SAVEETHA ENGINEERING COLLEGE
AUTONOMOUS
NAAC A GRADE
Affiliated to Anna University | Approved by AICTE

REGULATIONS 2024
FLEXIBLE CHOICE BASED CREDIT SYSTEM
DEPARTMENT OF COMPUTER SCIENCE ENGINEERING
B.E., Computer Science and Engineering
CURRICULUM - For Learners admitted from Academic Year 2024 - 2025

S.No	Remarks	Category	Course Code R2024	Course Code R2019	Course Title	Prerequisite	Theory Credits	Practical Credits	Total Credits	CGPA / Non - CGPA	Course Type
1	Any 1	HS	SH1104	19EN104	Technical Writing	-	3	0	3	CGPA	Theory
2	Any 1	HS	SH1105	19EN105	Public Speaking	-	0	3	3	CGPA	Practical (10 Expts)
3	Any 1	HS	SH1101	19EN101	Communicative English	-	3	1	4	CGPA	TIP (6 Expts)
4	Exempted for LE, Any 2 for Regular	HS	SH9154	19MS154	Basic Financial Accounting	-	3	0	3	CGPA	Theory
5	Exempted for LE, Any 2 for Regular	HS	SH9156	19MS156	Human Resource Management and Team Building	-	3	0	3	CGPA	Theory
6	Exempted for LE, Any 2 for Regular	HS	SH9155	19MS155	Stock Market and Company Operations	-	3	0	3	CGPA	Theory
7	Exempted for LE	HS	SH7101	22HS101	தமிழர் மரபு/ Heritage of Tamils	-	1	0	1	CGPA	Theory (Int Only)
8	Exempted for LE	HS	SH7102	22HS102	தமிழரும் தொழில்நுட்பமும்/ Tamils and Technology	-	1	0	1	CGPA	Theory (Int Only)
9	Exempted for LE	HS	SH7801	NA	Human Values and Professional Ethics	-	2	0	2	CGPA	Theory
10		HS	SH5624	NA	Japanese Language N5 Basic	-	0	2	2	CGPA	Practical (10 Expts)
11		HS	SH5625	NA	Japanese Language N5 Advanced	SH5624	0	2	2	CGPA	Practical (10 Expts)
12		HS	SH5626	NA	German Language A1 Basic	-	0	2	2	CGPA	Practical (10 Expts)
13		HS	SH5627	NA	German Language A1 Advanced	SH5626	0	2	2	CGPA	Practical (10 Expts)
14	Exempted for LE	BS	SH2201	19MA201	Calculus and Matrix Algebra	-	4	0	4	CGPA	Theory
15	Exempted for LE	BS	SH2206	19MA206	Logic and Combinatorics	19MA201	4	0	4	CGPA	Theory
16		BS	SH2212	19MA212	Algebra and Number Theory	19MA201	4	0	4	CGPA	Theory
17		BS	SH2222	19MA222	Probability and Queueing Models	-	3	1	4	CGPA	TIP (6 Expts)
18	Exempted for LE	BS	SH3214	NA	Physics for Quantum Computing	-	2	1	3	CGPA	TIP (6 Expts)
19	Exempted for LE	BS	SH4205	19CY205	Principles of Chemistry in Engineering	-	3	1	4	CGPA	TIP (6 Expts)

20		BS	SH4801	NA	Environmental Sciences and Sustainability	-	2	0	2	CGPA	Theory
21		ES	CS3301	19AI301	Python Programming	-	1	2	3	CGPA	Theory (Int Only) and Practical (10 Expts)
22	Exempted for LE	ES	CS3302	19AI302	Engineering Design and Modelling	-	0	3	3	CGPA	Practical (10 Expts)
23	Exempted for LE	ES	EC2404	19EE404	Digital Electronics	-	3	1	4	CGPA	TIP (6 Expts)
24	Exempted for LE	ES	EC2305	19EE305	Basic Electrical, Electronics and Measurement Engineering	-	2	1	3	CGPA	TIP (6 Expts)
25	Exempted for LE	ES	EC2309	19EE309	Programming Microcontrollers	-	2	1	3	CGPA	TIP (6 Expts)
26		ES	CS3304	19AI304	Fundamentals of C Programming	-	1	2	3	CGPA	Theory (Int Only) and Practical (10 Expts)
27		ES	CS3305	19AI305	Advanced C Programming	19AI304 / CS3304	1	2	3	CGPA	Theory (Int Only) and Practical (10 Expts)
28		ES	CS1305	19CS305	Computer Architecture	-	3	0	3	CGPA	Theory
29		PC	CS3307	19AI307	Object Oriented Programming using Java	19AI304 / CS3304	1	2	3	CGPA	Theory (Int Only) and Practical (10 Expts)
30		PC	CS3404	19AI404	Analysis of Algorithms	19AI301 / 19AI304 / 19AI307	1	2	3	CGPA	Theory (Int Only) and Practical (10 Expts)
31		PC	CS3405	19AI405	Fundamentals of Artificial Intelligence	19CS301 / 19AI301 / CS3301	2	1	3	CGPA	TIP (6 Expts)
32		PC	CS3408	19AI408	Data Structures	19AI301 / 19AI304 / 19AI307	1	2	3	CGPA	Theory (Int Only) and Practical (10 Expts)
33		PC	CS3410	19AI410	Introduction to Machine Learning	-	2	1	3	CGPA	TIP (6 Expts)
34		PC	CS3414	19AI414	Fundamentals of Web Application Development	-	3	2	5	CGPA	TIP (10 Expts)
35		PC	CS3541	19AI541	Cloud Computing	19CS406	3	1	4	CGPA	TIP (6 Expts)
36	Any 1	PC	CS3553	19AI553	Advanced Java Web Applications	19AI307	2	1	3	CGPA	TIP (6 Expts)
37	Any 1	PC	CS1567	19CS567	Cloud Native App Development	-	2	1	3	CGPA	TIP (6 Expts)
38	Any 1	PC	CS3545	19AI545	Modern Web Application Development	19CS410 / 19AI401 / 19AI414 / 19IT404	2	1	3	CGPA	TIP (6 Expts)
39		PC	CS3546	19AI546	Web Server Programming	19CS401	2	1	3	CGPA	TIP (6 Expts)
40		PC	CS4508	19AM508	Introduction to IoT	-	2	1	3	CGPA	TIP (6 Expts)
41		PC	CS1404	19CS404	Database Management System and its Applications	19AI301/19AI304/19CS301/19CS302/19CS30	3	1	4	CGPA	TIP (6 Expts)
42		PC	CS1405	19CS405	Operating System	-	3	1	4	CGPA	TIP (6 Expts)
43		PC	CS1406	19CS406	Computer Networks	-	3	1	4	CGPA	TIP (6 Expts)
44		PC	CS1407	19CS407	Theory of Computation	19MA206	3	0	3	CGPA	Theory
45		PC	CS1408	19CS408	Software Engineering	-	3	1	4	CGPA	TIP (6 Expts)

46		PC	CS1409	19CS409	Compiler Design	-	3	1	4	CGPA	TIP (6 Expts)
47		PC	CS1415	19CS415	Cryptography	-	2	1	3	CGPA	TIP (6 Expts)
48		PE	CS1549	19CS549	UI and UX Design	-	2	1	3	CGPA	TIP (6 Expts)
49		PE	CS3562	19AI562	Oracle Cloud Infrastructure and Operation	-	2	1	3	CGPA	TIP (6 Expts)
50		PE	CS3563	19AI563	Oracle Cloud Infrastructure AI Foundations	-	2	1	3	CGPA	TIP (6 Expts)
51		PE	CS3565	19AI565	Oracle Autonomous Database and Oracle Machine Learning Essentials	-	2	1	3	CGPA	TIP (6 Expts)
52		PE	CS3565	19AI565	Oracle Autonomous Database and Oracle Machine Learning Essentials	-	2	1	3	CGPA	TIP (6 Expts)
53		PE	CS3566	19AI566	Business Intelligence on Oracle Cloud	-	2	1	3	CGPA	TIP (6 Expts)
54		PE	CS3567	19AI567	Database Developer on Oracle Cloud (APEX)	-	2	1	3	CGPA	TIP (6 Expts)
55		PE	CS3568	19AI568	Application Development on Oracle Cloud	-	2	1	3	CGPA	TIP (6 Expts)
56		PE	CS3569	19AI569	Java 11 Development on Oracle Cloud	-	2	1	3	CGPA	TIP (6 Expts)
57		PE	CS3570	19AI570	Java 17 Development on Oracle Cloud	-	2	1	3	CGPA	TIP (6 Expts)
58		PE	CS3571	19AI571	SQL on Oracle Cloud	-	2	1	3	CGPA	TIP (6 Expts)
59		PE	CS3572	19AI572	PL_SQL on Oracle Cloud	-	2	1	3	CGPA	TIP (6 Expts)
60		PE	CS3573	19AI573	MySQL for Data Scientist	-	2	1	3	CGPA	TIP (6 Expts)
61		PE	CS3574	19AI574	Administer MySQL on Oracle Cloud	-	2	1	3	CGPA	TIP (6 Expts)
62		PE	CS3575	19AI575	Build MySQL Database for Applications on Oracle Cloud	-	2	1	3	CGPA	TIP (6 Expts)
63		PE	CS3509	19AI509	Concepts of Virtual And Augmented Reality	-	2	1	3	CGPA	TIP (6 Expts)
64		PE	CS3602	19AI602	CISCO Networking Certifications	-	2	1	3	CGPA	TIP (6 Expts)
65		PE	CS3603	19AI603	Pega Platform	-	2	1	3	CGPA	TIP (6 Expts)
66		PE	CS3604	19AI604	Rust Programming Language	-	2	1	3	CGPA	TIP (6 Expts)
67	Any 1	PE	CS1580	19CS580	Enterprise Cyber Security and Threat Detection	-	2	1	3	CGPA	TIP (6 Expts)
68	Any 1	PE	CS3589	19CS589	Enterprise Security and Cyber Threat Management	19CS417 / CS1417	2	1	3	CGPA	TIP (6 Expts)
69		PE	CS1581	19CS581	Network Infrastructure and Protocols	-	2	1	3	CGPA	TIP (6 Expts)
70		PE	CS1582	19CS582	Enterprise Networking and Network Security	19CS581 / CS1581	2	1	3	CGPA	TIP (6 Expts)
71		PE	CS1583	19CS583	Network Switching, Routing and Wireless Technologies	19CS581 / CS1581	2	1	3	CGPA	TIP (6 Expts)

72		PE (Honours - Vertical 1)	CS3526	19AI526	Information Security and Access Control	19AI527	2	1	3	CGPA	TIP (6 Expts)
73		PE (Honours - Vertical 1)	CS3527	19AI527	Security Assessment and Risk Analysis	-	3	1	4	CGPA	TIP (6 Expts)
74		PE (Honours - Vertical 1)	CS3531	19AI531	Cryptography and Security	-	2	1	3	CGPA	TIP (6 Expts)
75		PE (Honours - Vertical 1)	CS3532	19AI532	Information Theory for Cyber Security	-	2	1	3	CGPA	TIP (6 Expts)
76		PE (Honours - Vertical 1)	CS3536	19AI536	Steganography and Digital Watermarking	-	2	1	3	CGPA	TIP (6 Expts)
77		PE (Honours - Vertical 1)	CS3547	19AI547	Blockchain for Business	19CS301	2	1	3	CGPA	TIP (6 Expts)
78		PE (Honours - Vertical 1)	CS4406	19AM406	Blockchain and Cryptocurrency	-	3	0	3	CGPA	Theory
79		PE (Honours - Vertical 1)	CS4407	19AM407	Cyber Forensics	-	3	0	3	CGPA	Theory
80		PE (Honours - Vertical 1)	CS4507	19AM507	Security and Trust in IoT	-	2	1	3	CGPA	TIP (6 Expts)
81		PE (Honours - Vertical 1)	CS1416	19CS416	Cloud Security	-	2	1	3	CGPA	TIP (6 Expts)
82		PE (Honours - Vertical 1)	CS1417	19CS417	Ethical Hacking Techniques	-	2	1	3	CGPA	TIP (6 Expts)
83		PE (Honours - Vertical 1)	CS1418	19CS418	Cyber Law and Compliance	-	3	0	3	CGPA	Theory
84		PE (Honours - Vertical 1)	CS1419	19CS419	Digital Forensics and Digital Investigations	-	2	1	3	CGPA	TIP (6 Expts)
85		PE (Honours - Vertical 1)	CS1422	19CS422	Security for IoT Systems	-	3	0	3	CGPA	Theory
86		PE (Honours - Vertical 1)	CS1515	19CS515	Block Chain Architecture and its Use Cases	19CS412	3	0	3	CGPA	Theory
87		PE (Honours - Vertical 1)	CS1530	19CS530	Cyber Security	19CS412	3	0	3	CGPA	Theory
88		PE (Honours - Vertical 1)	CS1533	19CS533	Information Security Intelligence and Analytics using Big Data	-	2	1	3	CGPA	TIP (6 Expts)
89		PE (Honours - Vertical 1)	CS1534	19CS534	Prevention Methodology for Cybersecurity	-	2	1	3	CGPA	TIP (6 Expts)
90		PE (Honours - Vertical 1)	CS1536	19CS536	Firewalls and Intrusion Detection System	-	2	1	3	CGPA	TIP (6 Expts)
91		PE (Honours - Vertical 1)	CS1538	19CS538	System Security	-	3	0	3	CGPA	Theory
92		PE (Honours - Vertical 1)	CS1539	19CS539	Hardware Security	-	3	0	3	CGPA	Theory
93		PE (Honours - Vertical 1)	CS1547	19CS547	Fundamentals of Cryptocurrency	-	3	0	3	CGPA	Theory
94		PE (Honours - Vertical 1)	CS1553	19CS553	Web Application Security	-	2	1	3	CGPA	TIP (6 Expts)
95		PE (Honours - Vertical 1)	CS1558	19CS558	Data Privacy and Protection	-	2	1	3	CGPA	TIP (6 Expts)
96		PE (Honours - Vertical 1)	CS1559	19CS559	Blockchain Platforms and Its Use Cases	-	2	1	3	CGPA	TIP (6 Expts)
97		PE (Honours - Vertical 1)	CS1561	19CS561	Blockchain and Fintech	-	2	1	3	CGPA	TIP (6 Expts)

98		PE (Honours - Vertical 1)	CS1562	19CS562	Public Key Infrastructure and Trust Management	-	2	1	3	CGPA	TIP (6 Expts)
99		PE (Honours - Vertical 1)	CS1563	19CS563	Bitcoin Mining	-	2	1	3	CGPA	TIP (6 Expts)
100		PE (Honours - Vertical 1)	CS2510	19IT510	Ethical Hacking	-	3	0	3	CGPA	Theory
101		PE (Honours - Vertical 2)	CS3306	19AI306	Object Oriented Programming using C++	19AI304	2	1	3	CGPA	TIP (6 Expts)
102		PE (Honours - Vertical 2)	CS3308	19AI308	Object Oriented Programming using C#	19AI304	2	1	3	CGPA	TIP (6 Expts)
103		PE (Honours - Vertical 2)	CS3407	19AI407	Parallel Computing Architecture	-	3	1	4	CGPA	TIP (6 Expts)
104		PE (Honours - Vertical 2)	CS3513	19AI513	Game Programming	19CS401	2	2	4	CGPA	TIP (10 Expts)
105		PE (Honours - Vertical 2)	CS3529	19AI529	Advanced Data Structures	19CS401	2	1	3	CGPA	TIP (6 Expts)
106		PE (Honours - Vertical 2)	CS3538	19AI538	Mathematical Modelling and Computer Aided Engineering	-	2	1	3	CGPA	TIP (6 Expts)
107		PE (Honours - Vertical 2)	CS4502	19AM502	Genetic Algorithms	-	2	1	3	CGPA	TIP (6 Expts)
108		PE (Honours - Vertical 2)	CS4515	19AM515	Advanced Java Programming	-	2	1	3	CGPA	TIP (6 Expts)
109		PE (Honours - Vertical 2)	CS1506	19CS506	Multicore Architecture	19CS305	3	0	3	CGPA	Theory
110		PE (Honours - Vertical 2)	CS1508	19CS508	Parallel and Distributed Systems	19CS305/19CS401	3	0	3	CGPA	Theory
111		PE (Honours - Vertical 2)	CS1509	19CS509	Graph Theory and Applications	-	3	0	3	CGPA	Theory
112		PE (Honours - Vertical 2)	CS1514	19CS514	Network Management Systems	19CS406	3	0	3	CGPA	Theory
113		PE (Honours - Vertical 2)	CS1522	19CS522	Advanced Database Management System	19CS404	3	1	4	CGPA	TIP (6 Expts)
114		PE (Honours - Vertical 2)	CS1529	19CS529	Quantum Computing	19CS301/19CS303	3	0	3	CGPA	Theory
115		PE (Honours - Vertical 2)	CS1544	19CS544	Realtime Operating System	-	2	1	3	CGPA	TIP (6 Expts)
116		PE (Honours - Vertical 2)	CS1545	19CS545	Open Source Operating System	-	2	1	3	CGPA	TIP (6 Expts)
117		PE (Honours - Vertical 2)	CS1546	19CS546	Kernel Programming	-	2	1	3	CGPA	TIP (6 Expts)
118		PE (Honours - Vertical 2)	CS1554	19CS554	Stream Processing	-	2	1	3	CGPA	TIP (6 Expts)
119		PE (Honours - Vertical 2)	NA	19EC416	Principles of Digital Signal Processing	19EC307	3	0	3	CGPA	Theory
120		PE (Honours - Vertical 2)	CS2401	19IT401	Information Technology Essentials	-	3	1	4	CGPA	TIP (6 Expts)
121		PE (Honours - Vertical 2)	CS2405	19IT405	Data Structures using Python	-	3	1	4	CGPA	TIP (6 Expts)
122		PE (Honours - Vertical 2)	CS2501	19IT501	Information Theory and Coding Techniques	-	3	0	3	CGPA	Theory
123		PE (Honours - Vertical 2)	CS2508	19IT508	TCP/IP Design and Implementation	-	3	0	3	CGPA	Theory

124		PE (Honours - Vertical 2)	CS2509	19IT509	Advanced Algorithms	-	3	0	3	CGPA	Theory
125		PE (Honours - Vertical 2)	CS2513	19IT513	Free Open Source Software	-	3	0	3	CGPA	Theory
126		PE (Honours - Vertical 2)	CS2514	19IT514	Real Time Operating Systems	-	3	0	3	CGPA	Theory
127		PE (Honours - Vertical 3)	CS3303	19AI303	Engineering Mechanics and Product Development	-	2	1	3	CGPA	TIP (6 Expts)
128		PE (Honours - Vertical 3)	CS3542	19AI542	Agile Software Development	19CS301	3	1	4	CGPA	TIP (6 Expts)
129		PE (Honours - Vertical 3)	CS3543	19AI543	Software Testing	19CS301	2	1	3	CGPA	TIP (6 Expts)
130		PE (Honours - Vertical 3)	CS1504	19CS504	Software Project Management	19CS408	3	0	3	CGPA	Theory
131		PE (Honours - Vertical 3)	CS1513	19CS513	Green Computing	-	3	0	3	CGPA	Theory
132		PE (Honours - Vertical 3)	CS1516	19CS516	Software Testing and Quality Assurance	-	3	0	3	CGPA	Theory
133		PE (Honours - Vertical 3)	CS1532	19CS532	Professional Readiness for Innovation, Employability and Entrepreneurship	-	0	3	3	CGPA	Practical (10 Expts)
134		PE (Honours - Vertical 3)	CS1537	19CS537	Secure Software Engineering	-	2	1	3	CGPA	TIP (6 Expts)
135		PE (Honours - Vertical 3)	CS1566	19CS566	Software Project Management and Version Control	-	3	0	3	CGPA	Theory
136		PE (Honours - Vertical 3)	CS1570	19CS570	Entrepreneurship and Small Business Development	-	2	1	3	CGPA	TIP (6 Expts)
137		PE (Honours - Vertical 3)	CS1571	19CS571	Software Development and Operations	-	3	0	3	CGPA	Theory
138		PE (Honours - Vertical 3)	CS1574	19CS574	Advanced Class Design and Object-Oriented Techniques	-	3	0	3	CGPA	Theory
139		PE (Honours - Vertical 3)	CS1575	19CS575	Low-Code App Development	-	3	0	3	CGPA	Theory
140		PE (Honours - Vertical 3)	CS2502	19IT502	Enterprise Resource Planning	-	3	0	3	CGPA	Theory
141		PE (Honours - Vertical 3)	CS2505	19IT505	Software Design Patterns	-	3	0	3	CGPA	Theory
142		PE (Honours - Vertical 3)	CS2515	19IT515	Software Agents	-	3	0	3	CGPA	Theory
143		PE (Honours - Vertical 4)	CS3406	19AI406	Digital Image Processing Techniques	-	2	1	3	CGPA	TIP (6 Expts)
144		PE (Honours - Vertical 4)	CS3412	19AI412	Web Data Mining	-	3	1	4	CGPA	TIP (6 Expts)
145		PE (Honours - Vertical 4)	CS3504	19AI504	Mobile Robotics	-	2	1	3	CGPA	TIP (6 Expts)
146		PE (Honours - Vertical 4)	CS3509	19AI509	Concepts of Virtual And Augmented Reality	-	2	1	3	CGPA	TIP (6 Expts)
147		PE (Honours - Vertical 4)	CS3510	19AI510	Mobile VR And AI In Unity	19AI410/19CS302 / 19IT404 / 19AI414	2	1	3	CGPA	TIP (6 Expts)
148		PE (Honours - Vertical 4)	CS3511	19AI511	Scientific and Engineering Data Visualization	-	2	1	3	CGPA	TIP (6 Expts)
149		PE (Honours - Vertical 4)	CS3512	19AI512	NoSQL Database Design	19CS301	2	1	3	CGPA	TIP (6 Expts)

150		PE (Honours - Vertical 4)	CS1520	19CS520	Big Data Analytics	19CS411/19CS519	3	0	3	CGPA	Theory
151		PE (Honours - Vertical 4)	CS3517	19AI517	Business Analytics	-	2	1	3	CGPA	TIP (6 Expts)
152		PE (Honours - Vertical 4)	CS3519	19AI519	Distributed Database	19CS404	3	0	3	CGPA	Theory
153		PE (Honours - Vertical 4)	CS1521	19CS521	Data Warehousing and Data Mining	19CS404	3	0	3	CGPA	Theory
154		PE (Honours - Vertical 4)	CS3523	19AI523	Mobile Database	-	3	0	3	CGPA	Theory
155		PE (Honours - Vertical 4)	CS3524	19AI524	Multimedia Database	19CS410 / 19AI401 / 19AI414 / 19IT404	3	0	3	CGPA	Theory
156		PE (Honours - Vertical 4)	CS3537	19AI537	Computer Graphics for Virtual Reality	-	2	1	3	CGPA	TIP (6 Expts)
157		PE (Honours - Vertical 4)	CS3539	19AI539	Mobile User Interface Development	19CS401	2	1	3	CGPA	TIP (6 Expts)
158		PE (Honours - Vertical 4)	CS3540	19AI540	Programming Mobile Devices	19CS401	2	1	3	CGPA	TIP (6 Expts)
159		PE (Honours - Vertical 4)	CS3544	19AI544	Virtualization and Containerization	19CS405/19CS406	2	1	3	CGPA	TIP (6 Expts)
160		PE (Honours - Vertical 4)	CS3552	19AI552	Web Application User Interface Development	-	2	1	3	CGPA	TIP (6 Expts)
161		PE (Honours - Vertical 4)	CS3561	19AI561	Extended Reality	CS3307	2	1	3	CGPA	TIP (6 Expts)
162		PE (Honours - Vertical 4)	CS4503	19AM503	Data Modeling	-	3	0	3	CGPA	Theory
163		PE (Honours - Vertical 4)	CS1421	19CS421	Edge Computing	-	2	1	3	CGPA	TIP (6 Expts)
164		PE (Honours - Vertical 4)	CS1502	19CS502	Computer Graphics and Multimedia	19CS401	3	0	3	CGPA	Theory
165		PE (Honours - Vertical 4)	CS1503	19CS503	Developing Web Application in .Net	19CS404/19CS410/19AI401 / 19AI414/19I	3	0	3	CGPA	Theory
166		PE (Honours - Vertical 4)	CS1505	19CS505	Service Oriented Architecture	-	3	0	3	CGPA	Theory
167		PE (Honours - Vertical 4)	CS1507	19CS507	Human Computer Interaction	19CS502/19CS408	3	0	3	CGPA	Theory
168		PE (Honours - Vertical 4)	CS1510	19CS510	Social Network Analysis	19CS501/19CS413	3	0	3	CGPA	Theory
169		PE (Honours - Vertical 4)	CS1517	19CS517	Mobile Computing	19CS406	3	0	3	CGPA	Theory
170		PE (Honours - Vertical 4)	CS1518	19CS518	Game Design and Development	19CS502	3	0	3	CGPA	Theory
171		PE (Honours - Vertical 4)	CS1520	19CS520	Big Data Analytics	19CS411/19CS519	3	0	3	CGPA	Theory
172		PE (Honours - Vertical 4)	CS1521	19CS521	Data Warehousing and Data Mining	19CS404	3	0	3	CGPA	Theory
173		PE (Honours - Vertical 4)	CS1523	19CS523	Information Retrieval	19AI410/ 19CS501/19CS413 / 19AI414	3	0	3	CGPA	Theory
174		PE (Honours - Vertical 4)	CS1526	19CS526	R Programming	19CS301/19CS303	2	1	3	CGPA	TIP (6 Expts)
175		PE (Honours - Vertical 4)	CS1531	19CS531	Virtual Reality	19CS401/19CS301	3	0	3	CGPA	Theory

176		PE (Honours - Vertical 4)	CS1535	19CS535	Trusted Network Systems	-	3	0	3	CGPA	Theory
177		PE (Honours - Vertical 4)	CS1540	19CS540	Fog Computing	-	3	0	3	CGPA	Theory
178		PE (Honours - Vertical 4)	CS1548	19CS548	Cloud Services Management	-	2	1	3	CGPA	TIP (6 Expts)
179		PE (Honours - Vertical 4)	CS1549	19CS549	UI and UX Design	-	2	1	3	CGPA	TIP (6 Expts)
180		PE (Honours - Vertical 4)	CS1550	19CS550	AI and Ethics	-	3	0	3	CGPA	Theory
181		PE (Honours - Vertical 4)	CS1551	19CS551	Software Testing and Automation	-	2	1	3	CGPA	TIP (6 Expts)
182		PE (Honours - Vertical 4)	CS1552	19CS552	DevOps	-	2	1	3	CGPA	TIP (6 Expts)
183		PE (Honours - Vertical 4)	CS1557	19CS557	Software Defined Networks	-	2	1	3	CGPA	TIP (6 Expts)
184		PE (Honours - Vertical 4)	CS1572	19CS572	Serverless App Development	-	3	0	3	CGPA	Theory
185		PE (Honours - Vertical 4)	CS1573	19CS573	Enterprise Cloud Architecture	-	3	0	3	CGPA	Theory
186		PE (Honours - Vertical 4)	CS1577	19CS577	Cloud System Administration	-	3	0	3	CGPA	Theory
187		PE (Honours - Vertical 4)	EC1503	19EC503	Digital Image Processing	19EC409 / EC1409 / 19EI403	3	0	3	CGPA	Theory
188		PE (Honours - Vertical 4)	NA	19EC508	Ad hoc and Wireless Sensor Networks	19EC412	3	0	3	CGPA	Theory
189		PE (Honours - Vertical 4)	CS2402	19IT402	Game Development Technologies	-	3	1	4	CGPA	TIP (6 Expts)
190		PE (Honours - Vertical 4)	CS2406	19IT406	Grid and Cloud Computing	-	3	1	4	CGPA	TIP (6 Expts)
191		PE (Honours - Vertical 4)	CS2408	19IT408	Distributed Computing	-	3	0	3	CGPA	Theory
192		PE (Honours - Vertical 4)	CS2503	19IT503	User Interface Design	-	3	0	3	CGPA	Theory
193		PE (Honours - Vertical 4)	CS2504	19IT504	Information Storage Management	-	3	0	3	CGPA	Theory
194		PE (Honours - Vertical 4)	CS2511	19IT511	DHTML and XML	-	3	0	3	CGPA	Theory
195		PE (Honours - Vertical 4)	CS2512	19IT512	E-Commerce	-	3	0	3	CGPA	Theory
196		PE (Honours - Vertical 4)	CS2516	19IT516	Business Intelligence and Analytics	-	3	0	3	CGPA	Theory
197		PE (Honours - Vertical 5)	CS3514	19AI514	Self Driving Car	19CS301/19AI410 / 19AI414	2	2	4	CGPA	TIP (10 Expts)
198		PE (Honours - Vertical 5)	CS3530	19AI530	Control of Robotic Systems	-	2	1	3	CGPA	TIP (6 Expts)
199		PE (Honours - Vertical 5)	CS3533	19AI533	Introduction to Robotics	-	2	1	3	CGPA	TIP (6 Expts)
200		PE (Honours - Vertical 5)	CS3534	19AI534	Kinematics and Dynamics of Robots	-	2	1	3	CGPA	TIP (6 Expts)
201		PE (Honours - Vertical 5)	CS3535	19AI535	Robotic Sensors	-	2	1	3	CGPA	TIP (6 Expts)

202		PE (Honours - Vertical 5)	CS3548	19AI548	Robot Programming	-	2	1	3	CGPA	TIP (6 Expts)
203		PE (Honours - Vertical 5)	CS3549	19AI549	Drone Assembly and Applications	-	2	1	3	CGPA	TIP (6 Expts)
204		PE (Honours - Vertical 5)	CS3551	19AI551	Drone Design and Control	-	2	1	3	CGPA	TIP (6 Expts)
205		PE (Honours - Vertical 5)	CS3560	19AI560	Augmented Reality and ARCore	-	2	1	3	CGPA	TIP (6 Expts)
206		PE (Honours - Vertical 5)	CS4504	19AM504	Brain Computer Interaction	-	3	0	3	CGPA	Theory
207		PE (Honours - Vertical 5)	CS4506	19AM506	Sensors and Actuators for IoT	-	2	1	3	CGPA	TIP (6 Expts)
208		PE (Honours - Vertical 5)	CS4509	19AM509	Industrial Internet of Things	-	2	1	3	CGPA	TIP (6 Expts)
209		PE (Honours - Vertical 5)	CS4510	19AM510	Software for Embedded Systems	-	2	1	3	CGPA	TIP (6 Expts)
210		PE (Honours - Vertical 5)	CS4511	19AM511	IoT Architecture and Protocols	-	3	0	3	CGPA	Theory
211		PE (Honours - Vertical 5)	CS4512	19AM512	Arduino for IoT	-	2	1	3	CGPA	TIP (6 Expts)
212		PE (Honours - Vertical 5)	CS4513	19AM513	Raspberry Pi for IoT	-	2	1	3	CGPA	TIP (6 Expts)
213		PE (Honours - Vertical 5)	CS4514	19AM514	Motion Planning Techniques	-	2	1	3	CGPA	TIP (6 Expts)
214		PE (Honours - Vertical 5)	CS4516	19AM516	Python Programming for IoT	-	3	0	3	CGPA	Theory
215		PE (Honours - Vertical 5)	CS4517	19AM517	Applications of IoT in Robotics	-	3	0	3	CGPA	Theory
216		PE (Honours - Vertical 5)	CS4518	19AM518	Programming for IoT Boards	-	3	0	3	CGPA	Theory
217		PE (Honours - Vertical 5)	CS4519	19AM519	Design of Smart Cities	-	3	0	3	CGPA	Theory
218		PE (Honours - Vertical 5)	CS4520	19AM520	IoT and Multimedia Technology	-	3	0	3	CGPA	Theory
219		PE (Honours - Vertical 5)	CS4521	19AM521	Mobile Application Development for IoT	-	3	0	3	CGPA	Theory
220		PE (Honours - Vertical 5)	CS4522	19AM522	Open Source Programming for IoT	-	3	0	3	CGPA	Theory
221		PE (Honours - Vertical 5)	CS1420	19CS420	Prototyping of IoT Systems	-	2	1	3	CGPA	TIP (6 Expts)
222		PE (Honours - Vertical 5)	CS1528	19CS528	Robotics and its Applications	19CS302/19EC408	3	0	3	CGPA	Theory
223		PE (Honours - Vertical 5)	CS4506	19AM506	Sensors and Actuators for IoT	-	2	1	3	CGPA	TIP (6 Expts)
224		PE (Honours - Vertical 5)	CS1542	19CS542	Embedded Board Design	-	2	1	3	CGPA	TIP (6 Expts)
225		PE (Honours - Vertical 5)	CS1543	19CS543	Embedded Board Manufacturing	-	2	1	3	CGPA	TIP (6 Expts)
226		PE (Honours - Vertical 5)	CS1560	19CS560	Smart Contract and Solidity	-	2	1	3	CGPA	TIP (6 Expts)
227		PE (Honours - Vertical 5)	CS1565	19CS565	Robotic Process Automation	-	2	1	3	CGPA	TIP (6 Expts)

228		PE (Honours - Vertical 5)	NA	19EC414	Embedded Systems	19EC408	2	1	3	CGPA	TIP (6 Expts)
229		PE (Honours - Vertical 5)	CS2506	19IT506	E-Learning Techniques	-	3	0	3	CGPA	Theory
230		PE (Honours - Vertical 6)	CS3403	19AI403	Introduction to Data Science	19CS301	2	1	3	CGPA	TIP (6 Expts)
231		PE (Honours - Vertical 6)	CS3409	19AI409	Applied Artificial Intelligence	19AI405/19 CS301	2	1	3	CGPA	TIP (6 Expts)
232		PE (Honours - Vertical 6)	CS3411	19AI411	Neural Networks	-	2	1	3	CGPA	TIP (6 Expts)
233		PE (Honours - Vertical 6)	CS3413	19AI413	Deep Learning and its Applications	-	2	1	3	CGPA	TIP (6 Expts)
234		PE (Honours - Vertical 6)	CS3501	19AI501	Applications of Artificial Intelligence	-	2	1	3	CGPA	TIP (6 Expts)
235		PE (Honours - Vertical 6)	CS3502	19AI502	Applied Natural Language Processing	-	2	1	3	CGPA	TIP (6 Expts)
236		PE (Honours - Vertical 6)	CS3503	19AI503	Computer Vision	19CS301	2	1	3	CGPA	TIP (6 Expts)
237		PE (Honours - Vertical 6)	CS3505	19AI505	Reinforcement Learning	19CS301	2	1	3	CGPA	TIP (6 Expts)
238		PE (Honours - Vertical 6)	CS3506	19AI506	Speech Analysis and Processing	-	2	1	3	CGPA	TIP (6 Expts)
239		PE (Honours - Vertical 6)	CS3507	19AI507	Special Topics in Artificial Intelligence	-	2	1	3	CGPA	TIP (6 Expts)
240		PE (Honours - Vertical 6)	CS3508	19AI508	Soft Computing Techniques	-	2	1	3	CGPA	TIP (6 Expts)
241		PE (Honours - Vertical 6)	CS3515	19AI515	Smart Manufacturing Technology	-	2	1	3	CGPA	TIP (6 Expts)
242		PE (Honours - Vertical 6)	CS3518	19AI518	Cognitive Systems	-	3	0	3	CGPA	Theory
243		PE (Honours - Vertical 6)	CS3521	19AI521	Expert Systems	-	3	0	3	CGPA	Theory
244		PE (Honours - Vertical 6)	CS3522	19AI522	Knowledge Engineering	19CS410 / 19AI401 / 19AI414 / 19IT404	3	0	3	CGPA	Theory
245		PE (Honours - Vertical 6)	CS3525	19AI525	Video Processing	19CS301	2	1	3	CGPA	TIP (6 Expts)
246		PE (Honours - Vertical 6)	CS3528	19AI528	Advanced Graph Theory and Applications	19CS402	2	1	3	CGPA	TIP (6 Expts)
247		PE (Honours - Vertical 6)	CS3550	19AI550	Artificial Intelligence for Games	-	2	1	3	CGPA	TIP (6 Expts)
248		PE (Honours - Vertical 6)	CS3554	19AI554	Fundamentals of Large Language Models	-	2	1	3	CGPA	TIP (6 Expts)
249		PE (Honours - Vertical 6)	CS3555	19AI555	Exploratory Data Analysis	-	2	1	3	CGPA	TIP (6 Expts)
250		PE (Honours - Vertical 6)	CS3556	19AI556	Recommender Systems	-	2	1	3	CGPA	TIP (6 Expts)
251		PE (Honours - Vertical 6)	CS3557	19AI557	Neural Networks and Deep Learning	-	2	1	3	CGPA	TIP (6 Expts)
252		PE (Honours - Vertical 6)	CS3558	19AI558	Text and Speech Analysis	-	2	1	3	CGPA	TIP (6 Expts)
253		PE (Honours - Vertical 6)	CS3559	19AI559	Image and Video Analytics	-	2	1	3	CGPA	TIP (6 Expts)

254		PE (Honours - Vertical 6)	CS4401	19AM401	Time Series Analysis and Forecasting	-	3	1	4	CGPA	TIP (6 Expts)
255		PE (Honours - Vertical 6)	CS4501	19AM501	Machine Learning for Bioinformatics	-	3	0	3	CGPA	Theory
256		PE (Honours - Vertical 6)	CS4505	19AM505	Statistical Learning Theory	-	2	1	3	CGPA	TIP (6 Expts)
257		PE (Honours - Vertical 6)	CS1511	19CS511	Natural Language Processing	19MA201	3	0	3	CGPA	Theory
258		PE (Honours - Vertical 6)	CS1512	19CS512	Soft Computing	19CS501/19AI410 / 19AI401 / 19AI414	3	0	3	CGPA	Theory
259		PE (Honours - Vertical 6)	CS1524	19CS524	Deep Learning	19CS501	3	0	3	CGPA	Theory
260		PE (Honours - Vertical 6)	CS1579	19CS579	Generative AI Application Development	-	2	1	3	CGPA	TIP (6 Expts)
261		PE (Honours - Vertical 6)	CS1568	19CS568	Fine Tuning Large Language Models	-	3	0	3	CGPA	Theory
262		PE (Honours - Vertical 6)	CS1569	19CS569	Applied Data Science	-	2	1	3	CGPA	TIP (6 Expts)
263		PE (Honours - Vertical 6)	CS1578	19CS578	Machine Learning Operations	-	3	0	3	CGPA	Theory
264		PE (Honours - Vertical 6)	SH2220	19MA220	Mathematics for Artificial Intelligence	-	4	0	4	CGPA	Theory
265		PE (Honours - Vertical 6)	SH2221	19MA221	Linear Algebra Laboratory	-	0	2	2	CGPA	Practical (10 Expts)
266		PE (Honours - Vertical 6)	SH2211	19MA211	Statistics and Numerical Methods	-	3	1	4	CGPA	TIP (6 Expts)
267		OE	XXXXXX	19XXXXX	Open Electives	-	0	0	0	CGPA	Theory
268		OE	XXXXXX	19XXXXX	Online Courses	-	0	0	0	CGPA	Experiential Learning
269		EEC	CS1701	19CS701	Mini Project	-	0	2	2	CGPA	Project
270	Option 1	EEC	CS1702	19CS702	Project Work Phase I	-	0	2	2	CGPA	Project (Int Only)
271	Option 1	EEC	CS1703	19CS703	Project Work Phase II	19CS702	0	6	6	CGPA	Project
272	Option 2	EEC	SH6802	NA	Start Up	-	0	8	8	CGPA	Project
273		EEC	SH6708	19EY708	Career Development Skills	NIL	1	0	1	CGPA	Theory (Int Only)
274		EEC	SH6709	19EY709	Reasoning Ability	NIL	1	0	1	CGPA	Theory (Int Only)
275		EEC	SH6710	19EY710	Quantitative Ability I	NIL	1	0	1	CGPA	Theory (Int Only)
276		EEC	SH6711	19EY711	Quantitative Ability II	SH6710 /19EY710	1	0	1	CGPA	Theory (Int Only)
277		EEC	SH6712	19EY712	Employment Enrichment Skills	19EY702 / 19EY709 / SH6709	1	0	1	CGPA	Theory (Int Only)
278	Any 1	EEC	NA	19EY706	Company Specific Assessments For Employability	-	0	1	1	CGPA	Practical (6 Expts)
279	Any 1	EEC	SH6713	19EY713	Placement Readiness Assessment	19EY704 / 19EY711/SH6711	1	0	1	CGPA	Theory (Int Only)

280		EEC	SH6707	19EY707	Paper Publication	-	0	0	1	NON-CGPA	Experiential Learning (Int Only)
281		MC	SH8801	NA	Constitutionalism and Artificial Intelligence Policies in India	-	1	0	1	NON-CGPA	Theory (Int Only)
282	Any 1	MC	SH8802	NA	Internship	-	0	0	2	NON-CGPA	Experiential Learning (Int Only)
283	Any 1	MC	SH8803	NA	Entrepreneurship	-	0	0	2	NON-CGPA	Experiential Learning (Int Only)
284	Any 1	MC	SH6803	19MC807	National Service Scheme	-	0	0	0	NON-CGPA	Experiential Learning (Int Only)
285	Any 1	MC	SH8807	19MC808	National Sports Organization	-	0	0	0	NON-CGPA	Experiential Learning (Int Only)
286	Any 1	MC	SH8808	19MC809	Youth Red Cross	-	0	0	0	NON-CGPA	Experiential Learning (Int Only)

CREDIT SUMMARY		
Category	**Credits to be Earned (Regular)**	**Credits to be Earned (Lateral Entry)**
HS	13	3
BS	25	10
ES	25	12
PC	56	56
PE	16	16
OE	12	12
EEC	16	16
MC	3	3
TOTAL	166	128