SAHRDAYA AUTONOMOUS
COLLEGE OF ENGINEERING & TECHNOLOGY
A CENTRE OF EXCELLENCE IN SCIENCE & TECHNOLOGY | MANAGED BY IRINJALAKUDA DIOCESAN EDUCATION TRUST
Approved by AICTE & Affiliated to APJ Abdul Kalam Technological University | Accredited by:
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B. Tech

Curriculum (2024)- Semester I to VIII

Civil Engineering

Branch Code: CE

(SHR/AC/Auto/Acad. Council/B.Tech/2/Curri. /CE)

Recommended by BoS on 29/08/2024

Approved by Academic Council on 31/08/2024

Preface to the Curriculum

The B.Tech. Civil Engineering (CE) curriculum is meticulously drafted to cultivate industry-ready professionals endowed with creativity and innovative thinking. This comprehensive curriculum includes induction programs, core and elective courses, practical courses, projects, internships, skill enhancement courses, and extracurricular activities. Designed to total 170 credits, the curriculum ensures a holistic education that prepares students for the dynamic field of Civil Engineering. Below is a detailed overview of the curriculum's salient features:

1. **Project-Based Learning Courses:** From the first semester to the fifth semester, one course integrated with Project-Based Learning **(PBL)** empowers students with creativity, engaging them in meaningful projects to learn, explore, and investigate. PBL promotes teamwork and collaboration, essential skills for any professional, by having students work together in teams, each contributing unique skills and perspectives to achieve a common goal.
2. **Skill Enhancement Courses**: These courses are designed to provide students with industry-relevant certifications from reputed organizations, enhancing their employability by certifying their skill sets. They are integral to the academic curriculum and offered from Semester 1 to Semester 5, each carrying one credit.
3. **Foreign Language Courses**: To prepare students for global careers, the curriculum includes options to learn foreign languages, promoting cross-cultural communication skills and international collaboration. These courses are available in the seventh semester.
4. **Program Electives and Micro Specializations**: Students can pursue micro-specializations by completing thematic courses, which allow them to gain in-depth knowledge in specific sub-areas of their discipline. Starting in the fourth semester, this provides an opportunity for focused learning and expertise in emerging fields in alignment with program elective courses.
5. **Industry Elective Courses**: Offered jointly with industry partners, these courses ensure relevance and practical applicability. The academic department and industry partners develop and assess them collaboratively, without end-semester examinations, providing continuous and practical learning experiences.
6. **Startups and Entrepreneurial Skills**: The curriculum encourages students to pursue startups, offering options to engage in product-based or service-based startups during their seventh and eighth semesters. This fosters innovation, creativity, and entrepreneurial skills, preparing students for the dynamic business environment.
7. **Courses Embedded with Practicals**: The curriculum includes theory courses embedded with practicals and projects, ensuring students apply theoretical knowledge to real-world problems. This hands-on approach enhances learning outcomes and practical skills.

8. **Internships**: The program includes mandatory internships, allowing students to gain industry exposure and practical experience. Students can undertake at least four to six months of internship in a recognized industry, research organization, or prestigious institution relevant to their field. This bridges the gap between academic learning and industry requirements, enhancing employability.
9. **Community Work, Social Responsibility, and Universal Human Value Courses**: The curriculum integrates opportunities for community work and socially relevant projects, promoting civic responsibility and leadership skills. Universal Human Value courses also aim to cultivate a holistic understanding of life, enhancing physical and mental well-being and social and life skills. These courses address various dimensions of life, including individual, family, society, and the environment, promoting a healthy and harmonious lifestyle.
10. **Activity Points**: In addition to academic credits, students must earn activity points through participation in extracurricular activities such as sports, cultural events, community service, and entrepreneurship. This holistic approach ensures the development of leadership, teamwork, and communication skills, preparing students for global challenges.
11. **MOOC Courses:** Students selected for internships can fulfil their credit requirements in the seventh and eighth semesters through MOOC courses, providing flexibility and additional learning opportunities.
12. **Higher Credit Elective:** These courses carry more than the standard credit weight of elective courses. They allow students pursuing honors to reduce the number of required courses by earning additional credits through higher-credit electives. Additional credits earned from higher credit electives can be credited towards the total credit requirement of the honors program, with a maximum of 12 additional credits being applied towards the honors credit requirement.

This curriculum is designed to seamlessly blend theoretical knowledge with practical experience, foster interdisciplinary learning, and enhance employability through hands-on projects and internships, preparing students for successful careers in civil engineering.

General Course Structure

1. Credit and Courses:

Credits are a unit of measurement for coursework based on the number of hours of instruction required per week. One hour of classroom lecture (L), 60 minutes long per week and carried out during all weeks of the semester, is considered one instructional unit or one credit. The same goes for a tutorial (T) or a project (R) that is 60 minutes long per week and carried out during all weeks of the semester. In addition, a minimum of 120 minutes per week of laboratory session, practical or fieldwork, training (P) or a combination of these, carried out during all weeks of the semester, is also considered one

Instructional Unit or one Credit.

Classification	Credit assigned
1 Hour Lecture [L] per week	1 Credit
1 Hour Tutorial [T] per week	1 Credit
1 Hour Project [R] per week	1 Credit
1-2 Hours Practical [P] per week	1 Credit
3-4 Hours Practical [P] per week	2 Credit

- *For internship/Start-Up/Main project/Mini project, the credit weightage for equivalent hours is 50% of that for lectures/tutorials*

2. Course Category and Credits

The B.Tech. Program curriculum has 168 academic credits and 2 additional pass/fail credits that can be gained through 100 activity points. The program is expected to accommodate courses from other disciplines so that students have multi-disciplinary exposure. Additionally, the program should provide sufficient opportunities for students to enhance their communication, soft, managerial, and technical skills. Depending on the program, the courses should fall under the engineering, basic science, humanities science, and management categories. The structure of the UG program should essentially have the following categories of courses with the breakup of credits as given:

Sl. No	Category	Code	Credits
1	Humanities and Social Sciences including Management Courses	HMC	9
2	Basic Science Courses	BSC	20
3	Engineering Science Courses	ESC	26
4	Programme (Professional) Core Courses	PCC	52
5	Programme (Professional) Core Courses-Project Based Learning	PBL	16
6	Program Elective Courses	PEC	18
7	Open Elective Courses/Industry Linked Elective	OEC/ILE	9
8	Project Work and Seminar	PS	12
9	UHV and Community Work	PW	1
10	Skill Enhancement Courses	SEC	5
11	Mandatory Student Activities.	MSA	2
	Total Mandatory Credits	**170**	

A 10% to 15 % deviation in credits is permitted under each discipline. While developing the curriculum, the department offering the program should ensure that the students attain the above distribution upon completing their program. Either Minor or Honors can

be opted from the optional specialization.

The courses are organized into 1/2/3/4 credit courses based on the content delivery mechanism and desired depth. The delivery methods include Theory-only, Theory with tutorial, Theory with practice, Theory with project, etc. The L-T-P-R-C for each course indicates the number of credits delivered as Lecture (L), Tutorial (T), Practical (P), Project (R) and the total instructional delivery indicated as Credits (C).

$$C = L + T + [P/2] + R$$

Apart from lectures, tutorials, practical/practice and project hours, the curriculum offers Self-learning hours (S) that indicate the number of hours students are expected to spend for activities that should be completed outside the class defined by the faculty handling courses. The activities aim to support learning and should be initiated by the students themselves without guidance or direction from tutors. For each course, the self-learning hour per week is calculated as:

$$S = (L*1+P*1+[R/2])$$

Categories of courses included in the curriculum and their L-T-P-R-C componentsare given in the table below:

Sl. No.	Lecture- Tutorial-Practical- Project [L-T-P-R]	Credit [C]	Description
1.	1-0-2-0	2	Theory course without End Semester Examination [ESE]
2.	1-0-0-0	1	
3.	2-0-2-1	4	Theory course embedded with practical and project
4.	3-1-0-0	4	Theory course embedded with tutorial
5.	3-0-0-0	3	Theory course
6.	2-0-0-0	2	
7.	3-0-2-0	4	Theory course embedded with practical
8.	3-0-0-1	4	Theory course embedded with project
9.	0-0-2-0	1	Practical course without ESE
10.	0-0-3-0	2	Practical course
11.	0-0-3-0	2	Mini Project
12.	0-0-3-0	2	Seminar
13.	0-0-0-8	4	Major Project/Internship/Start-Up
14.	0-0-0-0	1	MOOC Course
Mandatory Courses			
15.	0-0-2-0	1	Skill Enhancement Courses
Minor/ Honors Course			
16.	4-0-0-0	4	Theory course
17.	0-0-0-4	4	Project only course

3. Course Code

Every course of B. Tech. The program shall take a code from the table given below.

Course category	Description
PCC	Program (Professional) Core Courses
PBL	Project Based Learning
CLT	Combined Lab Theory
PEC	Professional Elective Course
OEC	Open Elective Course
BSC	Basic Science Course
ESC	Engineering Science Course
HMC	Humanities, Social Sciences and Management course
MOOC	MOOC Course
IEL	Industry Elective Course
PW	Socially Relevant course
PS	Project Work and Seminar
SEC	Skill Enhancement Courses
HR	Honours
MR	Minor

Structure of Course Code: Each course will be identified by a unique Course Code consisting of eight alphanumeric characters, formatted as **24XXYABC**. The code can be interpreted as follows: "24" represents the regulation year, "XX" is the course category code, "Y" indicates the course delivery mode, "A" is the semester number (ranging from 1 to 8, with 0 indicating the course is offered in both odd and even semesters), "B" denotes the version of the course under each category, and "C" signifies the course sequence number.

For example, 24CET303 is a theory course offered by the civil engineering department in the third semester of the 2024 scheme.
24BML408 - laboratory course offered by the biomedical engineering department in the fourth semester of the 2024 scheme
The detailed expansion of the abbreviation of the course code structure is listed in the table below:

XX	Y	A	B	C
Course category	Course delivery mode	Semester No.	Version of the course	Serial No: of course
BM-Biomedical Engineering BT-Biotechnology CE – Civil Engineering CS-Computer Science	T-Theory L-Laboratory R-Theory Embedded with Project			

Engineering EC-Electronics and Communication Engineering EE-Electrical and Electronics Engineering MA-Mathematics CY – Chemistry PH-Physics ES-Engineering Science course HU-Humanities and Management Courses SE-Skill Enhancement Courses PW-Social Science and Community work	K-Certification Course E-Elective Course G- Minor H-Honour M-MOOC O-Open Elective I-Industry Elective S-Seminar P-Project N-Internship U-Start Up C – Theory Embedded with practical	0 1 2 3 etc	1 2 3 etc	1 2 3 4 5 6 etc

4. Allotted and Cumulative Credits

The allotted and cumulative credits are given in the table below:

Semester	Allotted Credits	Cumulative Credits
First	21	-
Second	22	43
Third	26	69
Fourth	24	93
Fifth	24	117
Sixth	23	140
Seventh	17	157
Eighth	11	168

FIRST SEMESTER (July-December)												
10 Days Compulsory Induction Program and UHV												
Sl. No:	**Slot**	**Course Code**	**Course Type**	**Course Title (Course Name)**	**Credit Structure**				**Total Marks**		**Credits**	**Hrs/ Week**
					L	**T**	**P**	**R**	**CIA**	**ESE**		
1	A	24MAT131	BSC	Linear Algebra & Differential Equations	3	0	0	0	40	60	3	3
2	B	24CYC122	BSC-CLT	Chemistry for Civil Engineering	3	0	2	0	50	50	4	5
3	C	24EST113	ESC	Engineering Mechanics	3	0	0	0	40	60	3	3
4	D	24EST124	ESC	Introduction to Civil Engineering	4	0	0	0	40	60	4	4
5	F	24ESR105	ESC-PBL	Algorithmic Thinking with Python	2	0	2	1	50	50	4	5
6	L	24ESL106	ESC	Civil Engineering Workshop	0	0	2	0	50	---	1	2
7	I*	24HUT007	HMC	Communicative English	0	0	2	0	100	---	1	2
8	J*	24SEK10N	SEC	Skill Enhancement Course 1							1	
Total											**21**	**24**

SECOND SEMESTER (January-June)												
Sl. No:	**Slot**	**Course Code**	**Course Type**	**Course Title (Course Name)**	**Credit Structure**				**Total Marks**		**Credits**	**Hrs./ Week**
					L	**T**	**P**	**R**	**CIA**	**ESE**		
1	A	24MAT231	BSC	Infinite Series, Vector Calculus & Statistics	3	0	0	0	40	60	3	3
2	B	24PHC232	BSC-CLT	Engineering Physics	3	0	2	0	50	50	4	5
3	C	24EST003	ESC	Engineering Graphics	3	0	0	0	40	60	3	3
4	D	24CER204	PCC-PBL	Surveying and Geomatics	3	0	0	1	50	50	4	4
5	E	24EST205	ESC	Mechanics of Solids	3	1	0	0	40	60	4	4
6	I*	24HUT006	HMC	Professional Ethics & Sustainable Development	1	0	2	0	100	--	2	3
7	L	24ESL007	ESC	Computer Aided Drawing (CAD) & Manufacturing workshop	0	0	2	0	50	--	1	2
8	J*	24SEK10N	SEC	Skill Enhancement Course2							1	
Total											**22**	**24**

No Grade Points will be awarded for the MOOC, I and J slot courses.
The self-learning (S) hours for each course is calculated based on the formulae, S= (L*1+P*1+[R/2])

THIRD SEMESTER (July-December)												
Sl. No:	**Slot**	**Course Code**	**Course Type**	**Course Title (Course Name)**	**Credit Structure**				**Total Marks**		**Credits**	**Hrs./ Week**
					L	**T**	**P**	**R**	**CIA**	**ESE**		
1	A	24MAT331	BSC	Probability Distributions, Statistical Inference & Numerical Methods	3	0	0	0	40	60	3	3
2	B	24CET302	PCC	Structural Analysis I	3	1	0	0	40	60	4	4
3	C	24CET303	PCC	Fluid Mechanics	3	1	0	0	40	60	4	4
4	D	24CER304	PCC-PBL	Concrete Technology and Building Planning	3	0	0	1	50	50	4	4
5	F	24HUT005	HMC	Engineering Economics	2	0	0	0	50	50	2	2
6	G	24EST306	ESC	Introduction to Artificial Intelligence and Data Science	3	1	0		40	60	4	4
7	L	24CEL307	PCL	Survey Lab	0	0	3	0	50	50	2	3
8	Q	24CEL308	PCL	Computer Aided Building Drawing Lab	0	0	3	0	50	50	2	3
9	J*	24SEK10N	SEC	Skill Enhancement Course 3							1	
10	R/M	24CEG3XX	VAC	Remedial/Minor							4*	4*
Total											**26/ 30***	**27/ 31***

FOURTH SEMESTER (January-June)												
Sl. No:	**Slot**	**Course Code**	**Course Type**	**Course Title (Course Name)**	**Credit Structure**				**Total Marks**		**Credits**	**Hrs./ Week**
					L	**T**	**P**	**R**	**CIA**	**ESE**		
1	A	24MAT431	BSC	Partial Differential Equations and Operational Research Techniques	3	0	0	0	40	60	3	3
2	B	24CET402	PCC	Structural Analysis II	3	1	0	0	40	60	4	4
3	C	24CET403	PCC	Soil Mechanics	4	0	0	0	40	60	4	4
4	D	24CER404	PCC-PBL	Water Resource Engineering	3	0	0	1	50	50	4	4
5	E	24CEE41N	PE	PE-1	3	0	0	0	40	60	3	3
6	L	24CEL406	PCL	Materials Testing Lab I	0	0	3	0	50	50	2	3
7	Q	24CEL407	PCL	Fluid Mechanics Lab	0	0	3	0	50	50	2	3
8	I*	24PWT208	PW	UHV II, Life skills & Community work	1	0	0	0	100	-	1	1
9	J*	24SEK10N	SEC	Skill Enhancement Course 4							1	
10	R/ M	24CEG4XX/ 24CEH4XX	VAC	Remedial/Minor/ Honours							4*	4*
Total											**24/ 28***	**25/ 39***

PROGRAM ELECTIVE I: 24CEE41N

Slot	Course Code	Courses	L-T-P-R	Hours	Credit
E	24CEE411	Advanced Mechanics of Solids	**3-0-0-0**	**3**	**3**
	24CEE412	Engineering Geology	**3-0-0-0**		**3**
	24CEE413	Open Channel Hydraulics	**3-0-0-0**		**3**
	24CEE414	Environmental Impact Assessment	**3-0-0-0**		**3**
	24CEE415	Environmental Science	**3-0-0-0**		**3**
	24CEE416	Advanced Concrete Technology	**3-0-0-0**		**3**
	24CEE417	Numerical Methods for Engineers	**3-0-0-0**		**3**
	24CEE418	Submission drawing preparation for buildings#	**3-0-3-0**	**6**	**5**

#- Higher credit elective

FIFTH SEMESTER (July-December)												
Sl. No:	**Slot**	**Course Code**	**Course Type**	**Course Title (Course Name)**	**Credit Structure**				**Total Marks**		**Credits**	**Hrs./ Week**
					L	**T**	**P**	**R**	**CIA**	**ESE**		
1	A	24CET501	PCC	Design of Concrete Structures	3	1	0	0	40	60	4	4
2	B	24CET502	PCC	Highway and Traffic Engineering	3	0	0	0	40	60	3	4
3	C	24CET503	PCC	Environmental Engineering I	4	0	0	0	40	60	4	4
4	D	24CER504	PCC-PBL	Soil Exploration & Foundation Engineering	3	0	0	1	50	50	4	4
5	E	24CEE52N	PE	PE-2	3	0	0	0	40	60	3	3
6	I*	24HUM506	HMC	Constitution Of India (MOOC)	-	-	-	-	-	-	1	-
7	L	24CEL507	PCL	Geotechnical & Pavement Engineering Lab	0	0	3	0	50	50	2	3
8	Q	24CEL508	PCL	Concrete Technology Lab	0	0	3	0	50	50	2	3
9	J*	24SEK10N	SEC	Skill Enhancement Course 5							1	
10	R/ M	24CEG5XX/ 24CEH5XX	VAC	Remedial/Minor/ Honours							4*	4*
S_5/ S_6		Industrial Visit (Maximum 10 Days are permitted, Not Exceeding more than 5 Working Days) /Industrial Training										
Total											**24/ 28***	**25/ 28***

PROGRAM ELECTIVE 2: 24CEE52N

Slot	Course Code	Courses	L-T-P-R	Hours	Credit
E	24CEE521	Advanced Structural Analysis	**3-0-0-0**	**3**	**3**
	24CEE522	Earth Retaining Structures	**3-0-0-0**		**3**
	24CEE523	Urban Transportation Planning	**3-0-0-0**		**3**
	24CEE524	Groundwater Hydrology	**3-0-0-0**		**3**
	24CEE525	Modern Construction Technology	**3-0-0-0**		**3**
	24CEE526	Architectural Engineering	**3-0-0-0**		**3**
	24CEE527	Operations Research for Civil Engineers	**3-0-0-0**		**3**
	24CEE528	Computational Fluid Dynamics#	**3-0-3-0**	**6**	**5**

#- Higher credit elective

Note: Open Electives are courses that other departments will offer.

SIXTH SEMESTER (January-June)												
Sl. No:	**Slot**	**Course Code**	**Course Type**	**Course Title (Course Name)**	**Credit Structure**				**Total Marks**		**Credits**	**Hrs./ Week**
					L	**T**	**P**	**R**	**CIA**	**ESE**		
1	A	24CET601	PCC	Design of Steel Structures	3	1	0	0	40	60	4	4
2	B	24CET602	PCC	Quantity Surveying and Valuation	3	0	0	0	40	60	3	3
3	C	24CEE63N	PE	PE-3	3	0	0	0	40	60	3	3
4	D	24CEC604	PCC-CLT	Environmental Engineering II	3	0	2	0	50	50	4	5
5	F	24EST605	ESC	Design Thinking and Product Development	2	0	0	0	50	50	2	2
6	O	24XXO61N/ 24XXI61N	OE / ILE	OE-1/ILE-1	3	0	0	0	40	60	3	3
7	L	24CEL607	PCC	Civil Engineering Software Lab	0	0	3	0	50	50	2	3
8	P	24CEP608	PS	Mini project	0	0	3	0	100	0	2	3
9	R/M/H	24CEG6XX/ 24CEH6XX	VAC	Remedial/Minor/ Honours	3	1	0	0			4*	4*
S5/ S6		Industrial Visit (Maximum 10 Days are permitted, Not exceeding more than 5 Working Days) /Industrial Training										
Total											**23/ 27***	**26/ 30***

PROGRAM ELECTIVE 3: 24CEE63N

Slot	Course Code	Courses	L-T-P-R	Hours	Credit
C	24CEE631	Advanced Concrete Structures	**3-0-0-0**	3	**3**
	24CEE632	Prestressed Concrete Structures	**3-0-0-0**		**3**
	24CEE633	Ground Improvement Techniques	**3-0-0-0**		**3**
	24CEE634	Tunnel, Dock & Harbor Engineering	**3-0-0-0**		**3**
	24CEE635	River Engineering	**3-0-0-0**		**3**
	24CEE636	Air Pollution Control Engineering	**3-0-0-0**		**3**
	24CEE637	Disaster Management	**3-0-0-0**		**3**
	24CEE638	Advanced Foundation Engineering#	**3-0-3-0**	**6**	**5**

#- Higher credit elective

OPEN ELECTIVE 1: 24CEO61N

Slot	Course Code	Courses	L-T-P-R	Hours	Credit

O	24CEO611	Introduction to Construction Engineering	**3-0-0-0**	**3**	**3**
	24CEO612	Structural Geology	**3-0-0-0**		**3**
	24CEO613	Disaster Management	**3-0-0-0**		**3**
	24CEO614	Environmental Impact Assessment	**3-0-0-0**		**3**
	24CEO615	Geoinformatics	**3-0-0-0**		**3**
	24CEO616	Applied Earth Systems	**3-0-0-0**		**3**
	24CEO617	Environmental Laws and Policy	**3-0-0-0**		**3**

SEVENTH SEMESTER (July-December)												
Sl. No:	**Slot**	**Course Code**	**Course Type**	**Course Title (Course Name)**	**Credit Structure**				**Total Marks**		**Credits**	**Hrs./ Week**
					L	**T**	**P**	**R**	**CIA**	**ESE**		
1	A	24CEE74N/ 24CEM74N	PE	PE-4 (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	3	0	0	0	40	60	3	3
2	B	24CEE75N/ 24CEM75N	PE	PE-5 (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	3	0	0	0	40	60	3	3
3	O	24XXO72N/ 24XXI72/ 24XXM72N	OE/ ILE	OE-2/ILE-2 (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	3	0	0	0	40	60	3	3
4	I*	24HUT704/ 24HUM70N	HMC	Elective (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	2	0	0	0	50	50	2	2
5	S	24CES705	PS	Seminar	0	0	3	0	50	-	2	3
6	P	24CEP706/ 24CEN706/ 24CEU706	PS	Option 1: Major Project Option 2: Internship (4-6 Months) Option 3: Startup	0	0	0	12	100	-	4	8
	R/M /H	24CEG7XX/ 24CEH7XX	VAC	Remedial/Minor/ Honours							4*	4*
Total											**17/ 21***	**22/ 26***

**The students can take the internship option either in 7th or in 8th semester.*
** Option 1: Work on a Project in the institute/department under the mentorship of faculty members.*
*Option 2: Full semester Internship in Industry/organization (**7th or 8th semester**)*
*Option 3: Full semester startup if the startup is service-based (**7th or 8th semester**), full year startup if the startup is product-based (**7th and 8th semester**)*

PROGRAM ELECTIVE 4: 24CEE74N

Slot	Course Code	Courses	L-T-P-R	Hours	Credit
A	24CEE741	Structural Dynamics	**3-0-0-0**	**3**	**3**
	24CEE742	Environmental Geotechnology	**3-0-0-0**		**3**
	24CEE743	Airport and Railway Engineering	**3-0-0-0**		**3**
	24CEE744	Pavement Engineering	**3-0-0-0**		**3**
	24CEE745	Legal Framework for Environment	**3-0-0-0**		**3**
	24CEE746	Repair and Rehabilitation of Structures	**3-0-0-0**		**3**
	24CEE747	Formwork Engineering	**3-0-0-0**		**3**
	24CEE748	Design of Offshore Structures#	**3-0-3-0**	**6**	**5**

PROGRAM ELECTIVE 5: 24CEE75N

SLOT	COURSE CODE	COURSES	L-T-P-R	HOURS	CREDIT
B	24CEE751	Bridge Engineering	**3-0-0-0**	**3**	**3**
	24CEE752	Advanced Geotechnical Investigation	**3-0-0-0**		**3**
	24CEE753	Intelligent Transportation Systems	**3-0-0-0**		**3**
	24CEE754	Groundwater Engineering	**3-0-0-0**		**3**
	24CEE755	Sustainable Construction Methods	**3-0-0-0**		**3**
	24CEE756	Air and Noise Pollution Control Engineering	**3-0-0-0**		**3**
	24CEE757	Functional Design of Buildings	**3-0-0-0**		**3**
	24CEE758	Design of Hydraulic Structures	**3-0-3-0**	**6**	**5**

#- Higher credit elective

OPEN ELECTIVE 2: 24CEO72N

Slot	Course Code	Courses	L-T-P-R	Hours	Credit
O	24CEO721	Smart Transportation Systems	**3-0-0-0**	**3**	**3**
	24CEO722	Environment Health and Safety	**3-0-0-0**		**3**
	24CEO723	Watershed Conservation and Management	**3-0-0-0**		**3**
	24CEO724	Coastal Zone Management and Remote Sensing	**3-0-0-0**		**3**
	24CEO725	Finance for Engineering	**3-0-0-0**		**3**
	24CEO726	Effect of Climate Change on Built Environment	**3-0-0-0**		**3**
	24CEO727	Forensic Engineering	**3-0-0-0**		**3**

HMC ELECTIVE

Slot	Course Code	Courses
I*	24HUT704	Project Management: Planning, Execution, Evaluation and Control
	24HUM701	Proficiency course in French (B1 level) (MOOC)
	UEHUM702	Proficiency Course in German (B1 Level) (MOOC)
	UEHUM703	Proficiency Course in Spanish (B1 Level) (MOOC)
	UEHUM704	Introduction to Japanese Language and Culture (N5 level) (MOOC)

EIGHTH SEMESTER (January-June)												
Sl. No:	**Slot**	**Course Code**	**Course Type**	**Course Title (Course Name)**	**Credit Structure**				**Total Marks**		**Credits**	**Hrs./ Week**
					L	**T**	**P**	**R**	**CIA**	**ESE**		
1	A	24CEE86N/ 24CEM86N	PE	PE-6 (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	3	0	0	0	40	60	3	3
2	O	24XXO83N/ 24XXI83N/ 24XXO84N	OE/ ILE	OE-3/ILE-3 (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	3	0	0	0	40	60	3	3
3	I*	24HUT803/ 24HUM803	HMC	Organizational Behavior and Business Communication (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	2	0	0	0	50	50	1	2
4	P	24CEP806/ 24CEN06/ 24CEJ806	PS	Option 1: Major Project Option 2: Internship (4-6 Months) Option 3: Major Project Phase –II (For the students who have not opted for internship in S7/S8) Option 4: Startup	0	0	0	8	100	0	4	8
	R/H	24CEH8XX	VAC	Project: Honours	0	0	0	4			4*	4*
Total											**11/ 15***	**16/ 20***

PROGRAM ELECTIVE 6: 24CEE86N

SLOT	COURSE CODE	COURSES	L-T-P-R	HOURS	CREDIT
A	24CEE861	Building Information Modelling	**3-0-0-0**	3	**3**
	24CEE862	Soil Dynamics and Machine Foundation	**3-0-0-0**		**3**
	24CEE863	Architecture and Town Planning	**3-0-0-0**		**3**
	24CEE864	Rural Water Supply and Onsite Sanitation Systems	**3-0-0-0**		**3**
	24CEE865	Water and Air Quality Management	**3-0-0-0**		**3**
	24CEE866	Contracts Management	**3-0-0-0**		**3**

	24CEE867	Valuation of Real Properties	**3-0-0-0**		**3**
	24CEE868	Design of Earthquake Resistant Structures#	**3-0-3-0**	**6**	**5**

OPEN ELECTIVE 3: 24CEO83N

Slot	Course Code	Courses	L-T-P-R	Hours	Credit
O	24CEO831	Public Transportation Systems	**3-0-0-0**	**3**	**3**
	24CEO832	Rainwater Harvesting	**3-0-0-0**		**3**
	24CEO833	Hydrogeology	**3-0-0-0**		**3**
	24CEO834	Waste Management	**3-0-0-0**		**3**
	24CEO835	Environmental Health and Safety	**3-0-0-0**		**3**
	24CEO836	Energy Efficient Buildings	**3-0-0-0**		**3**
	24CEO837	Fundamentals of Building Planning	**3-0-0-0**		**3**

Micro Specialization

Micro Specialization Group ID	Specialization	Courses
G-I	Structural Engineering	Advanced Mechanics of Solids (S4)
		Advanced Structural Analysis (S5)
		Advanced Concrete Structures (S6)
		Structural Dynamics (S7)
		Bridge Engineering (S7)

HMC Courses				
Sl. No:	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**S1/S2**	24HUT007	Communicative English	1
2		24HUT006	Professional Ethics and Sustainable Development	2
3	**S3**	24HUT005	Engineering Economics	2
4	**S5**	24HUM506	Constitution of India (MOOC)	1
5	**S7**	24HUT704/ 24HUM70N	Elective (Project Management/Foreign Languages)	2
6	**S8**	24HUT803/ 24HUM803	Organizational Behavior and Business Communication	1
Total Credits				**9**

BSC Courses				
Sl. No:	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**S1**	24MAT131	Linear Algebra and Differential Equations	3
2		24CYC122	Chemistry for Civil Engineering	4
3	**S2**	24MAT231	Infinite Series, Vector Calculus & Statistics	3
4		24PHC232	Engineering sPhysics	4
5	**S3**	24MAT331	Probability Distributions, Statistical Inference, Numerical Methods	3
6	**S4**	24MAT431	Partial Differential Equations, Assignment & Transportation problems	3
Total Credits				**20**

ESC Courses				
Sl. No:	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**S1**	24EST113	Engineering Mechanics A	3
2		24EST124	Introduction to Civil Engineering	4
3		24ESR105	Algorithmic Thinking with Python (PBL)	4
4		24ESL106	Civil Engineering Workshop	1
5	**S2**	24EST003	Engineering Graphics	3
6		24EST205	Mechanics of Solids	4
7		24ESL007	Computer Aided Drawing (CAD) & Manufacturing Workshop	1
8	**S3**	24EST306	Introduction to Artificial Intelligence and Data Science	4
9	**S6**	24EST605	Design Thinking and Product Development	2

Total Credits	26

Programme Core Courses (PCC)				
Sl. No:	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**S3**	24CET302	Structural Analysis I	4
2		24CET303	Fluid Mechanics	4
3		24CEL307	Survey Lab	2
4		24CEL308	Computer Aided Building Drawing Lab	2
5	**S4**	24CET402	Structural Analysis II	4
6		24CET403	Soil Mechanics	4
7		24CEL406	Materials Testing Lab I	2
8		24CEL407	Fluid Mechanics Lab	2
9	**S5**	24CET501	Design of Concrete Structures	4
10		24CET502	Highway and Traffic Engineering	3
11		24CET503	Environmental Engineering I	4
12		24CEL507	Geotechnical & Transportation Engineering Lab	2
13		24CEL508	Concrete Technology Lab	2
14	**S6**	24CET601	Design of Steel Structures	4
15		24CET602	Construction Management and Quantity Surveying	3
16		24CEC604	Environmental Engineering II	4
17		24CEL607	Civil Engineering Software Lab	2
Total Credits (Theory -11, Lab-6)				**52**

Programme Core-Project Based Learning (PBL)				
Sl. No:	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**S2**	24CER204	Surveying and Geomatics - PBL-2	4
2	**S3**	24CER304	Concrete Technology and Building Planning - PBL-3	4
3	**S4**	24CER404	Water Resource Engineering - PBL-4	4
4	**S5**	24CER504	Soil Exploration & Foundation Engineering - PBL-5	4
Total Credits				**16**

Programme Elective Courses (PE)				
Sl. No:	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**S4**	24CEE41N	PE-1	3
2	**S5**	24CEE52N	PE-2	3
3	**S6**	24CEE63N	PE-3	3
4	**S7**	24CEE74N	PE-4	3
5		24CEE75N	PE-5	3
6	**S8**	24CEE67N	PE-6	3

Total Credits	18

Open Elective Courses/Industry Elective(OE/IEL)				
Sl. No	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**S6**	24XXO61N/ 24XXI61N	OE/ILE-1	3
2	**S7**	24XXO72N/ 24XXI72N	OE/ILE-2	3
3	**S8**	24XXO83N/ 24XXI83N	OE/ILE-3	3
Total Credits				**9**

Project Work & Seminar				
Sl. No	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**S6**	24CEP608	Mini project	2
2	**S7**	24CES705	Seminar	2
3		24CEP706/ 24CEN706/ 24CEU706	Project/Internship/Startup	4
4	**S8**	24CEP806/ 24CEN806/ 24CEJ806	Project/Internship/Startup	4
Total Credits				**12**

UHV and Community Work				
Sl. No	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**S4**	24PWT206	UHV II, Life skills & Community work	1
Total Credits				**1**

Skill Enhancement Course				
Sl. No	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**S1-S5**	24SEC10N	Skill Enhancement Course	5
Total Credits				**5**

Mandatory Student Activities				
Sl. No	**Semester**	**Course Code**	**Course Area**	**Credits**
1	**-**	-	Mandatory Student Activities	2
Total Credits				**2**

Total Credits	170

RULES FOR ASSIGNING ACTIVITY POINTS

Apart from technical knowledge and skills, students should have excellent soft skills, leadership qualities and team spirit to be successful as professionals. They should have entrepreneurial capabilities and societal commitment. Student activity points to be earned, covering extracurricular and co-curricular activities, have been specified to nurture these qualities. All students must earn at least 100 activity points from various activity segments listed to qualify for the B.Tech degree. Two credits are given for this on a pass/ fail basis, which is mandatory for getting the B.Tech Degree. As no grade for these two credits is given, they are not included in the CGPA calculation. For lateral entry students joining from the third semester, the activity point requirement is 75 Points earned by the student, which will be indicated in the consolidated academic statement. In the case of NSS and NCC, points can be entered after completing a two-year Programme. All documental proof for awarding the activity points should be obtained, and the points will be consolidated. The rules for assigning activity points are given in the following sections.

The following table lists the main activity segments and the maximum points associated with each segment.

Activity Points				
Sl. No.	**Group**	**Courses**	**Credits**	**Minimum Credit Requirements**
1	I	NSS, NCC, NSO (National Sports Organization)	1 (50 Points)	2 Credits (One credit from each Group)
2		Arts/Sports/Games		
3		Union/Club Activities		
4	II	English Proficiency Certification (TOFEL, IELTS, BEC etc.)	1 (50 Points)	
5		Aptitude Proficiency Certification (GRE, CAT, GMAT etc.)/Valid Gate Score		
6		Short Term Internship, Clinical Exposure/Training (Minimum 2 weeks), Conferences/Paper Presentation/ Workshop Activities/ Professional Body Activities/ MOOC Courses/ Entrepreneurship and Innovation		

- ***75% per group for B. Tech Lateral Entry Students***

- ***To obtain the 2 Activity Credits required in the curriculum, students must acquire at least 100 activity points.***

The following table lists the activities under each of these segments, the expected level of achievement, activity points, the evidence needed to assign the points, and the minimum duration required for certain activities. Additional activities under these segments can be considered after approval from the Academic Council.

Group	Activity Head	Sl. No	Activity	Achievement Levels and Assigned Activity Points					** Approval Document	Max. Points	Min. duration of activity
			*Level	I	II	III	IV	V			
GROUP I	National Initiatives Participation	1.	NCC	-	-	-	-	-	a/b	50	2 Year
		2.	NSS	-	-	-	-	-	a/b	50	2 Year
		For a C certificate / outstanding performance supported by certification, additional marks up to 20 can be provided, subject to a maximum limit of 80 points. Best NSS Volunteer Awardee (University level) / Participation in National Integration Camp/ Pre-Republic Day Parade Camp (South India), supported by certification, additional marks up to 10 can be provided, subject to a maximum limit of 70 points. For the best NSS Volunteer Awardee (State / National level), Participation in Republic Day Parade Camp or International Youth Exchange Programme supported by certification, additional marks up to 20 can be provided, subject to a maximum limit of 80 points.									
	Sports & Games Participation	3.	Sports	5	10	20	30	50	a	50	1 Year
		4.	Games	5	10	20	30	50	a	50	1 Year
			First Prize	8	8	8	15	15	Additional points can be provided for winning. The maximum limit for activity points is 60. However, the maximum point limit is enhanced to 80 for Level IV and V winning.		
			Second Prize	5	5	5	12	12			
			Third Prize	3	3	3	9	9			
	Cultural Events	5.	Music	5	10	20	30	50	a	50	1 Year
		6.	Performing arts	5	10	20	30	50	a	50	1 Year
		7.	Literary arts	5	10	20	30	50	a	50	1 Year
			First Prize	8	8	8	15	15	Additional points can be provided for winning. The maximum limit for activity points is 60. But for Level IV and V winning, the maximum point limit is enhanced to 80.		
			Second Prize	5	5	5	12	12			
			Third Prize	3	3	3	9	9			
	Union/ Club			Coordinator		Sub/joint-coordinator		Volunteer			

		8.	Elected student representatives	25 (Chairman)	20 (Secretary)	10 (Members)	d	50	1 Year
		9.	Hobby Clubs	10	5	3	d	30	1 Year
		10.	Placement Activities	10	5	3	d	30	1 Year
		11.	Student Professional Societies (IEEE, IET, ASME, SAE, NASA etc.)	10	5	3	d	30	1 Year
		12.	Department Associations	10	5	3	d	30	1 Year
		13.	Festival & Technical Events (College approved)	10	5	3	d	30	1 Year
GROUP II	**14. Professional Self Initiatives**		**Activity**	**Achievement Levels and Assigned Activity Points**					
			***Level**	**I**	**II**	**III**	**IV**	**V**	
		14.	Tech Fest, Tech Quiz	10	20	30	40	50	a	40	
		15.	MOOC with final assessment certificate (Other than specified in the curriculum)	30					a	40	
		16.	Competitions conducted by Professional Societies - (IEEE, IEI, IET, ASME, SAE, NASA etc.)	5	10	15	20	30	a	30	
		17.	Hackathon	5	10	15	20	30	a	30	
			Additional 10 points for Winners of Smart India Hackathon (SIH)/ India Innovation Challenge Design Contest (IICDC)								
		18.	Attending Full time Conference/ Seminars / Exhibitions/ Workshop/ STTP conducted at IITs /NITs	10					a	20	

		18a	Attending Full time Conference/ Seminars / Exhibitions/ Workshop/ STTP conducted at KTU or its affiliated institutes	4	a	8	
		19.	Paper presentation/ publication at IITs/NITs	15	a	30	
			Additional 10 points for certificate of recognition.				
		19. a	Paper presentation/ publication at KTU or its affiliated institutes	6	a	12	
			Additional 2 points for a certificate of recognition.				
		20.	Poster Presentation at IITs /NITs	8	a	15	
			Additional 10 points for certificate of recognition.				
		20.a	Poster Presentation at KTU or its affiliated institutes	3	a	5	
			Additional 2 points for a certificate of recognition.				
		21.	Industrial Training/ Internship (at least for 2 weeks)	15	a/b	15	
		22.	Industrial/ Exhibition visits	3	a/b/ d	8	
		23.	Foreign Language Skills (TOEFL/ IELTS/ BEC exams, etc.)	40	a	40	
		24.	Aptitude Proficiency Certification (GRE, CAT, GMAT, etc)/Valid Gate Score	40	a	40	
		25.	Skilling Certificates (if not considered as part of the curriculum)	25	a	25	

	Entrepreneurship and Innovation	26.	Start-up Company Registered Legally (if not considered as part of the curriculum)	50	d	50	
		27.	Patent-Filed	25	d	25	
		28.	Patent - Published	30	d	50	
		29.	Patent- Granted (if Grace marks are not awarded)	40	d	50	
		30.	Patent- Licensed	70	d	70	
		31.	Prototype developed and tested	50	d	50	
		32.	Awards for Products developed	50	d	50	
		33.	Innovative technologies developed and used by industries/users	50	d	50	
		34.	Got venture capital funding for innovative ideas/products.	70	d	70	
		35.	Startup Employment (Offering jobs to two persons not less than Rs. 15000/- per month)	70	d	70	
		36.	Societal innovations	40	d	40	

*Level I College Events
*Level II Zonal Events
*Level III State/ University Events
*Level IV National Events
*Level V International Events
**Approval Documents: (a) Certificate (b) Letter from Authorities (c) Appreciation recognition letter (d) Documentary evidence (e) Legal Proof (f) Others (specify)