



Celebrating 50 Years of Excellence

Symbiosis Institute of Technology, Pune
Bachelor of Technology (Civil Engineering)
Programme Structure 2020-24

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		15
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 & SPECIALIZATION	<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	260000	20000	280000
		INTERNATIONAL STUDENTS (USD EQUIVALENT TO INR)	390000	20000	410000
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/ DIPLOMA/ CERTIFICATE	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 will be awarded at the end of semester VIII examination by taking into consideration the performance of all semester examinations after obtaining minimum .00 CGPA out of 10 CGPA.

14. CLASSIFICATION OF CREDITS

Semester	Generic Core	Generic Elective	Specialization Core	Specialization Elective	Open Elective	Audit	Total
1	22	0	0	0	0	0	22
2	20	1	0	0	0	0	21
3	20	2	0	0	0	3*	22
4	24	0	0	0	0	0	24
5	22	0	0	0	0	0	22
6	12	9	0	0	3	0	24
7	6	12	0	0	3	0	21
8	14	0	0	0	0	0	14
Total	140	24	0	0	6	0	170
Optional Additional Courses (Honours)							
Total	0	0	14	6	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 courses 'Integrated Disaster Management', 'Fitness for Life' Certificate in COVID-19 Care for the Community' is mandatory for the award of degree.

Note: For additional specializations (optional) as applicable, fees of Rs.25000/- will be charged, additionally in the third year

The revised programme structure supersedes the previously approved programme structure dated 03/03/2023 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
					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
T7540	0701210102	Basic Electrical and Electronics Engineering	ES		3	0	0	0	0	30	45	3	75
T7593	0701210103	Basic Electrical and Electronics Engineering Lab	ES		0	0	2	10	15	0	0	1	25
T7381	0701210104	Chemistry	BS		3	0	0	0	0	30	45	3	75
T7382	0701210105	Chemistry Lab	BS		0	0	2	10	15	0	0	1	25
T7414	0701210106	Engineering Mechanics	ES		3	0	0	0	0	30	45	3	75
T7415	0701210107	Engineering Mechanics Lab	ES		0	0	2	10	15	0	0	1	25
T7925	0701210108	Engineering Graphics Lab	ES		0	0	4	20	30	0	0	2	50
TE7286	0701210109	Programming and Problem Solving	ES		2	0	0	0	0	20	30	2	50
TE7287	0701210110	Programming and Problem Solving Lab	ES		0	0	2	10	15	0	0	1	25
T6732	0701210111	Critical Thinking	HS		1	0	0	0	0	25	0	1	25
Total					15	1	12	60	90	175	225	22	550
Semester : 2													
Generic Core Courses													
TE7169	0701210201	Engineering Mathematics -II	BS		3	1	0	0	0	40	60	4	100
T7391	0701210202	Physics	BS		3	0	0	0	0	30	45	3	75



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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
T7392	0701210203	Physics lab	BS		0	0	2	10	15	0	0	1	25
TE7178	0701210204	Basics of Civil Engineering	ES		3	0	0	0	0	30	45	3	75
TE7179	0701210205	Basics of Civil Engineering Lab	ES		0	0	2	10	15	0	0	1	25
T7383	0701210206	Communication Skills	HS		2	0	0	0	0	20	30	2	50
T7384	0701210207	Communication skills lab	HS		0	0	2	10	15	0	0	1	25
TE7188	0701210208	Environmental Science	ES		2	0	0	0	0	20	30	2	50
T2646	0701210209	Entrepreneurship Venture	HS		1	0	0	0	0	25	0	1	25
TE7396	0701210210	Software Tools	ES		0	0	2	25	0	0	0	1	25
T6773	0701210211	Creative Thinking	HS		1	0	0	0	0	25	0	1	25
Total					15	1	8	55	45	190	210	20	500
Generic Elective Courses Group													
T6761	0701210212	Foundation of Ethics	GE		1	0	0	0	0	25	0	1	25
T6760	0701210213	Introduction to Indian Philosophy	GE		1	0	0	0	0	25	0	1	25
Total Required Credits								0	0	25	0	1	25
Semester : 3													
Generic Core Courses													
T7957	0701210301	Building Construction Technology	PC		3	0	0	0	0	30	45	3	75
T7958	0701210302	Building Construction Technology Lab	PC		0	0	2	10	15	0	0	1	25



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								CA	ESE	CA	ESE		
TE7170	0701210303	Engineering Mathematics-III	BS		2	1	0	0	0	30	45	3	75
TE7199	0701210304	Hydrology and Water Resource Engineering	PC		3	0	0	0	0	30	45	3	75
TE7398	0701210305	Introduction to Solid Mechanics	ES		3	0	0	0	0	30	45	3	75
TE7399	0701210306	Introduction to Solid Mechanics Lab	ES		0	0	2	10	15	0	0	1	25
TE7181	0701210307	Computer Aided Civil Engineering Drawing	ES		0	0	4	50	0	0	0	2	50
TE7400	0701210308	Introduction to Fluid Mechanics	PC		3	0	0	0	0	30	45	3	75
TE7401	0701210309	Introduction to Fluid Mechanics Lab	PC		0	0	2	10	15	0	0	1	25
T4005	0701210310	Integrated Disaster Management *			0	0	0	0	0	0	0	Non Letter Grade	0
TH4095	0701210311	Fitness for Life *	0		0	0	0	0	0	0	0	Non Letter Grade	0
TH4272	0701210315	Certificate in COVID-19 Care for the Community *			0	0	0	0	0	0	0	Non Letter Grade	0
Total					14	1	10	80	45	150	225	20	500
Generic Elective Courses Group													
T6184	0701210312	Basic German I	GE		2	0	0	0	0	50	0	2	50
T6186	0701210313	Basic French 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		
T6188	0701210314	Basic Spanish I	GE		2	0	0	0	0	50	0	2	50
Total Required Credits								0	0	50	0	2	50
Semester : 4													
Generic Core Courses													
T8000	0701210401	Service Learning	HS		0	0	8	100	0	0	0	4	100
TE7691	0701210402	Statistics, Probability and Numerical Methods	BS		3	0	0	0	0	30	45	3	75
TE7402	0701210403	Structural Analysis-I	PC		3	0	0	0	0	30	45	3	75
TE7403	0701210404	Geology and Soil Mechanics	PC		3	0	0	0	0	30	45	3	75
T7963	0701210405	Geology & Soil Mechanics Lab	PC		0	0	2	10	15	0	0	1	25
TE7404	0701210406	Open Channel Flow	PC		3	0	0	0	0	30	45	3	75
TE7405	0701210407	Open Channel Flow Lab	PC		0	0	2	10	15	0	0	1	25
T7966	0701210408	Advanced Surveying Lab	PC		0	0	4	50	0	0	0	2	50
TE7290	0701210409	Project Based Learning -I	PIS		0	0	4	50	0	0	0	2	50
TE7300	0701210410	Tinker Lab	ES		0	0	4	50	0	0	0	2	50
Total					12	0	24	270	30	120	180	24	600
Semester : 5													
Generic Core Courses													
T7416	0701210501	Environmental Engineering I	PC		3	0	0	0	0	30	45	3	75
T7417	0701210502	Environmental Engineering I Lab	PC		0	0	2	10	15	0	0	1	25



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								CA	ESE	CA	ESE		
F7027	0701210503	Highway Engineering Practices and Innovation	PC		3	0	0	0	0	75	0	3	75
TE7406	0701210504	Structural Analysis-II	PC		3	0	0	0	0	30	45	3	75
TE7408	0701210505	Structural Design-I	PC		3	0	0	0	0	30	45	3	75
T7440	0701210506	Structural Design I Lab.	PC		0	0	2	25	0	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
TE7407	0701210509	Quantity Surveying and Valuation	PC		0	0	4	50	0	0	0	2	50
T6774	0701210510	Principles of Economics	HS		2	0	0	0	0	50	0	2	50
Total					16	0	12	135	15	265	135	22	550
Semester : 6													
Generic Core Courses													
T7419	0701210601	Environmental Engineering II	PC		3	0	0	0	0	30	45	3	75
F7039	0701210602	Innovations in Construction Project Management	PC		3	0	0	0	0	75	0	3	75
TE7410	0701210603	Structural Design-II	PC		3	0	0	0	0	30	45	3	75
T7802	0701210604	Capstone Course	PC		2	0	0	0	0	50	0	2	50
F7040	0701210605	Innovations in Construction Project Management Lab	PC		0	0	2	25	0	0	0	1	25



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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Total					11	0	2	25	0	185	90	12	300
Generic Elective Courses Group - I													
TE7224	0701210606	Soil Mechanics II	PE		4	0	0	0	0	40	60	4	100
TE7409	0701210607	Bridge Engineering	PE		4	0	0	0	0	40	60	4	100
T7975	0701210608	Green Building Technology	PE		4	0	0	0	0	40	60	4	100
TE7411	0701210609	Airport Planning and Design	PE		4	0	0	0	0	40	60	4	100
TE7412	0701210610	Introduction to Remote Sensing and GIS	PE		4	0	0	0	0	40	60	4	100
TE7189	0701210611	Environmental Systems	PE		4	0	0	0	0	40	60	4	100
TE7221	0701210612	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 Courses Group - II													
T7980	0701210613	Glass Facade Engineering	PE		3	0	0	0	0	30	45	3	75
TE7413	0701210614	Foundation Engineering	PE		3	0	0	0	0	30	45	3	75
TE7414	0701210615	Pavement Design	PE		3	0	0	0	0	30	45	3	75
TE7415	0701210616	Integrated Water Resource Management	PE		3	0	0	0	0	30	45	3	75
T7984	0701210617	Computer Applications in Construction Management	PE		3	0	0	0	0	30	45	3	75
TE7235	0701210618	Urban Transport Engineering	PE		3	0	0	0	0	30	45	3	75
TE7416	0701210619	Smart Cities Planning and Development	PE		3	0	0	0	0	30	45	3	75



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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
TE7175	0701210620	Advanced Structural Analysis	PE		3	0	0	0	0	30	45	3	75
TE7182	0701210621	Design of Hydraulic Structures	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Generic Elective Courses Group -III													
TE7225	0701210622	Soil Mechanics II Lab	PE		0	0	2	10	15	0	0	1	25
TE7191	0701210623	Environmental Systems Lab	PE		0	0	2	10	15	0	0	1	25
Total Required Credits								10	15	0	0	1	25
Generic Elective Courses Group - IV													
TE7176	0701210624	Advanced Structural Analysis Lab	PE		0	0	2	25	0	0	0	1	25
TE7183	0701210625	Design of Hydraulic Structures Lab	PE		0	0	2	25	0	0	0	1	25
Total Required Credits								25	0	0	0	1	25
Open Elective Courses Group													
TEE7018	0701210626	Engineering Simulation and Modeling Tools	OE		3	0	0	0	0	30	45	3	75
TE7335	0701210627	Introduction to Robotics	OE		3	0	0	0	0	30	45	3	75
TE7339	0701210628	Renewable Energy Systems	OE		3	0	0	0	0	30	45	3	75
TE7428	0701210629	Introduction to Image Processing	OE		3	0	0	0	0	30	45	3	75
TE7223	0701210630	Smart Urban Planning	OE		3	0	0	0	0	30	45	3	75



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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
TE7240	0701210631	Water Resource Planning and Management	OE		3	0	0	0	0	30	45	3	75
T7499	0701210632	Java	OE		3	0	0	0	0	30	45	3	75
TE7265	0701210633	Introduction to Data Science	OE		3	0	0	0	0	30	45	3	75
TE7263	0701210634	Introduction to AI and Machine Learning	OE		3	0	0	0	0	30	45	3	75
TE7388	0701210635	Quality Management Techniques	OE		3	0	0	0	0	30	45	3	75
TE7319	0701210636	Electrical and Electronics Materials	OE		3	0	0	0	0	30	45	3	75
TE7351	0701210637	3D Printing and Prototyping	OE		3	0	0	0	0	30	45	3	75
TE7387	0701210638	Project Management	OE		3	0	0	0	0	30	45	3	75
TE7698	0701210639	Nanotechnology	OE		3	0	0	0	0	30	45	3	75
T7393	0701210640	Computer Based Statistical Packages	OE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
GIP													
G7002	0701210663	Global Immersion Programme			0	0	0	0	0	0	50	2	50
Note: For students under Global Immersion Programme (0701210663), course "Capstone Course" (0701210604) will be waived off.													
GIP													
G7021	0701210664	Global Immersion Programme			0	0	0	0	0	0	525	21	525



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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		

Note: For students under Global Immersion Programme (0701210664), courses "Environmental Engineering II" (0701210601), "Innovations in Construction Project Management" (0701210602), "Capstone Course" (0701210604), "Innovations in Construction Project Management Lab" (0701210605), "Environmental Systems" (0701210611), "Integrated Water Resource Management" (0701210616), "Environmental Systems Lab" (0701210623), "Design of Hydraulic Structures Lab" (0701210625), "Renewable Energy Systems" (0701210628) will be waived off.

Semester : 7

Generic Core Courses

T7804	0701210701	B.Tech Project	PIS		0	0	8	40	60	0	0	4	100
T7674	0701210702	Cyber Security	ES		2	0	0	0	0	50	0	2	50
Total					2	0	8	40	60	50	0	6	150

Generic Elective Courses Group- I

T2585	0701210703	Organizational Behaviour	GE		2	0	0	0	0	50	0	2	50
TE7438	0701210704	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 Courses Group- II

TE7212	0701210705	Port and Harbor Engineering	PE		3	0	0	0	0	30	45	3	75
TE7238	0701210706	Water and Air Quality Modelling	PE		3	0	0	0	0	30	45	3	75
TE7417	0701210707	Advanced Concrete Technology	PE		3	0	0	0	0	30	45	3	75
TE7418	0701210708	Geoinformatics Application for Emergency Response Management	PE		3	0	0	0	0	30	45	3	75



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					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
T7955	0701210709	Professional Practices in Construction	PE		3	0	0	0	0	30	45	3	75
TE7216	0701210710	Project Management in Smart Cities	PE		3	0	0	0	0	30	45	3	75
TE7219	0701210711	Rock Mechanics	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Generic Elective Courses Group- III													
TE7231	0701210712	Sustainable Construction Methods	PE		3	0	0	0	0	75	0	3	75
TE7419	0701210713	Introduction to Finite Element Methods	PE		3	0	0	0	0	75	0	3	75
TE7420	0701210714	Environmental Geotechniques	PE		3	0	0	0	0	75	0	3	75
TE7421	0701210715	Environmental Impact Assessment	PE		3	0	0	0	0	75	0	3	75
TE7422	0701210716	Traffic Engineering	PE		3	0	0	0	0	75	0	3	75
TE7423	0701210717	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 Courses Group- IV													
TE7424	0701210718	Water Power Engineering	PE		3	0	0	0	0	30	45	3	75
TE7214	0701210719	Pre-stressed Concrete Structure	PE		3	0	0	0	0	30	45	3	75
T7952	0701210720	Waste Management Systems	PE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
Generic Elective Courses Group- V													
TE7239	0701210721	Water Power Engineering Lab	PE		0	0	2	25	0	0	0	1	25



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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
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
TE7215	0701210722	Prestressed Concrete Structure Lab	PE		0	0	2	25	0	0	0	1	25
TE7237	0701210723	Waste Management System Lab	PE		0	0	2	25	0	0	0	1	25
Total Required Credits								25	0	0	0	1	25
Open Elective Courses Group													
TE7171	0701210724	Introduction to Mathematical Modelling	OE		3	0	0	0	0	30	45	3	75
TE7195	0701210725	GIS Applications	OE		3	0	0	0	0	30	45	3	75
TE7203	0701210726	Intelligent Transportation Management	OE		3	0	0	0	0	30	45	3	75
T7584	0701210727	Printed Circuit Board (PCB) Design	OE		3	0	0	0	0	30	45	3	75
T7650	0701210728	Six sigma	OE		3	0	0	0	0	30	45	3	75
TE7700	0701210729	Smart Materials	OE		3	0	0	0	0	30	45	3	75
T7474	0701210730	Basics of Database	OE		3	0	0	0	0	30	45	3	75
T7616	0701210731	Fundamentals of Automotive Technology	OE		3	0	0	0	0	30	45	3	75
T7529	0701210732	Machine Learning	OE		3	0	0	0	0	30	45	3	75
TE7756	0701210733	Open Source Technologies	OE		3	0	0	0	0	30	45	3	75
TE7264	0701210734	Introduction to BIGDATA	OE		3	0	0	0	0	30	45	3	75
TE7334	0701210735	Introduction to Mechatronics	OE		3	0	0	0	0	30	45	3	75
TE7338	0701210736	Principles of Modern Communication Systems	OE		3	0	0	0	0	30	45	3	75
TE7376	0701210737	Introduction to Operations Research	OE		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
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
TE7377	0701210738	Introduction to Optimisation	OE		3	0	0	0	0	30	45	3	75
Total Required Credits								0	0	30	45	3	75
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	50	0	0	0	2	50
Total					0	0	28	170	180	0	0	14	350



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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	Internal Credits	External Credits	Total Credits	Total Marks
Semester 1	1	21	22	550
Semester 2	4	17	21	525
Semester 3	4	18	22	550
Semester 4	10	14	24	600
Semester 5	12	10	22	550
Semester 6	7	17	24	600
Semester 7	8	13	21	525
Semester 8	2	12	14	350
Total	48	122	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
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Semester : 5													
Environmental Hydraulics Specialization Core Courses													
TE7185	0701210511	Environmental Fluid Mechanics	PIS		3	0	0	0	0	30	45	3	75
TE7241	0701210512	Water Resources Field Methods	PC		3	0	0	0	0	30	45	3	75
TE7242	0701210513	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 Specialization Core Courses													
TE7190	0701210514	Environmental Systems	PC		3	0	0	0	0	30	45	3	75
TE7229	0701210515	Structural Geology	PC		3	0	0	0	0	30	45	3	75
TE7230	0701210516	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 Specialization Core Courses													
TE7184	0701210517	Digital Image Processing in GIS	PIS		3	0	0	0	0	30	45	3	75
TE7196	0701210518	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	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
TE7197	0701210519	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 Specialization Core Courses													
TE7236	0701210520	Urban Transportation Planning	PIS		3	0	0	0	0	30	45	3	75
TE7201	0701210521	Infrastructure Planning and Design	PC		3	0	0	0	0	30	45	3	75
TE7202	0701210522	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 Specialization Core Courses													
TE7220	0701210523	Smart Cities : Context Policy and Governance	PIS		3	0	0	0	0	30	45	3	75
TE7206	0701210524	IOT for Smart Cities	PC		3	0	0	0	0	30	45	3	75
TE7207	0701210525	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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Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Structural Engineering Specialization Core Courses													
TE7213	0701210526	Prestressed Concrete	PIS		3	0	0	0	0	30	45	3	75
TE7208	0701210527	Modelling and Analysis of Uncertainty	PC		3	0	0	0	0	30	45	3	75
TE7209	0701210528	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 Specialization Core Courses													
T7802	0701210641	Specialization Project	PIS		0	0	4	50	0	0	0	2	50
T7802	0701210642	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													
TE7211	0701210643	Pipeline Engineering	PE		3	0	0	0	0	30	45	3	75
TE7218	0701210644	River Engineering	PE		3	0	0	0	0	30	45	3	75
Total Required Credits					0	0	0	0	0	30	45	3	75
Semester : 6													

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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
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Geo-Environmental Engineering Specialization Core Courses													
T7802	0701210641	Specialization Project	PIS		0	0	4	50	0	0	0	2	50
T7802	0701210642	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													
TE7187	0701210645	Environmental Laws and Policy	PE		3	0	0	0	0	30	45	3	75
TE7194	0701210646	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 Specialization Core Courses													
T7802	0701210641	Specialization Project	PIS		0	0	4	50	0	0	0	2	50
T7802	0701210642	Specialization Seminar	PIS		0	0	4	50	0	0	0	2	50
TE7227	0701210647	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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Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Infrastructure Engineering and Management Specialization Core Courses													
T7802	0701210641	Specialization Project	PIS		0	0	4	50	0	0	0	2	50
T7802	0701210642	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													
TE7217	0701210648	Public Transportation Systems	PE		3	0	0	0	0	30	45	3	75
TE7210	0701210649	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 Specialization Core Courses													
T7802	0701210641	Specialization Project	PIS		0	0	4	50	0	0	0	2	50
T7802	0701210642	Specialization Seminar	PIS		0	0	4	50	0	0	0	2	50
TE7177	0701210650	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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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	La b	CA	ESE	CA	ESE		
Structural Engineering Specialization Core Courses													
T7802	0701210641	Specialization Project	PIS		0	0	4	50	0	0	0	2	50
T7802	0701210642	Specialization Seminar	PIS		0	0	4	50	0	0	0	2	50
TE7228	0701210651	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 Specialization Core Courses													
T7803	0701210739	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													
TE7198	0701210740	Hydraulic Modelling	PE		3	0	0	0	0	30	45	3	75
TE7180	0701210741	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 Specialization Core Courses													

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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	La b	CA	ESE	CA	ESE		
T7803	0701210739	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													
TE7226	0701210742	Solid and Hazardous Waste Management	PE		3	0	0	0	0	30	45	3	75
TE7186	0701210743	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 Specialization Core Courses													
T7803	0701210739	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													
TE7193	0701210744	Geoinformatics Applications in Natural Resource Management	PE		3	0	0	0	0	30	45	3	75
TE7205	0701210745	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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Catalog Course Code	Course Code	Course Title	Nature	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	La b	Practical		Theory			
								CA	ESE	CA	ESE		
Infrastructure Engineering and Management Specialization Core Courses													
T7803	0701210739	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													
TE7205	0701210745	Intelligent Transportation Systems	PE		3	0	0	0	0	30	45	3	75
TE7233	0701210746	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 Specialization Core Courses													
T7803	0701210739	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													
TE7205	0701210745	Intelligent Transportation Systems	PE		3	0	0	0	0	30	45	3	75
TE7234	0701210747	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	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
					L	T	Lab	Practical		Theory			
								CA	ESE	CA	ESE		
Semester : 7													
Structural Engineering Specialization Core Courses													
T7803	0701210739	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													
TE7200	0701210748	Industrial Structures	PE		3	0	0	0	0	30	45	3	75
TE7232	0701210749	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	Internal Credits	External Credits	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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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	Specialization/ 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 Specialization Core Courses													
TE7273	0701210529	Machine Learning: Classification	PE		3	0	0	0	0	30	45	3	75
TE7274	0701210530	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 Specialization Core Courses													
TE7281	0701210531	Open Source Tools for Data Science	PC		4	0	0	0	0	40	60	4	100
TE7292	0701210532	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 Specialization Core Courses													
TE7268	0701210533	Introduction to IOT	PC		4	0	0	0	0	40	60	4	100
TE7293	0701210534	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	Specialization/ 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 Specialization Core Courses													
TE7298	0701210535	System Programming	PC		4	0	0	0	0	40	60	4	100
T7801	0701210536	Specialization Project	PIS		0	0	2	10	15	0	0	1	25
T7802	0701210537	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
Total					4	0	6	30	45	40	60	7	175
Semester : 5													
Automobile Engineering with Hybrid and Autonomous Technology Specialization Core Courses													
TE7665	0701210538	Automotive Electronics and Instrumentation	PC		2	0	0	0	0	50	0	2	50
TE7666	0701210539	Automotive Vehicle Dynamics and NVH Lab	PC		0	0	2	10	15	0	0	1	25
TE7355	0701210540	Basics of Automotive Engineering	PC		3	0	0	0	0	30	45	3	75
Total					5	0	2	10	15	80	45	6	150
Semester : 6													
Artificial Intelligence and Machine Learning Specialization Core Courses													
TE7266	0701210652	Introduction to Deep Learning	PC		4	0	0	0	0	40	60	4	100
TE7271	0701210653	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	Specialization/ 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													
Specialization Core Courses													
TE7247	0701210654	Business Analytics	PC		3	0	0	0	0	30	45	3	75
TE7284	0701210655	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													
Specialization Core Courses													
TE7269	0701210656	IOT Security and Privacy	PC		3	0	0	0	0	30	45	3	75
TE7295	0701210657	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													
Specialization Core Courses													
T7802	0701210658	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
TE7325	0701210659	Embedded Linux	PC		4	0	0	0	0	40	60	4	100

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Optional 'Minor' Specialization

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	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													
Specialization Core Courses													
TE7669	0701210660	Hybrid Technology	PC		0	0	4	0	0	20	30	2	50
F7036	0701210661	Autonomous Technology (Self Driven Cars)	PC		2	0	0	50	0	0	0	2	50
TE7435	0701210662	Automotive Engine and Transmission System	PC		3	0	0	0	0	30	45	3	75
Total					5	0	4	50	0	50	75	7	175
Semester : 7													
Artificial Intelligence and Machine Learning													
Specialization Core Courses													
T7805	0701210750	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701210751	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													
Specialization Core Courses													
T7805	0701210750	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	Specialization/ Area/ Department	Teaching Scheme (Hours Per Week)			Examination Scheme (Marks)				Total Credits	Total
								Practical		Theory			
					L	T	La b	CA	ESE	CA	ESE		
T7802	0701210751	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													
Specialization Core Courses													
T7805	0701210750	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701210751	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													
Specialization Core Courses													
T7802	0701210752	Specialization Project	PIS		0	0	4	20	30	0	0	2	50
TE7304	0701210753	Advanced Microcontrollers and RTOS	PC		4	0	0	0	0	40	60	4	100
TE7305	0701210754	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													
Specialization Core Courses													



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Optional 'Minor' Specialization

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	La b	CA	ESE	CA	ESE		
T7805	0701210750	Specialization Project	PIS		0	0	10	50	75	0	0	5	125
T7802	0701210751	Specialization Seminar	PIS		0	0	4	20	30	0	0	2	50
Total					0	0	14	70	105	0	0	7	175



Celebrating 50 Years of Excellence

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Optional 'Minor' Specialization

Semester	Internal Credits	External Credits	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



Celebrating 50 Years of Excellence

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Annexure C
Optional 'Minor' Specialization

Semester 7	0	7	7	175
Total	4	16	20	500