DEPARTMENT OF CIVIL ENGINEERING
BOARD OF STUDIES MEETING

MINUTES OF THE MEETING OF BoS OF CIVIL ENGINEERING DEPARTMENT HELD ON JUNE 07, 2024 AT 10:30HRS

VENUE: OFFICE OF THE HEAD OF THE DEPARTMENT

Agenda Points:

1. Presentation and discussion on revision in the syllabus/curriculum of Bachelor of Technology (Civil Engineering) with minor specialization (automation in sustainable infrastructure) for the session 2024-25.
2. Approval of syllabus/curriculum of **PG program M.Tech (Structural & Construction Engineering)** for the session 24-25.

Level of the program: UG and PG

Name of the programme: Bachelor of Technology (Civil Engineering) and M.Tech (Structural & Construction Engineering)
The BoS meeting of Civil Engineering Department was held on **JUNE 07, 2024** and the following members were present in the meeting:

S. No.	External Expert/Chairperson/Faculty	Designation
1	Prof. S.S. Gupta	Professor/External Expert
2	Dr. Ashish Simalti	Head of the Department/ Chairperson
3	Dr. Sunkulp Goel	Associate Professor/Member nominated by Director
4	Prof. R.K. Jain	Professor & Member
5	Mr. A.K. Pipersenia	Associate Professor/Member
6	Mr. Siddharth Mathur	Assistant Professor/Member
7	Mr. Ankit Varshney	Assistant Professor/Member
9	Ms. Nikita Jain	Assistant Professor/Member
10	Mr Gaurav Jaiswal	Assistant Professor/Member

The chairperson welcomed the members for the meeting of BoS and the following points were discussed:

Agenda 1: Presentation and discussion on revision in the syllabus/curriculum of program Bachelor of Technology (Civil Engineering) with minor specialization for the session 2024-25

1. The syllabus of **B.Tech (Civil Engineering) with minor specialization** was presented and approved. A total five new course (mentioned in table) has been introduced for addition of minor specialization certification from second year onward till fourth year. The details of Minor specialization courses as follows:- **(Annexure -I)**

2.

S.No.	Name & Code of the Courses Newly Added	Semester
1.	**Basics of Python Programming & ECE SI 24 0101**	**Third**
2.	**Introduction to Artificial Intelligence & ECE SI 24 0102**	**Fourth**
3.	**Ancient Material and Construction Techniques & ECE SI 24 0103**	**Fifth**
4.	**Renewable energy in Built-Environment & ECE SI 24 0104**	**Seventh**
5.	**Green Building Material & Practices & ECE SI 24 0105**	**Eight**

3. If any student completes the minor specialization courses successfully, only then he/she will be eligible to get the degree of B.Tech (Civil Engineering) with minor specialization certificate, which will be equivalent to B.Tech (Hons.) Programme. Otherwise, he/she will get only B.Tech (Civil Engineering) Degree.
4. Department of Civil Engineering has proposed the removal of some subjects i.e co-curricular activity-I (BCCA201), Deep reading (BDR301), co-curricular activity-II (BCCA401) and co-curricular activity-III (BCCA601) from the course matrix of B. Tech CE 2024-25 batch. BoS members were agreed on this point. **(Annexure-II)**
5. Department of Civil Engineering has proposed the removal of some subjects i.e Deep reading (BDR301), co-curricular activity-II (BCCA401) and co-curricular activity-III (BCCA601) from the course matrix of B. Tech CE 2023-24 batch. BoS members were agreed on this point. **(Annexure-III)**
6. The changes in B.Tech (Civil Engineering) **with minor specialization** are mentioned in the Table as follows: - (These changes are less than 20 %. The details of the changes are made in the following courses):

S.No.	Name & Code of the Courses	Deletion	Addition	Other Changes (Minor Changes)
1	Public Health & Environmental Engineering (Lab) & (ECE661)	Please refer Annexure - IV	Please refer Annexure - IVA	-

Agenda2: Approval of syllabus/curriculum of M.Tech (Structural & Construction Engineering) for the session 24-25. **(Annexure -V)**

1. The syllabus of **PG program M.Tech (Structural & Construction Engineering)** was presented and approved.

The meeting ended with a note of thanks.

Annexure – I

Minor Specializations

S. No.	Minor Specialization Offered by CE
1	**Automation in Sustainable Infrastructure**

Minor Specialization: Course Offered by CE dept.

S. No.	Course Code	Title of Course	Contact Hours				Credits	
			L	T	P	Total		
1	ECE SI 24 0101	**Basics of Python Programming**	3	1	0	4	4	Third
2	ECE SI 24 0102	**Introduction to Artificial Intelligence**	3	1	0	4	4	Fourth
3	ECE SI 24 0103	**Ancient Material and Construction Techniques**	3	1	0	4	4	Fifth
4	ECE SI 24 0104	**Renewable energy in Built-Environment**	3	1	0	4	4	Seventh
5	ECE SI 24 0105	**Green Building Material & Practices**	3	1	0	4	4	Eighth
		Total				20	20	

Annexure-II

Study & Evaluation Scheme

of

Bachelor of Technology
(Civil Engineering)
With Minor specialization in
Automation for sustainable Infrastructure

[Applicable w.e.f. Academic Session - 2024-25]

[As per CBCS guidelines given by AICTE]

Accredited with NAAC A Grade

12-B Status from UGC

TEERTHANKER MAHAVEER UNIVERSITY

N.H.-24, Delhi Road, Moradabad, Uttar Pradesh-244001

Website: www.tmu.ac.in

TEERTHANKER MAHAVEER UNIVERSITY

TMU **(Established under Govt. of U.P. Act No. 30, 2008)**

Delhi Road, Bagarpur, Moradabad (U.P.)

Study & Evaluation Scheme

SUMMARY

Institute Name	*Faculty of Engineering*
Programme	*B.Tech. (Civil Engineering)*
Duration	*Four-year full time (Eight Semesters)*
Medium	*English*
Minimum Required Attendance	*75%*
Credits	
Minimum Credits Required for Degree	*189*

Assessment:

Evaluation			Internal	External	Total
Theory			40	60	100
Practical/ Dissertations/ Project Reports/ Viva-Voce			50	50	100
Class Test-1	Class Test-2	Class Test-3	Assignment(s)	Attendance & Participation	Total
Best two out of three					
10	10	10	10	10	40
Duration of Examination			**External**	**Internal**	
			3 Hours	1.5 Hours	

To qualify the course a student is required to secure a minimum of 45% marks in aggregate including the semester end examination and teachers' continuous evaluation (i.e. both internal and external). A candidate who secures less than 45% of marks in a course shall be deemed to have failed in that course. The student should have at least 45% marks in aggregate to clear the semester.

= Provision for delivery of 25% content through online mode.

= Policy regarding promoting the students from semester to semester & year to year. No specific condition to earn the credit for promoting the students from one semester to next semester

= Maximum no of years required to complete the program: N+2 (N=No of years for program)

Question Paper Structure

1	*The question paper shall consist of six questions. Out of which first question shall be of short answer type (not exceeding 50 words) and will be compulsory. Question no. 2 to 6 (from Unit-I to V) shall have explanatory answers (approximately 350 to 400 words) along with having an internal choice within each unit.*
2	*Question No. 1 shall contain 8 parts from all units of the syllabus with at least one question from each unit and students shall have to answer any five, each part will carry 2 marks.*
3	*The remaining five questions shall have internal choice within each unit; each question will carry 10 marks.*

IMPORTANT NOTES:

1	*The purpose of examination should be to assess the Course Outcomes (CO) that will ultimately lead to of attainment of Programme Specific Outcomes (PSOs). A question paper must assess the following aspects of learning: Remember, Understand, Apply, Analyze, Evaluate & Create (reference to Bloom's Taxonomy).*
2	*Case Study is essential in every question paper (wherever it is being taught as a part of pedagogy) for evaluating higher-order learning. Not all the courses might have case teaching method used as pedagogy.*
3	*There shall be continuous evaluation of the student and there will be a provision of backlog/ progress report.*

Program Structure-B.Tech.- Civil Engineering

A. Introduction:

Civil engineering is a professional engineering discipline that deals with the design, construction, and maintenance of the physical and naturally built environment, including public works such as roads, bridges, canals, dams, airports, sewerage systems, pipelines, structural components of buildings, and railways. Employability, innovation, theory to practice connectedness is the central focus of B.Tech.- Civil engineering curriculum. The curriculum is designed as such that the students can gain an in-depth mastery of the academic disciplines and applied functional areas necessary to meet the requirements of the industry.

Students will develop and gain various skills that are transferable within the engineering world and practical skills that are equally useful in plenty of other sectors. Problem-solving skills are honed, and their interpersonal and communication skills will also improve with the amount of team work that they will be required to do. Students will also learn how to better manage their time and resources and assess the risks involved in a certain project. Other useful skills that they will learn include design, leadership and organisational skills.

The institute emphasis on the following courses ***balanced with core and elective courses***. The curriculum of B.Tech. program emphasizes an intensive, flexible engineering education with 189 credits. Total 184 credits are allotted for the B.Tech. degree.

The programme structure and credits for B.Tech. are finalized based on the stakeholders' requirements and general structure of the programme. Minimum number of class room contact teaching credits for the B.Tech. program will be 189 credits (one credit equals 1.0 hour). However, the minimum number of the credits for award of B.Tech. degree will be 184 credits. Out of 167 credits of classroom contact teaching, 74 credits are to be allotted for core courses (PCC), 16 credits are allotted to Basic Science Courses (BSC), 15 credits are allotted to Engineering Science Courses (ESC), 11 credits are allotted to AECC-Ability Enhancement Compulsory Course, 06 credits are allotted to open elective courses (OEC), 17 credits are allotted to Professional Elective courses, 06 credits are allotted to SEC-Skill Enhancement Course and rest of 22 credits for Laboratory courses. 10 credits are allotted for LPBEI, Deep reading & Co-curricular Activities(CCA) as per NEP 2020. Credits distribution is given below in tabular form:

B.Tech. Civil Engineering: Four-Year (8-Semester) CBCS Programme			
Basic Structure: Distribution of Courses			
S. No.	**Type of Course**	**Credit Hours**	**Total Credits**
1	BSC - Basic Science Courses	4 Courses of 4 Credits each (Total Credit Hrs. 4X4)	16
2	ESC - Engineering Science Courses	3 Courses of 4 Credits each (Total Credit Hrs. 3X4) 1 Courses of 3 Credits each (Total Credit Hrs. 1X3)	15
3	PCC - Professional core courses	10 Courses of 3 Credits each (Total Credit Hrs. 10X3) 11 Courses of 4 Credits each (Total Credit Hrs. 11X4)	74
4	PEC - Professional Elective courses	2 Courses of 4 Credits each (Total Credit Hrs. 2X4) 3 Course of 3 Credits each (Total Credit Hrs. 3X3)	17
5	OEC - Open Elective courses	2 Course of 3 Credits each (Total Credit Hrs.2X3)	06
6	SEC-Skill Enhancement Course	6 Courses of 1 Credit each (Total Credit Hrs. 6X1)	06
7	LC - Laboratory course	18 Courses of 1 Credits each (Total Credit Hrs. 18X1) 2 Courses of 2 Credits each (Total Credit Hrs. 2X2)	22
8	AECC-Ability Enhancement Compulsory Course	2 Course of 3 Credits each (Total Credit Hrs.2X3) 2 Courses of 2 Credits each (Total Credit Hrs.2X2) 1 Course of 1 Credits each (Total Credit Hrs. 1X5)	11
9	PROJ-Skill based practical training & Industrial Training Report & Viva Voce for Dissertation	1 Course of 5 Credits each (Total Credit Hrs. 1X5) 1 Course of 3 Credits each (Total Credit Hrs. 1X3) 2 Course of 2 Credits each (Total Credit Hrs. 2X2)	12
10	MOOC-Optional (credits will consider only in case a student fails to secure minimum required credits for the award of degree)	As per the approval from Hon'ble Vice Chancellor	-
11	LPBEI- Learning by Project Based Entreprencurship Initiative	3 Course of 2 Credits each (Total Credit Hrs. 3X2)	06
14	**Minor Specialization***	**5 Courses of 4 Credits each (Total Credit Hrs. 5X4)**	20
15	DGP- Discipline & General Proficiency	8 Course of 0 Credits each (Total Credit Hrs. 8X0)	00
Total Credits			205

*If the student completes the minor specialization courses successfully, only then he/she will be eligible to get the minor specialization certificate with his/her degree. Otherwise, he/she will get only B.Tech (Civil Engineering) Degree.

Contact hours include work related to Lecture, Tutorial and Practical (LTP), where our institution will have flexibility to decide course wise requirements.

B. Tech. (Hons.) Programme:

A new academic programme B.Tech. (Hons.) is introduced in order to facilitate the students to choose additionally the specialized courses of their choices and build their competence in a specialized area. The features of the new programme, include:

1. B.Tech. Student in regular stream can opt for B.Tech. (Hons.), provided he/she passed in all courses with minimum aggregate 75% marks up-to the end of second semester.
2. For B. Tech (Hons), Student needs to earn additional 24 credits (over and above the required minimum 180 credits) relevant to her/his discipline as recommended by the faculty advisor.
3. The students opting for this program have to take four additional courses of their specialization of a

minimum of 2 credits each from 3rd to 8th semesters.

4. The faculty advisor will suggest the additional courses to be taken by the students based on their choice and level of their academic competence.
5. The list of such additional courses offered by the NPTEL will be approved by the Honorable Vice Chancellor in the beginning of the academic year to facilitate the registration process.
6. The student can also opt for post graduate level courses.
7. The students have to submit the NPTEL course completion certificate to exam division for considering as B.Tech. (Hons).

* Student should have to take permission of registration for the B.Tech. (Hons.) degree from Honourable Vice Chancellor in starting of third semester.

C. Choice Based Credit System (CBCS)

Choice Based Credit System (CBCS) is a versatile and flexible option for each student to achieve his/her target number of credits as specified by the AICTE/UGC and adopted by our university.

The following is the course module designed for the B.Tech.. program:

- ***Program Core Course (PCC):*** Core courses of B.Tech.. program will provide a holistic approach to engineering education, giving students an overview of the field, a basis to build and specialize upon. These core courses are the strong foundation to establish technical knowledge and provide broad multi-disciplined knowledge can be studied further in depth during the elective phase. The core courses will provide more practical-based knowledge, case-based lessons and collaborative learning models. It will train the students to analyze, decide, and lead-rather than merely know-while creating a common student experience that can foster deep understanding, develop decision-making ability and contribute to the society at large.

  A wide range of core courses provides groundwork in the basic civil engineering disciplines: surveying, transportation engineering, structural engineering, geotechnical engineering, environmental engineering, hydraulic engineering, etc.

  We offer core courses in semester III, IV, V, VI, VII &VIII during the B.Tech.. (Civil) program. There will be 3 or 4 credits for each core course offered depending upon the course content.

- ***Open Elective Course (OEC):*** Open Elective is an interdisciplinary additional subject that is compulsory in a program. The score of Open Elective is counted in the overall aggregate marks under Choice Based Credit System (CBCS). Each Open Elective paper will be of 3 Credits in VII and VIII semesters. Each student has to take Open/Generic Electives from department other than the parent department. Core/ Discipline Specific Electives will not be offered as Open Electives.

- **Ability Enhancement Compulsory Course (AECC):** This is a compulsory course that does not have any choice and will be 2, 3, 5 credits. Each student of B.Tech. Program has to compulsorily pass the Environmental Studies and acquire 3 credits respectively.

- ***Skill Enhancement Course (SEC):*** A Skill Enhancement Course is a credit course which is basically meant to enhance general ability of students in areas like soft skills, quantitative aptitude and reasoning ability - required for the overall development of a student and at the same time crucial for industry/corporate demands and requirements. The student possessing these skills will definitely develop acumen to perform well during the recruitment process of any premier organization and will have the desired confidence to face the interview. Moreover, these skills are also essential in day-to-day life of the corporate world. The aim is to nurture every student for making effective communication, develop the aptitude and a general reasoning ability for a better performance, as desired in corporate world. There shall be four courses of Aptitude in Semester III, IV, V & VI semesters and two courses of Soft Skills in V &VI Semesters and will carry 2 credit, as compulsory for every student to pass these courses with

minimum 45% marks.

- *Professional Elective courses (PEC):* The discipline specific elective course is chosen to make student specialist or having specialized knowledge of a specific domain like thermo-fluids, designing, industrial production management etc. It will be covered in two semesters (VII & VIII) of fourth year of the program relevant to chosen disciplines of core courses of the program. The student will have to choose any five theories out of the given list of specialization offered. Each theory of 3 & 4 credits.

D. Program Outcomes for Engineering:

PO – 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO – 2	**Problem analysis& Solving:** Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclussions using first principles of mathematics, natural sciences, and engineering sciences.
PO – 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO – 4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO – 5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO – 6	**Social Interaction & effective citizenship:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO – 7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO – 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO – 9	**Attitude (Individual and team work):** Function effectively as an individual, and as member or leader in diverse teams, and in multidisciplinary settings.
PO – 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clean instructions.
PO – 11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO – 12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change
PO--13	**Entrepreneurship:** An Entrepreneurship cut across every sector of human life including the field of engineering, engineering entrepreneurship is the process of harnessing the business opportunities in engineering and turning it into profitable commercially viable innovation.
PO--14	**Interpersonal skills:** Interpersonal skills involve the ability to communicate and build relationships with others. Effective interpersonal skills can help the students during the job interview process and can have a positive impact on your career advancement.
PO--15	**Technology savvy/usage:** Being technology savvy is essentially one's skill to be smart with technology. This skill reaches far beyond 'understanding' the concepts of how technology works and encompasses the 'utilization' of such modern technology for the purpose of enhancing productivity and efficiency.

E. Programme Specific Outcomes (PSOs)

The learning and abilities or skills that a student would have developed by the end of four-year **B.Tech. Program:**

PSO –1	**Understanding and remembering** fundamental concepts of assigned courses of each semester.
PSO –2	**Designing,** supervising, testing and evaluating foundations and superstructures for residences, public buildings, industries, irrigation structures, powerhouses, highways, railways, airways, docks and harbours.
PSO –3	**Designing** building by survey, map and plan layouts for buildings, structures and alignments for canals and roads.
PSO –4	**Analyzing** water resources hydrological systems to estimate safe and assured withdrawals, and specify, design, and evaluate water conveying systems, hydraulic machines and surge systems.
PSO –5	**Specifying, selecting and formulating** environmental engineering systems.

F. Pedagogy & Unique practices adopted:

"Pedagogy is the method and practice of teaching, especially for teaching an academic subject or theoretical concept". In addition to conventional time-tested lecture method, the institute will emphasize on experiential learning.

- ***Audio-Visual Based Learning:*** These days technology has taken a front seat and classrooms are well equipped with equipment and gadgets. Video-based learning has become an indispensable part of learning. Similarly, students can learn various concepts through video lectures. In fact, many teachers give examples from movies during their discourses. Making students learn few important theoretical concepts through Audio-visual Aids is a good idea and method. The learning becomes really interesting and easy as visuals add life to concepts and make the learning engaging and effective. Therefore, our institute is promoting *Audio-Visual Based Learning* wherever possible.

- ***Field / Live Projects:*** The students, who take up experiential projects in companies, where senior executives with a stake in teaching guide them, drive the learning. All students are encouraged to do such live project other than their regular classes.

- ***Industrial Visits:*** Industrial visit are essential to give students hand-on exposure and experience of how things and processes work in industries. Our institute organizes such visits to enhance students' exposure to practical learning and work out for a report of such a visit relating to their specific topic, course or even domain.

- *MOOCs:* Students may earn credits by passing MOOC's as decided by the college. Graduate level programs may award Honors degree provided students earn pre-requisite credits through MOOCs.

University allows students to undertake additional subjects/course(s) (In-house offered by the university through collaborative efforts or courses in the open domain by various internationally recognized universities) and to earn additional credits on successful completion of the same. Each course will be approved in advance by the University following the standard procedure of approval and will be granted credits as per the approval.

Keeping this in mind, University proposed and allowed a maximum of two credits to be allocated for each MOOC courses. In the pilot phase it is proposed that a student undertaking and successfully completing a MOOC course through only NPTEL could be given 2 credits for each MOOC course.
For smooth functioning and monitoring of the scheme the following shall be the guidelines for MOOC courses, Add-on courses carried out by the College from time to time.

a) This is recommended for every student to take at least one MOOC Course throughout the programme.
b) There shall be a MOOC co-ordination committee in the College with a faculty at the level of Professor heading the committee and all Heads of the Department being members of the Committee.
c) The Committee will list out courses to be offered during the semester, which could be requested by the department or the students and after deliberating on all courses finalize a list of courses to be offered with 2 credits defined for each course and the mode of credit consideration of the student. The complete process shall be obtained by the College before end of June and end of December for Odd and Even semester respectively of the year in which the course is being offe red. In case of MOOC course, the approval will be valid only for the semester on offer.
d) Students will register for the course and the details of the students enrolling under the course along with the approval of the Vice Chancellor will be forwarded to the Examination department within fifteen days of start of the semester by the Coordinator MOOC through the Principal of the College.
e) After completion of MOOC course, Student will submit the photo copy of Completion certificate of MOOC Course to the Examination cell as proof.
f) Marks will be considered which is mentioned on Completion certificate of MOOC Course.
g) College will consider the credits only in case a student fails to secure minimum required credits the additional subject(s) shall be counted for calculating the minimum credits required for the award of degree.

- *Special Guest Lectures (SGL) & Extra Mural Lectures (EML):* Some topics/concepts need extra attention and efforts athey either may be high in difficulty level or requires experts from specific industry domain to make things/concepts clear for a better understanding from the perspective of the industry. Hence, to cater to the present needs of industry we organize such lectures, as part of lecture series and invite prominent personalities from academia and industry from time to time to deliver the vital inputs and insights.

- *Student Development Programs (SDP):* Harnessing and developing the right talent for the right industry an overall development of a student is required. Apart from the curriculum teaching various skill development programs (training programs) relating to soft skills, interview skills, SAP, Advanced Excel training etc. that may be required as per the need of the student and industry trends, are conducted during the whole program. Participation in such programs is solicited through volunteering and contests.

- *Industry Focused programs:* Establishing collaborations with various industry partners to deliver the programme on sharing basis. The specific courses are to be delivered by industry experts to provide practice-based insight to the students.

- *Special assistance program for slow learners & fast learners:* There is a provision of identify slow learners, develop the mechanism to correcting knowledge gap through result analysis of various class tests. Extra classes will be arranged for slow learners and facilitate them with required study material. There are some terms of advance topics what learning challenging it will be provided to the fast learner.

- *Induction program:* Every year 3 weeks induction program is organized for 1st year students to make them familiarize with the entire academic environment of university including Curriculum, Classrooms, Labs, Faculty, Staff members, Academic calendar and various activities.

- **Mentoring scheme:** There is Mentor-Mentee system. One mentor lecture is provided per week in each class. Students can discuss their problems with mentor who is necessarily a teaching faculty. In this way student's problems or issues can be identified and resolved.

- **Extra-curricular Activities:** Organizing & participation in extracurricular activities will be mandatory to help students develop confidence & face audience boldly. It brings out their leadership qualities along with planning & organizing skills. Students undertake various cultural, sports and other co-curricular activities within and outside their campus. This helps them build their wholesome personality.

- **Career &Personal Counseling:** - Identifies the problem of student as early as possible also gives him to discuss their problems individually as well as with the parents. Counseling enables the students to focus on behavior and feelings with a goal to facilitate positive change.
  Its major role lies in giving: Advice, Help, Support, Tips, Assistance, Guidance.
  Strategies: a) Once in a week the counselors meet the students in order to inquire about problems. b) Available 24x7 on SOS basis.

- **Participation in Workshops, Seminars & writing & Presenting Papers:** Departments plan to organize the workshops, Seminars & Guest lecturers time to time on their respective topics as per academic calendar. Students must have to attend these programs. This participation would be count in the marks of general Discipline & General Proficiency which is the part of course scheme as noncredit course.

- **Formation of Student Clubs, Membership & Organizing & Participating events:** Every department has the departmental clubs with the specific club's name. The entire student's activity would be performed by the club. One faculty would be the coordinator of the student clubs & students would be the members with different responsibility.

- **Capability Enhancement & Development Schemes:** The Institute has these schemes to enhance the capability and holistic development of the students. Following measures/ initiatives are taken up from time to time for the same: Career Counseling, Soft skill development, Remedial Coaching, Bridge Course, Language Lab, Yoga and Meditation, Personal Counseling.

- **Library Visit & Utilization of E-Learning Resources:** Student can visit the library from morning 8 AM to evening 8 PM. Library created its resources Database and provided Online Public Access Catalogue (OPAC) through which users can be accessed from any of the computer connected in the LAN can know the status of the book. Now we are in process to move from OPAC to KOHA.
  a) Institute Library & Information is subscribing online e-books and e-journals databases (DELNET and EBSCO host E-databases) as per the requirement of the institute and fulfilling AICTE norms. IP based access is given to all computers connected on campus LAN to access e-journals.
  b) For the effective utilisation of resources, Information Literacy training programs are conducted for the staff and students.
  c) Wi-Fi enabled campus
  d) Regular addition of latest books and journals
  e) Well maintained e-library to access e-resources

Study & Evaluation Scheme

Semester I

S. No	Category	Course Code	Course	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	BSC-1	EAS116	Engineering Mathematics-I	3	1	-	4	40	60	100
2	BSC-2	EAS112/212	Engineering Physics	3	1	-	4	40	60	100
		EAS113/213	Engineering Chemistry							
3	ESC-1	EEE117/217	Basic Electrical Engineering	3	1	-	4	40	60	100
		EEC111/211	Basic Electronics Engineering							
4	AECC-1	TMU101	Environmental Studies	2	1	-	3	40	60	100
5	AECC-2	TGE103	English Communication- 1	1	-	2	2	40	60	100
6	LC-1	EAS162/262	Engineering Physics (Lab)	-	-	2	1	50	50	100
		EAS163/263	Engineering Chemistry (Lab)							
7	LC-2	EEE161/261	Basic Electrical Engineering (Lab)	-	-	2	1	50	50	100
		EEC161/261	Basic Electronics Engineering (Lab)							
8	LC-3	EME161/261	Engineering Drawing (Lab)	-	-	4	2	50	50	100
		EME162/262	Workshop Practice (Lab)							
9	DGP-1	EGP111	Discipline & General Proficiency	-	-	-	-	100	-	100
			Total	**12**	**4**	**10**	**21**	**450**	**450**	**900**

Semester II

S. No	Category	Course Code	Course	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	BSC-3	EAS211	Engineering Mathematics-II	3	1	-	4	40	60	100
2	BSC-4	EAS212/112	Engineering Physics	3	1	-	4	40	60	100
		EAS213/113	Engineering Chemistry							
3	ESC-2	EEE217/117	Basic Electrical Engineering	3	1	-	4	40	60	100
		EEC211/111	Basic Electronics Engineering							
4	ESC-3	ECS212	Computer System & Programming in C++	3	-	-	3	40	60	100
5	AECC-3	TGE203	English Communication- II	1	-	2	2	40	60	100
6	LC-4	EAS262/162	Engineering Physics (Lab)	-	-	2	1	50	50	100
		EAS263/163	Engineering Chemistry (Lab)							
7	LC-5	EEE261/161	Basic Electrical Engineering (Lab)	-	-	2	1	50	50	100
		EEC261/161	Basic Electronics Engineering (Lab)							
8	LC-6	ECS262	Computer System & Programming in C++ (Lab)	-	-	2	1	50	50	100
9	LC-7	EME261/161	Engineering Drawing (Lab)	-	-	4	2	50	50	100
		EME262/162	Workshop Practice (Lab)							
11	LPBEI-I	BLPBEI201	LPBEI-I*	2	-	-	2	100	0	100
12	DGP-2	EGP211	Discipline & General Proficiency	-	-	-	-	100	-	100
			Total	**15**	**3**	**12**	**24**	**600**	**500**	**1100**

*** Learning by Project Based Entrepreneurship Initiatives (Stage A, B & C)**

Stage A: Forming a team of multidisciplinary background

Stage B: Identifying business opportunity, Analysis of current economic, Social and Technology trends

Stage C: Market & customer Studies

B.Tech. (Civil Engineering)-Semester III

S. No	Category	Course Code	Course	Periods			Evaluation Scheme			
				L	T	P	Credit	Internal	External	Total
1	PCC-1	ECE311	Fluid Mechanics	3	1	-	4	40	60	100
2	PCC-2	ECE312	Surveying	3	1	-	4	40	60	100
3	PCC-3	ECE313	Building Materials & Construction	3	-	-	3	40	60	100
4	PCC-4	ECE314	Concrete Technology	3	1	-	4	40	60	100
5	ESC-4	EME311	Engineering Mechanics	3	1	-	4	40	60	100
6	LC-8	ECE360	Surveying (Lab)	-	-	2	1	50	50	100
7	LC-9	ECE361	Fluid Mechanics (Lab)	-	-	2	1	50	50	100
8	LC-10	ECE362	Building Planning and Drawing using CAD (Lab)	-	-	2	1	50	50	100
9	**MSC-1**	**ECE SI 24 0101**	**Basics of Python Programming**	3	1	-	4	40	60	100
10	LC-11	ECE363	Materials Testing (Lab)	-	-	2	1	50	50	100
11	SEC-1	TGC307	Foundation in Quantitative Aptitude	-	-	2	1	50	50	100
12	DGP-3	EGP311	Discipline & General Proficiency	-	-	-	-	100	-	100
			Total	18	5	10	28	590	610	1200

Following additional Course for Lateral Entry Students with B.Sc. background to be taken in III semester and all should pass with minimum of 45% marks for obtaining the degree: credits will not be added

1	LC	EME161/261	Engineering Drawing (Lab)	-	-	4	-	50	50	100
2		TMU101	Environmental Studies	2	1	-	-	40	60	100

B.Tech. (Civil Engineering)-Semester IV

S. No	Category	Course Code	Course	Periods			Evaluation Scheme			
				L	T	P	Credit	Internal	External	Total
1	PCC-5	ECE411	Geoinformatics	3	1	-	4	40	60	100
2	PCC-6	ECE412	Mechanics of Solids	3	1	-	4	40	60	100
3	PCC-7	ECE413	Engineering Geology & Soil Mechanics	3	1	-	4	40	60	100
4	PCC-8	ECE414	Transportation Engineering	3	-	-	3	40	60	100
5	MSC-2	ECE SI 24 0102	Introduction to Artificial Intelligence	3	1	-	4	40	60	100
6	LC-12	ECE461	Geoinformatics (Lab)	-	-	2	1	50	50	100
7	LC-13	ECE462	Mechanics of Solids (Lab)	-	-	2	1	50	50	100
8	LC-14	ECE463	Engineering Geology & Soil Mechanics (Lab)	-	-	2	1	50	50	100
9	LC-15	ECE464	Transportation Engineering (Lab)	-	-	2	1	50	50	100
10	SEC-2	TGC40 -	Analytical Reasoning	-	-	2	1	50	50	100
11	LPBEI-2	BLPBEI 401	LPBEI-II*	2	-	-	2	100	0	100
12	DGP-4	EGP411	Discipline & General Proficiency	-	-	-	-	100	-	100
			Total	**17**	**4**	**10**	**26**	**610**	**490**	**1100**

*Skill based Training/Internship of 4 weeks duration from a reputed Industry/organization after completion of 4th semester end-semester examination.

Following additional Courses for Lateral Entry Students with B.Sc. background to be taken in IV semester and all should pass with minimum of 45% marks for obtaining the degree: credits will not be added

1	LC	EME162/262	Workshop Practice (Lab)	-	-	4	-	50	50	100

* Learning by Project Based Entrepreneurship Initiatives (Stage D)

Stage D: Project formulation, analysis & Evaluation Phase

B.Tech. (Civil Engineering)-Semester V

S. No	Category	Course Code	Course	Periods			Evaluation Scheme			
				L	T	P	Credit	Internal	External	Total
1	PCC-9	ECE511	Steel Structure-I	3	1	-	4	40	60	100
2	PCC-10	ECE512	Geotechnical Engineering	3	-	-	3	40	60	100
3	PCC-11	ECE513	Structural Analysis-I	3	1	-	4	40	60	100
4	PCC-12	ECE514	RCC Structure-I	3	1	-	4	40	60	100
5	PCC-13	ECE515	Hydrology & Irrigation Engineering	3	-	-	3	40	60	100
6	MSC-2	ECE SI 24 0103	Ancient Material and Construction Techniques	3	1	-	4	40	60	100
7	LC-16	ECE562	Geotechnical Engineering (Lab)	-	-	2	1	50	50	100
8	LC-17	ECE563	Structural Analysis-I (Lab)	-	-	2	1	50	50	100
9	AECC-4	ECE564	Survey Camp	-	-	-	1	50	50	100
10	PROJ-1	ECE592	Skill based Practical Training & Presentation	-	-	-	2	50	50	100
11	SEC-3	TGC507	Modern Algebra and Data Management	-	-	2	1	50	50	100
12	SEC-4	TGC502	Self-Management for Engineers	-	-	2	1	50	50	100
13	DGP-5	EGP511	Discipline & General Proficiency	-	-	-	-	100	-	100
			Total	18	4	8	29	600	600	1200

MOOC Course:

1	MOOC-1	MOOC01	MOOC Program -I (Optional)	-	-	-	2	-	100	100

B.Tech. (Civil Engineering)-Semester VI

S. No	Category	Course Code	Course	Periods			Evaluation Scheme			
				L	T	P	Credit	Internal	External	Total
1	PCC-14	ECE611	Steel Structure-II	3	1	-	4	40	60	100
2	PCC-15	ECE612	Public Health & Environmental Engineering	3	-	-	3	40	60	100
3	PCC-16	ECE613	Structural Analysis-II	3	1	-	4	40	60	100
4	PCC-17	ECE614	Estimation & Costing	2	1	-	3	40	60	100
5	PCC-18	ECE615	RCC Structure-II	3	1	-	4	40	60	100
6	AECC-5	EHM613	Human values & Professional Ethics	3	-	-	3	40	60	100
7	LC-18	ECE661	Public Health & Environmental Engineering (Lab)	-	-	2	1	50	50	100
8	LC-19	ECE662	Estimation & Costing (Lab)	-	-	2	1	50	50	100
9	SEC-5	TGC607	Advance Algebra and Geometry	-	-	2	1	50	50	100
10	SEC-6	TGC602	Workplace Management for Engineers	-	-	2	1	50	50	100
12	LPBEI-3	BLPBEI601	LPBEI-III*	2	-	-	2	100	0	100
13	DGP-6	EGP611	Discipline & General Proficiency	-	-	-	-	100	-	100
			Total	22	5	8	31	640	460	1100

MOOC Course:

1	MOOC-2	MOOC02	MOOC Program –II (Optional)	-	-	-	2	-	100	100

* **Learning by Project Based Entrepreneurship Initiatives (Stage E & F)**

Stage E: Entrepreneurial Activity

Stage F: Project Outcomes

B.Tech. (Civil Engineering)-Semester VII

S. No.	Category	Course Code	Course		Periods			Evaluation Scheme			
					L	T	P	Credit	Internal	External	Total
1	PCC-19	ECE719	Earthquake Resistant Structures		3	-	-	3	40	60	100
2	PEC-1		Program Elective	Program Elective-I	3	-	-	3	40	60	100
3	PEC-2			Program Elective-II	3	-	-	3	40	60	100
4	PEC-3			Program Elective-III	3	0	-	3	40	60	100
5	OEC-1		Open Elective	Open Elective-I	3	-	-	3	40/50	60/50	100
6	MNC-5	ECE SI 24 0104	Renewable energy in Built-Environment								
7	LC-20	ECE761	Analysis & Design (Lab)		-	-	2	1	50	50	100
8	PROJ-2	ECE792	Industrial Training & Presentation		-	-	-	2	50	50	100
9	PROJ-3	ECE798	Project Work Phase-I		1	-	8	5	100	-	100
10	DGP-7	EGP711	Discipline & General Proficiency		-	-	-	-	100	-	100
			Total		19	1	10	27	500/510	400/390	900

MOOC Course:

1	MOOC-3	MOOC03	MOOC Program –III (Optional)	-	-	-	2	-	100	100

B.Tech. (Civil Engineering)-Semester VIII

S. No	Category	Course Code	Course		Periods			Evaluation Scheme			
					L	T	P	Credit	Internal	External	Total
1	PCC-20	ECE811	Project Planning &Control		3	-	-	3	40	60	100
2	PCC-21	ECE812	Design of Hydraulic Structures		3	-	-	3	40	60	100
3	PEC-4		Program Elective	Program Elective-IV	3	-	-	3	40	60	100
4	PEC-5			Program Elective-V	3	1	-	4	40	60	100
5	OEC-2		Open Elective	Open Elective-II	3	-	-	3	40/50	60/50	100
6	MNC-5	ECE SI 24 0105	**Green Building Material & Practices**		3	0					
6	PROJ-4	ECE898	Project Work Phase-II		1	-	4	3	50	50	100
7	DGP-8	EGP811	Discipline & GeneralProficiency		-	-	-	-	100	-	100
			Total		17	2	4	23	350/360	350/340	700

MOOC Course:

1	MOOC-4	MOOC04	MOOC Program –IV (Optional)	-	-	-	2	-	100

ELECTIVE COURSES OFFERED

S. No	Code	Course	L	T	P	Credit
Semester VII- Program Elective I- (Remote Sensing and Transportation Engineering) -Any one						
1	ECE712	Introduction to Remote Sensing	3	0	0	3
2	ECE713	Pavement Design	3	0	0	3
3	ECE715	Transportation Systems and Planning	3	0	0	3
4	ECE717	Introduction to GIS	3	0	0	3
5	ECE718	Railway and Airport Engineering	3	0	0	3
Semester VII- Program Elective II– (Structural Engineering)- Any one						
6	ECE711	Advanced Computer Aided Design (CAD)	3	0	0	3
7	ECE720	Advanced Concrete Design	3	0	0	3
8	ECE721	Pre-stressed Concrete	3	0	0	3
9	ECE722	Finite Element Method	3	0	0	3
10	ECE723	Building Maintenance & Repair	3	0	0	3
11	ECE724	Groundwater Management	3	0	0	3
Semester VII- Program Elective III-(Management) -Any one						
12	ECE731	Principle of Management	3	0	0	3
13	ECE732	Industrial Sociology	3	0	0	3
14	ECE733	Engineering and Managerial Economics	3	0	0	3
15	ECE734	Solid and HazardousWaste Management	3	0	0	3
16	ECE735	Disaster Management	3	0	0	3
Semester VIII- Program Elective IV– (Environmental and Geotechnical Engineering) -Any one						
17	ECE813	Rock Mechanics	3	0	0	3
18	ECE815	Bridge Engineering	3	0	0	3
19	ECE816	Environmental Impact Assessment and Management	3	0	0	3
20	ECE817	Plastic Analysis of Steel Structures	3	0	0	3
21	ECE818	Advanced Foundation Design	3	0	0	3
Semester VIII- Program Elective V-(Any one)						
22	ECE831	Machine learning & Data Analytics	3	1	0	4
23	ECE832	Total Quality Management	3	1	0	4
24	ECE833	Entrepreneurship	3	1	0	4
25	ECE834	Marine Structures & Airport Engineering	3	1	0	4

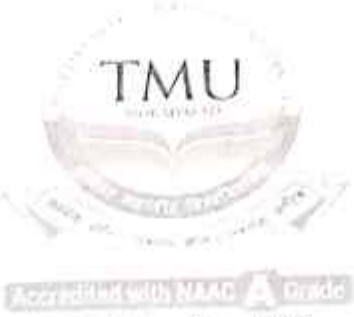
Annexure- III

Study & Evaluation Scheme

of

Bachelor of Technology
(Civil Engineering)
[Applicable w.e.f. Academic Session - 2023-24]

[As per CBCS guidelines given by AICTE]



12-B Status from UGC

TEERTHANKER MAHAVEER UNIVERSITY
N.H.-24, Delhi Road, Moradabad, Uttar Pradesh-244001
Website: www.tmu.ac.in

TEERTHANKER MAHAVEER UNIVERSITY
(Established under Govt. of U.P. Act No. 30, 2008)
Delhi Road, Bagarpur, Moradabad (U.P.)

Study & Evaluation Scheme *SUMMARY*	
Institute Name	*Faculty of Engineering*
Programme	*B.Tech. (Civil Engineering)*
Duration	*Four-year full time (Eight Semesters)*
Medium	*English*
Minimum Required Attendance	*75%*
Credits	
Minimum Credits Required for Degree	*189*

Assessment:

Evaluation			Internal	External	Total
Theory			40	60	100
Practical/ Dissertations/ Project Reports/ Viva-Voce			50	50	100
Class Test-1	Class Test-2	Class Test-3	Assignment(s)	Attendance & Participation	Total
Best two out of three					
10	10	10	10	10	40
Duration of Examination			External	Internal	
			3 Hours	1.5 Hours	

To qualify the course a student is required to secure a minimum of 45% marks in aggregate including the semester end examination and teachers' continuous evaluation (i.e. both internal and external). A candidate who secures less than 45% of marks in a course shall be deemed to have failed in that course. The student should have at least 45% marks in aggregate to clear the semester.

= Provision for delivery of 25% content through online mode.

Policy regarding promoting the students from semester to semester & year to year. No specific condition to earn the credit for promoting the students from one semester to next semester.

Maximum no of years required to complete the program: N+2 (N=No of years for program)

Question Paper Structure

1	*The question paper shall consist of six questions. Out of which first question shall be of short answer type (not exceeding 50 words) and will be compulsory. Question no. 2 to 6 (from Unit-I to V) shall have explanatory answers (approximately 350 to 400 words) along with having an internal choice within each unit.*
2	*Question No. 1 shall contain 8 parts from all units of the syllabus with at least one question from each unit and students shall have to answer any five, each part will carry 2 marks.*
3	*The remaining five questions shall have internal choice within each unit, each question will carry 10 marks.*

IMPORTANT NOTES:

1	*The purpose of examination should be to assess the Course Outcomes (CO) that will ultimately lead to of attainment of Programme Specific Outcomes (PSOs). A question paper must assess the following aspects of learning: Remember, Understand, Apply, Analyze, Evaluate & Create (reference to Bloom's Taxonomy).*
2	*Case Study is essential in every question paper (wherever it is being taught as a part of pedagogy) for evaluating higher-order learning. Not all the courses might have case teaching method used as pedagogy.*
3	*There shall be continuous evaluation of the student and there will be a provision of fortnight progress report.*

Program Structure-B.Tech.- Civil Engineering

A. Introduction:

Civil engineering is a professional engineering discipline that deals with the design, construction, and maintenance of the physical and naturally built environment, including public works such as roads, bridges, canals, dams, airports, sewerage systems, pipelines, structural components of buildings, and railways. Employability, innovation, theory to practice connectedness is the central focus of B.Tech - Civil engineering curriculum. The curriculum is designed as such that the students can gain an in-depth mastery of the academic disciplines and applied functional areas necessary to meet the requirements of the industry.

Students will develop and gain various skills that are transferable within the engineering world and practical skills that are equally useful in plenty of other sectors. Problem-solving skills are honed, and their interpersonal and communication skills will also improve with the amount of team work that they will be required to do. Students will also learn how to better manage their time and resources and assess the risks involved in a certain project. Other useful skills that they will learn include design, leadership and organisational skills.

The institute emphasis on the following courses ***balanced with core and elective courses:*** The curriculum of B.Tech. program emphasizes an intensive, flexible engineering education with 189 credits. Total 189 credits are allotted for the B.Tech. degree.

The programme structure and credits for B.Tech. are finalized based on the stakeholders' requirements and general structure of the programme. Minimum number of class room contact teaching credits for the B.Tech. program will be 189 credits (one credit equals 1.0 hour). However, the minimum number of the credits for award of B.Tech. degree will be 184 credits. Out of 167 credits of classroom contact teaching, 74 credits are to be allotted for core courses (PCC), 16 credits are allotted to Basic Science Courses (BSC), 15 credits are allotted to Engineering Science Courses (ESC), 11 credits are allotted to AECC-Ability Enhancement Compulsory Course, 06 credits are allotted to open elective courses (OEC), 17 credits are allotted to Professional Elective courses, 06 credits are allotted to SEC-Skill Enhancement Course and rest of 22 credits for Laboratory courses. 10 credits are allotted for LPBEI, Deep reading & Co-curricular Activities(CCA) as per NEP 2020. Credits distribution is given below in tabular form:

B.Tech. Civil Engineering: Four-Year (8-Semester) CBCS Programme Basic Structure: Distribution of Courses			
S. No.	Type of Course	Credit Hours	Total Credits
1	BSC - Basic Science Courses	4 Courses of 4 Credits each (Total Credit Hrs. 4X4)	16
2	ESC - Engineering Science Courses	3 Courses of 4 Credits each (Total Credit Hrs. 3X4) 1 Courses of 3 Credits each (Total Credit Hrs. 1X3)	15
3	PCC - Professional core courses	10 Courses of 3 Credits each (Total Credit Hrs. 10X3) 11 Courses of 4 Credits each (Total Credit Hrs. 11X4)	[illegible]
4	PEC - Professional Elective courses	2 Courses of 4 Credits each (Total Credit Hrs. 2X4) 3 Course of 3 Credits each (Total Credit Hrs. 3X3)	17
5	OEC - Open Elective courses	2 Course of 3 Credits each (Total Credit Hrs. 2X3)	06
6	SEC-Skill Enhancement Course	6 Courses of 1 Credit each (Total Credit Hrs. 6X1)	06
7	LC - Laboratory course	18 Courses of 1 Credits each (Total Credit Hrs. 18X1) 2 Courses of 2 Credits each (Total Credit Hrs. 2X2)	22
8	AECC-Ability Enhancement Compulsory Course	2 Course of 3 Credits each (Total Credit Hrs.2X3) 2 Courses of 2 Credits each (Total Credit Hrs.2X2) 1 Course of 1 Credits each (Total Credit Hrs. 1X5)	11
9	PROJ-Skill based practical training & Industrial Training Report & Viva Voce for Dissertation	1 Course of 5 Credits each (Total Credit Hrs. 1X5) 1 Course of 3 Credits each (Total Credit Hrs. 1X3) 2 Course of 2 Credits each (Total Credit Hrs. 2X2)	12
10	MOOC-Optional (credits will consider only in case a student fails to secure minimum required credits for the award of degree)	As per the approval from Hon'ble Vice Chancellor	
11	LPBEI- Learning by Project Based Entrepreneurship Initiative	3 Course of 2 Credits each (Total Credit Hrs. 3X2)	06
13	CCA- co-curricular Activities	1 Course of 1 Credits each (Total Credit Hrs. 3X1)	01
15	DGP- Discipline & General Proficiency	8 Course of 0 Credits each (Total Credit Hrs. 8X0)	00
Total Credits			185

Contact hours include work related to Lecture, Tutorial and Practical (LTP), where our institution will have flexibility to decide course wise requirements.

B. Tech. (Hons.) Programme:

A new academic programme B.Tech. (Hons.) is introduced in order to facilitate the students to choose additionally the specialized courses of their choices and build their competence in a specialized area. The features of the new programme, include:

1. B.Tech. Student in regular stream can opt for B.Tech. (Hons.), provided he/she passed in all courses with minimum aggregate 75% marks up-to the end of second semester.
2. For B. Tech (Hons). Student needs to earn additional 24 credits (over and above the required minimum 180 credits) relevant to her/his discipline as recommended by the faculty advisor.
3. The students opting for this program have to take four additional courses of their specialization of a minimum of 2 credits each from 3rd to 8th semesters.
4. The faculty advisor will suggest the additional courses to be taken by the students based on their cho[illegible]

and level of their academic competence.

5. The list of such additional courses offered by the NPTEL will be approved by the Honorable Vice Chancellor in the beginning of the academic year to facilitate the registration process.
6. The student can also opt for post graduate level courses.
7. The students have to submit the NPTEL course completion certificate to exam division for consideration as B.Tech.. (Hons)

* Student should have to take permission of registration for the B.Tech. (Hons.) degree from Honourable Vice Chancellor in starting of third semester.

C. Choice Based Credit System (CBCS)

Choice Based Credit System (CBCS) is a versatile and flexible option for each student to achieve his/her target number of credits as specified by the AICTE/UGC and adopted by our university.

The following is the course module designed for the B.Tech.. program:

- ***Program Core Course (PCC):*** Core courses of B.Tech.. program will provide a holistic approach to engineering education, giving students an overview of the field, a basis to build and specialize upon. These core courses are the strong foundation to establish technical knowledge and provide broad multi-disciplined knowledge can be studied further in depth during the elective phase. The core courses will provide more practical-based knowledge, case-based lessons and collaborative learning models. It will train the students to analyze, decide, and lead-rather than merely know-while creating a common student experience that can foster deep understanding, develop decision-making ability and contribute to the society at large.

  A wide range of core courses provides groundwork in the basic civil engineering disciplines: surveying, transportation engineering, structural engineering, geotechnical engineering, environmental engineering, hydraulic engineering, etc.

  We offer core courses in semester III, IV, V, VI, VII &VIII during the B.Tech.. (Civil) program. There will be 3 or 4 credits for each core course offered depending upon the course content.

- ***Open Elective Course (OEC):*** Open Elective is an interdisciplinary additional subject that is compulsory in a program. The score of Open Elective is counted in the overall aggregate marks under Choice Based Credit System (CBCS). Each Open Elective paper will be of 3 Credits in VII and VIII semesters. Each student has to take Open/Generic Electives from department other than the parent department. Core Discipline Specific Electives will not be offered as Open Electives.

- **Ability Enhancement Compulsory Course (AECC):** This is a compulsory course that does not carry any choice and will be 2, 3, 5 credits. Each student of B.Tech. Program has to compulsorily pass the Environmental Studies and acquire 3 credits respectively.

- ***Skill Enhancement Course (SEC):*** A Skill Enhancement Course is a credit course which is basically meant to enhance general ability of students in areas like soft skills, quantitative aptitude and reasoning ability - required for the overall development of a student and at the same time crucial for industry/corporate demands and requirements. The student possessing these skills will definitely develop acumen to perform well during the recruitment process of any premier organization and will have the desired confidence to face the interview. Moreover, these skills are also essential in day-to-day life of the corporate world. The aim is to nurture every student for making effective communication, developing aptitude and a general reasoning ability for a better performance, as desired in corporate world. There

shall be four courses of Aptitude in Semester III, IV, V & VI semesters and two courses of Soft Skills V &VI Semesters and will carry 2 credit, as compulsory for every student to pass these courses with minimum 45% marks.

- *Professional Elective courses (PEC):* The discipline specific elective course is chosen to make student specialist or having specialized knowledge of a specific domain like thermo-fluids, designing, industrial production management etc. It will be covered in two semesters (VII &VIII) of fourth year of the program relevant to chosen disciplines of core courses of the program. The student will have to choose any five theories out of the given list of specialization offered. Each theory of 3 & 4 credits.

D. Program Outcomes for Engineering:

PO – 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO – 2	**Problem analysis& Solving:** Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO – 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO – 4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO – 5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO – 6	**Social Interaction & effective citizenship:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO – 7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO – 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO – 9	**Attitude (Individual and team work):** Function effectively as an individual, and as member or leader in diverse teams, and in multidisciplinary settings.
PO – 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clean instructions.
PO – 11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO – 12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
PO--13	**Entrepreneurship:** An Entrepreneurship cut across every sector of human life including the field of engineering, engineering entrepreneurship is the process of harnessing the business opportunities in engineering and turning it into profitable commercially viable innovation.
PO--14	**Interpersonal skills:** Interpersonal skills involve the ability to communicate and build relationships with others. Effective interpersonal skills can help the student during the job interview process and can have a positive impact on your career advancement.
PO--15	**Technology savvy/usage:** Being technology savvy is essentially one's skill to be smart with technology. This skill reaches far beyond 'understanding' the concepts of how technology works and encompasses the 'utilization' of such modern technology for the purpose of enhancing productivity and efficiency.

E. Programme Specific Outcomes (PSOs)

The learning and abilities or skills that a student would have developed by the end of four-year **B.Tech. Program:**

PSO –1	**Understanding and remembering** fundamental concepts of assigned courses of each semester.
PSO –2	**Designing,** supervising, testing and evaluating foundations and superstructures for residences, public buildings, industries, irrigation structures, powerhouses, highways, railways, airways, docks and harbours.
PSO –3	**Designing** building by survey, map and plan layouts for buildings, structures and alignments for canals and roads.
PSO –4	**Analyzing** water resources hydrological systems to estimate safe and assured withdrawals, and specify, design, and evaluate water conveying systems, hydraulic machines and surge systems.
PSO –5	**Specifying, selecting and formulating** environmental engineering systems.

F. Pedagogy & Unique practices adopted:

"Pedagogy is the method and practice of teaching, especially for teaching an academic subject or theoretical concept". In addition to conventional time-tested lecture method, the institute will emphasize on experiential learning.

- *Audio-Visual Based Learning:* These days technology has taken a front seat and classrooms are well equipped with equipment and gadgets. Video-based learning has become an indispensable part of learning. Similarly, students can learn various concepts through video lectures. In fact, many teachers give examples from movies during their discourses. Making students learn few important theoretical concepts by Audio visual Aids is a good idea and method. The learning becomes really interesting and easy as videos add life to concepts and make the learning engaging and effective. Therefore, our institute is promoting *Audio-Visual Based Learning* wherever possible.

- *Field / Live Projects:* The students, who take up experiential projects in companies, where senior executives with a stake in teaching guide them, drive the learning. All students are encouraged to do one live project other than their regular classes.

- *Industrial Visits:* Industrial visit are essential to give students hand-on exposure and experience of how things and processes work in industries. Our institute organizes such visits to enhance students' exposure to practical learning and work out for a report of such a visit relating to their specific topic, course or even domain.

- *MOOCs:* Students may earn credits by passing MOOCs as decided by the college. Graduate [illegible] programs may award Honors degree provided students earn pre-requisite credits through specific [illegible]

University allows students to undertake additional subjects/course(s) (In-house offered by the university through collaborative efforts or courses in the open domain by various internationally recognized universities) and to earn additional credits on successful completion of the same. Each course will be approved in advance by the University following the standard procedure of approval and will be granted credits as per the approval.

Keeping this in mind, University proposed and allowed a maximum of two credits to be allocated for [illegible] MOOC courses. In the pilot phase it is proposed that a student undertaking and successfully completing a MOOC course through only NPTEL could be given 2 credits for each MOOC course.
For smooth functioning and monitoring of the scheme the following shall be the guidelines for MOOC courses. Add-on courses carried out by the College from time to time.

a) This is recommended for every student to take at least one MOOC Course throughout the programme.
b) There shall be a MOOC co-ordination committee in the College with a faculty at the level of Professor heading the committee and all Heads of the Department being members of the Committee.
c) The Committee will list out courses to be offered during the semester, which could be requested by the department or the students and after deliberating on all courses finalize a list of courses to be offered with 2 credits defined for each course and the mode of credit consideration of the student. The complete process shall be obtained by the College before end of June and end of December for Odd and Even semester respectively of the year in which the course is being offe red. In case of MOOC course, the approval will be valid only for the semester on offer.
d) Students will register for the course and the details of the students enrolling under the course [illegible] with the approval of the Vice Chancellor will be forwarded to the Examination department within fifteen days of start of the semester by the Coordinator MOOC through the Principal of the College.
e) After completion of MOOC course, Student will submit the photo copy of Completion certificate of MOOC Course to the Examination cell as proof.
f) Marks will be considered which is mentioned on Completion certificate of MOOC Course.
g) College will consider the credits only in case a student fails to secure minimum required credits then the additional subject(s) shall be counted for calculating the minimum credits required for the award of degree.

- *Special Guest Lectures (SGL) & Extra Mural Lectures (EML):* Some topics concepts need extra attention and efforts as they either may be high in difficulty level or requires experts from specific industry domain to make things concepts clear for a better understanding from the perspective of [illegible] industry. Hence, to cater to the present needs of industry we organize such lectures, as part of lecture series and invite prominent personalities from academia and industry from time to time to deliver their [illegible] vital inputs and insights.

- *Student Development Programs (SDP):* Harnessing and developing the right talent for the right industry an overall development of a student is required. Apart from the curriculum teaching various [illegible] development programs (training programs) relating to soft skills, interview skills, SAP, Advanced [illegible] training etc. that may be required as per the need of the student and industry trends, are conducted across the whole program. Participation in such programs is solicited through volunteering and consensus.

- *Industry Focused programs:* Establishing collaborations with various industry partners [illegible] programme on sharing basis. The specific courses are to be delivered by industry experts to provide practice-based insight to the students.

- *Special assistance program for slow learners & fast learners:* There is a provision of identifying slow learners, develop the mechanism to correcting knowledge gap through result analysis of various [illegible] tests. Extra classes will be arranged for slow learners and facilitate them with required study material. There are some terms of advance topics what learning challenging it will be provided [illegible]

- *Induction program:* Every year 3 weeks induction program is organized for the fresh students to them familiarize with the entire academic environment of university including Curriculum, Classrooms, Labs, Faculty, Staff members, Academic calendar and various activities.

- **Mentoring scheme:** There is Mentor-Mentee system. One mentor lecture is provided per week in a class. Students can discuss their problems with mentor who is necessarily a teaching faculty. In this, the student's problems or issues can be identified and resolved.

- **Extra-curricular Activities:** Organizing & participation in extracurricular activities will be arranged to help students develop confidence & face audience boldly. It brings out their leadership qualities with planning & organizing skills. Students undertake various cultural, sports and other co-curricular activities within and outside their campus. This helps them build their wholesome personality.

- **Career & Personal Counseling:** - Identifies the problem of student as early as possible and provides to discuss their problems individually as well as with the parents. Counseling enables the students to on behavior and feelings with a goal to facilitate positive change.
  Its major role lies in giving: Advice, Help, Support, Tips, Assistance, Guidance.
  Strategies: a) Once in a week the counselors meet the students in order to inquire about problems. Available 24x7 on SOS basis.

- **Participation in Workshops, Seminars & writing & Presenting Papers:** Departments plan to organize the workshops, Seminars & Guest lectures time to time as their respective departmental calendar. Students must have to attend these programs. This participation would be count in the marks of general Discipline & General Proficiency which is the part of course scheme as noncredit course.

- **Formation of Student Clubs, Membership & Organizing & Participating events:** Every department has the departmental clubs with the specific club's name. The entire student's activity would be performed by the club. One faculty would be the coordinator of the student clubs & students would be the members with different responsibility.

- **Capability Enhancement & Development Schemes:** The Institute has these schemes to enhance the capability and holistic development of the students. Following measures/ initiatives are taken up from time to time for the same: Career Counseling, Soft skill development, Remedial Coaching, Bridge Course, Language Lab, Yoga and Meditation, Personal Counseling.

- **Library Visit & Utilization of E-Learning Resources:** Student can visit the library from morning 10 AM to evening 8 PM. Library created its resources Database and provided Online Public Access Catalogue (OPAC) through which users can be accessed from any of the computer connected in the LAN can know the status of the book. Now we are in process to move from OPAC to KOHA.
  a) Institute Library & Information is subscribing online e-books and e-journals databases (DELNET and EBSCO host E-databases) as per the requirement of the institute and fulfilling. Web, Library IP based access is given to all computers connected on campus LAN to access e-journals.
  b) For the effective utilisation of resources, Information Literacy training programs are conducted to the staff and students.
  c) Wi-Fi enabled campus.
  d) Regular addition of latest books and journals.
  e) Well maintained e-library to access e-resources.

Study & Evaluation Scheme

Semester I

S. No	Category	Course Code	Course	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	BSC-1	EAS116	Engineering Mathematics-I	3	1	-	4	40	60	100
2	BSC-2	EAS112/212	Engineering Physics	3	1	-	4	40	60	100
		EAS113/213	Engineering Chemistry							
3	ESC-1	EEE117/217	Basic Electrical Engineering	3	1	-	4	40	60	100
		EEC111/211	Basic Electronics Engineering							
4	AECC-1	TMU101	Environmental Studies	2	1	-	3	40	60	100
5	AECC-2	TGE103	English Communication- I	1	-	2	2	40	60	100
6	LC-1	EAS162/262	Engineering Physics (Lab)	-	-	2	1	50	50	100
		EAS163/263	Engineering Chemistry (Lab)							
7	LC-2	EEE161/261	Basic Electrical Engineering (Lab)	-	-	2	1	50	50	100
		EEC161/261	Basic Electronics Engineering (Lab)							
8	LC-3	EME161/261	Engineering Drawing (Lab)	-	-	4	2	50	50	100
		EME162/262	Workshop Practice (Lab)							
9	DGP-1	EGP111	Discipline & General Proficiency	-	-	-	-	100	-	100
			Total	**12**	**4**	**10**	**21**	**450**	**450**	**900**

Semester II

S. No	Category	Course Code	Course	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	BSC-3	EAS211	Engineering Mathematics-II	3	1	-	4	40	60	100
2	BSC-4	EAS212/112	Engineering Physics	3	1	-	4	40	60	100
		EAS213/113	Engineering Chemistry							
3	ESC-2	EEE217/117	Basic Electrical Engineering	3	1	-	4	40	60	100
		EEC211/111	Basic Electronics Engineering							
4	ESC-3	ECS212	Computer System & Programming in C++	3	-	-	3	40	60	100
5	AECC-3	TGE203	English Communication- II	1	-	2	2	40	60	100
6	LC-4	EAS262/162	Engineering Physics (Lab)	-	-	2	1	50	50	100
		EAS263/163	Engineering Chemistry (Lab)							
7	LC-5	EEE261/161	Basic Electrical Engineering (Lab)	-	-	2	1	50	50	100
		EEC261/161	Basic Electronics Engineering (Lab)							
8	LC-6	ECS262	Computer System & Programming in C++ (Lab)	-	-	2	1	50	50	100
9	LC-7	EME261/161	Engineering Drawing (Lab)	-	-	4	2	50	50	100
		EME262/162	Workshop Practice (Lab)							
10	CCA-1	BCCA201	Co-Curricular Activity-I	-	-	2	1	100	0	100
11	LPBEI-I	BLPBEI201	LPBEI-I*	2	-	-	2	100	0	100
12	DGP-2	EGP211	Discipline & General Proficiency	-	-	-	-	100	-	100
			Total	**15**	**3**	**14**	**25**	**700**	**500**	**1200**

* **Learning by Project Based Entrepreneurship Initiatives (Stage A, B & C)**

Stage A: Forming a team of multidisciplinary background

Stage B: Identifying business opportunity, Analysis of current economic, Social and Technology trends

Stage C: Market & customer Studies

B.Tech. (Civil Engineering)-Semester III

S. No	Category	Course Code	Course	Periods			Evaluation Scheme			
				L	T	P	Credit	Internal	External	Total
1	PCC-1	ECE311	Fluid Mechanics	3	1	-	4	40	60	100
2	PCC-2	ECE312	Surveying	3	1	-	4	40	60	100
3	PCC-3	ECE313	Building Materials & Construction	3	-	-	3	40	60	100
4	PCC-4	ECE314	Concrete Technology	3	1	-	4	40	60	100
5	ESC-4	EME311	Engineering Mechanics	3	1	-	4	40	60	100
6	LC-8	ECE360	Surveying (Lab)	-	-	2	1	50	50	100
7	LC-9	ECE361	Fluid Mechanics (Lab)	-	-	2	1	50	50	100
8	LC-10	ECE362	Building Planning and Drawing using CAD (Lab)	-	-	2	1	50	50	100
9	LC-11	ECE363	Materials Testing (Lab)	-	-	2	1	50	50	100
10	SEC-1	TGC307	Foundation in Quantitative Aptitude	-	-	2	1	50	50	100
12	DGP-3	UGP311	Discipline & General Proficiency	-	-	-	-	100	-	100
			Total	**15**	**4**	**10**	**24**	**550**	**450**	**1200**

Following additional Course for Lateral Entry Students with B.Sc. background to be taken in III semester and all should pass with minimum of 45% marks for obtaining the degree: credits will not be added

1	LC	EME161/261	Engineering Drawing (Lab)	-	-	4	-	50	50	100
2		TMU101	Environmental Studies	2	1	-	-	40	60	100

B.Tech. (Civil Engineering)-Semester IV

S. No	Category	Course Code	Course	Periods			Evaluation Scheme			
				L	T	P	Credit	Internal	External	Total
1	PCC-5	ECE411	Geoinformatics	3	1	-	4	40	60	100
2	PCC-6	ECE412	Mechanics of Solids	3	1	-	4	40	60	100
3	PCC-7	ECE413	Engineering Geology & Soil Mechanics	3	1	-	4	40	60	100
4	PCC-8	ECE414	Transportation Engineering	3	-	-	3	40	60	100
5	LC-12	ECE461	Geoinformatics (Lab)	-	-	2	1	50	50	100
6	LC-13	ECE462	Mechanics of Solids (Lab)	-	-	2	1	50	50	100
7	LC-14	ECE463	Engineering Geology & Soil Mechanics (Lab)	-	-	2	1	50	50	100
8	LC-15	ECE464	Transportation Engineering (Lab)	-	-	2	1	50	50	100
9	SEC-2	TGC407	Analytical Reasoning	-	-	2	1	50	50	100
11	LPBEI-2	BLPBEI401	LPBEI-II*	2	-	-	2	100	0	100
12	DGP-4	EGP411	Discipline & General Proficiency	-	-	-	-	100	-	100
			Total	**17**	**4**	**10**	**22**	**610**	**490**	**1100**

*Skill based Training/Internship of 4 weeks duration from a reputed Industry/organization after completion of 4th semester end-semester examination.

Following additional Courses for Lateral Entry Students with B.Sc. background to be taken in IV semester and all should pass with minimum of 45% marks for obtaining the degree: credits will not be added

1	LC	EME162/262	Workshop Practice (Lab)	-	-	4	-	50	50	100

* **Learning by Project Based Entrepreneurship Initiatives (Stage D)**

Stage D: Project formulation, analysis & Evaluation Phase

B.Tech. (Civil Engineering)-Semester V

S. No	Category	Course Code	Course	Periods			Evaluation Scheme			
				L	T	P	Credit	Internal	External	
1	PCC-9	ECE511	Steel Structure-I	3	1	-	4	40	60	100
2	PCC-10	ECE512	Geotechnical Engineering	3	-	-	3	40	60	100
3	PCC-11	ECE513	Structural Analysis-I	3	1	-	4	40	60	100
4	PCC-12	ECE514	RCC Structure-I	3	1	-	4	40	60	100
5	PCC-13	ECE515	Hydrology & Irrigation Engineering	3	-	-	3	40	60	100
6	LC-16	ECE562	Geotechnical Engineering (Lab)	-	-	2	1	50	50	100
7	LC-17	ECE563	Structural Analysis-I (Lab)	-	-	2	1	50	50	100
8	AECC-4	ECE564	Survey Camp	-	-	-	1	50	50	100
9	PROJ-1	ECE592	Skill based Practical Training & Presentation	-	-	-	2	50	50	100
10	SEC-3	TGC507	Modern Algebra and Data Management	-	-	2	1	50	50	100
11	SEC-4	TGC502	Self-Management for Engineers	-	-	2	1	50	50	100
12	DGP-5	EGP511	Discipline & General Proficiency	-	-	-	-	100	-	100
			Total	**15**	**3**	**8**	**25**	**600**	**600**	**1200**

MOOC Course:

1	MOOC-1	MOOC01	MOOC Program -I (Optional)	-	-	-	2	-	100	100

B.Tech. (Civil Engineering)-Semester VI

S. No	Category	Course Code	Course	Periods			Evaluation Scheme			
				L	T	P	Credit	Internal	External	Total
1	PCC-14	ECE611	Steel Structure-II	3	1	-	4	40	60	100
2	PCC-15	ECE612	Public Health & Environmental Engineering	3	-	-	3	40	60	100
3	PCC-16	ECE613	Structural Analysis-II	3	1	-	4	40	60	100
4	PCC-17	ECE614	Estimation & Costing	2	1	-	3	40	60	100
5	PCC-18	ECE615	RCC Structure-II	3	1	-	4	40	60	100
6	AECC-5	EHM613	Human values & Professional Ethics	3	-	-	3	40	60	100
7	LC-18	ECE661	Public Health & Environmental Engineering (Lab)	-	-	2	1	50	50	100
8	LC-19	ECE662	Estimation & Costing (Lab)	-	-	2	1	50	50	100
9	SEC-5	TGC607	Advance Algebra and Geometry	-	-	2	1	50	50	100
10	SEC-6	TGC602	Workplace Management for Engineers	-	-	2	1	50	50	100
12	LPBEI-3	BLPBE160 1	LPBEI-III*	2	-	-	2	100	0	100
13	DGP-6	LGP611	Discipline & General Proficiency	-	-	-	-	100		100
			Total	**19**	**4**	**8**	**27**	**640**	**560**	**1200**

MOOC Course:

1	MOOC-2	MOOC02	MOOC Program –II (Optional)	-	-	-	2	-	100	0

* **Learning by Project Based Entrepreneurship Initiatives (Stage E & F)**

Stage E: Entrepreneurial Activity

Stage F: Project Outcomes

B.Tech. (Civil Engineering)-Semester VII

S. No.	Category	Course Code	Course		Periods			Evaluation Scheme			
					L	T	P	Credit	Internal	External	Total
1	PCC-19	ECE719	Earthquake Resistant Structures		3	-	-	3	40	60	100
2	PEC-1		Program Elective	Program Elective-I	3	-	-	3	40	60	100
3	PEC-2			Program Elective-II	3	-	-	3	40	60	100
4	PEC-3			Program Elective-III	3	0	-	3	40	60	100
5	OEC-1		Open Elective	Open Elective-I	3	-	-	3	40/50	60/50	100
6	LC-20	ECE761	Analysis & Design (Lab)		-	-	2	1	50	50	100
7	PROJ-2	ECE792	Industrial Training & Presentation		-	-	-	2	50	50	100
8	PROJ-3	ECE798	Project Work Phase-I		1	-	8	5	100	-	100
9	DGP-7	EGP711	Discipline & General Proficiency		-	-	-	-	100		
			Total		16	0	10	23	500/510	400/396	900

MOOC Course:

1	MOOC-3	MOOC03	MOOC Program –III (Optional)	-	-	-	2	-	100	100

B.Tech. (Civil Engineering)-Semester VIII

S. No	Category	Course Code	Course		Periods			Evaluation Scheme			
					L	T	P	Credit	Internal	External	Total
1	PCC-20	ECE811	Project Planning &Control		3	-	-	3	40	60	100
2	PCC-21	ECE812	Design of Hydraulic Structures		3	-	-	3	40	60	100
3	PEC-4		Program Elective	Program Elective-IV	3	-	-	3	40	60	100
4	PEC-5			Program Elective-V	3	1	-	4	40	60	100
5	OEC-2		Open Elective	Open Elective-II	3	-	-	3	40/50	60/50	100
6	PROJ-4	ECE898	Project Work Phase-II		1	-	4	3	50	50	100
7	DGP-8	EGP811	Discipline & GeneralProficiency		-	-	-	-	100	-	100
			Total		16	1	4	19	350/360	350/340	700

MOOC Course:

1	MOOC-4	MOOC04	MOOC Program –IV (Optional)	-	-	-	2	-	100	100

Course Code: ECE661	B.Tech. (Civil)- Semester-VI **Public Health & Environmental Engineering (Lab)**	L-0 T-0 P-2 C-1
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Remembering** the properties of water.	
CO2.	**Understanding** the physical, chemical and biological characteristics of water and wastewater.	
CO3.	**Applying** the experimental results to compare with standards and deliberate based on the purpose of analysis.	
CO4.	**Analyzing** the type & degree of treatment, for water and wastewater.	
CO5.	**Creating** the significance of experimental results in environmental engineering practices.	
Experiments	**Note: Minimum ten experiments should be performed:**	
Experiment-1	Determination of turbidity, color and conductivity.	
Experiment-2	Determination of pH, alkalinity and acidity.	
Experiment-3	Determination of hardness and chlorides.	
Experiment-4	Determination of residual chlorine.	
Experiment-5	Determination of most probable number of coliforms.	
Experiment-6	Measurement of air pollutants with high volume sampler.	
Experiment-7	Measurement of sound level with sound level meter.	
Experiment-8	Determination of total suspended and dissolved solids.	
Experiment-9	Determination of BOD.	
Experiment-10	Determination of COD.	
Experiment-11	Determination of kjeldahl nitrogen.	
Experiment-12	Determination of fluoride.	

ANNEXURE IV-A

Course Code: ECE661	B.Tech. (Civil)- Semester-VI **Public Health & Environmental Engineering (Lab)**	L-0 T-0 P-2 C-1
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Remembering** the properties of water.	
CO2.	**Understanding** the physical, chemical and biological characteristics of water and wastewater.	
CO3.	**Applying** the experimental results to compare with standards and deliberate based on the purpose of analysis.	
CO4.	**Analyzing** the type & degree of treatment, for water and wastewater.	
CO5.	**Creating** the significance of experimental results in environmental engineering practices.	
Experiments	**Note: Minimum eight experiments should be performed:**	
Course Outcomes:	**On completion of the course, the students will be :**	
Experiment-1	Determination of turbidity & color.	
Experiment-2	Determination of pH.	
Experiment-3	Determination of hardness.	
Experiment-4	Determination of residual chlorine.	
Experiment-5	Determination of total suspended and dissolved solids.	
Experiment-6	Determination of BOD.	
Experiment-7	Determination of COD.	
Experiment-8	Determination of fluoride.	
Experiment-9	Determination of acidity.	
Experiment-10	Determination of fluoride.	

ANNEXURE V

Study & Evaluation Scheme

of

Master of Technology
(Structural and Construction Engineering)
[Applicable w.e.f. Academic Session - 2024-25 till revised]

TEERTHANKER MAHAVEER UNIVERSITY
N.H.-24, Delhi Road, Moradabad, Uttar Pradesh-244001
Website: www.tmu.ac.in

Course Structure and Evaluation Scheme for M Tech
(S&CE) (Effective from session 2024-25)

Semester - I

S. No.	Course Code	Course	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	MSCE-101	Advance Structural Analysis	3	0	0	3	40	60	100
2	MSCE -102	Advance Concrete Technology	3	0	0	3	40	60	100
3		Departmental Elective – I	3	0	0	3	40	60	100
4		Departmental Elective – II	3	0	0	3	40	60	100
6	MSCE -161	Advance Material Testing Lab	-	-	3	2	20	30	50
7	MSCE -162	Computational Lab	-	-	3	2	20	30	50
		Total				**16**			**500**

Semester - II

S. No.	Course Code	Course	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	MSCE-201	Structural Dynamics	3	0	0	3	40	60	100
2		Departmental Elective - III	3	0	0	3	40	60	100
3		Departmental Elective - IV	3	0	0	3	40	60	100
4	MSCE-202	FEM in Structural Engineering	3	0	0	3	40	60	100
5	MSCE -261	Advance Computational Lab	-	-	3	2	20	30	50
6	MSCE -262	Geotechnical Engineering. Lab	-	-	3	2	20	30	50
		Total				**18**			**500**

Semester - III

S. No.	Course Code	Course	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	MSCE -301	Project Planning and Scheduling	3	0	0	3	40	60	100
2	MTOE-302	Open Elective	3	0	0	3	40	60	100
3	MSCE-361	Independent Study	0	0	6	3	40	60	100
4	MSCE-362	Dissertation Part I	0	0	16	8	40	60	100
		Total				**17**			**400**

Semester - IV

S. No	Course Code	Course	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	MSCE-461	Dissertation Part II	0	0	28	14	80	120	200
		Total				**14**			**200**

TOTAL CREDIT = 65

Departmental Elective I

1. MSCE-111 Advanced Pre-stressed Concrete Design
2. MSCE-112 Maintenance, Repair and Rehabilitation of Structures
3. MSCE-113 Design of Industrial Structures
4. MSCE-114 Bridge Engineering
5. MSCE-115 Advanced Reinforced Concrete Design

Departmental Elective II

1. MSCE -121 Construction Economics and Finance
2. MSCE -122 Solid and Hazardous Waste Management
3. MSCE -123 Advanced Construction Practices
4. MSCE -124 Analysis of Construction Cost and Finances
5. MSCE -125 Quantitative Methods in Construction Management

Departmental Elective III

1. MSCE-231 Geospatial Technique
2. MSCE-232 Design of Formwork
3. MSCE-233 Analysis and Design of Foundations
4. MSCE-234 Plastic Analysis

Departmental Elective IV

1. MSCE-241 Earthquake Resistant Design of Structures
2. MSCE-242 Theory of plates and Shells
3. MSCE-243 Theory of Elasticity
4. MSCE-244 Site Investigations and Ground Improvement
5. MSCE-245 Green Building Methodology

Open Elective

1. MTOE-131 Principles of Management
2. MTOE-132 Reliability Analysis
3. MTOE-133 Disaster Management
4. MTOE-136 Construction Equipment Management
5. MTOE-139 Industrial Safety
6.

1. For dissertation, the students are required to compile a report including title of the dissertation, literature review, methodology of work to be pursued and activity schedule in the III semester. The compiled report shall be presented at the end of the III[rd] semester. Same dissertation shall be continued in the fourth semester.