

Symbiosis Institute of Technology, Pune
Bachelor of Technology (Civil Engineering)
Programme Structure 2023-27

1. OBJECTIVE	<p>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.</p> <p>Being a professional programme it ensures a healthy balance between theoretical foundation and practical exposure to the present day world.</p> <p>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.</p>			
2. DURATION (IN MONTHS)	48 (Full Time)			
3. INTAKE	60			
4. RESERVATION	I. Within the sanctioned intake	a) SC (In Percentage)	b) ST (In Percentage)	c) Differently abled (In Percentage)
		15	7.5	3
	II. Over and above the sanctioned intake	a) Kashmiri Migrants (In Seats)		b) International Students (In Percentage)
		2		20
5. ELIGIBILITY	<p>Passed 10+2 examination with Physics and Mathematics as compulsory subjects along with one of Chemistry/ Biotechnology/ Biology/ Technical Vocational subjects. Obtained at least 45% marks or equivalent grade (40% marks or equivalent grade for Scheduled Caste /Scheduled Tribes) in the above subjects taken together.</p> <p>B. Tech (Lateral entry to second year) :</p> <p>a) Passed Diploma examination from an AICTE approved Institution; with at least 45% marks or equivalent grade (40% marks or equivalent grade for Scheduled Caste /Scheduled Tribes) in appropriate branch of Engineering / Technology.</p>			

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		<p>b) Passed B.Sc. Degree from a recognized University as defined by UGC, with at least 45% marks or equivalent grade (40% marks or equivalent grade for Scheduled Caste /Scheduled Tribes) and passed XII standard with mathematics as a subject.</p> <p>c) Provided that in case of students belonging to B. Sc. Stream, shall clear the subjects of Engineering Graphics / Engineering Drawing and Engineering Mechanics of the first year Engineering program along with the second year subjects.</p> <p>d) Provided further that, the students belonging to B. Sc. Stream shall be considered only after filling the supernumerary seats in this category with students belonging to the Diploma stream.</p> <p>e) Provided further that students, who have passed Diploma in Engineering and Technology from an AICTE approved Institution or B. Sc. Degree from a recognized University as defined by UGC, shall also be eligible for admission to the first year Engineering Degree courses subject to vacancies in the first year class in case the vacancies at lateral entry are exhausted. However the admissions shall be based strictly on the eligibility criteria as mentioned in a, b, c, and d above.</p>
6.	SELECTION PROCEDURE	Merit list by a valid score of Symbiosis Entrance Test (SIT EEE) or Joint Entrance Examination (JEE - Mains) or All States Engineering Entrance Test
7.	MEDIUM OF INSTRUCTION	English
8.	PROGRAMME PATTERN	Semester
9.	COURSE & SPECIALISATION	<p>Annexure A: Bachelor of Technology (Civil Engineering)</p> <p>Students may pursue optional (Honours) OR (Minor) specialization in one of the specialization areas by completing additional 20 credits in Semester: 5, 6 and 7 as specified in Annexure B for Honours and Annexure C for Minor in the respective specialization area.</p> <p>Annexure B: Optional (Honours) Specialization Area</p> <ol style="list-style-type: none"> 1. Environmental Hydraulics 2. Geo-Environmental Engineering 3. GIS and Surveying Technology 4. Infrastructure Engineering and Management 5. Smart Cities and Urban Analytics 6. Structural Engineering <p>Annexure C : Optional (Minor) Specialization Area</p>

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		1. Artificial Intelligence and Machine Learning (CSE) 2. Data Science (CSE) 3. Internet of Things (CSE) 4. Embedded Systems (E&TC) 5. Automobile Engineering with Hybrid and Autonomous Technology (ME)			
10.	FEE		Academic Fee p.a	Institute Deposit	Total
	Indian Students (Amount in INR)		300000	20000	320000
	International Students	NRI/ PIO/ OCI Category (Amount in US\$)	5875	275	6150
		Foreign National Category (Amount in US\$)	1300	275	1575
Note: For additional optional Specialisation 'Honours' or 'Minor', an additional fees of Rs. 25000/- will be charged in the third year.					
11.	ASSESSMENT	All internal courses will have 100% component as internal evaluation at the institute level. All external courses will have 40% internal component and 60% component as external [University] examination. The internal and external will be separate heads of passing.			
12.	STANDARD OF PASSING	The assessment of the student for each examination is done, based on relative performance. Maximum Grade Point (GP) is 10 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 (Civil Engineering) OR			

Bachelor of Technology (Civil Engineering) with Honours in Environmental Hydraulics / Geo-Environmental Engineering / GIS and Surveying Technology / Infrastructure Engineering and Management/ Smart Cities and Urban Analytics/ Structural Engineering
OR
Bachelor of Technology (Civil Engineering) with Minor in Artificial Intelligence and Machine Learning / Data Science / Internet of Things / Embedded Systems / Automobile Engineering with Hybrid and Autonomous Technology as applicable 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	Specialisation Core	Specialisation Elective	Open Elective	Non-Letter Grade Mandatory Course/s	Non-Letter Grade Audit Course/s	Total
Common								
1	20	0	0	0	0	1 *	As per the student's choice	20
2	23	0	0	0	0	1 *		23
3	20	2	0	0	0	1 *		22
4	22	1	0	0	0	0		23
5	19	2	0	0	3	0		24
6	14	7	0	0	3	0		24
7	8	12	0	0	0	0		20
8	14	0	0	0	0	1 *		14
Total	140	24	0	0	6	0		170
Optional Additional Courses (Honours)								
Total	0	0	14/17	6/3	0	0		20
Optional Additional Courses (Minor)								
Total	0	0	20	0	0	0		20
Grand Total								190

* Satisfactory completion of the non letter grade course 'Integrated Disaster Management', 'Environmental Science', 'Vasudhaiva Kutumbakam' and 'Fitness for Life' is mandatory for the award of degree.

The revised programme structure supersedes the previously approved programme structure dated 25/08/2024 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	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Semester : 1													
Generic Core Courses													
TE7168	0701210101	Engineering Mathematics -I	BS		3	1	0	0	0	40	60	4	100
TE7732	0701210102	Programming and Logic Building Lab	ES		0	0	4	20	30	0	0	2	50
TE7683	0701210103	Physics for Civil Engineers	BS		3	0	0	0	0	30	45	3	75
TE7687	0701210104	Physics Lab	BS		0	0	2	10	15	0	0	1	25
TE7702	0701210105	Applied Mechanics	ES		3	0	0	0	0	30	45	3	75
TE7703	0701210106	Applied Mechanics Lab	ES		0	0	2	10	15	0	0	1	25
T7925	0701210107	Engineering Graphics Lab	ES		0	0	4	20	30	0	0	2	50
T7383	0701210108	Communication Skills	HS		2	0	0	0	0	20	30	2	50
T7384	0701210109	Communication Skills Lab	HS		0	0	2	10	15	0	0	1	25
T6873	0701210110	Creative Thinking	HS		1	0	0	0	0	25	0	1	25
TE7188	0701210111	Environmental Science *	MC		0	0	0	0	0	0	0	Non - Letter Grade Mandatory	0
Total					12	1	14	70	105	145	180	20	500
Semester : 2													
Generic Core Courses													

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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
TE7169	0701210201	Engineering Mathematics -II	BS		3	1	0	0	0	40	60	4	100
TE7694	0701210202	Chemistry	BS		3	0	0	0	0	30	45	3	75
TE7695	0701210203	Chemistry Lab	BS		0	0	2	10	15	0	0	1	25
TE7720	0701210204	Digital Land Surveying and Mapping	ES		2	0	0	0	0	20	30	2	50
TE7721	0701210205	Digital Land Surveying and Mapping Lab	ES		0	0	2	10	15	0	0	1	25
TE7729	0701210206	Introduction to Python Programming Lab	ES		0	0	4	20	30	0	0	2	50
T7957	0701210207	Building Construction Technology	PC		3	0	0	0	0	30	45	3	75
TE7706	0701210208	Basics of Sensors and Microcontrollers	ES		2	0	0	0	0	20	30	2	50
TE7707	0701210209	Basics of Sensors and Microcontrollers Lab	ES		0	0	2	10	15	0	0	1	25
TE7739	0701210210	Software Tools for Civil Engineers	ES		0	0	2	10	15	0	0	1	25
T6732	0701210211	Critical Thinking	HS		1	0	0	0	0	25	0	1	25
TE7300	0701210212	Tinker Lab	ES		0	0	4	50	0	0	0	2	50
TH4095	0701210213	Fitness for Life *	MC		0	0	0	0	0	0	0	Non - Letter Grade Mandatory	0
Total					14	1	16	110	90	165	210	23	575
Semester : 3													
Generic Core Courses													

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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
TE7740	0701210301	Strength of Materials	PC		3	0	0	0	0	30	45	3	75
TEE7109	0701210302	Materials Testing Lab	PC		0	0	4	20	30	0	0	2	50
TE7170	0701210303	Engineering Mathematics-III	BS		2	1	0	0	0	30	45	3	75
TEE7098	0701210304	Cyber Security	ES		2	0	0	0	0	50	0	2	50
TE7710	0701210305	Computer Aided Building Design and Drawing Lab	ES		0	0	4	50	0	0	0	2	50
TE7400	0701210306	Introduction to Fluid Mechanics	PC		3	0	0	0	0	30	45	3	75
TE7728	0701210307	Introduction to Fluid Mechanics Lab	PC		0	0	2	10	15	0	0	1	25
T8000	0701210308	Service Learning	HS		0	0	8	100	0	0	0	4	100
T4005	0701210309	Integrated Disaster Management *	MC		0	0	0	0	0	0	0	Non - Letter Grade Mandatory	0
Total					10	1	18	180	45	140	135	20	500
Generic Elective Course Group (Choose any one course)													
T6184	0701210310	Basic German I	GE		2	0	0	0	0	50	0	2	50
T6186	0701210311	Basic French I	GE		2	0	0	0	0	50	0	2	50
T6188	0701210312	Basic Spanish I	GE		2	0	0	0	0	50	0	2	50

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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Total Required Credits								0	0	50	0	2	50
Semester : 4													
Generic Core Courses													
TE7711	0701210401	Computer Aided Structural Analysis-I	HS		3	0	0	0	0	30	45	3	75
TE7723	0701210402	Geotechnical Engineering	PC		3	0	0	0	0	30	45	3	75
TE7724	0701210403	Geotechnical Engineering Lab	PC		0	0	2	10	15	0	0	1	25
TE7404	0701210404	Open Channel Flow	PC		3	0	0	0	0	30	45	3	75
TE7731	0701210405	Open Channel Flow Simulation Lab	PC		0	0	2	10	15	0	0	1	25
TE7691	0701210406	Statistics, Probability and Numerical Methods	BS		3	0	0	0	0	30	45	3	75
TE7692	0701210407	Statistics, Probability and Numerical Methods Lab	BS		0	0	2	10	15	0	0	1	25
TE7290	0701210408	Project Based Learning -I	PIS		0	0	4	50	0	0	0	2	50
T7966	0701210409	Advanced Surveying Lab	PC		0	0	4	50	0	0	0	2	50
T2646	0701210410	Entrepreneurship Venture	HS		1	0	0	0	0	25	0	1	25
T6774	0701210411	Principles of Economics	HS		2	0	0	0	0	50	0	2	50
Total					15	0	14	130	45	195	180	22	550
Generic Elective Course Group (Choose any one course)													
T6872	0701210412	Foundation of Ethics	GE		1	0	0	0	0	25	0	1	25

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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
T6760	0701210413	Introduction to Indian Philosophy	GE		1	0	0	0	0	25	0	1	25
Total Required Credits								0	0	25	0	1	25
Semester : 5													
Generic Core Courses													
TE7743	0701210501	Water Treatment and Supply System	PC		3	0	0	0	0	30	45	3	75
F7083	0701210502	Water Distribution Network Design lab	PC		0	0	2	25	0	0	0	1	25
TE7712	0701210503	Computer Aided Structural Analysis-II	PC		3	0	0	0	0	30	45	3	75
TE7714	0701210504	Design of RCC Structures	PC		3	0	0	0	0	30	45	3	75
TE7715	0701210505	Design of RCC Structures Lab	PC		0	0	2	10	15	0	0	1	25
TE7713	0701210506	Construction Project Management Lab	PC		0	0	2	10	15	0	0	1	25
T6749	0701210507	Design Thinking	HS		2	0	0	0	0	50	0	2	50
TE7291	0701210508	Project Based Learning-II	PIS		0	0	4	50	0	0	0	2	50
TE7199	0701210509	Hydrology and Water Resource Engineering	PC		3	0	0	0	0	30	45	3	75
Total					14	0	10	95	30	170	180	19	475
Generic Elective Course Group (Choose any one course)													
TE7704	0701210510	Artificial Intelligence and Machine Learning	PE		2	0	0	0	0	50	0	2	50
TE7727	0701210511	Internet of Things	PE		2	0	0	0	0	50	0	2	50
TE7709	0701210512	Cloud Computing and Blockchain Technology	PE		2	0	0	0	0	50	0	2	50

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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
TE7708	0701210513	Big Data Analytics	PE		2	0	0	0	0	50	0	2	50
Total Required Credits								0	0	50	0	2	50
Open Electives Course Group (Choose any one course)													
TE7698	0701210514	Nanotechnology	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7676	0701210515	Executive Corporate Communication For Impact	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7195	0701210516	GIS Applications	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7203	0701210517	Intelligent Transportation Management	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7297	0701210518	Software Testing Tools	OE	Computer Science and Engineering and Information Technology	3	0	0	0	0	30	45	3	75
TE7756	0701210519	Open Source Technologies	OE	Computer Science and Engineering and Information Technology	3	0	0	0	0	30	45	3	75
T7584	0701210520	Printed Circuit Board (PCB) Design	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7334	0701210521	Introduction to Mechatronics	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75

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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
TEE7044	0701210522	Data Modelling and Analytics for Battery Energy Storage Systems	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
TE7351	0701210523	3D Printing and Prototyping	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Semester : 6													
Generic Core Courses													
TE7716	0701210601	Design of Steel Structures	PC		3	0	0	0	0	30	45	3	75
TE7717	0701210602	Design of Steel Structures Lab	PC		0	0	2	10	15	0	0	1	25
F0003	0701210603	Flexi-Credit Course	PC		3	0	0	0	0	75	0	3	75
TE7741	0701210604	Waste Water Treatment and Recycling	PC		3	0	0	0	0	30	45	3	75
T7802	0701210605	Capstone Course	PC		2	0	0	0	0	50	0	2	50
TE7726	0701210606	Highway Engineering Lab	PC		0	0	2	10	15	0	0	1	25
TE7742	0701210607	Water and Waste Water Analysis Lab	PC		0	0	2	10	15	0	0	1	25
Total					11	0	6	30	45	185	90	14	350
Generic Elective Course Group - I (Choose any one course)													
TE7409	0701210608	Bridge Engineering	PE		4	0	0	0	0	40	60	4	100
T7987	0701210609	Foundation Engineering	PE		4	0	0	0	0	40	60	4	100
T7975	0701210610	Green Building Technology	PE		4	0	0	0	0	40	60	4	100

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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
TE7412	0701210611	Introduction to Remote Sensing and GIS	PE		4	0	0	0	0	40	60	4	100
TE7734	0701210612	Railway and Tunnel Engineering	PE		4	0	0	0	0	40	60	4	100
TE7221	0701210613	Smart Cities and Future Urbanism	PE		4	0	0	0	0	40	60	4	100
Total Required Credits								0	0	40	60	4	100
Generic Elective Course Group - II (Choose any one course)													
TE7175	0701210614	Advanced Structural Analysis	PE		3	0	0	0	0	30	45	3	75
TE7705	0701210615	Automation in Construction	PE		3	0	0	0	0	30	45	3	75
T7984	0701210616	Computer Applications in Construction Management	PE		3	0	0	0	0	30	45	3	75
TE7182	0701210617	Design of Hydraulic Structures	PE		3	0	0	0	0	30	45	3	75
T7980	0701210618	Glass Facade Engineering	PE		3	0	0	0	0	30	45	3	75
TE7415	0701210619	Integrated Water Resource Management	PE		3	0	0	0	0	30	45	3	75
TE7414	0701210620	Pavement Design	PE		3	0	0	0	0	30	45	3	75
TE7416	0701210621	Smart Cities Planning and Development	PE		3	0	0	0	0	30	45	3	75
TE7235	0701210622	Urban Transport Engineering	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Open Electives Course Group (Choose any one course)													

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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
TE7677	0701210623	Financial Mathematics	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7700	0701210624	Smart Materials	OE	Applied Science	3	0	0	0	0	30	45	3	75
TE7223	0701210625	Smart Urban Planning	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7240	0701210626	Water Resource Planning and Management	OE	Civil Engineering	3	0	0	0	0	30	45	3	75
TE7948	0701210627	Introduction to Cloud Computing	OE	Computer Science and Engineering and Information Technology	3	0	0	0	0	30	45	3	75
TE7952	0701210628	User Interface and Experience Design	OE	Computer Science and Engineering and Information Technology	3	3	3	0	0	30	45	3	75
TEE7018	0701210629	Engineering Simulation and Modeling Tools	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7428	0701210630	Introduction to Image Processing	OE	Electronics & Tele-communication Engineering	3	0	0	0	0	30	45	3	75
TE7810	0701210631	Industrial Revolution and Introduction of Industry 5.0	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
T7650	0701210632	Six Sigma	OE	Mechanical Engineering	3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Semester : 7													

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								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
Generic Core Courses													
T7804	0701210701	B.Tech Project	PIS		0	0	8	40	60	0	0	4	100
TE7701	0701210702	Advanced BIM Lab	PC		0	0	4	50	0	0	0	2	50
TE7733	0701210703	Project Estimation, Costing and Valuation Lab	PC		0	0	4	20	30	0	0	2	50
Total					0	0	16	110	90	0	0	8	200
Generic Elective Course Group - I (Choose any one course)													
T2585	0701210704	Organizational Behaviour	GE		2	0	0	0	0	50	0	2	50
TE7438	0701210705	History of Science and Technology	GE		2	0	0	0	0	50	0	2	50
Total Required Credits								0	0	50	0	2	50
Generic Elective Course Group - II (Choose any one course)													
TE7725	0701210706	Harbour and Airport Engineering	PE		3	0	0	0	0	30	45	3	75
TE7238	0701210707	Water and Air Quality Modelling	PE		3	0	0	0	0	30	45	3	75
TE7417	0701210708	Advanced Concrete Technology	PE		3	0	0	0	0	30	45	3	75
TE7418	0701210709	Geoinformatics Application for Emergency Response Management	PE		3	0	0	0	0	30	45	3	75
T7955	0701210710	Professional Practices in Construction	PE		3	0	0	0	0	30	45	3	75
TE7216	0701210711	Project Management in Smart Cities	PE		3	0	0	0	0	30	45	3	75

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Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
TE7219	0701210712	Rock Mechanics	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Generic Elective Course Group - III (Choose any one course)													
TE7722	0701210713	Emerging Technologies in Construction	PE		3	0	0	0	0	75	0	3	75
TE7231	0701210714	Sustainable Construction Methods	PE		3	0	0	0	0	75	0	3	75
TE7419	0701210715	Introduction to Finite Element Methods	PE		3	0	0	0	0	75	0	3	75
TE7420	0701210716	Environmental Geotechniques	PE		3	0	0	0	0	75	0	3	75
TE7421	0701210717	Environmental Impact Assessment	PE		3	0	0	0	0	75	0	3	75
TE7422	0701210718	Traffic Engineering	PE		3	0	0	0	0	75	0	3	75
TE7423	0701210719	Optimization in Civil Engineering	PE		3	0	0	0	0	75	0	3	75
Total Required Credits								0	0	75	0	3	75
Generic Elective Course Group - IV (Choose any one course)													
TE7718	0701210720	Digital Image Processing	PE		3	0	0	0	0	30	45	3	75
TE7214	0701210721	Pre-stressed Concrete Structure	PE		3	0	0	0	0	30	45	3	75
TE7737	0701210722	Smart Transport Management	PE		3	0	0	0	0	30	45	3	75
TE7735	0701210723	Smart Solid Waste Management Systems	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75

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Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Generic Elective Course Group - V (Choose any one course)													
TE7719	0701210724	Digital Image Processing Lab	PE		0	0	2	25	0	0	0	1	25
TE7215	0701210725	Prestressed Concrete Structure Lab	PE		0	0	2	25	0	0	0	1	25
TE7738	0701210726	Smart Transport Management Lab	PE		0	0	2	25	0	0	0	1	25
TE7736	0701210727	Smart Solid Waste Management Systems Lab	PE		0	0	2	25	0	0	0	1	25
Total Required Credits								25	0	0	0	1	25
Semester : 8													
Generic Core Courses													
T7912	0701210801	Internship	PIS		0	0	24	120	180	0	0	12	300
T7802	0701210802	Seminar	PIS		0	0	4	20	30	0	0	2	50
SMC001	0701210803	Vasudhaiva Kutumbakam *	MC		0	0	0	0	0	0	0	Non - Letter Grade Mandatory	0
Total					0	0	28	140	210	0	0	14	350

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Annexure A

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
Semester 1	1	19	20	500
Semester 2	3	20	23	575
Semester 3	10	12	22	550
Semester 4	8	15	23	575
Semester 5	7	17	24	600
Semester 6	5	19	24	600
Semester 7	8	12	20	500
Semester 8	0	14	14	350
Total	42	128	170	4250

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Optional 'Honours' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Semester : 5													
Environmental Hydraulics Specialisation Core Courses													
TE7185	0701210524	Environmental Fluid Mechanics	PC		3	0	0	0	0	30	45	3	75
TE7241	0701210525	Water Resources Field Methods	PC		3	0	0	0	0	30	45	3	75
TE7242	0701210526	Water Resources Field Methods Lab	PC		0	0	2	10	15	0	0	1	25
Total					6	0	2	10	15	60	90	7	175
Semester : 5													
Geo-Environmental Engineering Specialisation Core Courses													
TE7190	0701210527	Environmental Systems	PC		3	0	0	0	0	30	45	3	75
TE7229	0701210528	Structural Geology	PC		3	0	0	0	0	30	45	3	75
TE7230	0701210529	Structural Geology Lab	PC		0	0	2	10	15	0	0	1	25
Total					6	0	2	10	15	60	90	7	175
Semester : 5													
GIS and Surveying Technology Specialisation Core Courses													
TE7184	0701210530	Digital Image Processing in GIS	PC		3	0	0	0	0	30	45	3	75
TE7196	0701210531	Global Navigation Satellite Systems	PC		3	0	0	0	0	30	45	3	75

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Optional 'Honours' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
TE7197	0701210532	Global Navigation Satellite Systems Lab	PC		0	0	2	10	15	0	0	1	25
Total					6	0	2	10	15	60	90	7	175
Semester : 5													
Infrastructure Engineering and Management Specialisation Core Courses													
TE7236	0701210533	Urban Transportation Planning	PC		3	0	0	0	0	30	45	3	75
TE7201	0701210534	Infrastructure Planning and Design	PC		3	0	0	0	0	30	45	3	75
TE7202	0701210535	Infrastructure Planning and Design Lab	PC		0	0	2	10	15	0	0	1	25
Total					6	0	2	10	15	60	90	7	175
Semester : 5													
Smart Cities and Urban Analytics Specialisation Core Courses													
TE7220	0701210536	Smart Cities : Context Policy and Governance	PC		3	0	0	0	0	30	45	3	75
TE7206	0701210537	IOT for Smart Cities	PC		3	0	0	0	0	30	45	3	75
TE7207	0701210538	IOT for Smart Cities Lab	PC		0	0	2	10	15	0	0	1	25
Total					6	0	2	10	15	60	90	7	175
Semester : 5													

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Optional 'Honours' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total	
								Practical		Theory				
					L	T	La b	CA	ESE	CA	ESE			
Structural Engineering Specialisation Core Courses														
TE7213	0701210539	Prestressed Concrete	PC		3	0	0	0	0	30	45	3	75	
TE7208	0701210540	Modelling and Analysis of Uncertainty	PC		3	0	0	0	0	30	45	3	75	
TE7209	0701210541	Modelling and Analysis of Uncertainty Lab	PC		0	0	2	10	15	0	0	1	25	
Total					6	0	2	10	15	60	90	7	175	
Semester : 6														
Environmental Hydraulics Specialisation Core Courses														
T7802	0701210633	Specialization Project	PIS		0	0	4	50	0	0	0	2	50	
T7802	0701210634	Specialization Seminar	PIS		0	0	4	50	0	0	0	2	50	
Total					0	0	8	100	0	0	0	4	100	
Specialization Elective :Environmental Hydraulics (Choose any one course)														
TE7211	0701210635	Pipeline Engineering	PE		3	0	0	0	0	30	45	3	75	
TE7218	0701210636	River Engineering	PE		3	0	0	0	0	30	45	3	75	
Total Required Credits									0	0	30	45	3	75
Semester : 6														

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Optional 'Honours' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Geo-Environmental Engineering Specialisation Core Courses													
T7802	0701210633	Specialization Project	PIS		0	0	4	50	0	0	0	2	50
T7802	0701210634	Specialization Seminar	PIS		0	0	4	50	0	0	0	2	50
Total					0	0	8	100	0	0	0	4	100
Specialization Elective :Geo-Environmental Engineering (Choose any one course)													
TE7187	0701210637	Environmental Laws and Policy	PE		3	0	0	0	0	30	45	3	75
TE7194	0701210638	Geotechnical Design	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Semester : 6													
GIS and Surveying Technology Specialisation Core Courses													
T7802	0701210633	Specialization Project	PIS		0	0	4	50	0	0	0	2	50
T7802	0701210634	Specialization Seminar	PIS		0	0	4	50	0	0	0	2	50
TE7227	0701210639	Spatial Modelling and Analysis	PC		3	0	0	0	0	30	45	3	75
Total					3	0	8	100	0	30	45	7	175
Semester : 6													

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Optional 'Honours' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
Infrastructure Engineering and Management Specialisation Core Courses													
T7802	0701210633	Specialization Project	PIS		0	0	4	50	0	0	0	2	50
T7802	0701210634	Specialization Seminar	PIS		0	0	4	50	0	0	0	2	50
Total					0	0	8	100	0	0	0	4	100
Specialization Elective :Infrastructure Engineering and Management (Choose any one course)													
TE7217	0701210640	Public Transportation Systems	PE		3	0	0	0	0	30	45	3	75
TE7210	0701210641	Pavement Materials	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Semester : 6													
Smart Cities and Urban Analytics Specialisation Core Courses													
T7802	0701210633	Specialization Project	PIS		0	0	4	50	0	0	0	2	50
T7802	0701210634	Specialization Seminar	PIS		0	0	4	50	0	0	0	2	50
TE7177	0701210642	Application of Sensor Technology to Smart Cities	PC		3	0	0	0	0	30	45	3	75
Total					3	0	8	100	0	30	45	7	175
Semester : 6													

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Optional 'Honours' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
Structural Engineering Specialisation Core Courses													
T7802	0701210633	Specialization Project	PIS		0	0	4	50	0	0	0	2	50
T7802	0701210634	Specialization Seminar	PIS		0	0	4	50	0	0	0	2	50
TE7228	0701210643	Structural Analysis by Matrix Methods	PC		3	0	0	0	0	30	45	3	75
Total					3	0	8	100	0	30	45	7	175
Semester : 7													
Environmental Hydraulics Specialisation Core Courses													
T7803	0701210728	Specialization Project	PIS		0	0	6	30	45	0	0	3	75
Total					0	0	6	30	45	0	0	3	75
Specialization Elective :Environmental Hydraulics (Choose any one course)													
TE7198	0701210729	Hydraulic Modelling	PE		3	0	0	0	0	30	45	3	75
TE7180	0701210730	Basics of Computational Methods	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Semester : 7													
Geo-Environmental Engineering Specialisation Core Courses													

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Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
T7803	0701210728	Specialization Project	PIS		0	0	6	30	45	0	0	3	75
Total					0	0	6	30	45	0	0	3	75
Specialization Elective :Geo-Environmental Engineering (Choose any one course)													
TE7226	0701210731	Solid and Hazardous Waste Management	PE		3	0	0	0	0	30	45	3	75
TE7186	0701210732	Environmental Geotechnology	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Semester : 7													
GIS and Surveying Technology Specialisation Core Courses													
T7803	0701210728	Specialization Project	PIS		0	0	6	30	45	0	0	3	75
Total					0	0	6	30	45	0	0	3	75
Specialization Elective :GIS and Surveying Technology (Choose any one course)													
TE7193	0701210733	Geoinformatics Applications in Natural Resource Management	PE		3	0	0	0	0	30	45	3	75
TE7205	0701210734	Intelligent Transportation Systems	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Semester : 7													

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Optional 'Honours' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
Infrastructure Engineering and Management Specialisation Core Courses													
T7803	0701210728	Specialization Project	PIS		0	0	6	30	45	0	0	3	75
Total					0	0	6	30	45	0	0	3	75
Specialization Elective :Infrastructure Engineering and Management (Choose any one course)													
TE7205	0701210734	Intelligent Transportation Systems	PE		3	0	0	0	0	30	45	3	75
TE7233	0701210735	Transportation Economics	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Semester : 7													
Smart Cities and Urban Analytics Specialisation Core Courses													
T7803	0701210728	Specialization Project	PIS		0	0	6	30	45	0	0	3	75
Total					0	0	6	30	45	0	0	3	75
Specialization Elective :Smart Cities and Urban Analytics (Choose any one course)													
TE7205	0701210734	Intelligent Transportation Systems	PE		3	0	0	0	0	30	45	3	75
TE7234	0701210736	Urban Hydrology and Hydraulics	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75

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Optional 'Honours' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
Semester : 7													
Structural Engineering Specialisation Core Courses													
T7803	0701210728	Specialization Project	PIS		0	0	6	30	45	0	0	3	75
Total					0	0	6	30	45	0	0	3	75
Specialization Elective :Structural Engineering (Choose any one course)													
TE7200	0701210737	Industrial Structures	PE		3	0	0	0	0	30	45	3	75
TE7232	0701210738	System Engineering and Economics	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75

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Optional 'Honours' Specialization

Semester	Continuous Assessment	Term End Examination	Total Credits	Total Marks
Environmental Hydraulics				
Semester 5	0	7	7	175
Semester 6	4	3	7	175
Semester 7	0	6	6	150
Total	4	16	20	500
Geo-Environmental Engineering				
Semester 5	0	7	7	175
Semester 6	4	3	7	175
Semester 7	0	6	6	150
Total	4	16	20	500
GIS and Surveying Technology				
Semester 5	0	7	7	175
Semester 6	4	3	7	175
Semester 7	0	6	6	150
Total	4	16	20	500
Infrastructure Engineering and Management				
Semester 5	0	7	7	175
Semester 6	4	3	7	175
Semester 7	0	6	6	150
Total	4	16	20	500
Smart Cities and Urban Analytics				
Semester 5	0	7	7	175
Semester 6	4	3	7	175

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Annexure B
Optional 'Honours' Specialization

Semester 7	0	6	6	150
Total	4	16	20	500
Structural Engineering				
Semester 5	0	7	7	175
Semester 6	4	3	7	175
Semester 7	0	6	6	150
Total	4	16	20	500

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Annexure C
Optional 'Minor' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Semester : 5													
Artificial Intelligence and Machine Learning Specialisation Core Courses													
TE7273	0701210542	Machine Learning: Classification	PC		3	0	0	0	0	30	45	3	75
TE7274	0701210543	Machine Learning: Regression	PC		3	0	0	0	0	30	45	3	75
Total					6	0	0	0	0	60	90	6	150
Semester : 5													
Data Science Specialisation Core Courses													
TE7281	0701210544	Open Source Tools for Data Science	PC		4	0	0	0	0	40	60	4	100
TE7292	0701210545	R Programming	PC		3	0	0	0	0	30	45	3	75
Total					7	0	0	0	0	70	105	7	175
Semester : 5													
Internet of Things Specialisation Core Courses													
TE7268	0701210546	Introduction to IOT	PC		4	0	0	0	0	40	60	4	100
TE7293	0701210547	Raspberry Pi and Python	PC		3	0	0	0	0	30	45	3	75
Total					7	0	0	0	0	70	105	7	175

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Annexure C
Optional 'Minor' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Semester : 5													
Embedded Systems Specialisation Core Courses													
T7801	0701210548	Specialization Project	PIS		0	0	2	10	15	0	0	1	25
T7802	0701210549	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
TE7298	0701210550	System Programming	PC		4	0	0	0	0	40	60	4	100
Total					4	0	6	30	45	40	60	7	175
Semester : 5													
Automobile Engineering with Hybrid and Autonomous Technology Specialisation Core Courses													
TE7355	0701210551	Basics of Automotive Engineering	PC		3	0	0	0	0	30	45	3	75
TE7666	0701210552	Automotive Vehicle Dynamics and NVH Lab	PC		0	0	2	10	15	0	0	1	25
TE7665	0701210553	Automotive Electronics and Instrumentation	PC		2	0	0	0	0	50	0	2	50
Total					5	0	2	10	15	80	45	6	150
Semester : 6													
Artificial Intelligence and Machine Learning Specialisation Core Courses													
TE7266	0701210644	Introduction to Deep Learning	PC		4	0	0	0	0	40	60	4	100
TE7271	0701210645	Machine Learning Clustering and Retrieval	PC		3	0	0	0	0	30	45	3	75

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Annexure C
Optional 'Minor' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
Total					7	0	0	0	0	70	105	7	175
Semester : 6													
Data Science													
Specialisation Core Courses													
TE7247	0701210646	Business Analytics	PC		3	0	0	0	0	30	45	3	75
TE7284	0701210647	Power BI	PC		3	0	0	0	0	30	45	3	75
Total					6	0	0	0	0	60	90	6	150
Semester : 6													
Internet of Things													
Specialisation Core Courses													
TE7269	0701210648	IOT Security and Privacy	PC		3	0	0	0	0	30	45	3	75
TE7295	0701210649	Software Defined Networking	PC		3	0	0	0	0	30	45	3	75
Total					6	0	0	0	0	60	90	6	150
Semester : 6													
Embedded Systems													
Specialisation Core Courses													
T7802	0701210633	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
TE7325	0701210650	Embedded Linux	PC		4	0	0	0	0	40	60	4	100

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Annexure C
Optional 'Minor' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
Total					4	0	4	20	30	40	60	6	150
Semester : 6													
Automobile Engineering with Hybrid and Autonomous Technology Specialisation Core Courses													
TE7669	0701210651	Hybrid Technology	PC		2	0	0	0	0	20	30	2	50
F0002	0701210652	Flexi-Credit Course	PC		2	0	0	0	0	50	0	2	50
TE7435	0701210653	Automotive Engine and Transmission System	PC		3	0	0	0	0	30	45	3	75
Total					7	0	0	0	0	100	75	7	175
Semester : 7													
Artificial Intelligence and Machine Learning Specialisation Core Courses													
T7805	0701210739	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701210740	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
Total					0	0	14	70	105	0	0	7	175
Semester : 7													
Data Science Specialisation Core Courses													
T7805	0701210739	Specialization Project	PIS		0	0	10	50	75	0	0	5	125

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Annexure C
Optional 'Minor' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
T7802	0701210740	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
Total					0	0	14	70	105	0	0	7	175
Semester : 7													
Internet of Things													
Specialisation Core Courses													
T7805	0701210739	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701210740	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
Total					0	0	14	70	105	0	0	7	175
Semester : 7													
Embedded Systems													
Specialisation Core Courses													
T7802	0701210741	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
TE7304	0701210742	Advanced Microcontrollers and RTOS	PC		4	0	0	0	0	40	60	4	100
TE7305	0701210743	Advanced Microcontrollers and RTOS Lab	PC		0	0	2	10	15	0	0	1	25
Total					4	0	6	30	45	40	60	7	175
Semester : 7													
Automobile Engineering with Hybrid and Autonomous Technology													
Specialisation Core Courses													

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Optional 'Minor' Specialization

Catalog Course Code	Course Code	Course Title	Nature	Specialisation/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
T7805	0701210739	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701210740	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
Total					0	0	14	70	105	0	0	7	175

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Semester	Continuous Assessment	Term End Examination	Total Credits	Total Marks
Artificial Intelligence and Machine Learning				
Semester 5	0	6	6	150
Semester 6	0	7	7	175
Semester 7	0	7	7	175
Total	0	20	20	500
Data Science				
Semester 5	0	7	7	175
Semester 6	0	6	6	150
Semester 7	0	7	7	175
Total	0	20	20	500
Internet of Things				
Semester 5	0	7	7	175
Semester 6	0	6	6	150
Semester 7	0	7	7	175
Total	0	20	20	500
Embedded Systems				
Semester 5	0	7	7	175
Semester 6	0	6	6	150
Semester 7	0	7	7	175
Total	0	20	20	500
Automobile Engineering with Hybrid and Autonomous Technology				
Semester 5	2	4	6	150
Semester 6	2	5	7	175

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Semester 7	0	7	7	175
Total	4	16	20	500