Symbiosis Institute of Technology, Nagpur
Bachelor of Technology (Computer Science and Engineering)
Programme Structure 2024-28

<table>
<tr><td>1.</td><td>OBJECTIVE</td><td colspan="5">B.Tech is a full-time four year graduation programme, which aims at transforming a student into a technically sound professional. The syllabus contains courses on basic sciences, technical arts, humanities & liberal arts and professional courses. The mix of these courses has been evolved with an aim to produce professionals who have knowledge not only of Engineering but who are good managers to contribute in a cross-functional team and have human values.
Being a professional programme it ensures a healthy balance between theoretical foundation and practical exposure to the present day world.
The emphasis is to develop all round personality that would enable the students to take up the challenges of the corporate world and also become responsible citizens of the society.</td></tr>
<tr><td>2.</td><td>DURATION (IN MONTHS)</td><td colspan="5">48 (Full Time)</td></tr>
<tr><td>3.</td><td>INTAKE</td><td colspan="5">240</td></tr>
<tr><td rowspan="2">4.</td><td rowspan="2">RESERVATION</td><td rowspan="2">I.Within the sanctioned intake</td><td>a) SC
(In Percentage)</td><td>b) ST
(In Percentage)</td><td>c) Differently abled
(In Percentage)</td><td>d) Domicile of Nagpur
(In Percentage)</td></tr>
<tr><td>15</td><td>7.5</td><td>3</td><td>25
(Includes
i. Scheduled Caste (percentage) - 15
ii. Scheduled Tribes (percentage) - 7.5
iii. Differently Abled (percentage) - 3)</td></tr>
<tr><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2">II.Over and above the sanctioned intake</td><td colspan="2">a) Kashmiri Migrants
(In Seats)</td><td colspan="2">b) International Students
(In Percentage)</td></tr>
<tr><td colspan="2">2</td><td colspan="2">20</td></tr>
<tr><td>5.</td><td>ELIGIBILITY</td><td colspan="5">Passed 10+2 examination with Physics and Mathematics as compulsory subjects along with one of Chemistry/ Computer</td></tr>
</table>

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		Science/Electronics/ Information Technology/Biology/Informatics Practices/ Biotechnology/Technical Vocational subject/ Agriculture/Engineering Graphics/Business Studies /Entrepreneurship. Obtained at least 45% marks (40% marks in case of candidates belonging to reserved category) in the above subjects taken together. OR Passed D.Voc. Stream in the same or allied sector.(The University will offer suitable bridge courses such as Mathematics, Physics, Engineering drawing, etc., for the students coming from diverse backgrounds to prepare Level playing field and desired learning outcomes of the programme). B.Tech. : Lateral Entry Passed Minimum Three-years/ Two-year (Lateral Entry) Diploma examination with at least 45% marks (40% marks in case of candidates belonging to reserved category) in ANY branch of Engineering and Technology. OR Passed B.Sc. Degree from a recognized University as defined by UGC, with at least 45% marks (40% marks or equivalent grade for Scheduled Caste / Scheduled Tribes) and passed 10+2 examination with Mathematics as a subject. OR Passed B. Voc/3-year D.Voc. Stream in the same allied sector. (The Constituent will offer suitable bridge courses such as Mathematics, Physics, Engineering drawing, etc., for the students coming from diverse backgrounds to achieve desired learning outcomes of the programme).
6.	**SELECTION PROCEDURE**	Merit list by valid score of Symbiosis Entrance Test (SITEEE) or Joint Entrance Examination (JEE - Main) or Any State Government Engineering Entrance Examination.
7.	**MEDIUM OF INSTRUCTION**	English
8.	**PROGRAMME PATTERN**	Semester

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9.	**COURSE & SPECIALIZATION**	Annexure A: Bachelor of Technology (Computer Science and Engineering) Students may pursue optional 'Honours' specialization in one of the specialization areas by completing an additional 20 credits in Semesters 2, 3, 4, 5, 6 and 7 as specified in Annexure B for Honours. Annexure B: Optional 'Honours' specialization area 1. Artificial Intelligence and Machine learning 2. Cyber Security 3. Artificial Intelligence of Things 4. Data Science and Analytics 5. Cloud Computing

10.	**FEE**		**Academic Fee p.a**	**Institute Deposit**	**Total**
	Indian Students	**Other than Nagpur Domicile**	260000	20000	280000
		Nagpur Domicile	221000	20000	241000
	International Students	**NRI/ PIO/ OCI Category (Amount in US$)**	5100	275	5375
		Foreign National Category (Amount in US$)	1300	275	1575

Note: For additional optional specialization 'Honours', an additional fees of Rs. 25000/- will be charged in the first year.

11.	**ASSESSMENT**	The courses will have 40% Continuous Assessment and 60% Term End [University] examination however, some courses (not more than 30% of the total programme credits) may have 100% Continuous Assessment.
12.	**STANDARD OF**	The assessment of the student for each examination is done, based on relative performance. Maximum Grade Point (GP) is 10

	PASSING	corresponding to O (Outstanding). For all courses, a student is required to pass both internal and external examination separately with a minimum Grade Point of 4 corresponding to Grade P. Students securing less than 40% absolute marks in each head of passing will be declared FAIL. The University awards a degree to the student who has achieved a minimum CGPA of 4 out of maximum of 10 CGPA for the programme.
13.	**AWARD OF DEGREE**	Bachelor of Technology (Computer Science and Engineering) OR Bachelor of Technology (Computer Science and Engineering) with Honours in Artificial Intelligence and Machine learning / Cyber Security/Artificial Intelligence of Things/Data Science and Analytics/ Cloud Computing, will be awarded at the end of semester 8 examination by taking into consideration the performance of all semester examinations after obtaining minimum 4.00 CGPA out of 10 CGPA

14. CLASSIFICATION OF CREDITS

Semester	Generic Core	Generic Elective	Specialization Core	Specialization Elective	Open Elective	Mandatory Non-Credit Course/s	Non-Letter Grade Audit Course/s	Total
Group A								
1	20	0	0	0	0	1		20
2	23	0	0	0	0	1		23
3	21	1	0	0	0	1	As per the student's choice	22
4	21	2	0	0	0	0		23
5	20	0	0	0	3	0		23
6	15	9	0	0	0	0		24
7	11	9	0	0	0	0		20
8	12	3	0	0	0	0		15
Total	**143**	**24**	**0**	**0**	**3**	**0**		**170**
Group B								
1	20	0	0	0	0	1		20
2	23	0	0	0	0	1		23
3	21	1	0	0	0	1	As per the student's choice	22
4	21	2	0	0	0	0		23
5	20	0	0	0	3	0		23
6	15	9	0	0	0	0		24
7	11	9	0	0	0	0		20
8	12	3	0	0	0	0		15
Total	**143**	**24**	**0**	**0**	**3**	**0**		**170**
Optional Additional Courses (Honours)								
Total	**0**	**0**	**20**	**0**	**0**	**0**		**20**

The revised programme structure supersedes the previously approved programme structure dated 17/07/2024 for the programme.

This Programme Structure is aligned with the norms laid down by the University and is approved by the Academic Council.
Hereafter changes (if any) which conform to the policy on "Curriculum Development and Review" would be permissible, subject to revision of the Programme Structure, following the specified processes.

Director - Academics

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Annexure A

Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Semester : 1													
Group A - Generic Core Courses													
TE7680	0705210101	Mathematics-I	BS		2	1	0	0	0	30	45	3	75
TE7684	0705210102	Physics for Computer Engineers	BS		3	0	0	0	0	30	45	3	75
TE7687	0705210103	Physics Lab	BS		0	0	2	10	15	0	0	1	25
T7383	0705210104	Communication Skills	HS		2	0	0	0	0	20	30	2	50
T7384	0705210105	Communication Skills Lab	HS		0	0	2	10	15	0	0	1	25
TE7288	0705210106	Programming in C	PC		3	0	0	0	0	30	45	3	75
TE7289	0705210107	Programming in C Lab	PC		0	0	2	10	15	0	0	1	25
TE7689	0705210108	Statistics and Probability	BS		2	1	0	0	0	30	45	3	75
TE7300	0705210109	Tinker Lab	ES		0	0	4	50	0	0	0	2	50
TEE7129	0705210110	Design Thinking and Creativity	HS		0	0	2	25	0	0	0	1	25
TE7188	0705210111	Environmental Science	0		0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
Total Required Credits								**105**	**45**	**140**	**210**	**20**	**500**
Group B - Generic Core Courses													
TE7680	0705210101	Mathematics-I	BS		2	1	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7288	0705210106	Programming in C	PC		3	0	0	0	0	30	45	3	75
TE7289	0705210107	Programming in C Lab	PC		0	0	2	10	15	0	0	1	25
TE7300	0705210109	Tinker Lab	ES		0	0	4	50	0	0	0	2	50
TEE7129	0705210110	Design Thinking and Creativity	HS		0	0	2	25	0	0	0	1	25
TE7188	0705210111	Environmental Science	0		0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
TE7694	0705210112	Chemistry	BS		3	0	0	0	0	30	45	3	75
TE7695	0705210113	Chemistry Lab	BS		0	0	2	10	15	0	0	1	25
T7540	0705210114	Basic Electrical and Electronics Engineering	ES		3	0	0	0	0	30	45	3	75
T7593	0705210115	Basic Electrical and Electronics Engineering Lab	ES		0	0	2	10	15	0	0	1	25
T7925	0705210116	Engineering Graphics Lab	ES		0	0	4	20	30	0	0	2	50
Total Required Credits								**125**	**75**	**120**	**180**	**20**	**500**
Semester : 2													
Group - A Generic Core Courses													
TE7681	0705210201	Mathematics II	BS		3	1	0	0	0	40	60	4	100
TE7694	0705210202	Chemistry	BS		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7695	0705210203	Chemistry Lab	BS		0	0	2	10	15	0	0	1	25
T7540	0705210204	Basic Electrical and Electronics Engineering	ES		3	0	0	0	0	30	45	3	75
T7593	0705210205	Basic Electrical and Electronics Engineering Lab	ES		0	0	2	10	15	0	0	1	25
TE7286	0705210206	Programming and Problem Solving	ES		2	0	0	0	0	20	30	2	50
TE7287	0705210207	Programming and Problem Solving Lab	ES		0	0	2	10	15	0	0	1	25
TE7960	0705210208	Data Structures	PC		3	0	0	0	0	30	45	3	75
TE7959	0705210209	Data Structures Lab	PC		0	0	2	10	15	0	0	1	25
T7925	0705210210	Engineering Graphics Lab	ES		0	0	4	20	30	0	0	2	50
TE7290	0705210211	Project Based Learning -I	PIS		0	0	4	20	30	0	0	2	50
TH4788	0705210212	Health and Wellness Module I	OE		0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
Total Required Credits								**80**	**120**	**150**	**225**	**23**	**575**
Group - B Generic Core Courses													
TE7681	0705210201	Mathematics II	BS		3	1	0	0	0	40	60	4	100
TE7286	0705210206	Programming and Problem Solving	ES		2	0	0	0	0	20	30	2	50
TE7287	0705210207	Programming and Problem Solving Lab	ES		0	0	2	10	15	0	0	1	25

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7960	0705210208	Data Structures	PC		3	0	0	0	0	30	45	3	75
TE7959	0705210209	Data Structures Lab	PC		0	0	2	10	15	0	0	1	25
TE7290	0705210211	Project Based Learning -I	PIS		0	0	4	20	30	0	0	2	50
TH4788	0705210212	Health and Wellness Module I	OE		0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
TE7684	0705210213	Physics for Computer Engineers	BS		3	0	0	0	0	30	45	3	75
TE7687	0705210214	Physics Lab	BS		0	0	2	10	15	0	0	1	25
T7383	0705210215	Communication Skills	HS		2	0	0	0	0	20	30	2	50
T7384	0705210216	Communication Skills Lab	HS		0	0	2	10	15	0	0	1	25
TE7689	0705210217	Statistics and Probability	BS		2	1	0	0	0	30	45	3	75
Total Required Credits								**60**	**90**	**170**	**255**	**23**	**575**
Semester : 3													
Generic Core Courses													
TE7675	0705210301	Discrete Mathematics and Graph Theory	BS		3	1	0	0	0	40	60	4	100
T7996	0705210302	Computer Organization	PC		3	0	0	0	0	30	45	3	75
T7909	0705210303	Design and Analysis of Algorithms	PC		3	0	0	0	0	30	45	3	75
T7491	0705210304	Design and Analysis of Algorithms Lab	PC		0	0	2	10	15	0	0	1	25

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
T7997	0705210305	Digital Electronics and Logic Design	ES		3	0	0	0	0	30	45	3	75
T7555	0705210306	Digital Electronics and Logic Design Lab	ES		0	0	2	10	15	0	0	1	25
T2646	0705210307	Entrepreneurship Venture	HS		1	0	0	0	0	25	0	1	25
F0003	0705210308	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
TE7291	0705210309	Project Based Learning-II	PIS		0	0	4	20	30	0	0	2	50
TH4789	0705210320	Health and Wellness Module II			0	0	0	0	0	0	0	Mandatory Non-Credit Course	0
				Total	**16**	**1**	**8**	**40**	**60**	**230**	**195**	**21**	**525**
Generic Elective Courses Group (Choose Any One Course)													
T6872	0705210310	Foundation of Ethics	GE		1	0	0	0	0	25	0	1	25
T6760	0705210311	Introduction to Indian Philosophy	GE		1	0	0	0	0	25	0	1	25
				Total Required Credits				**0**	**0**	**25**	**0**	**1**	**25**
Semester : 4													
Generic Core Courses													
TEE7173	0705210401	Microcontrollers and Embedded Systems	ES		3	0	0	0	0	30	45	3	75
TEE7174	0705210402	Microcontrollers and Embedded Systems Lab	ES		0	0	2	10	15	0	0	1	25

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
F0003	0705210403	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
T7907	0705210404	Database Management Systems	PC		3	0	0	0	0	30	45	3	75
T7487	0705210405	Data Base Management Systems Lab	PC		0	0	4	20	30	0	0	2	50
T7510	0705210406	Operating Systems	PC		3	0	0	0	0	30	45	3	75
T7511	0705210407	Operating Systems Lab	PC		0	0	2	10	15	0	0	1	25
T7802	0705210408	Project Based Learning-III	PIS		0	0	4	20	30	0	0	2	50
TE7299	0705210409	Theory of Computation	PC		3	0	0	0	0	30	45	3	75
				Total	**15**	**0**	**12**	**60**	**90**	**195**	**180**	**21**	**525**
Generic Elective Courses Group (Choose Any One Course)													
T6186	0705210410	Basic French I	GE		2	0	0	0	0	50	0	2	50
T6184	0705210411	Basic German I	GE		2	0	0	0	0	50	0	2	50
T6188	0705210412	Basic Spanish I	GE		2	0	0	0	0	50	0	2	50
				Total Required Credits				**0**	**0**	**50**	**0**	**2**	**50**
Semester : 5													
Generic Core Courses													
F0003	0705210501	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
TEE7125	0705210502	Data Compression	ES		3	1	0	0	0	40	60	4	100
T7908	0705210503	Computer Networks	PC		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
T7482	0705210504	Computer Networks Lab	PC		0	0	2	10	15	0	0	1	25
TE7798	0705210505	Project Based Learning	PIS		0	0	4	20	30	0	0	2	50
TE7751	0705210506	Compiler Construction	PC		3	0	0	0	0	30	45	3	75
T7478	0705210507	Compiler Construction Lab	PC		0	0	2	10	15	0	0	1	25
T3013	0705210508	Javascript	PC		0	0	4	20	30	0	0	2	50
T7901	0705210509	Internship	PIS		0	0	0	25	0	0	0	1	25
Total					**12**	**1**	**12**	**85**	**90**	**175**	**150**	**20**	**500**
Open Elective Courses Group (Choose Any One Course)													
TE7952	0705210510	User Interface and Experience Design	OE	Computer Science and Engineering	3	0	0	0	0	30	45	3	75
TE7428	0705210511	Introduction to Image Processing	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TEE7018	0705210512	Engineering Simulation and Modeling Tools	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7810	0705210513	Industrial Revolution and Introduction of Industry 5.0	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
T7650	0705210514	Six sigma	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Semester : 6													
Generic Core Courses													
T3373	0705210601	Introduction to Android Programming	PC		2	0	0	0	0	20	30	2	50
TEE7111	0705210602	Android Application Development Lab	PC		0	0	2	10	15	0	0	1	25
F0004	0705210603	Flexi-Credit Course	PC		4	0	0	0	0	100	0	4	100
TE7951	0705210604	DevOps	PC		0	0	4	20	30	0	0	2	50
T8000	0705210605	Service Learning	HS		0	0	8	100	0	0	0	4	100
T7802	0705210606	Project	PIS		0	0	4	50	0	0	0	2	50
Total					**6**	**0**	**18**	**180**	**45**	**120**	**30**	**15**	**375**
Generic Elective Courses Group - I (Choose Any One Course)													
T3561	0705210607	Human Computer Interaction	PE		3	0	0	0	0	30	45	3	75
TEE7153	0705210608	Mathematical Techniques for Machine Learning	PE		3	0	0	0	0	30	45	3	75
TEE7146	0705210609	Introduction to ML for Data Science	PE		3	0	0	0	0	30	45	3	75
TE7916	0705210610	Cloud Computing Tools and Techniques	PE		3	0	0	0	0	30	45	3	75
TEE7158	0705210611	Open-source Tools for Cyber Security and Forensics	PE		3	0	0	0	0	30	45	3	75
TE7101	0705210612	Internet of Things	PE		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TEE7172	0705210613	Programming using Arduino	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Generic Elective Courses Group - II (Choose Any One Course)													
TEE7117	0705210614	Business for Data Driven Companies	PE		3	0	0	0	0	30	45	3	75
TEE7157	0705210615	Neural Networks for Data Science	PE		3	0	0	0	0	30	45	3	75
TE7953	0705210616	Information and Network Security	PE		3	0	0	0	0	30	45	3	75
TEE7154	0705210617	Mobile and Wireless Security	PE		3	0	0	0	0	30	45	3	75
TE7349	0705210618	Wireless Sensor Network	PE		3	0	0	0	0	30	45	3	75
TEE7133	0705210619	Distributed Computing and System	PE		3	0	0	0	0	30	45	3	75
TEE7162	0705210620	Programming with SENSEnuts IoT Platform	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Generic Elective Courses Group - III (Choose Any One Course)													
TE7088	0705210621	Digital Image Processing	PE		3	0	0	0	0	30	45	3	75
TEE7113	0705210622	Artificial Intelligence for IoT	PE		3	0	0	0	0	30	45	3	75
TEE7141	0705210623	Grid Computing	PE		3	0	0	0	0	30	45	3	75
TEE7136	0705210624	Exploit Writing	PE		3	0	0	0	0	30	45	3	75
TEE7152	0705210625	Malware Analysis	PE		3	0	0	0	0	30	45	3	75
TEE7156	0705210626	Networking and Content Delivery with Web Services	PE		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Semester : 7													
Generic Core Courses													
T7808	0705210701	B.Tech Project	PIS		0	0	16	80	120	0	0	8	200
T7901	0705210702	Internship	PIS		0	0	0	25	0	0	0	1	25
T6774	0705210703	Principles of Economics	HS		2	0	0	0	0	50	0	2	50
Total					**2**	**0**	**16**	**105**	**120**	**50**	**0**	**11**	**275**
Generic Elective Courses Group - IV (Choose Any One Course)													
TE7282	0705210704	Optimization Techniques and Algorithms	PE		3	0	0	0	0	30	45	3	75
T3366	0705210705	Predictive Analytics	PE		3	0	0	0	0	30	45	3	75
TE7253	0705210706	Data Science	PE		3	0	0	0	0	30	45	3	75
TEE7169	0705210707	Web and Text Analysis	PE		3	0	0	0	0	30	45	3	75
TEE7161	0705210708	Penetration Testing	PE		3	0	0	0	0	30	45	3	75
TEE7142	0705210709	Image Processing with IoT	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Generic Elective Courses Group - V (Choose Any One Course)													
TEE7163	0705210710	Recommender Systems	PE		3	0	0	0	0	30	45	3	75
T3458	0705210711	Healthcare analytics	PE		3	0	0	0	0	30	45	3	75
T3367	0705210712	Social Media Analytics	PE		3	0	0	0	0	30	45	3	75

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Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TEE7120	0705210713	Container and Serverless Computing	PE		3	0	0	0	0	30	45	3	75
TEE7124	0705210714	Cyber Security in Cloud	PE		3	0	0	0	0	30	45	3	75
T3056	0705210715	Wireless Networks	PE		3	0	0	0	0	30	45	3	75
TEE7137	0705210716	Fog Computing and IoT	PE		3	0	0	0	0	30	45	3	75
TEE7143	0705210717	Industrial IoT 4.0	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Generic Elective Courses Group - VI (Choose Any One Course)													
T3675	0705210718	Business Intelligence	PE		3	0	0	0	0	30	45	3	75
TE7484	0705210719	Computer Vision	PE		3	0	0	0	0	30	45	3	75
TEE7116	0705210720	Business Analytics with Cloud	PE		3	0	0	0	0	30	45	3	75
TEE7132	0705210721	Disaster Recovery and Backup Storage in Cloud	PE		3	0	0	0	0	30	45	3	75
TEE7144	0705210722	Information Security and Audit Monitoring	PE		3	0	0	0	0	30	45	3	75
TEE7164	0705210723	Robotics and Intelligent Systems	PE		3	0	0	0	0	30	45	3	75
TEE7134	0705210724	Drones in IoT	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								**0**	**0**	**30**	**45**	**3**	**75**
Semester : 8													
Generic Core Courses													
T7912	0705210801	Internship	PIS		0	0	24	120	180	0	0	12	300

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
				Total	**0**	**0**	**24**	**120**	**180**	**0**	**0**	**12**	**300**
Generic Elective Courses Group - VII (Choose Any One Course)													
TE7276	0705210802	Natural Language Processing	PE		3	0	0	0	0	30	45	3	75
T3723	0705210803	Data Privacy and Protection	PE		3	0	0	0	0	30	45	3	75
TEE7118	0705210804	Business Intelligence and Process Management	PE		3	0	0	0	0	30	45	3	75
TEE7166	0705210805	Sensor-Cloud for Internet of Things	PE		3	0	0	0	0	30	45	3	75
TEE7155	0705210806	Network and Cyber Forensics	PE		3	0	0	0	0	30	45	3	75
TEE7123	0705210807	Cyber Security in Blockchain Technology	PE		3	0	0	0	0	30	45	3	75
TEE7114	0705210808	Basics of Internet of Things and Raspberry Pi	PE		3	0	0	0	0	30	45	3	75
TEE7112	0705210809	Applications of AIoT	PE		3	0	0	0	0	30	45	3	75
				Total Required Credits				**0**	**0**	**30**	**45**	**3**	**75**

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Abbreviations (Nature)

BS	Basic Sciences
ES	Engineering Sciences
HS	Humanities and Social Sciences
OE	Open Electives
PC	Professional Core
PE	Professional Elective
PIS	Project, Internship, Seminar
PD	Professional Development Course
MC	Mandatory Course
L	Lecture
T	Tutorial
CA	Continuous Assessment
ESE	End Semester Examination
GE	Generic Elective

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Semester	Continuous Assessment	Term End Examination	Total Credits	Total Marks
Group A				
Semester 1	3	17	20	500
Semester 2	0	23	23	575
Semester 3	5	17	22	550
Semester 4	5	18	23	575
Semester 5	4	19	23	575
Semester 6	10	14	24	600
Semester 7	3	17	20	500
Semester 8	0	15	15	375
Total	**30**	**140**	**170**	**4250**
Group B				
Semester 1	3	17	20	500
Semester 2	0	23	23	575
Semester 3	5	17	22	550
Semester 4	5	18	23	575
Semester 5	4	19	23	575
Semester 6	10	14	24	600
Semester 7	3	17	20	500
Semester 8	0	15	15	375
Total	**30**	**140**	**170**	**4250**

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Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Semester : 2													
Artificial Intelligence and Machine Learning Specialization Core Courses													
TE7704	0705210218	Artificial Intelligence and Machine Learning	PC		2	0	0	0	0	20	30	2	50
		Total			**2**	**0**	**0**	**0**	**0**	**20**	**30**	**2**	**50**
Semester : 2													
Cyber Security Specialization Core Courses													
TEE7098	0705210219	Cyber Security	PC		2	0	0	0	0	20	30	2	50
		Total			**2**	**0**	**0**	**0**	**0**	**20**	**30**	**2**	**50**
Semester : 2													
Artificial Intelligence of Things Specialization Core Courses													
T3520	0705210220	Introduction to Internet of Things	PC		2	0	0	0	0	20	30	2	50
		Total			**2**	**0**	**0**	**0**	**0**	**20**	**30**	**2**	**50**
Semester : 2													
Data Science and Analytics Specialization Core Courses													
T3442	0705210221	Introduction to data Sciences	PC		2	0	0	0	0	20	30	2	50

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Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
				Total	**2**	**0**	**0**	**0**	**0**	**20**	**30**	**2**	**50**
Semester : 2													
Cloud Computing Specialization Core Courses													
T3422	0705210222	Introduction to Cloud Technology	PC		2	0	0	0	0	20	30	2	50
				Total	**2**	**0**	**0**	**0**	**0**	**20**	**30**	**2**	**50**
Semester : 3													
Artificial Intelligence and Machine Learning Specialization Core Courses													
T7529	0705210312	Machine Learning	PC		3	0	0	0	0	30	45	3	75
TE7105	0705210313	Machine Learning Lab	PC		0	0	2	10	15	0	0	1	25
				Total	**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Semester : 3													
Cyber Security Specialization Core Courses													
TEE7131	0705210314	Digital Water Marking and Steganography	PC		3	0	0	0	0	30	45	3	75
TEE7130	0705210315	Digital Forensics Lab	PC		0	0	2	10	15	0	0	1	25
				Total	**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**

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Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Semester : 3													
Artificial Intelligence of Things Specialization Core Courses													
T7529	0705210312	Machine Learning	PC		3	0	0	0	0	30	45	3	75
TE7105	0705210313	Machine Learning Lab	PC		0	0	2	10	15	0	0	1	25
		Total			**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Semester : 3													
Data Science and Analytics Specialization Core Courses													
TEE7138	0705210316	Foundation of Data Engineering	PC		3	0	0	0	0	30	45	3	75
TEE7139	0705210317	Foundation of Data Engineering Lab	PC		0	0	2	10	15	0	0	1	25
		Total			**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Semester : 3													
Cloud Computing Specialization Core Courses													
TE7948	0705210318	Introduction to Cloud Computing	PC		3	0	0	0	0	30	45	3	75
TEE7145	0705210319	Introduction to Cloud Computing Lab	PC		0	0	2	10	15	0	0	1	25
		Total			**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**

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Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Semester : 4													
Artificial Intelligence and Machine Learning Specialization Core Courses													
TE7279	0705210413	Neural Networks	PC		3	0	0	0	0	30	45	3	75
		Total			**3**	**0**	**0**	**0**	**0**	**30**	**45**	**3**	**75**
Semester : 4													
Cyber Security Specialization Core Courses													
TEE7135	0705210414	Ethical Hacking	PC		3	0	0	0	0	30	45	3	75
		Total			**3**	**0**	**0**	**0**	**0**	**30**	**45**	**3**	**75**
Semester : 4													
Artificial Intelligence of Things Specialization Core Courses													
TE7279	0705210413	Neural Networks	PC		3	0	0	0	0	30	45	3	75
		Total			**3**	**0**	**0**	**0**	**0**	**30**	**45**	**3**	**75**
Semester : 4													
Data Science and Analytics Specialization Core Courses													
TEE7126	0705210415	Data Warehouse	PC		3	0	0	0	0	30	45	3	75

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								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
		Total			**3**	**0**	**0**	**0**	**0**	**30**	**45**	**3**	**75**
Semester : 4													
Cloud Computing Specialization Core Courses													
TEE7168	0705210416	Virtualization Techniques in Cloud Storage: Principles and Applications	PC		3	0	0	0	0	30	45	3	75
		Total			**3**	**0**	**0**	**0**	**0**	**30**	**45**	**3**	**75**
Semester : 5													
Artificial Intelligence and Machine Learning Specialization Core Courses													
TEE7167	0705210515	Soft Computing	PC		3	0	0	0	0	30	45	3	75
		Total			**3**	**0**	**0**	**0**	**0**	**30**	**45**	**3**	**75**
Semester : 5													
Cyber Security Specialization Core Courses													
TEE7165	0705210516	Security and Risk Management	PC		3	0	0	0	0	30	45	3	75
		Total			**3**	**0**	**0**	**0**	**0**	**30**	**45**	**3**	**75**
Semester : 5													

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Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
Artificial Intelligence of Things Specialization Core Courses													
TEE7149	0705210517	IoT Programming	PC		3	0	0	0	0	30	45	3	75
				Total	**3**	**0**	**0**	**0**	**0**	**30**	**45**	**3**	**75**
Semester : 5													
Data Science and Analytics Specialization Core Courses													
T3761	0705210518	Data Mining	PC		3	0	0	0	0	30	45	3	75
				Total	**3**	**0**	**0**	**0**	**0**	**30**	**45**	**3**	**75**
Semester : 5													
Cloud Computing Specialization Core Courses													
TEE7140	0705210519	Fundamentals of Web Services: Concepts and Practical Applications	PC		3	0	0	0	0	30	45	3	75
				Total	**3**	**0**	**0**	**0**	**0**	**30**	**45**	**3**	**75**
Semester : 6													
Artificial Intelligence and Machine Learning Specialization Core Courses													
TEE7159	0705210627	Pattern Recognition	PC		3	0	0	0	0	30	45	3	75

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Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TEE7160	0705210628	Pattern Recognition Lab	PC		0	0	2	10	15	0	0	1	25
				Total	**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Semester : 6													
Cyber Security Specialization Core Courses													
TEE7039	0705210629	Cryptography and Network Security	PC		3	0	0	0	0	30	45	3	75
TEE7121	0705210630	Cryptography and Network Security Lab	PC		0	0	2	10	15	0	0	1	25
				Total	**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Semester : 6													
Artificial Intelligence of Things Specialization Core Courses													
TEE7175	0705210631	IoT Sensors and Actuators	PC		3	0	0	0	0	30	45	3	75
TEE7176	0705210632	IoT Sensors and Actuators Lab	PC		0	0	2	10	15	0	0	1	25
				Total	**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Semester : 6													
Data Science and Analytics Specialization Core Courses													
T3567	0705210633	Data Analysis and Visualization	PC		3	0	0	0	0	30	45	3	75

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Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TE7772	0705210634	Data Analytics with Excel	PC		0	0	2	10	15	0	0	1	25
				Total	**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Semester : 6													
Cloud Computing Specialization Core Courses													
T3722	0705210635	Cloud Security	PC		3	0	0	0	0	30	45	3	75
TEE7119	0705210636	Cloud Security Lab	PC		0	0	2	10	15	0	0	1	25
				Total	**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Semester : 7													
Artificial Intelligence and Machine Learning Specialization Core Courses													
TEE7127	0705210725	Deep Learning and Its Applications	PC		3	0	0	0	0	30	45	3	75
TEE7128	0705210726	Deep Learning and Its Applications Lab	PC		0	0	2	10	15	0	0	1	25
				Total	**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Semester : 7													
Cyber Security Specialization Core Courses													
TEE7147	0705210727	Intrusion Detection and Prevention System	PC		3	0	0	0	0	30	45	3	75

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Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TEE7148	0705210728	Intrusion Detection and Prevention System Lab	PC		0	0	2	10	15	0	0	1	25
				Total	**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Semester : 7													
Artificial Intelligence of Things Specialization Core Courses													
TEE7170	0705210729	Wireless Technologies for IoT	PC		3	0	0	0	0	30	45	3	75
TEE7171	0705210730	Wireless Technologies for IoT Lab	PC		0	0	2	10	15	0	0	1	25
				Total	**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Semester : 7													
Data Science and Analytics Specialization Core Courses													
TE7945	0705210731	Big Data Analytics	PC		3	0	0	0	0	30	45	3	75
TE7554	0705210732	Big Data Analytics Lab	PC		0	0	2	10	15	0	0	1	25
				Total	**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**
Semester : 7													
Cloud Computing Specialization Core Courses													
TEE7150	0705210733	Machine Learning with Web Services	PC		3	0	0	0	0	30	45	3	75

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Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	Lab	CA	ESE	CA	ESE		
TEE7151	0705210734	Machine Learning with Web Services Lab	PC		0	0	2	10	15	0	0	1	25
				Total	**3**	**0**	**2**	**10**	**15**	**30**	**45**	**4**	**100**

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Semester	Continuous Assessment	Term End Examination	Total Credits	Total Marks
Artificial Intelligence and Machine Learning				
Semester 2	0	2	2	50
Semester 3	0	4	4	100
Semester 4	0	3	3	75
Semester 5	0	3	3	75
Semester 6	0	4	4	100
Semester 7	0	4	4	100
Total	**0**	**20**	**20**	**500**
Cyber Security				
Semester 2	0	2	2	50
Semester 3	0	4	4	100
Semester 4	0	3	3	75
Semester 5	0	3	3	75
Semester 6	0	4	4	100
Semester 7	0	4	4	100
Total	**0**	**20**	**20**	**500**
Artificial Intelligence of Things				
Semester 2	0	2	2	50
Semester 3	0	4	4	100
Semester 4	0	3	3	75
Semester 5	0	3	3	75
Semester 6	0	4	4	100
Semester 7	0	4	4	100

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Total	**0**	**20**	**20**	**500**
Data Science and Analytics				
Semester 2	0	2	2	50
Semester 3	0	4	4	100
Semester 4	0	3	3	75
Semester 5	0	3	3	75
Semester 6	0	4	4	100
Semester 7	0	4	4	100
Total	**0**	**20**	**20**	**500**
Cloud Computing				
Semester 2	0	2	2	50
Semester 3	0	4	4	100
Semester 4	0	3	3	75
Semester 5	0	3	3	75
Semester 6	0	4	4	100
Semester 7	0	4	4	100
Total	**0**	**20**	**20**	**500**