

Course Structure
for Degree Program
B. Tech. in Civil & Infrastructure Engineering
In line with National Education Policy 2020
(Effective from AY 2024-25 for Affiliated Institutes)



Dr. Babasaheb Ambedkar Technological University
Lonere 402 103, Dist- Raigad, Maharashtra, INDIA

Established vide Maharashtra Act No. XXII of 1989 and Act. No. XXIX of 2014
"Vidyavihar", P.O. Lonere, Dist. Raigad, Pin 402 103, Maharashtra, India
Telephone and Fax.: 02140 - 275142

www.dbatu.ac.in

Course Structure, Guidelines, Rules and Regulations

Preamble

Economic advancement of a country is closely tied to the quality of technical education it offers. Engineering education is reaching new heights and plays a significant role in the overall education system. The preparation of engineering graduates should focus on enhancing their employability and sustainability in response to evolving industry and societal needs. As technology advances and expectations change rapidly, updating the curriculum to be contemporary and relevant is imperative.

In order to align our technical education system with global standards and practices, based on performance and assessment system was implemented earlier for all Undergraduate Programs (UG). Now as per National

Education Policy-2020 framework we are incorporating project-based learning. The realm of engineering and technology, characterized by its interdisciplinary nature, demands the synthesis of knowledge from a wide array of domains including humanities, arts, and advanced technologies. However, what distinguishes technologists is their proficiency in design and their ability to adeptly apply this knowledge across diverse disciplines to achieve effective problem-solving.

In response to these needs, aspiring engineers need thorough preparation and a deep understanding of the latest technological trends and industrial requirements. This calls for studying under a modern and adaptable curriculum that mirrors the global environment. As part of this initiative, there is a push to integrate recent advancements and enrich course content with pertinent and up-to-date subjects. Consequently, a revised structure and curriculum will debut from the academic year 2023-24 for First Year Civil Engineering, with intentions to progressively implement these updates across second, third- and fourth-year engineering programs.

Project-based learning has been introduced alongside traditional classroom teaching and laboratory-based learning to enhance the overall learning experience. The objective is to encourage students to learn collaboratively in groups of 3 to 4, focusing on solving meaningful problems. These problems can be theoretical, practical, social, technical, symbolic, cultural, or scientific, arising from students' curiosity across various disciplines and professional contexts. The selected problems should be exemplary and may require an interdisciplinary approach for both analysis and resolution. This approach aims to develop students' capacity for learning through shared cognition.

- **Laboratory Course:**

This is focused on completing experiments and assignments related to the courses of the Semester.

- Seminar: This aspect will revolve around state-of-the-art topics selected by students and approved by the authority. Students are required to submit a certified seminar report in a standard format, evaluated by their assigned guide and the department/institute head for satisfactory completion of the work.
- Project Work in Final Year: Project work in the seventh Semester is integral to the curriculum. It involves applying knowledge gained throughout the graduation program, ideally addressing societal needs. The project provides an opportunity for students to design and construct complete systems or subsystems, specializing in areas of their interest. Students must prepare a certified final project report in standard format, evaluated by their guide and the department/institute head for satisfactory completion of the work.
- Internship: Internships are crucial for educational and career development, offering practical experience in field of discipline. It plays a significant role as employers seek well-trained employees. The primary objective is to expose technical students to real-world industrial environments, providing insights into the social, economic, and administrative factors influencing organizational operations. Students may choose internships in industries, government agencies, NGOs, MSMEs, rural settings, innovation hubs, intellectual property rights (IPR), or entrepreneurship initiatives. They can opt to focus on innovation, leading to start-up's, or gain experience in industry/NGO/government/MSME settings to prepare for professional roles. The conduction, monitoring, assessment, and evaluation of internships follow guidelines provided by AICTE.

Definition of Credit **

| | |
|--|----------------------|
| 1 Hour Lecture (L) per week | 1 credit for 1 Hour |
| Tutorial (T) per week | 1 credit for 1 Hour |
| Practical(P) per week 2 Hours Practical (Lab)/week | 1 credit for 2 Hours |

** The head of Tutorial and Practical (as a special case) may be merged for common credit with the permission of authority.

Rule No. 1: Eligibility for Admission

Eligibility Criteria

Students seeking admission to the first year of the Bachelor's degree course in Engineering and Technology must fulfil the eligibility criteria as laid down from time to time by the following authorities:

- **Dr. Babasaheb Ambedkar Technological University (DBATU)**
- **Government of Maharashtra**
- **All India Council for Technical Education (AICTE)**

Rule No. 2: Scheme of Assessment

Eligibility for the Degree of Bachelor of Engineering and Technology

To be eligible for the degree of Bachelor of Engineering and Technology, a candidate must:

1. Appearing for Examinations:

- A candidate is required to appear for all prescribed examinations during the course of study. This includes theory exams, practical exams, term-work assessments, project evaluations, and any other form of examination as specified in the Course Contents.

2. Passing of Examinations:

- A candidate must pass all the prescribed examinations. The passing criteria, including minimum marks required in theory, practical, term-work, and other components, will be as per the rules laid down by the university.

Components of Assessment

The scheme of assessment typically includes the following components:

1. Theory Examinations:

- Conducted at the end of each Semester.
- Assess the theoretical understanding of the subjects.

2. Practical Examinations:

- Conducted to assess the practical skills and application of knowledge.
- Includes laboratory work, experiments, and practical assignments.

3. Term-Work Assessments:

- Continuous assessment of assignments, tutorials, and project work throughout the Semester.
- Includes the evaluation of written assignments, presentations, and project reports.

4. Project Work:

- Assessment of project-based learning and final year projects.
- Includes continuous assessment by the faculty and final evaluation through project reports, presentations, and viva-voce.

5. Internal Continuous Assessment:

- Regular assessments conducted throughout the Semester.
- Includes quizzes, class tests, mid-term exams, and participation in class activities.

General Rules and Regulations

1. The normal duration of the course leading to B.Tech. degree will be EIGHT semesters.
2. The normal duration of the course leading to M.Tech. degree will be FOUR semesters.
3. Each academic year shall be divided into 2 semesters, each of 20 weeks duration, including evaluation and grade finalization, etc. The Academic Session in each semester shall provide for at

least 90 Teaching Days, with at least 40 hours of teaching contact periods in a five to six days session per week. The semester that is typically from Mid-July to November is called the ODD SEMESTER, and the one that is from January to Mid-May is called the EVEN SEMESTER. Academic Session may be scheduled for the Summer Session/Semester as well. For 1st year B. Tech and M. Tech the schedule will be decided as per the admission schedule declared by Government of Maharashtra.

4. The schedule of academic activities for a Semester, including the dates of registration, mid-semester examination, end-semester examination, inter-semester vacation, etc. shall be referred to as the Academic Calendar of the Semester, which shall be prepared by the Dean (Academic), and announced at least TWO weeks before the Closing Date of the previous Semester.
5. The Academic Calendar must be strictly adhered to, and all other activities including co-curricular and/or extra -curricular activities must be scheduled so as not to interfere with the Curricular Activities as stipulated in the Academic Calendar.

Registration:

1. Lower and Upper Limits for Course Credits Registered in a Semester, by a Full- Time Student of a UG/PG Program:

A full time student of a particular UG/PG program shall register for the appropriate number of course credits in each semester/session that is within the minimum and maximum limits specific to that UG/PG program as stipulated in the specific Regulations pertaining to that UG/PG program.

2. Mandatory Pre-Registration for higher semesters: In order to facilitate proper planning of the academic activities of a semester, it is essential for the every institute to inform to Dean (Academics) and COE regarding details of total no. of electives offered (Course-wise) along with the number of students opted for the same. This information should be submitted within two weeks from the date of commencement of the semester as per academic calendar.
3. PhD students can register for any of PG/PhD courses and the corresponding rules of evaluation will apply.
4. Under Graduate students may be permitted to register for a few selected Post Graduate courses, in exceptionally rare circumstances, only if the DUGC/DPGC is convinced of the level of the academic achievement and the potential in a student.

Course Pre-Requisites:

1. In order to register for some courses, it may be required either to have exposure in, or to have completed satisfactorily, or to have prior earned credits in, some specified courses.
2. Students who do not register on the day announced for the purpose may be permitted LATE REGISTRATION up to the notified day in academic calendar on payment of late fee.

3. REGISTRATION IN ABSENTIA will be allowed only in exceptional cases with the approval of the Dean (Academic) / Principal.
4. A student will be permitted to register in the next semester only if he fulfills the following conditions:
 - i) Satisfied all the Academic Requirements to continue with the program of Studies without termination
 - ii) Cleared all Institute, Hostel and Library dues and fines (if any) of the previous semesters;
 - iii) Paid all required advance payments of the Institute and hostel for the current semester;
 - iv) Not been debarred from registering on any specific ground by the Institute.

Evaluation System:

1. Absolute grading system based on absolute marks as indicated below will be implemented from academic year 2023-24, from I year B. Tech.

| Percentage of marks | Letter Grade | Grade Point |
|----------------------------|---------------------|--------------------|
| 91-100 | EX | 10.0 |
| 86-90 | AA | 9.0 |
| 81-85 | AB | 8.5 |
| 76-80 | BB | 8.0 |
| 71-75 | BC | 7.5 |
| 66-70 | CC | 7.0 |
| 61-65 | CD | 6.5 |
| 56-60 | DD | 6.0 |
| 51-55 | DE | 5.5 |
| 40-50 | EE | 5.0 |
| <40 | EF | 0.0 |

2. Class is awarded based on CGPA of all eighth semester of B.Tech Program.

| CGPA for pass is minimum 5.0 | |
|-------------------------------------|--------------|
| CGPA upto <5.50 | Pass class |
| CGPA ≥ 5.50 & <6.00 | Second Class |
| CGPA ≥ 6.00 & <7.5 | First Class |
| CGPA >7.50 | Distinction |
| [Percentage of Marks =CGPA*10.0] | |

3. A total of 100 Marks for each theory course are distributed as follows:

| | |
|------------------------------------|----|
| Mid Semester Exam (MSE) Marks | 20 |
| Continuous Assessment Marks | 20 |
| End Semester Examination(ESE)Marks | 60 |

4. A total of 100 Marks for each practical course are distributed as follows

| | | |
|----|-------------------------------------|----|
| 1. | Continuous Assessment Marks | 40 |
| 2. | End Semester Examination (ESE)Marks | 60 |

- It is mandatory for every student of B. Tech to score a minimum of 40 marks out of 100, M. Tech to score a minimum of 45 marks out of 100 with a minimum of 20 marks out of 60 marks in End Semester Examination for theory course.
- This will be implemented from the first year of B. Tech starting from Academic Year 2023-24

5. Description of Grades

EX Grade: An ‘EX’ grade stands for outstanding achievement.

EE Grade: The ‘EE’ grade stands for minimum passing grade.

The students may appear for the remedial examination for the subjects he/she failed for the current semester of admission only and his/her performance will be awarded with EE grade only.

If any of the students remain absent for the regular examination due to genuine reason and the same will be verified and tested by the Dean (Academics) or committee constituted by the University Authority.

FF Grade: The ‘FF’ grade denotes very poor performance, i.e. failure in a course due to poor performance. The students who have been awarded ‘FF’ grade in a course in any semester must repeat the subject in next semester.

6. Evaluation of Performance

a. Semester Grade Point Average (SGPA)

The performance of a student in a semester is indicated by Semester Grade Point Average (SGPA) which is a weighted average of the grade points obtained in all the courses taken by the student in the semester and scaled to a maximum of 10. (SGPI is to be calculated up to two decimal places). A Semester Grade Point Average (SGPA) will be computed for each semester as follows:

$$SGPA = \frac{[\sum_{i=1}^n c_i g_i]}{[\sum_{i=1}^n c_i]}$$

Where

'n' is the number of subjects for the semester,

' c_i ' is the number of credits allotted to a particular subject, and

' g_i ' is the grade-points awarded to the student for the subject based on his performance as per the above table.

SGPA will be rounded off to the second place of decimal and recorded as such.

b. Cumulative Grade Point Average (CGPA):

An up to date assessment of the overall performance of a student from the time he entered the Institute is obtained by calculating Cumulative Grade Point Average (CGPA) of a student. The CGPA is weighted average of the grade points obtained in all the courses registered by the student since s/he entered the Institute. CGPA is also calculated at the end of every semester (upto two decimal places). Starting from the first semester at the end of each semester (S), a Cumulative Grade Point Average (CGPA) will be computed as follows:

$$CGPA = \frac{[\sum_{i=1}^m c_i g_i]}{[\sum_{i=1}^m c_i]}$$

Where,

'm' is the total number of subjects from the first semester onwards up to and including the semester S,

' c_i ' is the number of credits allotted to a particular subject, and

' g_i ' is the grade-points awarded to the student for the subject based on his/her performance as per the above table.

CGPA will be rounded off to the second place of decimal and recorded as such.

7. Attendance Requirements:

- a. All students must attend every lecture, tutorial and practical classes.
- b. To account for approved leave of absence (eg. representing the Institute in sports, games or athletics; placement activities; NCC/NSS activities; etc.) and/or any other such contingencies like medical emergencies, etc., the attendance requirement shall be a minimum of 75% of the classes actually conducted. If the student failed to maintain 75% attendance, he/she will be detained for appearing the successive examination. The Dean (Academics)/ Principal is permitted to give 10% concession for the genuine reasons as such the case may be. In any case the student will not be permitted for appearing the examination if the attendance is less than 65%.
- c. The course instructor handling a course must finalize the attendance 3 calendar days before the last day of classes in the current semester and communicate clearly to the students by displaying prominently in the department and also in report writing to the head of the department concerned.
- d. The attendance records are to be maintained by the course instructor and he shall show it to the student, if and when required.

8. Transfer of Credits:

The courses credited elsewhere, in Indian or foreign University/Institutions/ Colleges/Swayam Courses by students during their study period at DBATU may count towards the credit requirements for the award of degree. The guidelines for such transfer of credits are as follows:

- a. 20 % of the total credit will be considered for respective calculations.
- b. Credits transferred will be considered for overall credits requirements of the program.
- c. Credits transfer can be considered only for the course at same level i.e UG, PG etc.
- d. A student must provide all details (original or attested authentic copies) such as Course Contents, number of contact hours, course instructor /project guide and evaluation system for the course for which he is requesting a credits transfer. He shall also provide the approval or acceptance letter from the other side. These details will be evaluated by the concerned Board of Studies before giving approval. The Board of Studies will then decide the number of equivalent credits the student will get for such course(s) in DBATU. The complete details will then be forwarded to Dean for approval.
- e. A student has to get minimum passing grades/ marks for such courses for which the credits transfers are to be made.
- f. Credits transfers availed by a student shall be properly recorded on academic record(s) of the student.
- g. In exceptional cases, the students may opt for higher credits than the prescribed.

Table A: Credit Structure for UG program in Engineering

| Course Category | Recommended | Provided |
|---|-------------------|------------|
| Basic Science Course (BSC) | 14 to 18 | 17 |
| Engineering Science Course (ESC) | 12 to 16 | 16 |
| Program Core Course (PCC) | 44 to 56 | 58 |
| Multidisciplinary Minor (MDM) | 14 | 14 |
| Humanities Social Science and Management (HSSM-IKS/VEC/AEC) | 14 | 12 |
| Vocational and Skill Enhancement Course (VSEC) | 08 | 08 |
| Open Elective (OE) Other than a particular program | 08 | 09 |
| Program Elective Course (PEC) | 20 | 19 |
| Experiential Learning Courses (ELC) | 22 | 20 |
| Co-curricular Courses (CC) | 02-04 | 02 |
| TOTAL | 160 to 176 | 175 |

Civil & Infrastructure Engineering Program

Program Objectives

Goal of the Civil & Infrastructure Engineering Program at Dr. Babasaheb Ambedkar Technological University, Lonere (DBATU) is to provide students with preparation to become worthy of professional careers in the field and to be motivated for lifelong learning. All prescribed courses have definite objectives and outcomes.

Program objectives are expected qualities of engineers as under:

- a) Preparation: To prepare students to excel in various educational programmes or to succeed in industry / technical profession through further education/training;
- b) Core Competence: To provide students with a solid foundation in mathematical, scientific fundamentals required to solve real life civil engineering problems;
- c) Breadth: To train students with a breadth of scientific knowledge to comprehend, analyze, design & create novel products and solutions for real life problems;
- d) Professionalism: To inculcate in students professional/ethical attitude, effective team work skills, multidisciplinary approach and to relate engineering issues to a broader context;
- e) Learning Environment: To provide students with academic environment of excellence, leadership, ethical guidelines and life-long learning needed for a long / productive career.

Program Educational Objectives

1. Taking pride in their profession and have commitment to highest standards of ethical practices and related technical disciplines;
2. Able to design various structures and systems that is safe, economical and efficient;
3. Capable of using modern tools efficiently in all aspects of professional practices;
4. Dealing successfully with real life civil engineering problems and achieve practical solutions based on a sound science and engineering knowledge;
5. Shall be engage in continuous research, development and exchange of knowledge for professional development;
6. Be honest in their control and performing their duties and promote effective use of resources through open, honest and impartial services to the public;
7. Act in such a manner which will uphold the honour, integrity, or dignity of the engineering profession, and avoid knowingly engaging in business or professional practices of a fraudulent, dishonest or unethical nature;
8. Recognize that the lives, safety, health and welfare of the general public are dependent upon engineering, decision and practices;
9. Continue their professional development throughout their careers and provide opportunities for the professional development.

Program Outcomes

At the end of the program the student will be able to:

| | |
|--------------|---|
| PO 1 | Apply the knowledge of mathematics, basic sciences, and civil engineering to the solution of complex engineering problems. |
| PO 2 | Identify, formulate, research literature, and analyze complex civil engineering problems reaching substantiated conclusions. |
| PO 3 | Design solutions for complex engineering problems and design of civil engineering structures that meet the specified needs. |
| PO 4 | Use civil engineering research-based knowledge related to interpretation of data and provide valid conclusions. |
| PO 5 | Create, select, and apply modern civil engineering and IT tools to complex engineering activities with an understanding of the limitations. |
| PO 6 | Apply reasoning acquired by the civil engineering knowledge to assess societal and safety issues. |
| PO 7 | Understand the impact of engineering solutions on the environment, and demonstrate the knowledge for sustainable development. |
| PO 8 | Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. |
| PO 9 | Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. |
| PO 10 | Communicate effectively on complex engineering activities with the engineering community and with society at large. |
| PO 11 | Understand the engineering and management principles and apply these to the multidisciplinary environments. |
| PO 12 | Recognize the need for life-long learning in the broadest context of technological change. |

Program-Specific Outcomes (PSOs)

| | |
|--------------|---|
| PSO 1 | Make the students employable in engineering industries. |
| PSO 2 | Motivate the students for higher studies and research. |
| PSO 3 | Motivate the students for various competitive examinations. |

Dr. Babasaheb Ambedkar Technological University, Lonere

Teaching & Evaluation Scheme for First Year B. Tech.

Civil & Infrastructure Engineering

GROUP A

| Sr. No. | Course Code | Course Title | Teaching Scheme | | | Evaluation Scheme | | | | Credit |
|--------------------|----------------|-------------------------------------|-----------------|----------|-----------|-------------------|------------|------------|-------------|-----------|
| | | | L | T | P | ISE | MSE | ESE | Total | |
| Semester- I | | | | | | | | | | |
| 1 | 24AF1000BS101 | Engineering Mathematics – I | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 2 | 24AF1CHEBS102 | Engineering Chemistry | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 3 | 24AF1CHEBS103L | Engineering Chemistry Lab | 0 | 0 | 2 | 60 | -- | 40 | 100 | 1 |
| 4 | 24AF1EMES104 | Engineering Mechanics | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 5 | 24AF1EMES105L | Engineering Mechanics Lab | 0 | 0 | 2 | 60 | -- | 40 | 100 | 1 |
| 6 | 24AF1000ES106 | Programming for Problem Solving | 2 | 0 | 0 | 20 | 20 | 60 | 100 | 2 |
| 7 | 24AF1000ES107L | Programming for Problem Solving Lab | 0 | 0 | 2 | 60 | -- | 40 | 100 | 1 |
| 8 | 24AF1000VS108L | Workshop Practices | 0 | 0 | 4 | 60 | -- | 40 | 100 | 2 |
| 9 | 24AF1000VS109 | Communication Skills | 2 | 0 | 0 | 20 | 20 | 60 | 100 | 2 |
| 10 | 24AF1000VS110L | Communication Skills Lab | 0 | 0 | 2 | 60 | -- | 40 | 100 | 1 |
| 11 | 24AF1000CC111A | Yoga Education | 1 | 0 | 2 | 60 | -- | 40 | 100 | 2 |
| | 24AF1000CC111B | NSS-I | | | | | | | | |
| | 24AF1000CC111C | NCC | | | | | | | | |
| Total | | | 14 | 0 | 14 | 460 | 100 | 540 | 1100 | 21 |

Dr. Babasaheb Ambedkar Technological University, Lonere

Teaching & Evaluation Scheme for First Year B. Tech.

Civil & Infrastructure Engineering

GROUP A

| Sr. No. | Course Code | Course Title | Teaching Scheme | | | Evaluation Scheme | | | | Credit |
|---------------------|----------------|--|-----------------|----------|----------|-------------------|------------|------------|-------------|-----------|
| | | | L | T | P | ISE | MSE | ESE | Total | |
| Semester- II | | | | | | | | | | |
| 1 | 24AF1000BS201 | Engineering Mathematics – II | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 2 | 24AF2PHYBS202 | Engineering Physics | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 3 | 24AF2PHYBS203L | Engineering Physics Lab | 0 | 0 | 2 | 60 | -- | 40 | 100 | 1 |
| 4 | 24AF2EGRES204 | Engineering Graphics | 2 | 0 | 0 | 20 | 20 | 60 | 100 | 2 |
| 5 | 24AF2EGRES205L | Engineering Graphics Lab | 0 | 0 | 2 | 60 | -- | 40 | 100 | 1 |
| 6 | 24AF1000ES206 | Basic Electrical and Electronics Engineering | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 7 | 24AF1000ES207L | Basic Electrical and Electronics Engineering Lab | 0 | 0 | 2 | 60 | -- | 40 | 100 | 1 |
| 8 | 24AF2CMEES208 | Basic Civil and Mechanical Engineering | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 9 | 24AF1EEEES209 | Energy and Environmental Engineering | 2 | 0 | 0 | 50 | -- | -- | 50 | AU |
| 10 | 24AF1000IK210 | IKS Bucket # | 2 | 0 | 0 | 60 | -- | 40 | 100 | 2 |
| 11 | 24AF1000VS211 | Design Thinking | 2 | 0 | 0 | 60 | -- | 40 | 100 | 2 |
| 12 | 24AF1000CC212A | Integrated Personality Development | 1 | 0 | 2 | 60 | -- | 40 | 100 | 2 |
| | 24AF1000CC212B | NSS-II | | | | | | | | |
| | 24AF1000CC212C | Health and Wellness | | | | | | | | |
| Total | | | 21 | 0 | 8 | 510 | 100 | 540 | 1150 | 23 |

Refer to the University website for the subjects under IKS bucket

Note: Students can complete online courses of 40% of total credits through online platform NPTEL / SWAYAM/ Sector Skill council of India and other online platforms identified by the University time to time. At least 80% contents of the NPTEL / SWAYAM/ Sector Skill council of India course should match with syllabus contents of the subject prescribed by the university.

Dr. Babasaheb Ambedkar Technological University, Lonere

Teaching & Evaluation Scheme for First Year B. Tech.

Civil & Infrastructure Engineering

GROUP B

| Sr. No. | Course Code | Course Title | Teaching Scheme | | | Evaluation Scheme | | | | Credit |
|---------------------|-------------|--|-----------------|----------|-----------|-------------------|------------|------------|-------------|-----------|
| | | | L | T | P | ISE | MSE | ESE | Total | |
| Semester- I | | | | | | | | | | |
| 1 | | Engineering Mathematics – I | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 2 | | Engineering Physics | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 3 | | Engineering Physics Lab | 0 | 0 | 2 | 60 | -- | 40 | 100 | 1 |
| 4 | | Engineering Graphics | 2 | 0 | 0 | 20 | 20 | 60 | 100 | 2 |
| 5 | | Engineering Graphics Lab | 0 | 0 | 2 | 60 | -- | 40 | 100 | 1 |
| 6 | | Basic Electrical and Electronics Engineering | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 7 | | Basic Electrical and Electronics Engineering Lab | 0 | 0 | 2 | 60 | -- | 40 | 100 | 1 |
| 8 | | Basic Civil and Mechanical Engineering | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 9 | | Energy and Environmental Engineering | 2 | 0 | 0 | 50 | -- | -- | 50 | AU |
| 10 | | IKS Bucket # | 2 | 0 | 0 | 60 | -- | 40 | 100 | 2 |
| 11 | | Design Thinking | 2 | 0 | 0 | 60 | -- | 40 | 100 | 2 |
| 12 | | Integrated Personality Development | 1 | 0 | 2 | 60 | -- | 40 | 100 | 2 |
| | | NSS-II | | | | | | | | |
| | | Health and Wellness | | | | | | | | |
| Total | | | 21 | 0 | 8 | 510 | 100 | 540 | 1150 | 23 |
| Semester- II | | | | | | | | | | |
| 1 | | Engineering Mathematics – II | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 2 | | Engineering Chemistry | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 3 | | Engineering Chemistry Lab | 0 | 0 | 2 | 60 | -- | 40 | 100 | 1 |
| 4 | | Engineering Mechanics | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 5 | | Engineering Mechanics Lab | 0 | 0 | 2 | 60 | -- | 40 | 100 | 1 |
| 6 | | Programming for Problem Solving | 2 | 0 | 0 | 20 | 20 | 60 | 100 | 2 |
| 7 | | Programming for Problem Solving Lab | 0 | 0 | 2 | 60 | -- | 40 | 100 | 1 |
| 8 | | Workshop Practices | 0 | 0 | 4 | 60 | -- | 40 | 100 | 2 |
| 9 | | Communication Skills | 2 | 0 | 0 | 20 | 20 | 60 | 100 | 2 |
| 10 | | Communication Skills Lab | 0 | 0 | 2 | 60 | -- | 40 | 100 | 1 |
| 12 | | Yoga Education | 1 | 0 | 2 | 60 | -- | 40 | 100 | 2 |
| | | NSS-I | | | | | | | | |
| | | NCC | | | | | | | | |
| Total | | | 14 | 0 | 14 | 460 | 100 | 540 | 1100 | 21 |

Refer to the University website for the subjects under IKS bucket.

Note: Students can complete online courses of 40% of total credits through online platform NPTEL / SWAYAM/ Sector Skill council of India and other online platforms identified by the University time to time. At least 80% contents of the NPTEL / SWAYAM/ Sector Skill council of India course should match with syllabus contents of the subject prescribed by the university.

Dr. Babasaheb Ambedkar Technological University, Lonere
Teaching & Evaluation Scheme for Second Year B. Tech.
Civil & Infrastructure Engineering

| Sr. No. | Course Code | Course Title | Teaching Scheme | | | Evaluation Scheme | | | | Credit |
|---------------------|----------------|---|-----------------|----------|----------|-------------------|------------|------------|------------|-----------|
| | | | L | T | P | ISE | MSE | ESE | Total | |
| Semester-III | | | | | | | | | | |
| 1 | 25AF1000BS301 | Civil Engineering Mathematics | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 2 | 25AF1918PC302 | Mechanics of Solids | 2 | 1 | 0 | 20 | 20 | 60 | 100 | 3 |
| 3 | 25AF1918PC303 | Surveying | 2 | 1 | 0 | 20 | 20 | 60 | 100 | 3 |
| 4 | 25AF1918PC304 | Urban Transportation Planning | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 5 | 25AF1ARPOEM05 | OPEN ELECTIVE-I | 2 | 0 | 0 | 20 | 20 | 60 | 100 | 2 |
| 6 | Refer Bucket | Multi-Disciplinary Minor-I | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 7 | 25AF1COIVE307 | Constitution of India | 2 | 0 | 0 | - | - | - | AU | GR |
| 8 | 25AF1000VE308B | Life of Bharat Ratna Dr. Babasaheb Ambedkar | 1 | 0 | 0 | 50 | - | - | 50 | 1 |
| 9 | 25AF1918PCL309 | Mechanics of Solid Lab | 0 | 0 | 2 | 25 | - | 25 | 50 | 1 |
| 10 | 25AF1000AE310 | Modern Indian Language | 2 | 0 | 0 | 50 | - | 50 | 100 | 2 |
| 11 | 25AF1918PCL311 | Surveying Lab | 0 | 0 | 2 | 25 | - | 25 | 50 | 1 |
| TOTAL | | | 20 | 2 | 4 | 240 | 140 | 470 | 850 | 22 |
| Semester-IV | | | | | | | | | | |
| 1 | 25AF1918PC401 | Structural Mechanics | 2 | 1 | 0 | 20 | 20 | 60 | 100 | 3 |
| 2 | 25AF1918PC402 | Highway Engineering | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 3 | 25AF1918PC403 | Hydraulics Engineering | 2 | 1 | 0 | 20 | 20 | 60 | 100 | 3 |
| 4 | 25AF1918PC404 | Building Planning, Drawing & Construction | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 5 | 25AF1ARPOEM05 | OPEN ELECTIVE-II | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 6 | Refer Bucket | Multi-Disciplinary Minor-II | 2 | 0 | 0 | 20 | 20 | 60 | 100 | 2 |
| 7 | 25AF1UHVVE407 | Universal Human Values-II | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 8 | 25AF1000VE408A | Life of Chhatrapati Shivaji Maharaj | 1 | 0 | 0 | 50 | 0 | 0 | 50 | 1 |
| 9 | 25AF1918HM409 | Entrepreneurship Development Process | 1 | 0 | 0 | 25 | - | 25 | 50 | 1 |
| 10 | 25AF1918PCL410 | Hydraulics Lab | 0 | 0 | 2 | 25 | - | 25 | 50 | 1 |
| 11 | 25AF1918PCL409 | Building Planning, Drawing & Construction Lab | 0 | 0 | 2 | 25 | - | 25 | 50 | 1 |
| TOTAL | | | 20 | 2 | 4 | 265 | 140 | 495 | 900 | 24 |

| Course Type | Course Code | Course Name | Course Type | Course Code | Course Name |
|-----------------|--------------------|------------------------------|-----------------------------|----------------|--------------|
| Open Elective-I | 25AF1ARPOEM05H | Building Materials | Multi-Disciplinary Minor-I | Refer Bucket | Refer Bucket |
| | 25AF1ARPOEM05I | Design of Masonry Structures | Multi-Disciplinary Minor-II | Refer Bucket | Refer Bucket |
| | 25AF1ARPOEM05J | Energy Efficient Buildings | Modern Indian Language | 25AF1000AE310A | Marathi |
| 25AF1ARPOEM05G | Advanced Surveying | 25AF1000AE310B | | Hindi | |
| 25AF1ARPOEM0Q | Modern Surveying | 25AF1000AE310C | | Sanskrit | |

Dr. Babasaheb Ambedkar Technological University, Lonere
Teaching & Evaluation Scheme for Third Year B. Tech.
Civil & Infrastructure Engineering

| Sr. No. | Course Code | Course Title | Teaching Scheme | | | Evaluation Scheme | | | | Credits |
|--------------------|----------------|---|-----------------|----------|----------|-------------------|------------|------------|------------|-----------|
| | | | L | T | P | ISE | MSE | ESE | Total | |
| Semester-V | | | | | | | | | | |
| 1 | 26AF1918PC501 | Limit State of Design of Steel Structures | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 2 | 26AF1918PC502 | Bridge & Tunnel Engineering | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 3 | 26AF1918PC503 | Concrete Technology | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 4 | 26AF1918PC504 | Geotechnical Engineering | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 5 | 26AFARPOE505 | OPEN ELECTIVE-III | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 6 | Refer Bucket | Multi-Disciplinary Minor-III | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 7 | 26AF1918PCL507 | Limit State of Design of Steel Structures Lab | 0 | 0 | 2 | 25 | - | 25 | 50 | 1 |
| 8 | 26AF1918PCL508 | Bridge & Tunnel Engineering Lab | 0 | 0 | 2 | 25 | - | 25 | 50 | 1 |
| 9 | 26AF1918PCL509 | Geotechnical Engineering Lab | 0 | 0 | 2 | 25 | - | 25 | 50 | 1 |
| 10 | 26AF1918HM510 | Soft Skills Development | 0 | 2 | 0 | - | - | - | AU | GR |
| 11 | 26AF1918VS511 | Construction Equipment and Site Safety Management | 0 | 2 | 0 | 50 | - | 50 | 100 | 2 |
| TOTAL | | | 18 | 4 | 6 | 245 | 120 | 485 | 900 | 23 |
| Semester-VI | | | | | | | | | | |
| 1 | 26AF1918PC601 | Design of Concrete Structures | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 2 | 26AF1918PE602 | Program Elective-I | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 3 | 26AF1918PE603 | Program Elective -II | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 4 | 26AF1918PE604 | Program Elective-III | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 5 | 26AF1918PC 605 | Foundation Engineering | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 6 | Refer Bucket | Multi-Disciplinary Minor-IV | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 7 | 26AF1918PCL607 | Design of Concrete Structures Lab | 0 | 0 | 2 | 50 | - | 50 | 100 | 1 |
| 8 | 26AF1918PEL608 | Program Elective-II- Lab | 0 | 0 | 2 | 25 | - | 25 | 50 | 1 |
| 9 | 26AF1918PEL609 | Program Elective-III- Lab | 0 | 0 | 2 | 25 | - | 25 | 50 | 1 |
| 10 | 26AF1918EL610 | Seminar | 0 | 0 | 2 | 25 | - | 25 | 50 | 1 |
| 11 | 26AF1918 EL611 | Project Phase-I | 0 | 0 | 4 | 50 | - | 50 | 100 | 2 |
| TOTAL | | | 19 | 0 | 8 | 295 | 120 | 485 | 900 | 24 |

| Course Type | Course Code | Course Name | Course Type | Course Code | Course Name |
|----------------------|----------------|-------------------------------------|------------------------------|----------------|------------------------------|
| Program Elective-I | 26AF1918PE602A | Airport Engineering | Open elective-III | 26AF1ARPOEM05H | Material Testing Engineering |
| | 26AF1918PE602B | Integrated Region and Smart City | | 26AF1ARPOEM05O | Ropeway Engineering |
| Program Elective-II | 26AF1918PE603A | Railway Engineering | | 26AF1ARPOEM05P | Road Safety Audits |
| | 26AF1918PE603B | Pavement Design and Management | Multi-Disciplinary Minor-III | Refer Bucket | Refer Bucket |
| Program Elective-III | 26AF1918PE604A | Intelligent Transportation Systems | Multi-Disciplinary Minor-IV | Refer Bucket | Refer Bucket |
| | 26AF1918PE604B | Advanced Traffic Management Systems | | | |

Dr. Babasaheb Ambedkar Technological University, Lonere
Teaching & Evaluation Scheme for Fourth Year B. Tech.
Civil & Infrastructure Engineering

| Sr. No. | Course Code | Course Title | Teaching Scheme | | | Evaluation Scheme | | | | Credit |
|-----------------------|----------------|---------------------------------|-----------------|-----------|-----------|-------------------|------------|------------|------------|-----------|
| | | | L | T | P | ISE | MSE | ESE | Total | |
| Semester- VII | | | | | | | | | | |
| 1 | 27AF1918PC701 | RC & PSC Structures | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 2 | 27AF1918PC702 | Construction Techniques | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 3 | 27AF1918PE703 | Program Elective -IV | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 4 | 27AF1918PE704 | Program Elective -V | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 5 | 27AF1918PC705 | Water Resource Engineering | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 6 | Refer Bucket | Multi-Disciplinary Minor-V | 3 | 0 | 0 | 20 | 20 | 60 | 100 | 3 |
| 7 | 27AF1918PLC707 | RC & PSC Structures Lab | 0 | 0 | 2 | 50 | - | 50 | 100 | 1 |
| 8 | 27AF1918PEL708 | Program Elective -IV -LAB | 0 | 0 | 2 | 25 | - | 25 | 50 | 1 |
| 9 | 27AF1918PEL709 | Program Elective -V-LAB | 0 | 0 | 2 | 25 | - | 25 | 50 | 1 |
| 10 | 27AF1918ELP10 | Academic Research Writing | 1 | 0 | 0 | 50 | - | - | 50 | 1 |
| 11 | 27AF1918EL711 | Project Phase-II | 0 | 0 | 4 | 25 | - | 25 | 50 | 2 |
| TOTAL | | | 19 | 0 | 10 | 295 | 120 | 485 | 900 | 24 |
| Semester- VIII | | | | | | | | | | |
| 1 | 27AF1918EL801 | Civil Engineering Software | 0 | 0 | 4 | 50 | - | - | 50 | 2 |
| 2 | 27AF1918VS802 | Self Study Course (MOOC/SWAYAM) | 0 | 0 | 0 | 25 | - | 25 | 50 | 2 |
| 3 | 27AF1918EL803 | Internship | 0 | 0 | 20 | 100 | - | 100 | 200 | 10 |
| TOTAL | | | 00 | 00 | 24 | 175 | - | 125 | 300 | 14 |

| Course Type | Course Code | Course Name | Course Type | Course Code | Course Name |
|---------------------|----------------|-----------------------------------|----------------------------|--------------|--------------|
| Program Elective-IV | 27AF1918PE703A | Infrastructure Planning | Multi-Disciplinary Minor-V | Refer Bucket | Refer Bucket |
| | 27AF1918PE703B | Port & Harbour Engineering | | | |
| | 27AF1918PE703C | Industrial Waste water Management | | | |
| Program Elective-V | 27AF1918PE704A | Professional Practices | | | |
| | 27AF1918PE704B | Construction Cost Analysis | | | |

Type of course:

| | | |
|--------------------------------------|--|--|
| Basic Science: BS | Engineering Science: ES | Program Elective: PE |
| Program Core: PC | Modern Indian Language: MIL | Indian Knowledge System: IK |
| Value Education Course: VEC | Ability Enhancement Course: AE | Vocational and Skill Enhancement: VS |
| Audit Course: AU | Open Elective: OE (Other than particular program) | Co-curricular & Extracurricular Activities: CC |
| Multidisciplinary Courses: MD | | Humanities, Management, language and Commerce: HM |

ELECTIVE / OPEN ELECTIVE/ MULTIDISCIPLINARY MINOR COURSES

Below listed courses will be offered as per student's requirement and availability of subject expert with the approval of the head of the department.

OPEN ELECTIVE OTHER THAN PARTICULAR PROGRAM

| Sr.No. | Course Offered | Teaching Scheme (Hrs) | | | | Credits |
|--------|---------------------------------|-----------------------|----|----|-------|---------|
| | | L | T | P | TOTAL | |
| 1 | Building Materials & Composites | 02 | 00 | 00 | 02 | 02 |
| 2 | Design of Masonry Structures | 02 | 00 | 00 | 02 | 02 |
| 3 | Energy Efficient Buildings | 02 | 00 | 00 | 02 | 02 |
| 4 | Advanced Surveying | 03 | 00 | 00 | 03 | 03 |
| 5 | Modern Surveying | 03 | 00 | 00 | 03 | 03 |
| 6 | Material Testing Engineering | 03 | 00 | 00 | 03 | 03 |
| 7 | Ropeway Engineering | 03 | 00 | 00 | 03 | 03 |
| 8 | Road Safety Audits | 03 | 00 | 00 | 03 | 03 |

PROGRAM ELECTIVE COURSE

| Sr.No. | Course Offered | Teaching Scheme (Hrs) | | | | Credits |
|--------|--|-----------------------|----|----|-------|---------|
| | | L | T | P | TOTAL | |
| 1 | Airport Engineering | 03 | 00 | 00 | 03 | 03 |
| 2 | Integrated Region and Smart City | 03 | 00 | 00 | 03 | 03 |
| 3 | Railway Engineering | 03 | 00 | 00 | 03 | 03 |
| 4 | Pavement Design and Management Environment | 03 | 00 | 00 | 03 | 03 |
| 5 | Intelligent Transportation Systems | 03 | 00 | 00 | 03 | 03 |
| 6 | Advanced Traffic Management Systems | 03 | 00 | 00 | 03 | 03 |
| 7 | Infrastructure Planning | 03 | 00 | 00 | 03 | 03 |
| 8 | Port & Harbour Engineering | 03 | 00 | 00 | 03 | 03 |
| 9 | Industrial Waste water Management | 03 | 00 | 00 | 03 | 03 |
| 10 | Professional Practices | 03 | 00 | 00 | 03 | 03 |
| 11 | Construction Cost Analysis | 03 | 00 | 00 | 03 | 03 |

HONORS- CIVIL ENGINEERING

| Sr.No. | Course Offered | Teaching Scheme (Hrs) | | | | Credits |
|--------|-----------------------------|-----------------------|----|----|-------|---------|
| | | L | T | P | TOTAL | |
| 1 | Finite Element Method | 03 | 00 | 00 | 03 | 03 |
| 2 | Elements of Remote Sensing | 03 | 00 | 00 | 03 | 03 |
| 3 | Advanced Structural Design | 03 | 00 | 00 | 03 | 03 |
| 4 | Theory of Plates and Shells | 03 | 00 | 00 | 03 | 03 |
| 5 | Structural Dynamics | 03 | 00 | 00 | 03 | 03 |

RESEARCH - CIVIL ENGINEERING

| Sr.No. | Course Offered | Teaching Scheme (Hrs) | | | | Credits |
|--------|--|-----------------------|----|----|-------|---------|
| | | L | T | P | TOTAL | |
| 1 | Problem Identification and Definition | 03 | 01 | 00 | 04 | 04 |
| 2 | Experimental Work/ Analytical Tools and Prototype Development | 03 | 01 | 00 | 04 | 04 |
| 3 | Literature Review | 03 | 01 | 00 | 04 | 04 |
| 4 | Publication | 03 | 01 | 00 | 04 | 04 |
| 5 | Data Analysis | 03 | 01 | 00 | 04 | 04 |

Note: The elective courses listed in the Course Contents structure are indicative. Students shall ensure availability of Course Contents prior to registration.

SELF STUDY COURSE(MOOC/SWAYAM/NPTEL)

| Sr.No. | Course Offered | Duration of Online Course |
|--------|---------------------------------------|---------------------------|
| 1 | Research Methodology | 08 to 12 weeks |
| 2 | Problem Identification and Definition | |
| 3 | Literature Review | |
| 4 | Publication | |
| 5 | Data Analysis | |

Teaching Scheme: Students must enroll any above mentioned course on online platform like MOOC/SWAYAM or can attend the offline workshops during the SEM-VII/VIII as per availability and produce the certificate to faculty co coordinator of institute/department. Assessment work can be done by faculty coordinator based on the student's performance.

MULTIDISCIPLINARY MINOR BUCKET
for AFFILIATED INSTITUTES
MINOR DEGREE IN CIVIL & INFRASTRUCTURE ENGINEERING
(For other than B.Tech. in Civil & Infrastructure Engineering program students)

| Semester | Subject Code | Subject Name | Total Credit |
|---|----------------|---|--------------|
| SEM-III | 25AF1918MD306 | Introduction to Engineering Geology | 3 |
| SEM-III | 25AF1918MD306A | Urban Transportation Planning | 3 |
| SEM-IV | 25AF1918MD406 | Highway Engineering | 3 |
| SEM-V | 25AF1918MD506 | Concrete Technology | 3 |
| SEM-VI | 25AF1918MD606 | Project Management | 3 |
| SEM-VII | 25AF1918MD706 | Construction Equipment and Site Safety Management | 2 |
| MINIMUM CREDITS REQUIRED TO COMPLETE A MINOR DEGREE IN CIVIL ENGINEERING | | | 14 |

MINOR DEGREE IN PLANNING ENGINEERING
(only for B.Tech. in Civil & Infrastructure Engineering program students)

| Semester | Subject Code | Subject Name | Total Credit |
|--|----------------|--|--------------|
| SEM-III | 25AFMDPLAN306A | Site Planning | 3 |
| SEM-III | 25AF1918MD306 | Introduction to Engineering Geology | 3 |
| SEM-IV | 25AFMDPLAN406A | Fundamentals of Urban Design | 2 |
| SEM-IV | 25AFMDPLAN406B | Town and Urban Planning | 2 |
| SEM-V | 25AFMDPLAN506A | Real Estate Development and Management | 3 |
| SEM-V | 25AFMDPLAN506B | Planning Legislation | 3 |
| SEM-VI | 25AFMDPLAN606A | Disaster Mitigation and Management | 3 |
| SEM- VI | 25AFMDPLAN606B | Project Management | 3 |
| SEM-VII | 25AFMDPLAN706A | Sustainable Building Planning | 3 |
| SEM-VII | 25AFMDPLAN706B | Appropriate Building Technologies | 3 |
| MINIMUM CREDITS REQUIRED TO COMPLETE A MINOR DEGREE IN PLANNING ENGINEERING | | | 14 |