SAVEETHA ENGINEERING COLLEGE
AUTONOMOUS
NAAC A GRADE
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REGULATIONS 2019
FLEXIBLE CHOICE BASED CREDIT SYSTEM
DEPARTMENT OF COMPUTER SCIENCE ENGINEERING
B.Tech., Artificial Intelligence and Data Science
CURRICULUM

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	Exempted for LE , Any 1 for Regular	HS	SH1104	19EN104	Technical Writing	-	3	0	3	CGPA	Theory
2	Exempted for LE , Any 1 for Regular	HS	SH1105	19EN105	Public Speaking	-	0	3	3	CGPA	Practical (10 Expts)
3	Exempted for LE , Any 1 for Regular	HS	SH1101	19EN101	Communicative English	-	3	1	4	CGPA	TIP (6 Expts)
4	Exempted for LE	HS	SH9154	19MS154	Basic Financial Accounting	-	3	0	3	CGPA	Theory
5	Exempted for LE	HS	SH9156	19MS156	Human Resource Management and Team Building	-	3	0	3	CGPA	Theory
6	Exempted for LE	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		BS	SH2222	19MA222	Probability and Queueing Models	-	3	1	4	CGPA	TIP (6 Expts)
10		BS	SH2219	19MA219	Transforms and Its Applications	-	4	0	4	CGPA	Theory
11		BS	SH2220	19MA220	Mathematics for Artificial Intelligence	-	4	0	4	CGPA	Theory
12		BS	SH2221	19MA221	Linear Algebra Laboratory	-	0	2	2	CGPA	Practical (10 Expts)
13	Exempted for LE	BS	NA	19PH214	Physics for Quantum Computing	-	3	0	3	CGPA	Theory
14	Exempted for LE	BS	SH4205	19CY205	Principles of Chemistry in Engineering	-	3	1	4	CGPA	TIP (6 Expts)
15		ES	CS3301	19AI301	Python Programming	-	1	2	3	CGPA	Theory (Int Only) and Practical (10 Expts)
16	Exempted for LE	ES	CS3302	19AI302	Engineering Design and Modelling	-	0	3	3	CGPA	Practical (10 Expts)
17	Exempted for LE	ES	CS3303	19AI303	Engineering Mechanics and Product Development	-	2	1	3	CGPA	TIP (6 Expts)
18	Option 1	ES	CS3306	19AI306	Object Oriented Programming using C++	19AI304	2	1	3	CGPA	TIP (6 Expts)
19	Option 2	ES	CS3307	19AI307	Object Oriented Programming using Java	19AI304 / CS3304	1	2	3	CGPA	Theory (Int Only) and Practical (10 Expts)

20	Option 3	ES	CS3308	19AI308	Object Oriented Programming using C#	19AI304	2	1	3	CGPA	TIP (6 Expts)
21	Exempted for LE	ES	EC2404	19EE404	Digital Electronics	-	3	1	4	CGPA	TIP (6 Expts)
22	Exempted for LE	ES	EC2305	19EE305	Basic Electrical, Electronics and Measurement Engineering	-	2	1	3	CGPA	TIP (6 Expts)
23	Exempted for LE	ES	EC2309	19EE309	Programming Microcontrollers	-	2	1	3	CGPA	TIP (6 Expts)
24		ES	CS3304	19AI304	Fundamentals of C Programming	-	1	2	3	CGPA	Theory (Int Only) and Practical (10 Expts)
25		ES	CS3305	19AI305	Advanced C Programming	19AI304 / CS3304	1	2	3	CGPA	Theory (Int Only) and Practical (10 Expts)
26		PC	SH2211	19MA211	Statistics and Numerical Methods	-	3	1	4	CGPA	TIP (6 Expts)
27		PC	CS3408	19AI408	Data Structures	19AI301 / 19AI304 / 19AI307	1	2	3	CGPA	Theory (Int Only) and Practical (10 Expts)
28		PC	CS3404	19AI404	Analysis of Algorithms	19AI301 / 19AI304 / 19AI307	1	2	3	CGPA	Theory (Int Only) and Practical (10 Expts)
29		PC	CS3405	19AI405	Fundamentals of Artificial Intelligence	19CS301 / 19AI301 / CS3301	2	1	3	CGPA	TIP (6 Expts)
30		PC	CS3406	19AI406	Digital Image Processing Techniques	-	2	1	3	CGPA	TIP (6 Expts)
31	Option 1	PC	CS3401	19AI401	Fundamentals of Web Technology	-	3	0	3	CGPA	Theory
32	Option 1	PC	CS3402	19AI402	Web Technology Laboratory	-	0	2	2	CGPA	Practical (10 Expts)
33	Option 2	PC	CS3414	19AI414	Fundamentals of Web Application Development	-	3	2	5	CGPA	TIP (10 Expts)
34		PC	CS1404	19CS404	Database Management System and its Applications	19AI301/19AI304/19CS301/19CS302/19CS30	3	1	4	CGPA	TIP (6 Expts)
35	Exempted for LE	PC	CS1405	19CS405	Operating System	-	3	1	4	CGPA	TIP (6 Expts)
36	Exempted for LE	PC	CS1406	19CS406	Computer Networks	-	3	1	4	CGPA	TIP (6 Expts)
37		PC	CS3403	19AI403	Introduction to Data Science	19CS301	2	1	3	CGPA	TIP (6 Expts)
38		PC	CS3409	19AI409	Applied Artificial Intelligence	19AI405/19CS301	2	1	3	CGPA	TIP (6 Expts)
39		PC	CS3407	19AI407	Parallel Computing Architecture	-	3	1	4	CGPA	TIP (6 Expts)
40		PC	CS3410	19AI410	Introduction to Machine Learning	-	2	1	3	CGPA	TIP (6 Expts)
41		PC	CS3411	19AI411	Neural Networks	-	2	1	3	CGPA	TIP (6 Expts)
42		PC	CS3412	19AI412	Web Data Mining	-	3	1	4	CGPA	TIP (6 Expts)
43		PC	CS3413	19AI413	Deep Learning and its Applications	-	2	1	3	CGPA	TIP (6 Expts)
44		PE	CS3509	19AI509	Concepts of Virtual And Augmented Reality	-	2	1	3	CGPA	TIP (6 Expts)
45		PE	CS3562	19AI562	Oracle Cloud Infrastructure and Operation	-	2	1	3	CGPA	TIP (6 Expts)

46		PE	CS3563	19AI563	Oracle Cloud Infrastructure AI Foundations	-	2	1	3	CGPA	TIP (6 Expts)
47		PE	CS3565	19AI565	Oracle Autonomous Database and Oracle Machine Learning Essentials	-	2	1	3	CGPA	TIP (6 Expts)
48		PE	CS3565	19AI565	Oracle Autonomous Database and Oracle Machine Learning Essentials	-	2	1	3	CGPA	TIP (6 Expts)
49		PE	CS3566	19AI566	Business Intelligence on Oracle Cloud	-	2	1	3	CGPA	TIP (6 Expts)
50		PE	CS3567	19AI567	Database Developer on Oracle Cloud (APEX)	-	2	1	3	CGPA	TIP (6 Expts)
51		PE	CS3568	19AI568	Application Development on Oracle Cloud	-	2	1	3	CGPA	TIP (6 Expts)
52		PE	CS3569	19AI569	Java 11 Development on Oracle Cloud	-	2	1	3	CGPA	TIP (6 Expts)
53		PE	CS3570	19AI570	Java 17 Development on Oracle Cloud	-	2	1	3	CGPA	TIP (6 Expts)
54		PE	CS3571	19AI571	SQL on Oracle Cloud	-	2	1	3	CGPA	TIP (6 Expts)
55		PE	CS3572	19AI572	PL_SQL on Oracle Cloud	-	2	1	3	CGPA	TIP (6 Expts)
56		PE	CS3573	19AI573	MySQL for Data Scientist	-	2	1	3	CGPA	TIP (6 Expts)
57		PE	CS3574	19AI574	Administer MySQL on Oracle Cloud	-	2	1	3	CGPA	TIP (6 Expts)
58		PE	CS3575	19AI575	Build MySQL Database for Applications on Oracle Cloud	-	2	1	3	CGPA	TIP (6 Expts)
59		PE	CS3602	19AI602	CISCO Networking Certifications	-	2	1	3	CGPA	TIP (6 Expts)
60		PE	CS3603	19AI603	Pega Platform	-	2	1	3	CGPA	TIP (6 Expts)
61		PE	CS3604	19AI604	Rust Programming Language	-	2	1	3	CGPA	TIP (6 Expts)
62		PE	CS1580	19CS580	Enterprise Cyber Security and Threat Detection	-	2	1	3	CGPA	TIP (6 Expts)
63		PE	CS1581	19CS581	Network Infrastructure and Protocols	-	2	1	3	CGPA	TIP (6 Expts)
64		PE	CS1582	19CS582	Enterprise Networking and Network Security	19CS581 / CS1581	2	1	3	CGPA	TIP (6 Expts)
65		PE	CS1583	19CS583	Network Switching, Routing and Wireless Technologies	19CS581 / CS1581	2	1	3	CGPA	TIP (6 Expts)
66		PE (Honours - Vertical 1)	CS1536	19CS536	Firewalls and Intrusion Detection System	-	2	1	3	CGPA	TIP (6 Expts)
67		PE (Honours - Vertical 1)	CS1561	19CS561	Blockchain and Fintech	-	2	1	3	CGPA	TIP (6 Expts)
68		PE (Honours - Vertical 1)	CS2504	19IT504	Information Storage Management	-	3	0	3	CGPA	Theory
69		PE (Honours - Vertical 1)	CS3526	19AI526	Information Security and Access Control	19AI527	2	1	3	CGPA	TIP (6 Expts)
70		PE (Honours - Vertical 1)	CS3527	19AI527	Security Assessment and Risk Analysis	-	3	1	4	CGPA	TIP (6 Expts)
71		PE (Honours - Vertical 1)	CS3531	19AI531	Cryptography and Security	-	2	1	3	CGPA	TIP (6 Expts)

72		PE (Honours - Vertical 1)	CS3532	19AI532	Information Theory for Cyber Security	-	2	1	3	CGPA	TIP (6 Expts)
73		PE (Honours - Vertical 1)	CS3536	19AI536	Steganography and Digital Watermarking	-	2	1	3	CGPA	TIP (6 Expts)
74		PE (Honours - Vertical 1)	CS3547	19AI547	Blockchain for Business	19CS301	2	1	3	CGPA	TIP (6 Expts)
75		PE (Honours - Vertical 1)	CS4507	19AM507	Security and Trust in IoT	-	2	1	3	CGPA	TIP (6 Expts)
76		PE (Honours - Vertical 1)	CS1412	19CS412	Cryptography and Network Security	19CS406	3	1	4	CGPA	TIP (6 Expts)
77		PE (Honours - Vertical 1)	CS1415	19CS415	Cryptography	-	2	1	3	CGPA	TIP (6 Expts)
78		PE (Honours - Vertical 1)	CS1416	19CS416	Cloud Security	-	2	1	3	CGPA	TIP (6 Expts)
79		PE (Honours - Vertical 1)	CS1417	19CS417	Ethical Hacking Techniques	-	2	1	3	CGPA	TIP (6 Expts)
80		PE (Honours - Vertical 1)	CS1418	19CS418	Cyber Law and Compliance	-	3	0	3	CGPA	Theory
81		PE (Honours - Vertical 1)	CS1419	19CS419	Digital Forensics and Digital Investigations	-	2	1	3	CGPA	TIP (6 Expts)
82		PE (Honours - Vertical 1)	CS1422	19CS422	Security for IoT Systems	-	3	0	3	CGPA	Theory
83		PE (Honours - Vertical 1)	CS1515	19CS515	Block Chain Architecture and its Use Cases	19CS412	3	0	3	CGPA	Theory
84		PE (Honours - Vertical 1)	CS1530	19CS530	Cyber Security	19CS412	3	0	3	CGPA	Theory
85		PE (Honours - Vertical 1)	CS1533	19CS533	Information Security Intelligence and Analytics using Big Data	-	2	1	3	CGPA	TIP (6 Expts)
86		PE (Honours - Vertical 1)	CS1534	19CS534	Prevention Methodology for Cybersecurity	-	2	1	3	CGPA	TIP (6 Expts)
87		PE (Honours - Vertical 1)	CS1535	19CS535	Trusted Network Systems	-	3	0	3	CGPA	Theory
88		PE (Honours - Vertical 1)	CS1537	19CS537	Secure Software Engineering	-	2	1	3	CGPA	TIP (6 Expts)
89		PE (Honours - Vertical 1)	CS1538	19CS538	System Security	-	3	0	3	CGPA	Theory
90		PE (Honours - Vertical 1)	CS1539	19CS539	Hardware Security	-	3	0	3	CGPA	Theory
91		PE (Honours - Vertical 1)	CS1547	19CS547	Fundamentals of Cryptocurrency	-	3	0	3	CGPA	Theory
92		PE (Honours - Vertical 1)	CS1558	19CS558	Data Privacy and Protection	-	2	1	3	CGPA	TIP (6 Expts)
93		PE (Honours - Vertical 1)	CS1559	19CS559	Blockchain Platforms and Its Use Cases	-	2	1	3	CGPA	TIP (6 Expts)
94		PE (Honours - Vertical 1)	CS1563	19CS563	Bitcoin Mining	-	2	1	3	CGPA	TIP (6 Expts)
95		PE (Honours - Vertical 1)	CS2510	19IT510	Ethical Hacking	-	3	0	3	CGPA	Theory
96		PE (Honours - Vertical 2)	CS1407	19CS407	Theory of Computation	19MA206	3	0	3	CGPA	Theory
97		PE (Honours - Vertical 2)	CS1409	19CS409	Compiler Design	-	3	1	4	CGPA	TIP (6 Expts)

98		PE (Honours - Vertical 2)	CS2514	19IT514	Real Time Operating Systems	-	3	0	3	CGPA	Theory
99		PE (Honours - Vertical 2)	CS3508	19AI508	Soft Computing Techniques	-	2	1	3	CGPA	TIP (6 Expts)
100		PE (Honours - Vertical 2)	CS3513	19AI513	Game Programming	19CS401	2	2	4	CGPA	TIP (10 Expts)
101		PE (Honours - Vertical 2)	CS3528	19AI528	Advanced Graph Theory and Applications	19CS402	2	1	3	CGPA	TIP (6 Expts)
102		PE (Honours - Vertical 2)	CS3529	19AI529	Advanced Data Structures	19CS401	2	1	3	CGPA	TIP (6 Expts)
103		PE (Honours - Vertical 2)	CS3538	19AI538	Mathematical Modelling and Computer Aided Engineering	-	2	1	3	CGPA	TIP (6 Expts)
104		PE (Honours - Vertical 2)	CS3553	19AI553	Advanced Java Web Applications	19AI307	2	1	3	CGPA	TIP (6 Expts)
105		PE (Honours - Vertical 2)	CS4505	19AM505	Statistical Learning Theory	-	2	1	3	CGPA	TIP (6 Expts)
106		PE (Honours - Vertical 2)	CS4515	19AM515	Advanced Java Programming	-	2	1	3	CGPA	TIP (6 Expts)
107		PE (Honours - Vertical 2)	CS1301	19CS301	Problem Solving and Python Programming	-	3	1	4	CGPA	TIP (6 Expts)
108		PE (Honours - Vertical 2)	NA	19CS302	Programming in C	-	2	2	4	CGPA	TIP (10 Expts)
109		PE (Honours - Vertical 2)	CS1305	19CS305	Computer Architecture	-	3	0	3	CGPA	Theory
110		PE (Honours - Vertical 2)	NA	19CS402	Design and Analysis of Algorithms	19CS401	3	0	3	CGPA	Theory
111		PE (Honours - Vertical 2)	NA	19CS403	Programming Paradigms	19CS401	3	1	4	CGPA	TIP (6 Expts)
112		PE (Honours - Vertical 2)	CS1506	19CS506	Multicore Architecture	19CS305	3	0	3	CGPA	Theory
113		PE (Honours - Vertical 2)	CS1508	19CS508	Parallel and Distributed Systems	19CS305/19CS401	3	0	3	CGPA	Theory
114		PE (Honours - Vertical 2)	CS1509	19CS509	Graph Theory and Applications	-	3	0	3	CGPA	Theory
115		PE (Honours - Vertical 2)	CS1512	19CS512	Soft Computing	19CS301/19AI410 / 19AI401 / 19AI414	3	0	3	CGPA	Theory
116		PE (Honours - Vertical 2)	CS1514	19CS514	Network Management Systems	19CS406	3	0	3	CGPA	Theory
117		PE (Honours - Vertical 2)	CS1518	19CS518	Game Design and Development	19CS502	3	0	3	CGPA	Theory
118		PE (Honours - Vertical 2)	CS1521	19CS521	Data Warehousing and Data Mining	19CS404	3	0	3	CGPA	Theory
119		PE (Honours - Vertical 2)	CS1522	19CS522	Advanced Database Management System	19CS404	3	1	4	CGPA	TIP (6 Expts)
120		PE (Honours - Vertical 2)	CS1529	19CS529	Quantum Computing	19CS301/19CS303	3	0	3	CGPA	Theory
121		PE (Honours - Vertical 2)	CS1544	19CS544	Realtime Operating System	-	2	1	3	CGPA	TIP (6 Expts)
122		PE (Honours - Vertical 2)	CS1545	19CS545	Open Source Operating System	-	2	1	3	CGPA	TIP (6 Expts)
123		PE (Honours - Vertical 2)	CS1546	19CS546	Kernel Programming	-	2	1	3	CGPA	TIP (6 Expts)

124		PE (Honours - Vertical 2)	CS1554	19CS554	Stream Processing	-	2	1	3	CGPA	TIP (6 Expts)
125		PE (Honours - Vertical 2)	CS1556	19CS556	Core Computing Concepts	-	2	1	3	CGPA	TIP (6 Expts)
126		PE (Honours - Vertical 2)	CS1575	19CS575	Low-Code App Development	-	3	0	3	CGPA	Theory
127		PE (Honours - Vertical 2)	NA	19EC416	Principles of Digital Signal Processing	19EC307	3	0	3	CGPA	Theory
128		PE (Honours - Vertical 2)	CS2501	19IT501	Information Theory and Coding Techniques	-	3	0	3	CGPA	Theory
129		PE (Honours - Vertical 2)	CS2508	19IT508	TCP/IP Design and Implementation	-	3	0	3	CGPA	Theory
130		PE (Honours - Vertical 2)	CS2509	19IT509	Advanced Algorithms	-	3	0	3	CGPA	Theory
131		PE (Honours - Vertical 2)	CS2513	19IT513	Free Open Source Software	-	3	0	3	CGPA	Theory
132		PE (Honours - Vertical 3)	CS1566	19CS566	Software Project Management and Version Control	-	3	0	3	CGPA	Theory
133		PE (Honours - Vertical 3)	CS1570	19CS570	Entrepreneurship and Small Business Development	-	2	1	3	CGPA	TIP (6 Expts)
134		PE (Honours - Vertical 3)	CS3542	19AI542	Agile Software Development	19CS301	3	1	4	CGPA	TIP (6 Expts)
135		PE (Honours - Vertical 3)	CS3543	19AI543	Software Testing	19CS301	2	1	3	CGPA	TIP (6 Expts)
136		PE (Honours - Vertical 3)	CS4510	19AM510	Software for Embedded Systems	-	2	1	3	CGPA	TIP (6 Expts)
137		PE (Honours - Vertical 3)	NA	19CS308	Software Testing Laboratory	19CS410 /19AI401 / 19AI414	0	2	2	CGPA	Practical (10 Expts)
138		PE (Honours - Vertical 3)	CS1408	19CS408	Software Engineering	-	3	1	4	CGPA	TIP (6 Expts)
139		PE (Honours - Vertical 3)	CS1504	19CS504	Software Project Management	19CS408	3	0	3	CGPA	Theory
140		PE (Honours - Vertical 3)	CS1513	19CS513	Green Computing	-	3	0	3	CGPA	Theory
141		PE (Honours - Vertical 3)	CS1516	19CS516	Software Testing and Quality Assurance	-	3	0	3	CGPA	Theory
142		PE (Honours - Vertical 3)	CS1517	19CS517	Mobile Computing	19CS406	3	0	3	CGPA	Theory
143		PE (Honours - Vertical 3)	CS1532	19CS532	Professional Readiness for Innovation, Employability and Entrepreneurship	-	0	3	3	CGPA	Practical (10 Expts)
144		PE (Honours - Vertical 3)	CS1551	19CS551	Software Testing and Automation	-	2	1	3	CGPA	TIP (6 Expts)
145		PE (Honours - Vertical 3)	CS1552	19CS552	DevOps	-	2	1	3	CGPA	TIP (6 Expts)
146		PE (Honours - Vertical 3)	CS1557	19CS557	Software Defined Networks	-	2	1	3	CGPA	TIP (6 Expts)
147		PE (Honours - Vertical 3)	CS1571	19CS571	Software Development and Operations	-	3	0	3	CGPA	Theory
148		PE (Honours - Vertical 3)	CS1574	19CS574	Advanced Class Design and Object-Oriented Techniques	-	3	0	3	CGPA	Theory
149		PE (Honours - Vertical 3)	CS2505	19IT505	Software Design Patterns	-	3	0	3	CGPA	Theory

150		PE (Honours - Vertical 3)	CS2506	19IT506	E-Learning Techniques	-	3	0	3	CGPA	Theory
151		PE (Honours - Vertical 4)	CS3504	19AI504	Mobile Robotics	-	2	1	3	CGPA	TIP (6 Expts)
152		PE (Honours - Vertical 4)	CS3541	19AI541	Cloud Computing	19CS406	3	1	4	CGPA	TIP (6 Expts)
153		PE (Honours - Vertical 4)	CS1510	19CS510	Social Network Analysis	19CS501/19CS413	3	0	3	CGPA	Theory
154		PE (Honours - Vertical 4)	CS1523	19CS523	Information Retrieval	19AI410/ 19CS501/19CS413 /	3	0	3	CGPA	Theory
155		PE (Honours - Vertical 4)	CS1577	19CS577	Cloud System Administration	-	3	0	3	CGPA	Theory
156		PE (Honours - Vertical 4)	CS3510	19AI510	Mobile VR And AI In Unity	19AI410/19CS302 / 19IT404 /	2	1	3	CGPA	TIP (6 Expts)
157		PE (Honours - Vertical 4)	CS3512	19AI512	NoSQL Database Design	19CS301	2	1	3	CGPA	TIP (6 Expts)
158		PE (Honours - Vertical 4)	CS3519	19AI519	Distributed Database	19CS404	3	0	3	CGPA	Theory
159		PE (Honours - Vertical 4)	CS3520	19AI520	Data Mining and Warehousing	-	2	1	3	CGPA	TIP (6 Expts)
160		PE (Honours - Vertical 4)	CS3522	19AI522	Knowledge Engineering	19CS410 / 19AI401 / 19AI414 /	3	0	3	CGPA	Theory
161		PE (Honours - Vertical 4)	CS3523	19AI523	Mobile Database	-	3	0	3	CGPA	Theory
162		PE (Honours - Vertical 4)	CS3524	19AI524	Multimedia Database	19CS410 / 19AI401 / 19AI414 /	3	0	3	CGPA	Theory
163		PE (Honours - Vertical 4)	CS3539	19AI539	Mobile User Interface Development	19CS401	2	1	3	CGPA	TIP (6 Expts)
164		PE (Honours - Vertical 4)	CS3540	19AI540	Programming Mobile Devices	19CS401	2	1	3	CGPA	TIP (6 Expts)
165		PE (Honours - Vertical 4)	CS3544	19AI544	Virtualization and Containerization	19CS405/19CS406	2	1	3	CGPA	TIP (6 Expts)
166		PE (Honours - Vertical 4)	CS3545	19AI545	Modern Web Application Development	19CS410 / 19AI401 / 19AI414 /	2	1	3	CGPA	TIP (6 Expts)
167		PE (Honours - Vertical 4)	CS3546	19AI546	Web Server Programming	19CS401	2	1	3	CGPA	TIP (6 Expts)
168		PE (Honours - Vertical 4)	CS3552	19AI552	Web Application User Interface Development	-	2	1	3	CGPA	TIP (6 Expts)
169		PE (Honours - Vertical 4)	NA	19CS410	Web Programming	-	3	1	4	CGPA	TIP (6 Expts)
170		PE (Honours - Vertical 4)	CS1411	19CS411	Virtualization and Cloud Computing	19CS406	3	1	4	CGPA	TIP (6 Expts)
171		PE (Honours - Vertical 4)	CS1421	19CS421	Edge Computing	-	2	1	3	CGPA	TIP (6 Expts)
172		PE (Honours - Vertical 4)	CS1502	19CS502	Computer Graphics and Multimedia	19CS401	3	0	3	CGPA	Theory
173		PE (Honours - Vertical 4)	CS1503	19CS503	Developing Web Application in .Net	19CS404/19CS410/19AI401 /	3	0	3	CGPA	Theory
174		PE (Honours - Vertical 4)	CS1505	19CS505	Service Oriented Architecture	-	3	0	3	CGPA	Theory
175		PE (Honours - Vertical 4)	CS1507	19CS507	Human Computer Interaction	19CS502/19CS408	3	0	3	CGPA	Theory

176		PE (Honours - Vertical 4)	CS1540	19CS540	Fog Computing	-	3	0	3	CGPA	Theory
177		PE (Honours - Vertical 4)	CS1548	19CS548	Cloud Services Management	-	2	1	3	CGPA	TIP (6 Expts)
178		PE (Honours - Vertical 4)	CS1549	19CS549	UI and UX Design	-	2	1	3	CGPA	TIP (6 Expts)
179		PE (Honours - Vertical 4)	CS1553	19CS553	Web Application Security	-	2	1	3	CGPA	TIP (6 Expts)
180		PE (Honours - Vertical 4)	CS1567	19CS567	Cloud Native App Development	-	2	1	3	CGPA	TIP (6 Expts)
181		PE (Honours - Vertical 4)	CS1572	19CS572	Serverless App Development	-	3	0	3	CGPA	Theory
182		PE (Honours - Vertical 4)	CS1573	19CS573	Enterprise Cloud Architecture	-	3	0	3	CGPA	Theory
183		PE (Honours - Vertical 4)	CS2406	19IT406	Grid and Cloud Computing	-	3	1	4	CGPA	TIP (6 Expts)
184		PE (Honours - Vertical 4)	CS2408	19IT408	Distributed Computing	-	3	0	3	CGPA	Theory
185		PE (Honours - Vertical 4)	CS2503	19IT503	User Interface Design	-	3	0	3	CGPA	Theory
186		PE (Honours - Vertical 4)	CS2511	19IT511	DHTML and XML	-	3	0	3	CGPA	Theory
187		PE (Honours - Vertical 5)	CS3549	19AI549	Drone Assembly and Applications	-	2	1	3	CGPA	TIP (6 Expts)
188		PE (Honours - Vertical 5)	CS4514	19AM514	Motion Planning Techniques	-	2	1	3	CGPA	TIP (6 Expts)
189		PE (Honours - Vertical 5)	CS1565	19CS565	Robotic Process Automation	-	2	1	3	CGPA	TIP (6 Expts)
190		PE (Honours - Vertical 5)	CS3502	19AI502	Applied Natural Language Processing	-	2	1	3	CGPA	TIP (6 Expts)
191		PE (Honours - Vertical 5)	CS3503	19AI503	Computer Vision	19CS301	2	1	3	CGPA	TIP (6 Expts)
192		PE (Honours - Vertical 5)	CS3509	19AI509	Concepts of Virtual And Augmented Reality	-	2	1	3	CGPA	TIP (6 Expts)
193		PE (Honours - Vertical 5)	CS3514	19AI514	Self Driving Car	19CS301/19AI410 / 19AI414	2	2	4	CGPA	TIP (10 Expts)
194		PE (Honours - Vertical 5)	CS3515	19AI515	Smart Manufacturing Technology	-	2	1	3	CGPA	TIP (6 Expts)
195		PE (Honours - Vertical 5)	CS3518	19AI518	Cognitive Systems	-	3	0	3	CGPA	Theory
196		PE (Honours - Vertical 5)	CS3530	19AI530	Control of Robotic Systems	-	2	1	3	CGPA	TIP (6 Expts)
197		PE (Honours - Vertical 5)	CS3533	19AI533	Introduction to Robotics	-	2	1	3	CGPA	TIP (6 Expts)
198		PE (Honours - Vertical 5)	CS3534	19AI534	Kinematics and Dynamics of Robots	-	2	1	3	CGPA	TIP (6 Expts)
199		PE (Honours - Vertical 5)	CS3535	19AI535	Robotic Sensors	-	2	1	3	CGPA	TIP (6 Expts)
200		PE (Honours - Vertical 5)	CS3537	19AI537	Computer Graphics for Virtual Reality	-	2	1	3	CGPA	TIP (6 Expts)
201		PE (Honours - Vertical 5)	CS3548	19AI548	Robot Programming	-	2	1	3	CGPA	TIP (6 Expts)

202		PE (Honours - Vertical 5)	CS3551	19AI551	Drone Design and Control	-	2	1	3	CGPA	TIP (6 Expts)
203		PE (Honours - Vertical 5)	CS3560	19AI560	Augmented Reality and ARCore	-	2	1	3	CGPA	TIP (6 Expts)
204		PE (Honours - Vertical 5)	CS3561	19AI561	Extended Reality	CS3307	2	1	3	CGPA	TIP (6 Expts)
205		PE (Honours - Vertical 5)	CS4504	19AM504	Brain Computer Interaction	-	3	0	3	CGPA	Theory
206		PE (Honours - Vertical 5)	CS4506	19AM506	Sensors and Actuators for IoT	-	2	1	3	CGPA	TIP (6 Expts)
207		PE (Honours - Vertical 5)	CS4508	19AM508	Introduction to 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)	CS4511	19AM511	IoT Architecture and Protocols	-	3	0	3	CGPA	Theory
210		PE (Honours - Vertical 5)	CS4512	19AM512	Arduino for IoT	-	2	1	3	CGPA	TIP (6 Expts)
211		PE (Honours - Vertical 5)	CS4513	19AM513	Raspberry Pi for IoT	-	2	1	3	CGPA	TIP (6 Expts)
212		PE (Honours - Vertical 5)	CS1420	19CS420	Prototyping of IoT Systems	-	2	1	3	CGPA	TIP (6 Expts)
213		PE (Honours - Vertical 5)	CS1528	19CS528	Robotics and its Applications	19CS302/19EC408	3	0	3	CGPA	Theory
214		PE (Honours - Vertical 5)	CS1531	19CS531	Virtual Reality	19CS401/19CS301	3	0	3	CGPA	Theory
215		PE (Honours - Vertical 5)	CS1542	19CS542	Embedded Board Design	-	2	1	3	CGPA	TIP (6 Expts)
216		PE (Honours - Vertical 5)	CS1543	19CS543	Embedded Board Manufacturing	-	2	1	3	CGPA	TIP (6 Expts)
217		PE (Honours - Vertical 5)	CS1560	19CS560	Smart Contract and Solidity	-	2	1	3	CGPA	TIP (6 Expts)
218		PE (Honours - Vertical 5)	NA	19EC414	Embedded Systems	19EC408	2	1	3	CGPA	TIP (6 Expts)
219		PE (Honours - Vertical 5)	NA	19EC508	Ad hoc and Wireless Sensor Networks	19EC412	3	0	3	CGPA	Theory
220		PE (Honours - Vertical 5)	CS2502	19IT502	Enterprise Resource Planning	-	3	0	3	CGPA	Theory
221		PE (Honours - Vertical 5)	CS2512	19IT512	E-Commerce	-	3	0	3	CGPA	Theory
222		PE (Honours - Vertical 5)	CS2515	19IT515	Software Agents	-	3	0	3	CGPA	Theory
223		PE (Honours - Vertical 6)	CS3506	19AI506	Speech Analysis and Processing	-	2	1	3	CGPA	TIP (6 Expts)
224		PE (Honours - Vertical 6)	CS3517	19AI517	Business Analytics	-	2	1	3	CGPA	TIP (6 Expts)
225		PE (Honours - Vertical 6)	CS3559	19AI559	Image and Video Analytics	-	2	1	3	CGPA	TIP (6 Expts)
226		PE (Honours - Vertical 6)	CS4401	19AM401	Time Series Analysis and Forecasting	-	3	1	4	CGPA	TIP (6 Expts)
227		PE (Honours - Vertical 6)	CS1511	19CS511	Natural Language Processing	19MA201	3	0	3	CGPA	Theory

228		PE (Honours - Vertical 6)	CS1568	19CS568	Fine Tuning Large Language Models	-	3	0	3	CGPA	Theory
229		PE (Honours - Vertical 6)	CS1579	19CS579	Generative AI Application Development	-	2	1	3	CGPA	TIP (6 Expts)
230		PE (Honours - Vertical 6)	CS3501	19AI501	Applications of Artificial Intelligence	-	2	1	3	CGPA	TIP (6 Expts)
231		PE (Honours - Vertical 6)	CS3505	19AI505	Reinforcement Learning	19CS301	2	1	3	CGPA	TIP (6 Expts)
232		PE (Honours - Vertical 6)	CS3507	19AI507	Special Topics in Artificial Intelligence	-	2	1	3	CGPA	TIP (6 Expts)
233		PE (Honours - Vertical 6)	CS3511	19AI511	Scientific and Engineering Data Visualization	-	2	1	3	CGPA	TIP (6 Expts)
234		PE (Honours - Vertical 6)	CS3516	19AI516	Big Data Mining and Analysis	19AI408/ 19CS410/19IT405/19AI401 /	2	1	3	CGPA	TIP (6 Expts)
235		PE (Honours - Vertical 6)	CS3521	19AI521	Expert Systems	-	3	0	3	CGPA	Theory
236		PE (Honours - Vertical 6)	CS3525	19AI525	Video Processing	19CS301	2	1	3	CGPA	TIP (6 Expts)
237		PE (Honours - Vertical 6)	CS3550	19AI550	Artificial Intelligence for Games	-	2	1	3	CGPA	TIP (6 Expts)
238		PE (Honours - Vertical 6)	CS3554	19AI554	Fundamentals of Large Language Models	-	2	1	3	CGPA	TIP (6 Expts)
239		PE (Honours - Vertical 6)	CS3555	19AI555	Exploratory Data Analysis	-	2	1	3	CGPA	TIP (6 Expts)
240		PE (Honours - Vertical 6)	CS3556	19AI556	Recommender Systems	-	2	1	3	CGPA	TIP (6 Expts)
241		PE (Honours - Vertical 6)	CS3557	19AI557	Neural Networks and Deep Learning	-	2	1	3	CGPA	TIP (6 Expts)
242		PE (Honours - Vertical 6)	CS3558	19AI558	Text and Speech Analysis	-	2	1	3	CGPA	TIP (6 Expts)
243		PE (Honours - Vertical 6)	CS4501	19AM501	Machine Learning for Bioinformatics	-	3	0	3	CGPA	Theory
244		PE (Honours - Vertical 6)	CS4502	19AM502	Genetic Algorithms	-	2	1	3	CGPA	TIP (6 Expts)
245		PE (Honours - Vertical 6)	CS4503	19AM503	Data Modeling	-	3	0	3	CGPA	Theory
246		PE (Honours - Vertical 6)	CS1501	19CS501	Machine Learning	19MA211 / 19MA212/ 19MA217 / 19MA218 /	3	0	3	CGPA	Theory
247		PE (Honours - Vertical 6)	CS1519	19CS519	Data Science	19CS301/19CS501	3	0	3	CGPA	Theory
248		PE (Honours - Vertical 6)	CS1520	19CS520	Big Data Analytics	19CS411/19CS519	3	0	3	CGPA	Theory
249		PE (Honours - Vertical 6)	CS1524	19CS524	Deep Learning	19CS501	3	0	3	CGPA	Theory
250		PE (Honours - Vertical 6)	CS1526	19CS526	R Programming	19CS301/19CS303	2	1	3	CGPA	TIP (6 Expts)
251		PE (Honours - Vertical 6)	CS1550	19CS550	AI and Ethics	-	3	0	3	CGPA	Theory
252		PE (Honours - Vertical 6)	CS1569	19CS569	Applied Data Science	-	2	1	3	CGPA	TIP (6 Expts)
253		PE (Honours - Vertical 6)	CS1578	19CS578	Machine Learning Operations	-	3	0	3	CGPA	Theory

254		PE (Honours - Vertical 6)	EC1503	19EC503	Digital Image Processing	19EC409 / EC1409 / 19EI403	3	0	3	CGPA	Theory
255		PE (Honours - Vertical 6)	CS2516	19IT516	Business Intelligence and Analytics	-	3	0	3	CGPA	Theory
256		OE	XXXXXX	19XXXXX	Open Electives	-	0	0	0	CGPA	Theory
257		OE	XXXXXX	19XXXXX	Online Courses	-	0	0	0	CGPA	Experiential Learning
258		EEC	CS3701	19AI701	Mini Project	-	0	1	1	CGPA	Project
259		EEC	CS3702	19AI702	Project Work I	-	0	3	3	CGPA	Project (Int Only)
260		EEC	CS3703	19AI703	Project Work II	19AI702	0	6	6	CGPA	Project
261	Any 1	EEC	NA	19EY701	Soft Skills	-	0	1	1	CGPA	Practical (6 Expts)
262	Any 1	EEC	SH6708	19EY708	Career Development Skills	NIL	1	0	1	CGPA	Theory (Int Only)
263	Any 1	EEC	NA	19EY702	Creative Skills for Communication	-	0	1	1	CGPA	Practical (6 Expts)
264	Any 1	EEC	SH6709	19EY709	Reasoning Ability	NIL	1	0	1	CGPA	Theory (Int Only)
265	Option 1	EEC	NA	19EY703	System of Numerical and Logical Terminologies	-	0	1	1	CGPA	Practical (6 Expts)
266	Option 1	EEC	NA	19EY704	Advanced Quantitative and Logical Reasoning	-	0	1	1	CGPA	Practical (6 Expts)
267	Option 2	EEC	SH6710	19EY710	Quantitative Ability I	NIL	1	0	1	CGPA	Theory (Int Only)
268	Option 2	EEC	SH6711	19EY711	Quantitative Ability II	SH6710 /19EY710	1	0	1	CGPA	Theory (Int Only)
269	Any 1	EEC	NA	19EY705	Employment Enhancement Skills	-	0	1	1	CGPA	Practical (6 Expts)
270	Any 1	EEC	SH6712	19EY712	Employment Enrichment Skills	19EY702 / 19EY709 / SH6709	1	0	1	CGPA	Theory (Int Only)
271	Any 1	EEC	NA	19EY706	Company Specific Assessments For Employability	-	0	1	1	CGPA	Practical (6 Expts)
272	Any 1	EEC	SH6713	19EY713	Placement Readiness Assessment	19EY704 / 19EY711/SH6711	1	0	1	CGPA	Theory (Int Only)
273		EEC	SH6707	19EY707	Paper Publication	-	0	0	1	NON-CGPA	Experiential Learning (Int Only)
274		MC	NA	19MC801	Professional Ethics	-	0	0	0	NON - CGPA	Theory (Int Only)
275		MC	NA	19MC802	Environmental Science	-	0	0	0	CGPA	Theory (Int Only)
276		MC	NA	19MC803	Constitution of India	-	0	0	0	CGPA	Theory (Int Only)
277		MC	NA	19MC804	Internship/Entrepreneurship/Consultancy	-	0	0	2	NON-CGPA	Experiential Learning (Int Only)
278		MC	NA	19MC805	Inplant Training	-	0	0	1	Non - CGPA	Experiential Learning (Int Only)
279	Any 1	MC	SH6803	19MC807	National Service Scheme	-	0	0	0	NON-CGPA	Experiential Learning (Int Only)
280	Any 1	MC	SH8807	19MC808	National Sports Organization	-	0	0	0	NON-CGPA	Experiential Learning (Int Only)
281	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	14	3
BS	21	14
ES	28	12
PC	56	48
PE	16	16
OE	12	12
EEC	16	16
MC	3	3
TOTAL	**166**	**124**