3
4	20CS401	Data Structures	PCC	3	3	0	0	3
5	20EC305	Communication Engineering	ESC	3	3	0	0	3
6	20MC804	Essence of Indian Traditional Knowledge	MC	0	2	0	0	0
<b>PRACTICALS</b>								
7	20EC307	Digital Systems Laboratory	ESC	4	0	0	4	2
8	20CS403	Data Structures Laboratory	PCC	4	0	0	4	2
9	20TP703	Soft Skills & Aptitude – III	EEC	2	0	0	2	1
<b>TOTAL</b>				<b>27</b>	16	1	12	<b>21</b>

### SEMESTER IV

S. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
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<b>THEORY</b>								
1	20MA207	Probability and Queuing Theory	BSC	4	3	1	0	4
2	20CS404	Data Visualization	PCC	4	2	0	2	3
3	20CS405	Database Management Systems	PCC	3	3	0	0	3
4	20CS406	Operating Systems	PCC	3	3	0	0	3
5	20CS407	Analysis of Algorithms	PCC	3	3	0	0	3
6	20CS307	Computer Architecture	ESC	3	3	0	0	3
<b>PRACTICALS</b>								
7	20CS408	Database Management Systems Laboratory	PCC	4	0	0	4	2
8	20CS409	Operating Systems Laboratory	PCC	4	0	0	4	2
9	20CS707	Mini Project – I	EEC	4	0	0	4	2
10	20TP704	Soft Skills & Aptitude – IV	EEC	2	0	0	2	1
<b>TOTAL</b>				<b>34</b>	<b>17</b>	<b>1</b>	<b>16</b>	<b>26</b>

#### SEMESTER V

<b>S. No</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Category</b>	<b>Contact Periods</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>THEORY</b>								
1	20CS410	Automata and Compiler Design	PCC	4	3	1	0	4
2	20CS411	Computer Networks	PCC	3	3	0	0	3
3	20CS412	Web Programming	PCC	4	2	0	4	4
4	20CS416	Software Engineering	PCC	3	3	0	0	3
5	20CS5XX	Professional Elective-I	PEC	3	3	0	0	3
6	20MC802	Environmental Science and Engineering	MC	2	2	0	0	0
<b>PRACTICALS</b>								
7	20CS413	Network Programming Laboratory	PCC	4	0	0	4	2

8	20CS417	Design Thinking Laboratory	PCC	4	1	0	2	2
9	20TP705	Programming Aspects and Technical Aptitude – I	EEC	2	0	0	2	1
<b>TOTAL</b>				<b>29</b>	16	1	12	22

#### SEMESTER VI

S. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
<b>THEORY</b>								
1	20CS414	Artificial Intelligence	PCC	3	3	0	0	3
2	20CS415	Development of Machine Learning Models	PCC	3	2	0	2	3
3	20EC311	Microprocessor and Microcontrollers	ESC	3	3	0	0	3
4	20XX6XX	Open Elective-I	OEC	3	3	0	0	3
5	20CS5XX	Professional Elective-II	PEC	3	2	0	2	3
6	20MC803	Indian Constitution	MC	0	2	0	0	0
<b>PRACTICALS</b>								
7	20EC421	Microprocessor and Microcontrollers Laboratory	ESC	4	0	0	4	2
8	20CS708	Mini Project-II	EEC	4	0	0	4	2
9	20TP709	Internship / Inplant Training	EEC	4	0	0	0	2
10	20TP706	Programming Aspects and Technical Aptitude – II	EEC	2	0	0	2	1
<b>TOTAL</b>				<b>29</b>	15	1	14	22

#### SEMESTER VII

S. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
<b>THEORY</b>								
1	20CS419	Cloud Computing	PCC	3	3	0	0	3

2	20CS420	Cryptography and Network Security	PCC	4	3	0	0	3
3	20XX6XX	Open Elective-II	OEC	3	3	0	0	3
4	20CS5XX	Professional Elective-III	PEC	3	3	0	0	3
5	20CS5XX	Professional Elective-IV	PEC	3	3	0	0	3
6	20MB101	Organizational Behavior and Accounting	HSMC	2	2	0	0	2
<b>PRACTICALS</b>								
7	20CS421	Mobile Application Development Laboratory	PCC	4	0	0	4	2
8	20CS422	Cloud computing Laboratory	PCC	4	0	0	4	2
9	20CS423	Artificial Intelligence Analyst	PCC	4	1	0	2	2
<b>TOTAL</b>				<b>30</b>	18	0	10	<b>23</b>

#### SEMESTER VIII

S. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
<b>THEORY</b>								
1	20CS5XX	Professional Elective -V	PEC	3	3	0	0	3
2	20CS5XX	Professional Elective -VI	PEC	3	3	0	0	3
<b>PRACTICALS</b>								
3	20CS710	Project Work	EEC	12	0	0	12	6
<b>TOTAL</b>				<b>18</b>	6	0	12	<b>12</b>

#### CURRICULUM COMPONENTS

##### HUMANITIES AND SOCIALSCIENCES (HSMC)

S. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1	20EN101	Technical English-I	HSMC	3	3	0	0	3
2	20EN102	Technical English-II	HSMC	3	3	0	0	3

3	20MB101	Organizational Behavior and accounting	HSMC	4	2	0	0	2
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### BASIC SCIENCES (BSC)

S. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1	20MA201	Engineering Mathematics-I	BSC	4	3	1	0	4
2	20PH201	Engineering Physics	BSC	3	2	0	0	3
3	20CY201	Engineering Chemistry	BSC	3	2	0	0	3
4	20PC201	Physics and Chemistry Laboratory	BSC	4	0	0	4	2
5	20MA202	Engineering Mathematics-II	BSC	4	3	1	0	4
6	20PH203	Physics for Circuit Branches	BSC	3	3	0	0	3
7	20MA204	Discrete Mathematics	BSC	4	3	1	0	4
8	20MA207	Probability and Queuing Theory	BSC	4	3	1	0	4

### ENGINEERING SCIENCES (ESC)

S. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1	20ME301	Engineering Graphics	ESC	3	3	0	0	3
2	20ME302	Engineering Practice Laboratory	ESC	4	0	0	4	2
3	20CS301	Python Programming	ESC	3	3	0	0	3
4	20CS302	Python Programming Laboratory	PEC	4	0	0	4	2
5	20EC304	Digital Principles and Systems Design	ESC	3	3	0	0	3
6	20EC305	Communication Engineering	ESC	3	3	0	0	3
7	20EC307	Digital Systems Laboratory	ESC	4	0	0	4	2
8	20CS307	Computer Architecture	ESC	3	3	0	0	3
9	20EC311	Microprocessors and Microcontrollers	ESC	3	3	0	0	3

<b>10</b>	20EC312	Microprocessors and MicrocontrollersLaboratory	ESC	4	0	0	4	2
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### PROFESSIONAL CORE (PCC)

<b>S. No</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Category</b>	<b>Contact Periods</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
1	20CS401	Data Structures	PCC	3	3	0	0	3
2	20CS402	Clean Coding and Devops	PCC	3	2	0	2	3
3	20CS403	Data Structures Laboratory	PCC	4	0	0	4	2
4	20CS404	Data Visualization	PCC	4	2	0	2	3
5	20CS405	Database Management Systems	PCC	3	3	0	0	3
6	20CS406	Operating Systems	PCC	3	3	0	0	3
7	20CS407	Analysis of Algorithms	PCC	3	3	0	0	3
8	20CS408	Database Management Systems Laboratory	PCC	4	0	0	4	2
9	20CS409	Operating Systems Laboratory	PCC	4	0	0	4	2
10	20CS410	Automata and Compiler Design	PCC	4	3	1	0	4
11	20CS411	Computer Network	PCC	3	3	0	0	3
12	20CS412	Web Programming	PCC	4	2	0	0	4
13	20CS413	Network Programming Laboratory	PCC	4	0	0	4	2
14	20CS414	Artificial Intelligence	PCC	3	3	1	0	3
15	20CS415	Development of Machine Learning Models	PCC	3	2	0	2	3
16	20CS416	Software Engineering	PCC	3	3	0	0	3
17	20CS417	Design Thinking Laboratory	PCC	4	1	0	2	2

18	20CS419	Cloud Computing	PCC	3	3	0	0	3
19	20CS420	Cryptography and Network Security	PCC	4	3	0	2	4
20	20CS421	Mobile Application Development Laboratory	PCC	4	0	0	4	2
21	20CS422	Cloud computing Laboratory	PCC	4	0	0	4	2
22	20CS423	Artificial Intelligence Analyst	PCC	4	1	0	2	3
23	20CS424	Java Fundamentals	PCC	3	3	0	0	3
24	20CS425	Java Laboratory	PCC	4	0	0	4	2

### PROFESSIONAL ELECTIVES (PEC)

#### LIST OF STREAMS BASED ELECTIVE COURSES

#### ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Sl. No.	Course Code	Course Title	Category	L	T	P	C
1	20CS501	Machine Learning	PEC	3	0	0	3
2	20CS502	Soft Computing	PEC	3	0	0	3
3	20CS503	Natural Language Processing	PEC	3	0	0	3
4	20CS504	Deep Learning	PEC	3	0	0	3
5	20CS505	Quantum Computing	PEC	3	0	0	3
6	20CS508	Reinforcement Learning	PEC	3	0	0	3
7	20CS509	Predictive Modeling	PEC	3	0	0	3
8	20CS514	Deep Learning for Vision	PEC	3	0	0	3
9	20CS520	Knowledge Engineering	PEC	2	0	2	3
10	20CS522	Cognitive Science	PEC	2	0	2	3



### DATA SCIENCE

Sl. No.	Course Code	Course Title	Category	L	T	P	C
<b>Theory</b>							
1	20CS510	Data warehouse and Mining	PEC	3	0	0	3
2	20CS511	Data Science using R	PEC	3	0	0	3
3	20CS512	Information Retrieval	PEC	3	0	0	3
4	20CS513	Information Science and Ethics	PEC	3	0	0	3
5	20CS516	Data Security	PEC	3	0	0	3
6	20CS517	Data Analytics	PEC	3	0	0	3

### NETWORK AND CLOUD

Sl. No.	Course Code	Course Title	Contact Periods	Category	L	T	P	C
1	20CS518	Wireless Network	3	PEC	3	0	0	3
2	20CS519	Block chain	3	PEC	3	0	0	3
3	20CS521	Cloud Security	3	PEC	3	0	0	3
4	20CS523	Cloud Storage infrastructure	3	PEC	3	0	0	3
5	20CS524	Cloud Strategy Planning and Management	3	PEC	3	0	0	3
6	20CS525	Software Defined Network	3	PEC	3	0	0	3
7	20CS533	Internet of Things	3	PEC	3	0	0	3

### COMPUTER VISION AND VIRTUAL REALITY

Sl. No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1	20CS526	Computer Graphics	PEC	3	3	0	0	3

2	20CS527	Computer Vision	PEC	3	3	0	0	3
3	20CS529	Content Based Image and Video Retrieval	PEC	3	3	0	0	3
4	20CS530	Game Programming	PEC	3	3	0	0	3
5	20CS532	Introduction to Augmented Reality	PEC	3	3	0	0	3
6	20CS528	Virtual Reality	PEC	3	3	0	0	3

### OPEN ELECTIVE

S. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1	20AE601	Introduction To Flight	OEC	3	3	0	0	3
2	20AT601	Hybrid and Electric Vehicle	OEC	3	3	0	0	3
3	20MA601	Graph Theory	OEC	3	3	0	0	3
4	20MA603	Resource Management Techniques	OEC	3	3	0	0	3
5	20EC612	Medical Electronics	OEC	3	3	0	0	3
6	20ME601	Principles of Management	OEC	3	3	0	0	3
7	20ME603	Supply chain Management	OEC	3	3	0	0	3
8	20PT601	Indian Systems of Medicine	OEC	3	3	0	0	3
9	20PT602	Antibiotics and Vaccines	OEC	3	3	0	0	3
10	20BA603	Customer Relationship Management	OEC	3	3	0	0	3
11	20ME516	Entrepreneurship Development	OEC	3	3	0	0	3
12	20BA608	Enterprise Resource Planning	OEC	3	3	0	0	3

### EMPLOYABILITY ENHANCEMENT COURSES (EEC)

S. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1	20TP701	Soft Skills & Aptitude – I	EEC	2	0	0	2	1
2	20TP702	Soft Skills & Aptitude – II	EEC	2	0	0	2	1
3	20TP703	Soft Skills & Aptitude – III	EEC	2	0	0	2	1
4	20CS707	Mini Project – I	EEC	4	0	0	2	2
5	20TP704	Soft Skills & Aptitude – IV	EEC	2	0	0	2	1
6	20TP705	Programming Aspects and Technical Aptitude – I	EEC	2	0	0	2	1
7	20SS803	Indian Constitution	MC	2	2	0	0	0
8	20CS708	Mini Project-II	EEC	4	0	0	2	2
9	20TP709	Internship / Inplant Training	EEC	0	0	0	0	2
10	20TP706	Programming Aspects and Technical Aptitude - II	EEC	2	0	0	2	1
11	20CS710	Project Work	EEC	12	0	0	12	6

#### MANDATORY COURSES (MC)

S. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1	20MC801	Universal Human Values and Healthy Practices	MC	-	2 Weeks			
2	20MC802	Environmental Science and Engineering	MC	2	2	0	0	0
3	20MC803	Indian Constitution	MC	0	2	0	0	0
4	20MC804	Essence of Indian Traditional Knowledge	MC	2	2	0	0	0

## **VERTICALS FOR MINOR DEGREE PROGRAMME**

**(Offered to Students of Other Discipline)**

### **FULL STACK DEVELOPMENT**

<b>Sl. No.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Category</b>	<b>Contact Periods</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
1	20CS533	Web Programming	PEC	4	2	0	2	3
2	20CS534	Advanced Web Programming	PEC	4	2	0	2	3
3	20CS535	Mobile Application Development	PEC	4	2	0	2	3
4	20CS536	UI / UX Design	PEC	4	2	0	2	3
5	20CS537	Software Testing and Automation	PEC	3	3	0	0	3
6	20CS538	Devops	PEC	4	2	0	2	3

### **ARTIFICIAL INTELLIGENCE AND DATA SCIENCE**

<b>Sl. No.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Category</b>	<b>Contact Periods</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
1	20AD401	Introduction to Artificial Intelligence and Data Science	PCC	3	3	0	0	3
2	20MA501	Probability Distributions and Statistical Inference	PCC	3	3	0	0	3
3	20CS515	Python Programming for Data Science	PCC	4	2	0	2	3

4	20CS404	Data Visualization	PCC	4	2	0	2	3
5	20CS501	Machine Learning	PEC	3	3	0	0	3
6	20CS504	Deep Learning	PEC	3	3	0	0	3
7	20CS517	Data Analytics	PEC	3	3	0	0	3

### CREDIT DISTRIBUTION

S. No	Category	Credits as per Semester								Credits Total	Percentage
		I	II	III	IV	V	VI	VII	VIII		
1	HS	3	3					2		8	4.73
2	BS	12	7	4	4					27	15.98
3	ES	5	5	8	3		5			26	15.38
4	PC		5	8	16	18	6	12		65	38.46
5	PE					3	3	6	6	18	10.65
6	OE						3	3		6	3.55
7	EEC	1	1	1	3	1	5		6	18	10.65
Total		21	21	21	26	22	22	23	12	168	
8	Non Credit / Mandatory	Yes	-	Yes	-	Yes	Yes	-	-	-	

### Connection of courses with POs/PSOs

PO Number	List of Courses
P01	20MA201-Engineering Mathematics-I, 20PH201-Engineering physics, 20CY201-Engineering Chemistry, 20CS301-Python Programming, 20PC201-Physics and Chemistry Laboratory, 20CS302-Python Programming Laboratory, 20TP701-Soft Skills & Aptitude – I, 20MA202-Engineering Mathematics-II, 20PH202-Physics of Materials, 20ME301-Engineering Graphics, 20CS424-Java Fundamentals, 20CS425-Java Laboratory, 20ME302-Engineering Practice Laboratory, 20TP702-Soft Skills & Aptitude – II, 20MA204-Discrete Mathematics, 20EC304-Digital Principles and Systems Design, 20CS402-Clean Coding and Devops, 20CS401-Data Structures, 20EC305-Communication Engineering, 20MC804-Essence of Indian Traditional Knowledge, 20EC307-Digital Systems Laboratory, 20CS403-Data Structures Laboratory, 20TP703-Soft Skills & Aptitude – III, 20MA207-Probability and Queuing Theory, 20CS404-Data Visualization, 20CS405-Database Management Systems, 20CS406-Operating Systems, 20CS407-Analysis of Algorithms, 20CS307-Computer Architecture, 20CS408- Database Management Systems Laboratory, 20CS409 –Operating Systems Laboratory, 20CS707 –Mini Project – I, 20TP704 –Soft Skills & Aptitude – IV, 20CS410 –Automata and Compiler Design, 20CS412 –Web Programming, 20MC802 –Environmental Science and Engineering, 20CS413 –Network Programming Laboratory, 20CS417 –Design Thinking Laboratory,

	20TP705 –Programming Aspects and Technical Aptitude – I, 20CS415 –Development of Machine Learning Models, 20EC311 –Microprocessor and Microcontrollers, 20ME516-Entrepreneurship Development, 20BA603-Customer Relationship Management, 20CS537-Software Testing and automation, 20EC421 –Microprocessor and Microcontrollers Laboratory, 20CS708 –Mini Project-II, 20TP709 –Internship /Inplant Training, 20TP706 –Programming Aspects and Technical Aptitude – II, 20CS501 –Machine Learning, 20CS502 –Soft Computing, 20CS519 –Block Chain, 20CS511 –Data Science Using R, 20CS509 –Predictive Modelling, 20CS512 –Information Retrieval, 20CS513 –Information Science and Ethics, 20CS419 –Cloud Computing, 20CS420 –Cryptography and Network Security, 20MB101 –Organizational Behavior and Accounting, 20CS411 –Computer Networks , 20CS423 –AI Analyst Laboratory, 20CS710 –Project Work, 20CS533 –Internet of Things, 20CS504 –Deep Learning, 20CS503 –Natural Language Processing, 20CS524 –Cloud Strategy, Planning and Management, 20CS521 –Cloud Security, 20CS523 –Cloud Storage Infrastructure, 20CS516 –Data Security
P02	20MA201-Engineering Mathematics-I, 20PH201-Engineering physics, 20CY201-Engineering Chemistry, 20CS301-Python Programming, 20PC201-Physics and Chemistry Laboratory, 20CS302-Python Programming Laboratory, 20MA202-Engineering Mathematics-II, 20PH202-Physics of Materials, 20ME301-Engineering Graphics, 20CS424-Java Fundamentals, 20CS425-Java Laboratory, 20ME302-Engineering Practice Laboratory, 20MA204-Discrete Mathematics, 20EC304-Digital Principles and Systems Design, 20CS402-Clean Coding and Devops,

	20CS401-Data Structures, 20EC305-Communication Engineering, 20EC307-Digital Systems Laboratory, 20CS403-Data Structures Laboratory, 20MA207-Probability and Queuing Theory, 20CS404-Data Visualization, 20CS405-Database Management Systems, 20CS406-Operating Systems, 20CS407-Analysis of Algorithms, 20CS307-Computer Architecture, 20CS408- Database Management Systems Laboratory, 20CS409 –Operating Systems Laboratory, 20CS707 –Mini Project – I, 20CS410 –Automata and Compiler Design, 20CS411 –Computer Networks, 20CS412 –Web Programming, 20CS416 –Software Engineering, 20MC802 –Environmental Science and Engineering, 20TP705 –Programming Aspects and Technical Aptitude – I, 20CS414 –Artificial Intelligence, 20CS415 –Development of Machine Learning Models, 20EC311 –Microprocessor and Microcontrollers, 20EC421 –Microprocessor and Microcontrollers Laboratory, 20CS708 –Mini Project-II, 20TP709 –Internship /Inplant Training, 20TP706 –Programming Aspects and Technical Aptitude – II, 20CS501 –Machine Learning, 20CS502 –Soft Computing, 20CS519 –Block Chain, 20CS511 –Data Science Using R, 20CS509 –Predictive Modelling, 20CS512 –Information Retrieval, 20CS513 –Information Science and Ethics, 20CS510 –Data Warehousing and Mining, 20CS419 –Cloud Computing, 20CS420 –Cryptography and Network Security, 20MB101 –Organizational Behavior and Accounting, 20CS421 –Mobile Application Development Laboratory, 20CS422 –Cloud computing Laboratory, 20CS524 –Cloud Strategy, Planning and Management , 20CS423 –AI Analyst Laboratory, 20CS710 –Project Work, 20CS533 –Internet of Things, 20CS504 –Deep Learning, 20CS503 –Natural Language Processing, Planning and Management, 20CS521 –Cloud Security,
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	20CS523 –Cloud Storage Infrastructure, 20CS516 –Data Security, 20CS537-Software Testing and automation
P03	20CY201-Engineering Chemistry, 20PC201-Physics and Chemistry Laboratory, 20CS302-Python Programming Laboratory, 20CS424-Java Fundamentals, 20CS425-Java Laboratory, 20EC304-Digital Principles and Systems Design, 20CS401-Data Structures, 20CS408- Database Management Systems Laboratory , 20EC305-Communication Engineering, 20EC307-Digital Systems Laboratory, 20CS403-Data Structures Laboratory, 20CS404-Data Visualization, 20CS405-Database Management Systems, 20CS406-Operating Systems, 20CS407-Analysis of Algorithms, 20CS409 –Operating Systems Laboratory, 20CS707 –Mini Project – I, 20CS410 –Automata and Compiler Design, 20CS412 –Web Programming, 20CS416 –Software Engineering, 20CS413 –Network Programming Laboratory, 20CS417 –Design Thinking Laboratory, 20CS414 –Artificial Intelligence, 20EC311 –Microprocessor and Microcontrollers, 20EC421 –Microprocessor and Microcontrollers Laboratory, 20CS708 –Mini Project-II,20TP709 –Internship /Inplant Training, 20CS501 –Machine Learning, 20CS502 –Soft Computing, 20CS519 –Block Chain, 20CS511 –Data Science Using R, 20CS537-Software Testing and automation, 20CS509 –Predictive Modelling, 20CS512 –Information Retrieval, 20CS510 –Data Warehousing and Mining, 20CS419 –Cloud Computing, 20CS420 –Cryptography and Network Security, 20CS524 –Cloud Strategy, Planning and Management , 20CS421 –Mobile Application Development Laboratory, 20CS422 –Cloud computing Laboratory, 20CS710 –Project Work, 20CS533 –Internet of Things, 20CS504 –Deep Learning,

	20CS503 –Natural Language Processing, 20CS423 –AI Analyst Laboratory , 20CS521 –Cloud Security, 20CS516 –Data Security
P04	20CS301-Python Programming, 20CS302-Python Programming Laboratory, 20CS425-Java Laboratory, 20EC304-Digital Principles and Systems Design, 20CS402-Clean Coding and Devops, 20CS401-Data Structures, 20CS403-Data Structures Laboratory, 20CS405-Database Management Systems, 20CS406-Operating Systems, 20CS407-Analysis of Algorithms, 20CS409 –Operating Systems Laboratory, 20CS408- Database Management Systems Laboratory , 20CS707 –Mini Project – I, 20CS411 –Computer Networks, 20TP705 –Programming Aspects and Technical Aptitude – I, 20CS414 –Artificial Intelligence, 20CS415 –Development of Machine Learning Models, 20EC311 –Microprocessor and Microcontrollers, 20BA603-Customer Relationship Management, 20EC421 –Microprocessor and Microcontrollers Laboratory, 20CS708 –Mini Project-II, 20TP709 –Internship /Inplant Training, 20TP706 –Programming Aspects and Technical Aptitude – II, 20CS501 –Machine Learning, 20CS519 –Block Chain, 20CS509 –Predictive Modelling, 20CS512 –Information Retrieval, 20CS513 –Information Science and Ethics, 20CS420 –Cryptography and Network Security, 20CS422 –Cloud computing Laboratory, 20CS423 –AI Analyst Laboratory, 20CS710 –Project Work, 20CS533 –Internet of Things, 20CS504 –Deep Learning, 20CS503 –Natural Language Processing, 20CS521 –Cloud Security, 20CS523 –Cloud Storage Infrastructure, 20CS516 –Data Security
P05	20CS301-Python Programming, 20CS302-Python Programming Laboratory, 20EC304-Digital Principles and Systems Design, 20CS402-Clean Coding and Devops,

	20CS401-Data Structures, 20CS403-Data Structures Laboratory, 20CS404-Data Visualization, 20CS409 –Operating Systems Laboratory, 20CS707 –Mini Project – I, 20CS412 –Web Programming, 20CS416 –Software Engineering, 20CS413 –Network Programming Laboratory, 20CS417 –Design Thinking Laboratory, 20TP705 –Programming Aspects and Technical Aptitude – I, 20CS415 –Development of Machine Learning Models, 20EC311 –Microprocessor and Microcontrollers, 20BA603-Customer Relationship Management, 20EC421 –Microprocessor and Microcontrollers Laboratory, 20CS708 –Mini Project-II, 20TP709 –Internship /Inplant Training, 20TP706 –Programming Aspects and Technical Aptitude – II, 20CS501 –Machine Learning, 20CS519 –Block Chain, 20CS509 –Predictive Modelling, 20CS512 –Information Retrieval, 20CS513 –Information Science and Ethics, 20CS419 –Cloud Computing, 20CS420 –Cryptography and Network Security, 20CS421 –Mobile Application Development Laboratory, 20CS422 –Cloud computing Laboratory, 20CS423 –AI Analyst Laboratory, 20CS710 –Project Work, 20CS533 –Internet of Things, 20CS504 –Deep Learning, 20CS503 –Natural Language Processing, 20CS524 –Cloud Strategy, Planning and Management, 20CS521 –Cloud Security, 20CS523 –Cloud Storage Infrastructure, 20CS537-Software Testing and automation
P06	20PH201-Engineering physics, 20CY201-Engineering Chemistry, 20PC201-Physics and Chemistry Laboratory, 20MC804-Essence of Indian Traditional Knowledge, 20CS707 –Mini Project – I, 20EN101-Technical English-I , 20MC802 –Environmental Science and Engineering, 20CS411 –Computer Networks , 20ME516-Entrepreneurship Development, 20CS708 –Mini Project-II,

	20TP709 –Internship /Inplant Training, 20ME507-Professional Ethics, 20CS423 –AI Analyst Laboratory, 20CS710 –Project Work,
P07	20PH201-Engineering physics, 20CY201-Engineering Chemistry, 20CS707 –Mini Project – I, 20TP701-Soft Skills & Aptitude – I , 20MC802 –Environmental Science and Engineering, 20ME516-Entrepreneurship Development, 20CS708 –Mini Project-II, 20TP709 –Internship /Inplant Training, 20ME507-Professional Ethics, 20MB101 –Organizational Behavior and Accounting, 20CS710 –Project Work
P08	20EN101-Technical English-I, 20MC801-Universal Human Values and Healthy Practices, 20ME302-Engineering Practice Laboratory, 20MC804-Essence of Indian Traditional Knowledge, 20CS707 –Mini Project – I, 20CS412 –Web Programming, 20ME516-Entrepreneurship Development, 20CS408- Database Management Systems Laboratory , 20MC803-Indian Constitution, 20CS417 –Design Thinking Laboratory , 20CS708 –Mini Project-II, 20TP709 –Internship /Inplant Training, 20MC802 –Environmental Science and Engineering, 20MB101 –Organizational Behavior and Accounting, 20BA603-Customer Relationship Management , 20CS513 –Information Science and Ethics , 20CS512 –Information Retrieval , 20CS420 –Cryptography and Network Security, 20CS524 –Cloud Strategy, Planning and Management , 20ME507-Professional Ethics, 20CS710 –Project Work, 20CS516 –Data Security
P09	20EN101-Technical English-I, 20MC801-Universal Human Values and Healthy Practices, 20EN102-Technical English-II, 20ME302-Engineering Practice Laboratory, 20CS406-Operating Systems, 20CS707 –Mini Project – I, 20ME516-Entrepreneurship Development, 20MC803-Indian Constitution,

	20CS708 –Mini Project-II, 20TP709 –Internship /Inplant Training, 20TP701-Soft Skills & Aptitude – I , 20TP702-Soft Skills & Aptitude – II , 20TP703-Soft Skills & Aptitude – III , 20TP704 –Soft Skills & Aptitude – IV, 20CS412 –Web Programming , 20MB101 –Organizational Behavior and Accounting, 20CS423 –AI Analyst Laboratory, 20CS710 –Project Work
PO10	20PH201-Engineering physics, 20EN101-Technical English-I, 20TP701-Soft Skills & Aptitude – I, 20EN102-Technical English-II, 20ME302-Engineering Practice Laboratory, 20TP702-Soft Skills & Aptitude – II, 20EC304-Digital Principles and Systems Design, 20CS402-Clean Coding and Devops, 20TP703-Soft Skills & Aptitude – III, 20CS408- Database Management Systems Laboratory, 20CS707 –Mini Project – I, 20TP704 –Soft Skills & Aptitude – IV, 20CS412 –Web Programming, 20CS413 –Network Programming Laboratory, 20CS417 –Design Thinking Laboratory, 20CS425-Java Laboratory , 20ME516-Entrepreneurship Development, 20MC803-Indian Constitution, 20EC421 –Microprocessor and Microcontrollers Laboratory, 20CS708 –Mini Project-II, 20TP709 –Internship /Inplant Training, 20CS502 –Soft Computing, 20CS422 –Cloud computing Laboratory , 20CS509 –Predictive Modelling, 20CS419 –Cloud Computing, 20MB101 –Organizational Behavior and Accounting, 20CS710 –Project Work, 20CS521 –Cloud Security
PO11	20EN101-Technical English-I, 20TP701-Soft Skills & Aptitude – I, 20EN102-Technical English-II, 20PH202-Physics of Materials, 20CS425-Java Laboratory, 20TP702-Soft Skills & Aptitude – II, 20TP703-Soft Skills & Aptitude – III,

	20CS707 –Mini Project – I, 20TP704 –Soft Skills & Aptitude – IV, 20TP705 –Programming Aspects and Technical Aptitude – I, 20EC311 –Microprocessor and Microcontrollers, 20ME516-Entrepreneurship Development, 20CS411 –Computer Networks, 20EC421 –Microprocessor and Microcontrollers Laboratory, 20CS708 –Mini Project-II, 20TP709 –Internship /Inplant Training, 20BA603-Customer Relationship Management , 20TP706 –Programming Aspects and Technical Aptitude – II, 20MB101 –Organizational Behavior and Accounting, 20CS710 –Project Work
PO12	20PH201-Engineering physics, 20CY201-Engineering Chemistry, 20EN101-Technical English-I, 20PC201-Physics and Chemistry Laboratory, 20TP701-Soft Skills & Aptitude – I, 20EN102-Technical English-II, 20PH202-Physics of Materials, 20ME301-Engineering Graphics, 20CS425-Java Laboratory, 20TP702-Soft Skills & Aptitude – II, 20TP703-Soft Skills & Aptitude – III, 20CS406-Operating Systems, 20CS707 –Mini Project – I, 20TP704 –Soft Skills & Aptitude – IV, 20CS412 –Web Programming, 20MC802 –Environmental Science and Engineering, 20CS413 –Network Programming Laboratory, 20CS417 –Design Thinking Laboratory, 20TP705 –Programming Aspects and Technical Aptitude – I, 20EC311 –Microprocessor and Microcontrollers, 20ME516-Entrepreneurship Development, 20EC421 –Microprocessor and Microcontrollers Laboratory, 20CS708 –Mini Project-II, 20TP709 –Internship /Inplant Training, 20TP706 –Programming Aspects and Technical Aptitude – II, 20CS502 –Soft Computing, 20MB101 –Organizational Behavior and Accounting, 20CS423 –AI Analyst Laboratory, 20CS710 –Project Work, 20CS533 –Internet of Things, 20CS524 –Cloud Strategy, Planning and Management
PSO1	20MA201-Engineering Mathematics-I,

	20PH201-Engineering physics, 20CS301-Python Programming, 20CS302-Python Programming Laboratory, 20MA202-Engineering Mathematics-II, 20CS424-Java Fundamentals, 20CS425-Java Laboratory, 20MA204-Discrete Mathematics, 20EC304-Digital Principles and Systems Design, 20CS408- Database Management Systems Laboratory , 20CS402-Clean Coding and Devops, 20CS401-Data Structures, 20EC307-Digital Systems Laboratory, 20CS403-Data Structures Laboratory, 20MA207-Probability and Queuing Theory, 20CS404-Data Visualization, 20CS405-Database Management Systems, 20CS406-Operating Systems, 20CS407-Analysis of Algorithms, 20CS307-Computer Architecture, 20CS409 –Operating Systems Laboratory, 20CS707 –Mini Project – I, 20CS411 –Computer Networks, 20CS412 –Web Programming, 20CS416 –Software Engineering, 20CS414 –Artificial Intelligence, 20CS415 –Development of Machine Learning Models, 20EC311 –Microprocessor and Microcontrollers, 20ME516-Entrepreneurship Development, 20CS708 –Mini Project-II, 20TP709 –Internship /Inplant Training, 20CS502 –Soft Computing, 20CS511 –Data Science Using R, 20CS509 –Predictive Modelling, 20CS512 –Information Retrieval, 20CS513 –Information Science and Ethics, 20CS510 –Data Warehousing and Mining, 20CS419 –Cloud Computing, 20CS519 –Block Chain, 20ME507-Professional Ethics, 20CS422 –Cloud computing Laboratory, 20CS710 –Project Work, 20CS533 –Internet of Things, 20CS501 –Machine Learning , 20CS504 –Deep Learning, 20CS410 –Automata and Compiler Design ,
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	20TP706 –Programming Aspects and Technical Aptitude , 20MB101 –Organizational Behavior and Accounting , 20CS503 –Natural Language Processing, 20CS413 –Network Programming Laboratory , 20CS421 –Mobile Application Development Laboratory , 20CS423 –AI Analyst Laboratory , 20CS420 –Cryptography and Network Security , 20TP705 –Programming Aspects and Technical Aptitude , 20CS524 –Cloud Strategy, Planning and Management, 20CS523 –Cloud Storage Infrastructure, 20CS537-Software Testing and automation, 20CS516 –Data Security
PSO2	20ME301-Engineering Graphics, 20CS424-Java Fundamentals, 20CS425-Java Laboratory, 20ME302-Engineering Practice Laboratory, 20EC304-Digital Principles and Systems Design, 20CS402-Clean Coding and Devops, 20CS301-Python Programming , 20CS401-Data Structures, 20EC305-Communication Engineering, 20EC307-Digital Systems Laboratory, 20CS403-Data Structures Laboratory, 20CS404-Data Visualization, 20CS405-Database Management Systems, 20CS302-Python Programming Laboratory , 20CS406-Operating Systems, 20CS408- Database Management Systems Laboratory, 20CS307-Computer Architecture, 20CS409 –Operating Systems Laboratory, 20CS707 –Mini Project – I, 20CS410 –Automata and Compiler Design, 20CS412 –Web Programming, 20CS416 –Software Engineering, 20CS414 –Artificial Intelligence, 20CS415 –Development of Machine Learning Models, 20CS407-Analysis of Algorithms , 20EC311 –Microprocessor and Microcontrollers, 20CS411 –Computer Networks , 20ME516-Entrepreneurship Development, 20EC421 –Microprocessor and Microcontrollers Laboratory, 20CS708 –Mini Project-II, 20TP709 –Internship /Inplant Training, 20CS501 –Machine Learning, 20CS502 –Soft Computing, 20CS519 –Block Chain,



	20CS511 –Data Science Using R, 20CS509 –Predictive Modelling, 20CS537-Software Testing and automation, 20CS512 –Information Retrieval, 20CS420 –Cryptography and Network Security, 20MB101 –Organizational Behavior and Accounting, 20CS421 –Mobile Application Development Laboratory, 20CS413 –Network Programming Laboratory, 20CS422 –Cloud computing Laboratory, 20CS513 –Information Science and Ethics , 20CS419 –Cloud Computing , 20ME507-Professional Ethics , 20CS710 –Project Work, 20CS533 –Internet of Things, 20CS504 –Deep Learning, 20CS524 –Cloud Strategy, Planning and Management, 20CS521 –Cloud Security, 20CS523 –Cloud Storage Infrastructure, 20CS516 –Data Security
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## Programme Articulation Matrix

Mapping framework showing the correlation between all courses in a program and the 12 POs

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C101	20MA201-Engineering Mathematics-I	2.4	2.4	-	-	-	-	-	-	-	-	-	-	1	-
C102	20PH201-Engineering Physics	2	2.67	-	-	-	2	1	-	-	1	-	1	-	-
C103	20CY201-Engineering Chemistry	3	2.4	2.25	-	-	2	2	-	-	-	-	1	-	-
C104	20EN101-Technical English-I	-	-	-	-	-	1	-	1	1	3	1	1	-	-
C105	20CS301-Python Programming	3	2.8	-	2	2	-	-	-	-	-	-	-	3	2
C106	20PC201-Physics and Chemistry Laboratory	3	2.4	2.25	-	-	2	-	-	-	-	-	1.6	-	-
C107	20CS302-Python Programming Laboratory	3	3	3	3	3	-	-	-	-	-	-	-	3	2
C108	20MC801-Universal Human Values and Healthy Practices	-	-	-	-	-	-	-	3	3	-	-	-	-	-
C109	20TP701-Soft Skills & Aptitude – I	3	-	-	-	-	-	2	-	2	3	1	3	-	-
C110	20MA202-Engineering Mathematics-II	2.8	2.8	-	-	-	-	-	-	-	-	-	-	1	-
C111	20EN102-Technical English-II	-	-	-	-	-	-	-	-	1	3	1	1	-	-

C112	20PH202-Physics of Materials	2	2	-	-	-	-	-	-	-	-	1	1	-	-
C113	20ME301-Engineering Graphics	2.8	2	-	-	-	-	-	-	-	-	-	2.2	-	2
C114	20CS424-Java Fundamentals	3	3	3	-	-	-	-	-	-	-	-	-	3	3
C115	20CS425-Java Laboratory	3	3	3	2.6	-	-	-	-	-	2	2	2	3	3
C116	20ME302-Engineering Practice Laboratory	3	3	-	-	-	-	-	2	2	2	-	-	-	2
C117	20TP702-Soft Skills & Aptitude – II	3	-	-	-	-	-	2	-	2	3	1	3	-	-
C201	20MA204-Discrete Mathematics	3	3	-	-	-	-	-	-	-	-	-	-	2	-
C202	20EC304-Digital Principles and Systems Design	3	3	3	3	2	-	-	-	-	2	-	-	2	2.6
C203	20CS402-Clean Coding and Devops	3	2.3	-	3	3	-	-	-	-	2	-	-	3	2
C204	20CS401-Data Structures	3	2.6	2.8	2.6	2	-	-	-	-	-	-	-	3	3
C205	20EC305-Communication Engineering	3	3	2	-	-	-	-	-	-	-	-	-	-	2
C206	20MC804-Essence of Indian Traditional Knowledge	2	-	-	-	-	3	-	2.5	-	-	-	-	-	-
C207	20EC307-Digital Systems Laboratory	3	3	3	-	-	-	-	-	-	-	-	-	1	2
C208	20CS403-Data Structures Laboratory	3	3	2.7	2.3	2	-	-	-	-	-	-	-	3	3
C209	20TP703-Soft Skills &	3	-	-	-	-	-	2	-	2	3	1	3	-	-





C317	20CS519 -Block Chain	2	2.1	2.3	2	2	-	-	-	-	-	-	-	1	2
C318	20CS511 -Data Science Using R	3	2	3	-	-	-	-	-	-	-	-	-	3	3
C319	20CS509 - Predictive Modelling	2.8	2.8	2.2	2	2.4	-	-	-	-	2	-	-	2.8	2.5
C320	20CS537- Software Testing and automation	2	3	3	-	3	-	-	-	-	-	-	-	2	2.6
C321	20MC803-Indian Constitution	-	-	-	-	-	-	-	1.5	3	3	-	-	-	-
C322	20EC421 - Microprocessor and Microcontrollers Laboratory	2	2.2	2.6	2	3	-	-	-	-	2	2	3	-	3
C323	20CS708 -Mini Project-II	3	3	3	3	3	3	3	3	3	3	3	3	3	3
C324	20TP709 - Internship / Inplant Training	3	3	3	3	3	3	3	3	3	3	3	3	3	3
C325	20TP706 - Programming Aspects and Technical Aptitude – II	3	3	-	2	3	-	-	-	-	-	1	3	3	-
C401	20CS419 -Cloud Computing	3	3	3	-	3	-	-	-	-	3	-	-	2	3
C402	20CS420 - Cryptography and Network Security	3	3	3	2	3	-	-	2	-	-	-	-	3	2
C403	20ME507- Professional Ethics	-	-	-	-	-	3	3	3	-	-	-	-	2	2
C404	20MB101 - Organizational Behavior and Accounting	3	3	-	-	-	-	2	1	3	3	3	2.3	1	1

[illegible]