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BTEUP Civil Engineering Complete Syllabus 2026-27

All Years, All Semesters — In One Place

Diploma in Civil Engineering • NEP-2020 • Approved 16.07.2026

What is inside: the complete BTEUP Diploma in Civil Engineering syllabus for session 2026-27 in one file — 42 subject-wise syllabus PDFs: the full 1st-year common curriculum (11 subjects, the same for all 41 engineering branches), the full 3rd semester (1000 marks, 20 credits), the full 4th semester (950 marks, 20 credits), the full 5th semester (850 marks, 20 credits, with electives) and the full 6th semester (650 marks, 20 credits, with electives and the major project). Each subject keeps its own pages, tables and reference books. **1st year:** the full 1st-year examination scheme is from the official 1st-year curriculum (folder2627), corrected and approved by the Board of Technical Education, U.P. Lucknow in the C.D.C. meeting held on 16.07.2026, effective from 2026-27 — 1st semester 18 credits / 900 marks, 2nd semester 22 credits / 1050 marks. The official curriculum gives no paper codes — subjects are numbered 1.1-1.6 and 2.1-2.7 only. **2nd year (3rd & 4th semester):** confirmed as the 2026-27 syllabus from the IIMT mirror of the official BTEUP 2nd-year curriculum, approved in the C.D.C. meeting held on 16.07.2026 (the approval line appears 185 times in the mirror PDF, and its 3rd-semester scheme table matches the syllabus in this file exactly — 20 credits, 1000 marks). **Two discrepancies as printed in the official 3rd-year PDF:** (1) the 6th-semester total row prints internal 310 / external 390, but the subject rows add up to internal 370 / external 280 — the total of 650 marks matches the subject rows, so the printed internal/external split is unreliable; (2) the 6.4 Project internal assessment criteria add up to 290 (40 + 50 + 50 + 90 + 60), not the printed total of 240 — the scheme's 240 internal / 160 external / 400 total is used in the Project pages. Nothing here has been silently “fixed”.

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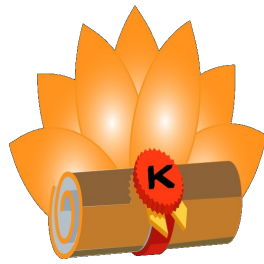
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Source: BTEUP 1st Year common curriculum, 2nd Year Civil Engineering curriculum (confirmed from the IIMT mirror of the official curriculum, approved in C.D.C. meeting held on 16.07.2026) and 3rd Year Civil Engineering curriculum (folder2627), approved in C.D.C. meeting held on 16.07.2026. Topic lists follow the official syllabi; short explanations are the author's own plain-English summaries, not syllabus text.



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Mathematics — First Year

BTEUP Diploma • 1st Semester (First Year — Common Curriculum) • Session 2026–27
Common Curriculum • 1st Semester • All 41 Engineering Branches

About this document: The first year of a BTEUP diploma runs on one common curriculum for 41 engineering branches, so this subject is the same whether you are in Computer Science, Mechanical, Civil or Electrical. The examination scheme below is from the official 1st-year curriculum (folder2627, NEP-2020), corrected and approved by the Board of Technical Education, U.P. Lucknow in the C.D.C. meeting held on 16.07.2026.

What This Subject Aims To Do

To build the mathematical foundation every engineer needs — the algebra, calculus and matrices that later subjects (C programming logic, networks, data structures) all stand on.

Unit-Wise Complete Topic List

Algebra & Trigonometry

Topics: Algebraic expressions and equations; trigonometric ratios, identities and heights and distances.

In simple words: The everyday maths of engineering: solving equations and working with angles and triangles.

Calculus

Topics: Limits, differentiation and its applications; integration and its applications; definite integrals.

In simple words: How things change and accumulate — the maths behind rates, slopes, areas and volumes.

Matrices & Determinants

Topics: Types of matrices; operations on matrices; determinants; solving systems of linear equations.

In simple words: Organising numbers in tables and solving several equations at once — the same idea behind computer graphics and data handling.

Differential Equations

Topics: First-order differential equations and their simple applications.

In simple words: Equations that describe how things change over time — used everywhere from circuits to mechanics.

Examination Scheme — 1st & 2nd Semester (Official, Verified 2026-27)

1st Semester — 18 Credits, 900 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
1.1	Mathematics-I	2-1-0	3	Th 40	Th 60	100
1.2	Applied Physics-I	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.3	Applied Chemistry OR Introduction to IT and AI	3-0-2 / 2-0-4	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.4	Communication Skills in English OR Fundamentals of Electrical & Electronics Engineering	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200

1.5	Engineering Graphics OR Engineering Workshop Practice	0-0- 4	2	Graphics: Pr 40 / Workshop: Pr 60	Graphics: Th 60 / Workshop: Pr 40	100
1.6	Sports & Yoga	0-0- 2	1	Pr 50	—	50
—	Student Centred Activities (SCA)	0-0- 10	—	Pr 50	—	50
1st Semester Total			18	—	—	900

2nd Semester — 22 Credits, 1050 Marks

Sr. No.	Subject	L-T- P	Credits	Internal	External	Total
2.1	Mathematics-II	3-1- 0	4	Th 40	Th 60	100
2.2	Applied Physics-II	3-0- 2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.3	Introduction to IT and AI OR Applied Chemistry	2-0- 4 / 3-0- 2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.4	Fundamentals of Electrical & Electronics Engineering OR Communication Skills in English	3-0- 2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.5	Engineering Mechanics	2-1- 2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.6	Engineering Workshop Practice OR Engineering Graphics	0-0- 4	2	Workshop: Pr 60 / Graphics: Pr 40	Workshop: Pr 40 / Graphics: Th 60	100
2.7	(Q) Environmental Sciences	3-0- 0	— (Audit)	—	Th 60*	—
—	Student Centred Activities (SCA)	0-0- 4	—	Pr 50	—	50
2nd Semester Total			22	—	—	1050

About the OR choices: at Sr. No. 1.3, 1.4 and 1.5 the institute chooses which alternative runs in the 1st semester; the other alternative then runs in the 2nd semester (1.3 ↔ 2.3, 1.4 ↔ 2.4, 1.5 ↔ 2.6). An alternative once selected in the 1st semester is not selected again in the 2nd semester.

No paper codes: the official 1st-year curriculum gives no paper codes — subjects are numbered 1.1–1.6 in the 1st semester and 2.1–2.7 in the 2nd semester only.

Qualifying subject: Environmental Sciences (2.7, Q) is an audit subject — you must appear and pass, but its 60 external marks are not counted for percentage or division.

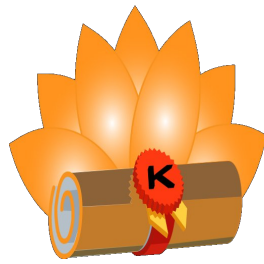
Each period is 60 minutes; each session is 16 weeks, with at least 14 effective teaching weeks. A 4-week summer internship (Internship-I) is organised after the 2nd-semester examination and is evaluated in the 3rd semester.

How This Helps You Later

If your maths is weak, building logic in C programming becomes difficult. Strong first-year maths makes 2nd-year subjects noticeably easier.

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Source: BTEUP 1st Year common curriculum (folder2627), corrected and approved in the C.D.C. meeting held on 16.07.2026 — scheme and subject areas verified. Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text. Please confirm with your own polytechnic for any local changes.



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Physics — First Year

BTEUP Diploma • 1st Semester (First Year — Common Curriculum) • Session 2026–27
Common Curriculum • 1st Semester • All 41 Engineering Branches

About this document: The first year of a BTEUP diploma runs on one common curriculum for 41 engineering branches, so this subject is the same whether you are in Computer Science, Mechanical, Civil or Electrical. The examination scheme below is from the official 1st-year curriculum (folder2627, NEP-2020), corrected and approved by the Board of Technical Education, U.P. Lucknow in the C.D.C. meeting held on 16.07.2026.

What This Subject Aims To Do

To build a working understanding of the physical world — motion, force, energy, light, sound and electricity — through concepts and simple experiments.

Unit-Wise Complete Topic List

Mechanics

Topics: Laws of motion; force, work, energy and power; friction; circular motion.

In simple words: Why things move the way they do — the foundation of machines and structures.

Electricity & Magnetism

Topics: Electric charge, current and voltage; Ohm's law; magnetic effects of current.

In simple words: The physics behind every circuit you will meet in electronics and networks.

Optics & Waves

Topics: Reflection and refraction; lenses; wave motion and sound.

In simple words: How light and sound behave — used in instruments, communication and displays.

Modern Physics

Topics: Atomic structure; semiconductors in brief; lasers and their uses.

In simple words: A first look at the physics inside chips and modern devices.

Examination Scheme — 1st & 2nd Semester (Official, Verified 2026-27)

1st Semester — 18 Credits, 900 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
1.1	Mathematics-I	2-1-0	3	Th 40	Th 60	100
1.2	Applied Physics-I	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.3	Applied Chemistry OR Introduction to IT and AI	3-0-2 / 2-0-4	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.4	Communication Skills in English OR Fundamentals of Electrical & Electronics Engineering	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.5	Engineering Graphics OR Engineering Workshop Practice	0-0-4	2	Graphics: Pr 40 / Workshop: Pr 60	Graphics: Th 60 / Workshop: Pr 40	100
1.6	Sports & Yoga	0-0-2	1	Pr 50	—	50
—	Student Centred Activities (SCA)	0-0-10	—	Pr 50	—	50

1st Semester Total	18	—	—	900
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2nd Semester — 22 Credits, 1050 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
2.1	Mathematics-II	3-1-0	4	Th 40	Th 60	100
2.2	Applied Physics-II	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.3	Introduction to IT and AI OR Applied Chemistry	2-0-4 / 3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.4	Fundamentals of Electrical & Electronics Engineering OR Communication Skills in English	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.5	Engineering Mechanics	2-1-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.6	Engineering Workshop Practice OR Engineering Graphics	0-0-4	2	Workshop: Pr 60 / Graphics: Pr 40	Workshop: Pr 40 / Graphics: Th 60	100
2.7	(Q) Environmental Sciences	3-0-0	— (Audit)	—	Th 60*	—
—	Student Centred Activities (SCA)	0-0-4	—	Pr 50	—	50
2nd Semester Total			22	—	—	1050

About the OR choices: at Sr. No. 1.3, 1.4 and 1.5 the institute chooses which alternative runs in the 1st semester; the other alternative then runs in the 2nd semester (1.3 ↔ 2.3, 1.4 ↔ 2.4, 1.5 ↔ 2.6). An alternative once selected in the 1st semester is not selected again in the 2nd semester.

No paper codes: the official 1st-year curriculum gives no paper codes — subjects are numbered 1.1–1.6 in the 1st semester and 2.1–2.7 in the 2nd semester only.

Qualifying subject: Environmental Sciences (2.7, Q) is an audit subject — you must appear and pass, but its 60 external marks are not counted for percentage or division.

Each period is 60 minutes; each session is 16 weeks, with at least 14 effective teaching weeks. A 4-week summer internship (Internship-I) is organised after the 2nd-semester examination and is evaluated in the 3rd semester.

How This Helps You Later

Physics and electronics form the base of Computer Networks and IoT. Weak physics in the first year makes networks harder in the 2nd year.

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Chemistry — First Year

BTEUP Diploma • 1st Semester (First Year — Common Curriculum) • Session 2026–27
Common Curriculum • 1st Semester • All 41 Engineering Branches

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What This Subject Aims To Do

To give a practical understanding of the chemistry that engineers meet — materials, water, fuels and corrosion — and safe laboratory practice.

Unit-Wise Complete Topic List

Atomic Structure & Bonding

Topics: Atoms, molecules and ions; chemical bonds; the periodic table in brief.

In simple words: What materials are made of and why they behave the way they do.

Water Technology

Topics: Hardness of water; water treatment methods; boiler feed water.

In simple words: Why water must be treated before it is used in boilers and industry.

Fuels & Combustion

Topics: Types of fuels; calorific value; combustion and its control.

In simple words: How fuels release energy and how that energy is used efficiently.

Corrosion & Its Prevention

Topics: What corrosion is; types of corrosion; methods of prevention.

In simple words: Why metals rust and wear out, and how engineers protect them.

Examination Scheme – 1st & 2nd Semester (Official, Verified 2026-27)

1st Semester — 18 Credits, 900 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
1.1	Mathematics-I	2-1-0	3	Th 40	Th 60	100
1.2	Applied Physics-I	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.3	Applied Chemistry OR Introduction to IT and AI	3-0-2 / 2-0-4	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.4	Communication Skills in English OR Fundamentals of Electrical & Electronics Engineering	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.5	Engineering Graphics OR Engineering Workshop Practice	0-0-4	2	Graphics: Pr 40 / Workshop: Pr 60	Graphics: Th 60 / Workshop: Pr 40	100
1.6	Sports & Yoga	0-0-2	1	Pr 50	—	50
—	Student Centred Activities (SCA)	0-0-10	—	Pr 50	—	50
1st Semester Total			18	—	—	900

2nd Semester — 22 Credits, 1050 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
2.1	Mathematics-II	3-1-0	4	Th 40	Th 60	100
2.2	Applied Physics-II	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.3	Introduction to IT and AI OR Applied Chemistry	2-0-4 / 3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.4	Fundamentals of Electrical & Electronics Engineering OR Communication Skills in English	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.5	Engineering Mechanics	2-1-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.6	Engineering Workshop Practice OR Engineering Graphics	0-0-4	2	Workshop: Pr 60 / Graphics: Pr 40	Workshop: Pr 40 / Graphics: Th 60	100
2.7	(Q) Environmental Sciences	3-0-0	— (Audit)	—	Th 60*	—
—	Student Centred Activities (SCA)	0-0-4	—	Pr 50	—	50
2nd Semester Total			22	—	—	1050

About the OR choices: at Sr. No. 1.3, 1.4 and 1.5 the institute chooses which alternative runs in the 1st semester; the other alternative then runs in the 2nd semester (1.3 ↔ 2.3, 1.4 ↔ 2.4, 1.5 ↔ 2.6). An alternative once selected in the 1st semester is not selected again in the 2nd semester.

No paper codes: the official 1st-year curriculum gives no paper codes — subjects are numbered 1.1–1.6 in the 1st semester and 2.1–2.7 in the 2nd semester only.

Qualifying subject: Environmental Sciences (2.7, Q) is an audit subject — you must appear and pass, but its 60 external marks are not counted for percentage or division.

Each period is 60 minutes; each session is 16 weeks, with at least 14 effective teaching weeks. A 4-week summer internship (Internship-I) is organised after the 2nd-semester examination and is evaluated in the 3rd semester.

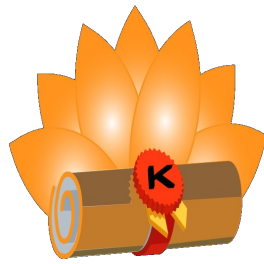
How This Helps You Later

Chemistry teaches you how materials behave — useful whenever you work with hardware, batteries and electronic components.

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Source: BTEUP 1st Year common curriculum (folder2627), corrected and approved in the C.D.C. meeting held on 16.07.2026 — scheme and subject areas verified. Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text. Please confirm with your own polytechnic for any local changes.





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English Communication — First Year

BTEUP Diploma • 1st Semester (First Year — Common Curriculum) • Session 2026–27
Common Curriculum • 1st Semester • All 41 Engineering Branches

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What This Subject Aims To Do

To build the English communication skills a diploma engineer needs — reading technical material, writing clearly, and speaking confidently in interviews and at work.

Unit-Wise Complete Topic List

Reading & Comprehension

Topics: Reading technical passages; understanding instructions and manuals; vocabulary building.

In simple words: Reading a manual or a question paper and understanding exactly what it asks.

Writing Skills

Topics: Letters, emails, reports and notices; paragraph and essay writing; grammar in use.

In simple words: Writing clearly and correctly — the skill behind every report, email and job application.

Speaking & Listening

Topics: Introducing yourself; group discussion; presentation skills; listening comprehension.

In simple words: Speaking with confidence in class, in viva and in placement interviews.

Workplace Communication

Topics: Resume writing; interview skills; telephone and email etiquette.

In simple words: The communication that gets you placed and keeps you professional at work.

Examination Scheme — 1st & 2nd Semester (Official, Verified 2026-27)

1st Semester — 18 Credits, 900 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
1.1	Mathematics-I	2-1-0	3	Th 40	Th 60	100
1.2	Applied Physics-I	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.3	Applied Chemistry OR Introduction to IT and AI	3-0-2 / 2-0-4	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.4	Communication Skills in English OR Fundamentals of Electrical & Electronics Engineering	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200

1.5	Engineering Graphics OR Engineering Workshop Practice	0-0- 4	2	Graphics: Pr 40 / Workshop: Pr 60	Graphics: Th 60 / Workshop: Pr 40	100
1.6	Sports & Yoga	0-0- 2	1	Pr 50	—	50
—	Student Centred Activities (SCA)	0-0- 10	—	Pr 50	—	50
1st Semester Total			18	—	—	900

2nd Semester — 22 Credits, 1050 Marks

Sr. No.	Subject	L-T- P	Credits	Internal	External	Total
2.1	Mathematics-II	3-1- 0	4	Th 40	Th 60	100
2.2	Applied Physics-II	3-0- 2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.3	Introduction to IT and AI OR Applied Chemistry	2-0- 4 / 3-0- 2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.4	Fundamentals of Electrical & Electronics Engineering OR Communication Skills in English	3-0- 2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.5	Engineering Mechanics	2-1- 2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
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2.7	(Q) Environmental Sciences	3-0- 0	— (Audit)	—	Th 60*	—
—	Student Centred Activities (SCA)	0-0- 4	—	Pr 50	—	50
2nd Semester Total			22	—	—	1050

About the OR choices: at Sr. No. 1.3, 1.4 and 1.5 the institute chooses which alternative runs in the 1st semester; the other alternative then runs in the 2nd semester (1.3 ↔ 2.3, 1.4 ↔ 2.4, 1.5 ↔ 2.6). An alternative once selected in the 1st semester is not selected again in the 2nd semester.

No paper codes: the official 1st-year curriculum gives no paper codes — subjects are numbered 1.1–1.6 in the 1st semester and 2.1–2.7 in the 2nd semester only.

Qualifying subject: Environmental Sciences (2.7, Q) is an audit subject — you must appear and pass, but its 60 external marks are not counted for percentage or division.

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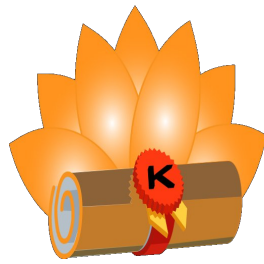
How This Helps You Later

Communication skill decides how far technical skill takes you — in viva, in interviews and in every job after the diploma.

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Engineering Graphics — First Year

BTEUP Diploma • 1st Semester (First Year — Common Curriculum) • Session 2026–27
Common Curriculum • 1st Semester • All 41 Engineering Branches

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What This Subject Aims To Do

To teach the language engineers draw in — lines, projections and sections — so you can read a drawing and make one, by hand and on computer.

Unit-Wise Complete Topic List

Drawing Basics

Topics: Drawing instruments; lines and lettering; dimensioning; scales.

In simple words: The alphabet of engineering drawing: line types, letters and measurements.

Projections

Topics: Orthographic projections; first-angle and third-angle projection; isometric views.

In simple words: How a 3D object is shown correctly on a flat sheet of paper.

Sections & Development

Topics: Sectional views; development of surfaces.

In simple words: Seeing inside an object on paper, and unfolding a 3D shape into a flat pattern.

Computer-Aided Drawing

Topics: Introduction to CAD tools for engineering drawing.

In simple words: The same drawing work done on a computer — the skill used in every design office today.

Examination Scheme — 1st & 2nd Semester (Official, Verified 2026-27)

1st Semester — 18 Credits, 900 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
1.1	Mathematics-I	2-1-0	3	Th 40	Th 60	100
1.2	Applied Physics-I	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.3	Applied Chemistry OR Introduction to IT and AI	3-0-2 / 2-0-4	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.4	Communication Skills in English OR Fundamentals of Electrical & Electronics Engineering	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.5	Engineering Graphics OR Engineering Workshop Practice	0-0-4	2	Graphics: Pr 40 / Workshop: Pr 60	Graphics: Th 60 / Workshop: Pr 40	100
1.6	Sports & Yoga	0-0-2	1	Pr 50	—	50
—	Student Centred Activities (SCA)	0-0-10	—	Pr 50	—	50

1st Semester Total	18	—	—	900
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2nd Semester — 22 Credits, 1050 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
2.1	Mathematics-II	3-1-0	4	Th 40	Th 60	100
2.2	Applied Physics-II	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.3	Introduction to IT and AI OR Applied Chemistry	2-0-4 / 3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.4	Fundamentals of Electrical & Electronics Engineering OR Communication Skills in English	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.5	Engineering Mechanics	2-1-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.6	Engineering Workshop Practice OR Engineering Graphics	0-0-4	2	Workshop: Pr 60 / Graphics: Pr 40	Workshop: Pr 40 / Graphics: Th 60	100
2.7	(Q) Environmental Sciences	3-0-0	— (Audit)	—	Th 60*	—
—	Student Centred Activities (SCA)	0-0-4	—	Pr 50	—	50
2nd Semester Total			22	—	—	1050

About the OR choices: at Sr. No. 1.3, 1.4 and 1.5 the institute chooses which alternative runs in the 1st semester; the other alternative then runs in the 2nd semester (1.3 ↔ 2.3, 1.4 ↔ 2.4, 1.5 ↔ 2.6). An alternative once selected in the 1st semester is not selected again in the 2nd semester.

No paper codes: the official 1st-year curriculum gives no paper codes — subjects are numbered 1.1–1.6 in the 1st semester and 2.1–2.7 in the 2nd semester only.

Qualifying subject: Environmental Sciences (2.7, Q) is an audit subject — you must appear and pass, but its 60 external marks are not counted for percentage or division.

Each period is 60 minutes; each session is 16 weeks, with at least 14 effective teaching weeks. A 4-week summer internship (Internship-I) is organised after the 2nd-semester examination and is evaluated in the 3rd semester.

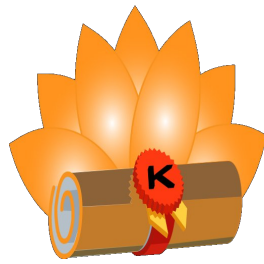
How This Helps You Later

Graphics trains your eye for shape and size — useful in every branch, and the base of design and modelling work.

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Source: BTEUP 1st Year common curriculum (folder2627), corrected and approved in the C.D.C. meeting held on 16.07.2026 — scheme and subject areas verified. Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text. Please confirm with your own polytechnic for any local changes.





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Workshop Practice — First Year

BTEUP Diploma • 1st Semester (First Year — Common Curriculum) • Session 2026–27
Common Curriculum • 1st Semester • All 41 Engineering Branches

About this document: The first year of a BTEUP diploma runs on one common curriculum for 41 engineering branches, so this subject is the same whether you are in Computer Science, Mechanical, Civil or Electrical. The examination scheme below is from the official 1st-year curriculum (folder2627, NEP-2020), corrected and approved by the Board of Technical Education, U.P. Lucknow in the C.D.C. meeting held on 16.07.2026.

What This Subject Aims To Do

To give hands-on workshop experience — measuring, cutting, fitting, joining and finishing — with real tools, safely and correctly.

Unit-Wise Complete Topic List

Fitting Shop

Topics: Measuring instruments; marking; filing; sawing; drilling; tapping.

In simple words: Making a metal piece to exact size by hand — the core workshop skill.

Carpentry & Joinery

Topics: Woodworking tools; joints; simple wooden jobs.

In simple words: Working with wood: cutting, shaping and joining it cleanly.

Welding & Sheet Metal

Topics: Arc and gas welding in brief; sheet-metal cutting, bending and joining.

In simple words: Joining metals and shaping thin sheets — used in fabrication everywhere.

Safety & Housekeeping

Topics: Workshop safety rules; personal protective equipment; tool care.

In simple words: The habits that keep you and others safe in any workshop or lab.

Examination Scheme — 1st & 2nd Semester (Official, Verified 2026-27)

1st Semester — 18 Credits, 900 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
1.1	Mathematics-I	2-1-0	3	Th 40	Th 60	100
1.2	Applied Physics-I	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.3	Applied Chemistry OR Introduction to IT and AI	3-0-2 / 2-0-4	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.4	Communication Skills in English OR Fundamentals of Electrical & Electronics Engineering	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.5	Engineering Graphics OR Engineering Workshop Practice	0-0-4	2	Graphics: Pr 40 / Workshop: Pr 60	Graphics: Th 60 / Workshop: Pr 40	100
1.6	Sports & Yoga	0-0-2	1	Pr 50	—	50
—	Student Centred Activities (SCA)	0-0-10	—	Pr 50	—	50

1st Semester Total	18	—	—	900
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2nd Semester — 22 Credits, 1050 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
2.1	Mathematics-II	3-1-0	4	Th 40	Th 60	100
2.2	Applied Physics-II	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.3	Introduction to IT and AI OR Applied Chemistry	2-0-4 / 3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.4	Fundamentals of Electrical & Electronics Engineering OR Communication Skills in English	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.5	Engineering Mechanics	2-1-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.6	Engineering Workshop Practice OR Engineering Graphics	0-0-4	2	Workshop: Pr 60 / Graphics: Pr 40	Workshop: Pr 40 / Graphics: Th 60	100
2.7	(Q) Environmental Sciences	3-0-0	— (Audit)	—	Th 60*	—
—	Student Centred Activities (SCA)	0-0-4	—	Pr 50	—	50
2nd Semester Total			22	—	—	1050

About the OR choices: at Sr. No. 1.3, 1.4 and 1.5 the institute chooses which alternative runs in the 1st semester; the other alternative then runs in the 2nd semester (1.3 ↔ 2.3, 1.4 ↔ 2.4, 1.5 ↔ 2.6). An alternative once selected in the 1st semester is not selected again in the 2nd semester.

No paper codes: the official 1st-year curriculum gives no paper codes — subjects are numbered 1.1–1.6 in the 1st semester and 2.1–2.7 in the 2nd semester only.

Qualifying subject: Environmental Sciences (2.7, Q) is an audit subject — you must appear and pass, but its 60 external marks are not counted for percentage or division.

Each period is 60 minutes; each session is 16 weeks, with at least 14 effective teaching weeks. A 4-week summer internship (Internship-I) is organised after the 2nd-semester examination and is evaluated in the 3rd semester.

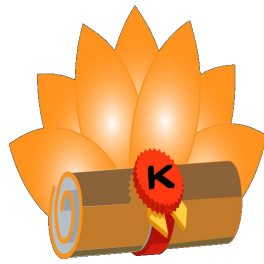
How This Helps You Later

Workshop is where you stop being only a theory student and become a practical engineer. Many students take it lightly — do not.

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Source: BTEUP 1st Year common curriculum (folder2627), corrected and approved in the C.D.C. meeting held on 16.07.2026 — scheme and subject areas verified. Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text. Please confirm with your own polytechnic for any local changes.





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IT Systems — First Year

BTEUP Diploma • 1st Semester (First Year — Common Curriculum) • Session 2026–27
Common Curriculum • 1st Semester • All 41 Engineering Branches

About this document: The first year of a BTEUP diploma runs on one common curriculum for 41 engineering branches, so this subject is the same whether you are in Computer Science, Mechanical, Civil or Electrical. The examination scheme below is from the official 1st-year curriculum (folder2627, NEP-2020), corrected and approved by the Board of Technical Education, U.P. Lucknow in the C.D.C. meeting held on 16.07.2026.

What This Subject Aims To Do

To build a solid base in computers — hardware, software, operating systems, the internet and everyday office tools — before branch subjects begin.

Unit-Wise Complete Topic List

Computer Fundamentals

Topics: Parts of a computer; input and output devices; memory and storage; types of software.

In simple words: What is inside a computer and how its parts work together.

Operating Systems

Topics: What an operating system does; files and folders; basic commands.

In simple words: Managing your own computer properly — the first step before the Operating Systems subject in the 3rd semester.

Internet & Email

Topics: Browsers and search; email; safe internet use; online services.

In simple words: Using the internet for study and work, and staying safe while doing it.

Office Tools

Topics: Word processing; spreadsheets; presentations.

In simple words: Documents, tables and slides — the tools behind every report, assignment and seminar.

Examination Scheme — 1st & 2nd Semester (Official, Verified 2026-27)

1st Semester — 18 Credits, 900 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
1.1	Mathematics-I	2-1-0	3	Th 40	Th 60	100
1.2	Applied Physics-I	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.3	Applied Chemistry OR Introduction to IT and AI	3-0-2 / 2-0-4	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.4	Communication Skills in English OR Fundamentals of Electrical & Electronics Engineering	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.5	Engineering Graphics OR Engineering Workshop Practice	0-0-4	2	Graphics: Pr 40 / Workshop: Pr 60	Graphics: Th 60 / Workshop: Pr 40	100
1.6	Sports & Yoga	0-0-2	1	Pr 50	—	50
—	Student Centred Activities (SCA)	0-0-10	—	Pr 50	—	50

1st Semester Total	18	—	—	900
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2nd Semester — 22 Credits, 1050 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
2.1	Mathematics-II	3-1-0	4	Th 40	Th 60	100
2.2	Applied Physics-II	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.3	Introduction to IT and AI OR Applied Chemistry	2-0-4 / 3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.4	Fundamentals of Electrical & Electronics Engineering OR Communication Skills in English	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.5	Engineering Mechanics	2-1-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.6	Engineering Workshop Practice OR Engineering Graphics	0-0-4	2	Workshop: Pr 60 / Graphics: Pr 40	Workshop: Pr 40 / Graphics: Th 60	100
2.7	(Q) Environmental Sciences	3-0-0	— (Audit)	—	Th 60*	—
—	Student Centred Activities (SCA)	0-0-4	—	Pr 50	—	50
2nd Semester Total			22	—	—	1050

About the OR choices: at Sr. No. 1.3, 1.4 and 1.5 the institute chooses which alternative runs in the 1st semester; the other alternative then runs in the 2nd semester (1.3 ↔ 2.3, 1.4 ↔ 2.4, 1.5 ↔ 2.6). An alternative once selected in the 1st semester is not selected again in the 2nd semester.

No paper codes: the official 1st-year curriculum gives no paper codes — subjects are numbered 1.1–1.6 in the 1st semester and 2.1–2.7 in the 2nd semester only.

Qualifying subject: Environmental Sciences (2.7, Q) is an audit subject — you must appear and pass, but its 60 external marks are not counted for percentage or division.

Each period is 60 minutes; each session is 16 weeks, with at least 14 effective teaching weeks. A 4-week summer internship (Internship-I) is organised after the 2nd-semester examination and is evaluated in the 3rd semester.

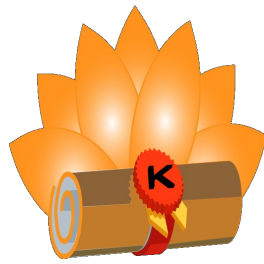
How This Helps You Later

This subject is your first step into computing — it makes the 3rd-semester subjects (Operating Systems, Web Technologies, C) much easier to pick up.

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Source: BTEUP 1st Year common curriculum (folder2627), corrected and approved in the C.D.C. meeting held on 16.07.2026 — scheme and subject areas verified. Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text. Please confirm with your own polytechnic for any local changes.





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Electrical & Electronics Fundamentals — First Year

BTEUP Diploma • 1st Semester (First Year — Common Curriculum) • Session 2026-27
Common Curriculum • 1st Semester • All 41 Engineering Branches

About this document: The first year of a BTEUP diploma runs on one common curriculum for 41 engineering branches, so this subject is the same whether you are in Computer Science, Mechanical, Civil or Electrical. The examination scheme below is from the official 1st-year curriculum (folder2627, NEP-2020), corrected and approved by the Board of Technical Education, U.P. Lucknow in the C.D.C. meeting held on 16.07.2026.

What This Subject Aims To Do

To explain electricity and basic electronics from the ground up — current, voltage, circuits and components — with simple experiments.

Unit-Wise Complete Topic List

Basic Electrical Concepts

Topics: Charge, current, voltage, resistance and power; Ohm's law; series and parallel circuits.

In simple words: The four quantities behind every electrical circuit, and how they relate.

AC & DC

Topics: Direct current and alternating current; single-phase AC in brief; transformers in brief.

In simple words: The two kinds of electric supply, and how voltage is changed for transmission and use.

Electronic Components

Topics: Resistors, capacitors, inductors; diodes and transistors in brief.

In simple words: The small parts that make electronic circuits work.

Measuring Instruments

Topics: Multimeter; ammeter and voltmeter; measuring voltage, current and resistance.

In simple words: Measuring a real circuit and checking whether it behaves as expected.

Examination Scheme — 1st & 2nd Semester (Official, Verified 2026-27)

1st Semester — 18 Credits, 900 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
1.1	Mathematics-I	2-1-0	3	Th 40	Th 60	100
1.2	Applied Physics-I	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.3	Applied Chemistry OR Introduction to IT and AI	3-0-2 / 2-0-4	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.4	Communication Skills in English OR Fundamentals of Electrical & Electronics Engineering	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.5		0-0-4	2	Graphics: Pr 40 /	Graphics: Th 60 /	100

	Engineering Graphics OR Engineering Workshop Practice			Workshop: Pr 60	Workshop: Pr 40	
1.6	Sports & Yoga	0-0- 2	1	Pr 50	—	50
—	Student Centred Activities (SCA)	0-0- 10	—	Pr 50	—	50
1st Semester Total			18	—	—	900

2nd Semester — 22 Credits, 1050 Marks

Sr. No.	Subject	L-T- P	Credits	Internal	External	Total
2.1	Mathematics-II	3-1- 0	4	Th 40	Th 60	100
2.2	Applied Physics-II	3-0- 2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.3	Introduction to IT and AI OR Applied Chemistry	2-0- 4 / 3-0- 2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.4	Fundamentals of Electrical & Electronics Engineering OR Communication Skills in English	3-0- 2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.5	Engineering Mechanics	2-1- 2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.6	Engineering Workshop Practice OR Engineering Graphics	0-0- 4	2	Workshop: Pr 60 / Graphics: Pr 40	Workshop: Pr 40 / Graphics: Th 60	100
2.7	(Q) Environmental Sciences	3-0- 0	— (Audit)	—	Th 60*	—
—	Student Centred Activities (SCA)	0-0- 4	—	Pr 50	—	50
2nd Semester Total			22	—	—	1050

About the OR choices: at Sr. No. 1.3, 1.4 and 1.5 the institute chooses which alternative runs in the 1st semester; the other alternative then runs in the 2nd semester (1.3 ↔ 2.3, 1.4 ↔

2.4, 1.5 ↔ 2.6). An alternative once selected in the 1st semester is not selected again in the 2nd semester.

No paper codes: the official 1st-year curriculum gives no paper codes — subjects are numbered 1.1–1.6 in the 1st semester and 2.1–2.7 in the 2nd semester only.

Qualifying subject: Environmental Sciences (2.7, Q) is an audit subject — you must appear and pass, but its 60 external marks are not counted for percentage or division.

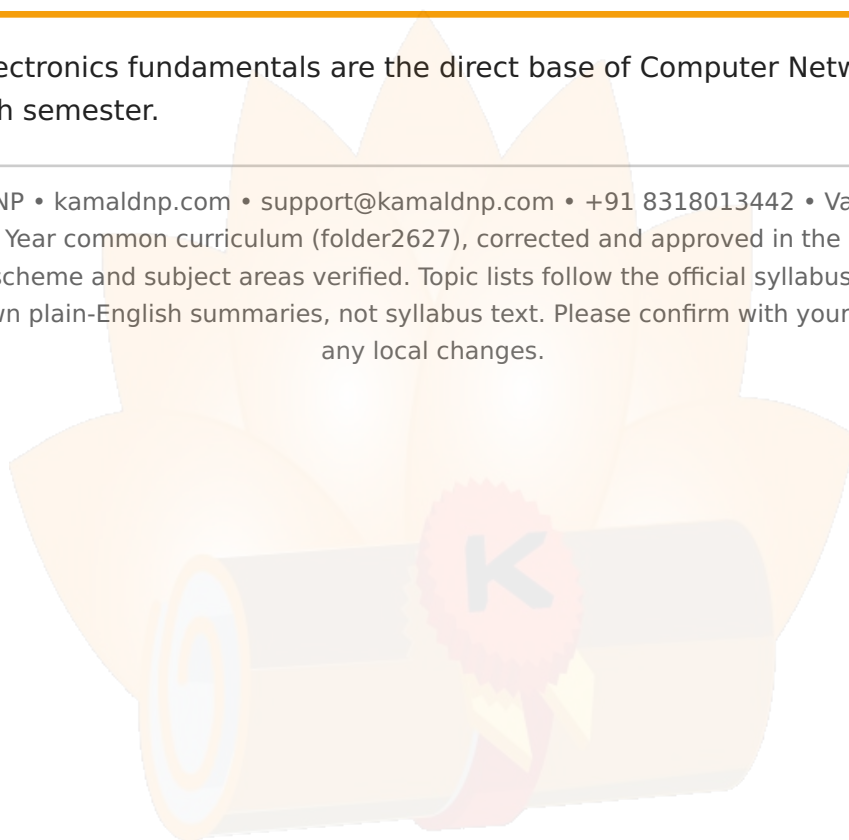
Each period is 60 minutes; each session is 16 weeks, with at least 14 effective teaching weeks. A 4-week summer internship (Internship-I) is organised after the 2nd-semester examination and is evaluated in the 3rd semester.

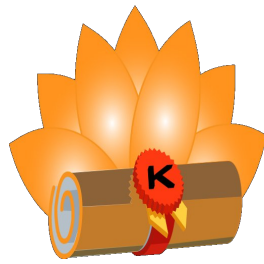
How This Helps You Later

Electrical and electronics fundamentals are the direct base of Computer Networks and the IoT subject in the 5th semester.

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Source: BTEUP 1st Year common curriculum (folder2627), corrected and approved in the C.D.C. meeting held on 16.07.2026 — scheme and subject areas verified. Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text. Please confirm with your own polytechnic for any local changes.





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Engineering Mechanics — First Year

BTEUP Diploma • 1st Semester (First Year — Common Curriculum) • Session 2026–27
Common Curriculum • 1st Semester • All 41 Engineering Branches

About this document: The first year of a BTEUP diploma runs on one common curriculum for 41 engineering branches, so this subject is the same whether you are in Computer Science, Mechanical, Civil or Electrical. The examination scheme below is from the official 1st-year curriculum (folder2627, NEP-2020), corrected and approved by the Board of Technical Education, U.P. Lucknow in the C.D.C. meeting held on 16.07.2026.

What This Subject Aims To Do

To explain how forces act on bodies — at rest and in motion — so you can analyse simple machines and structures.

Unit-Wise Complete Topic List

Forces & Equilibrium

Topics: Types of forces; resultant and equilibrant; conditions of equilibrium.

In simple words: When things stay still and when they move — the first question of mechanics.

Friction

Topics: Laws of friction; angle of friction; friction in simple machines.

In simple words: Why things grip or slip, and how friction is used or reduced.

Laws of Motion & Simple Machines

Topics: Newton's laws; levers, pulleys and inclined planes.

In simple words: The classic machines that multiply force — still the base of mechanical design.

Centre of Gravity & Moment of Inertia

Topics: Centre of gravity of simple shapes; moment of inertia in brief.

In simple words: Where a body's weight acts, and how hard it is to turn it.

Examination Scheme — 1st & 2nd Semester (Official, Verified 2026-27)

1st Semester — 18 Credits, 900 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
1.1	Mathematics-I	2-1-0	3	Th 40	Th 60	100
1.2	Applied Physics-I	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.3	Applied Chemistry OR Introduction to IT and AI	3-0-2 / 2-0-4	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.4	Communication Skills in English OR Fundamentals of Electrical & Electronics Engineering	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.5	Engineering Graphics OR Engineering Workshop Practice	0-0-4	2	Graphics: Pr 40 / Workshop: Pr 60	Graphics: Th 60 / Workshop: Pr 40	100
1.6	Sports & Yoga	0-0-2	1	Pr 50	—	50
—	Student Centred Activities (SCA)	0-0-10	—	Pr 50	—	50

1st Semester Total	18	—	—	900
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2nd Semester — 22 Credits, 1050 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
2.1	Mathematics-II	3-1-0	4	Th 40	Th 60	100
2.2	Applied Physics-II	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.3	Introduction to IT and AI OR Applied Chemistry	2-0-4 / 3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.4	Fundamentals of Electrical & Electronics Engineering OR Communication Skills in English	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.5	Engineering Mechanics	2-1-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.6	Engineering Workshop Practice OR Engineering Graphics	0-0-4	2	Workshop: Pr 60 / Graphics: Pr 40	Workshop: Pr 40 / Graphics: Th 60	100
2.7	(Q) Environmental Sciences	3-0-0	— (Audit)	—	Th 60*	—
—	Student Centred Activities (SCA)	0-0-4	—	Pr 50	—	50
2nd Semester Total			22	—	—	1050

About the OR choices: at Sr. No. 1.3, 1.4 and 1.5 the institute chooses which alternative runs in the 1st semester; the other alternative then runs in the 2nd semester (1.3 ↔ 2.3, 1.4 ↔ 2.4, 1.5 ↔ 2.6). An alternative once selected in the 1st semester is not selected again in the 2nd semester.

No paper codes: the official 1st-year curriculum gives no paper codes — subjects are numbered 1.1–1.6 in the 1st semester and 2.1–2.7 in the 2nd semester only.

Qualifying subject: Environmental Sciences (2.7, Q) is an audit subject — you must appear and pass, but its 60 external marks are not counted for percentage or division.

Each period is 60 minutes; each session is 16 weeks, with at least 14 effective teaching weeks. A 4-week summer internship (Internship-I) is organised after the 2nd-semester examination and is evaluated in the 3rd semester.

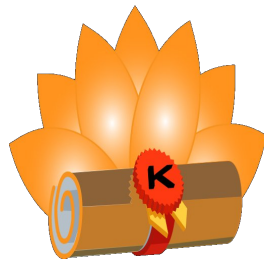
How This Helps You Later

Mechanics trains structured problem-solving — the same step-by-step thinking used in programming and in Data Structures.

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Source: BTEUP 1st Year common curriculum (folder2627), corrected and approved in the C.D.C. meeting held on 16.07.2026 — scheme and subject areas verified. Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text. Please confirm with your own polytechnic for any local changes.





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Environmental Science — First Year

BTEUP Diploma • 1st Semester (First Year — Common Curriculum) • Session 2026–27
Common Curriculum • 1st Semester • All 41 Engineering Branches

About this document: The first year of a BTEUP diploma runs on one common curriculum for 41 engineering branches, so this subject is the same whether you are in Computer Science, Mechanical, Civil or Electrical. The examination scheme below is from the official 1st-year curriculum (folder2627, NEP-2020), corrected and approved by the Board of Technical Education, U.P. Lucknow in the C.D.C. meeting held on 16.07.2026.

What This Subject Aims To Do

To build awareness of the environment engineers work in — pollution, resources and sustainability — and the engineer's responsibility towards them.

Unit-Wise Complete Topic List

Environment & Ecosystems

Topics: What an ecosystem is; biodiversity in brief; natural resources.

In simple words: The natural systems that engineering draws on and affects.

Pollution

Topics: Air, water, soil and noise pollution; their causes and effects; control measures.

In simple words: What pollution is, where it comes from, and how it is controlled.

Sustainability & Green Energy

Topics: Sustainable development; renewable energy sources — solar, wind, hydro.

In simple words: Meeting today's needs without taking away tomorrow's — and the clean energy that makes it possible.

Environmental Laws & Responsibility

Topics: Key environmental laws in brief; the engineer's role.

In simple words: The rules that protect the environment, and what they ask of an engineer.

Examination Scheme — 1st & 2nd Semester (Official, Verified 2026-27)

1st Semester — 18 Credits, 900 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
1.1	Mathematics-I	2-1-0	3	Th 40	Th 60	100
1.2	Applied Physics-I	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.3	Applied Chemistry OR Introduction to IT and AI	3-0-2 / 2-0-4	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.4	Communication Skills in English OR Fundamentals of Electrical & Electronics Engineering	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.5	Engineering Graphics OR Engineering Workshop Practice	0-0-4	2	Graphics: Pr 40 / Workshop: Pr 60	Graphics: Th 60 / Workshop: Pr 40	100
1.6	Sports & Yoga	0-0-2	1	Pr 50	—	50
—	Student Centred Activities (SCA)	0-0-10	—	Pr 50	—	50

1st Semester Total	18	—	—	900
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2nd Semester — 22 Credits, 1050 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
2.1	Mathematics-II	3-1-0	4	Th 40	Th 60	100
2.2	Applied Physics-II	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.3	Introduction to IT and AI OR Applied Chemistry	2-0-4 / 3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.4	Fundamentals of Electrical & Electronics Engineering OR Communication Skills in English	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.5	Engineering Mechanics	2-1-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.6	Engineering Workshop Practice OR Engineering Graphics	0-0-4	2	Workshop: Pr 60 / Graphics: Pr 40	Workshop: Pr 40 / Graphics: Th 60	100
2.7	(Q) Environmental Sciences	3-0-0	— (Audit)	—	Th 60*	—
—	Student Centred Activities (SCA)	0-0-4	—	Pr 50	—	50
2nd Semester Total			22	—	—	1050

About the OR choices: at Sr. No. 1.3, 1.4 and 1.5 the institute chooses which alternative runs in the 1st semester; the other alternative then runs in the 2nd semester (1.3 ↔ 2.3, 1.4 ↔ 2.4, 1.5 ↔ 2.6). An alternative once selected in the 1st semester is not selected again in the 2nd semester.

No paper codes: the official 1st-year curriculum gives no paper codes — subjects are numbered 1.1–1.6 in the 1st semester and 2.1–2.7 in the 2nd semester only.

Qualifying subject: Environmental Sciences (2.7, Q) is an audit subject — you must appear and pass, but its 60 external marks are not counted for percentage or division.

Each period is 60 minutes; each session is 16 weeks, with at least 14 effective teaching weeks. A 4-week summer internship (Internship-I) is organised after the 2nd-semester examination and is evaluated in the 3rd semester.

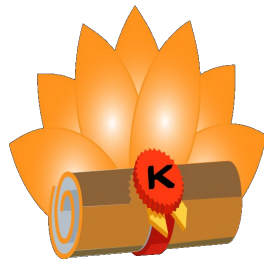
How This Helps You Later

Every project today is judged on its environmental impact too — this subject teaches you to think that way from the start.

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Source: BTEUP 1st Year common curriculum (folder2627), corrected and approved in the C.D.C. meeting held on 16.07.2026 — scheme and subject areas verified. Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text. Please confirm with your own polytechnic for any local changes.





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Sports & Yoga — First Year

BTEUP Diploma • 1st Semester (First Year — Common Curriculum) • Session 2026–27
Common Curriculum • 1st Semester • All 41 Engineering Branches

About this document: The first year of a BTEUP diploma runs on one common curriculum for 41 engineering branches, so this subject is the same whether you are in Computer Science, Mechanical, Civil or Electrical. The examination scheme below is from the official 1st-year curriculum (folder2627, NEP-2020), corrected and approved by the Board of Technical Education, U.P. Lucknow in the C.D.C. meeting held on 16.07.2026.

What This Subject Aims To Do

To build physical fitness, discipline and focus through sports and yoga, alongside academic study.

Unit-Wise Complete Topic List

Physical Fitness

Topics: Warm-up and exercise; games and sports activities.

In simple words: Staying fit and active — the base of steady study and work.

Yoga

Topics: Asanas, pranayama and meditation in brief; benefits for concentration and health.

In simple words: Simple practices that improve focus, calm and stamina.

Teamwork & Discipline

Topics: Playing in a team; following rules; sportsmanship.

In simple words: The discipline and teamwork that employers value as much as marks.

Health Awareness

Topics: Balanced diet; sleep; avoiding harmful habits.

In simple words: Looking after the body that has to carry you through the diploma and beyond.

Examination Scheme — 1st & 2nd Semester (Official, Verified 2026-27)

1st Semester — 18 Credits, 900 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
1.1	Mathematics-I	2-1-0	3	Th 40	Th 60	100
1.2	Applied Physics-I	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.3	Applied Chemistry OR Introduction to IT and AI	3-0-2 / 2-0-4	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.4	Communication Skills in English OR Fundamentals of Electrical & Electronics Engineering	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
1.5	Engineering Graphics OR Engineering Workshop Practice	0-0-4	2	Graphics: Pr 40 / Workshop: Pr 60	Graphics: Th 60 / Workshop: Pr 40	100
1.6	Sports & Yoga	0-0-2	1	Pr 50	—	50
—	Student Centred Activities (SCA)	0-0-10	—	Pr 50	—	50

1st Semester Total	18	—	—	900
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2nd Semester — 22 Credits, 1050 Marks

Sr. No.	Subject	L-T-P	Credits	Internal	External	Total
2.1	Mathematics-II	3-1-0	4	Th 40	Th 60	100
2.2	Applied Physics-II	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.3	Introduction to IT and AI OR Applied Chemistry	2-0-4 / 3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.4	Fundamentals of Electrical & Electronics Engineering OR Communication Skills in English	3-0-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.5	Engineering Mechanics	2-1-2	4	Th 40 + Pr 60	Th 60 + Pr 40	200
2.6	Engineering Workshop Practice OR Engineering Graphics	0-0-4	2	Workshop: Pr 60 / Graphics: Pr 40	Workshop: Pr 40 / Graphics: Th 60	100
2.7	(Q) Environmental Sciences	3-0-0	— (Audit)	—	Th 60*	—
—	Student Centred Activities (SCA)	0-0-4	—	Pr 50	—	50
2nd Semester Total			22	—	—	1050

About the OR choices: at Sr. No. 1.3, 1.4 and 1.5 the institute chooses which alternative runs in the 1st semester; the other alternative then runs in the 2nd semester (1.3 ↔ 2.3, 1.4 ↔ 2.4, 1.5 ↔ 2.6). An alternative once selected in the 1st semester is not selected again in the 2nd semester.

No paper codes: the official 1st-year curriculum gives no paper codes — subjects are numbered 1.1–1.6 in the 1st semester and 2.1–2.7 in the 2nd semester only.

Qualifying subject: Environmental Sciences (2.7, Q) is an audit subject — you must appear and pass, but its 60 external marks are not counted for percentage or division.

Each period is 60 minutes; each session is 16 weeks, with at least 14 effective teaching weeks. A 4-week summer internship (Internship-I) is organised after the 2nd-semester examination and is evaluated in the 3rd semester.

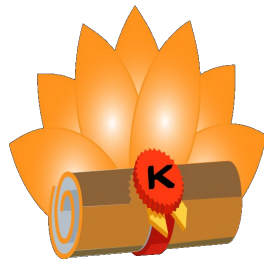
How This Helps You Later

A diploma is a marathon, not a sprint — fitness and focus decide how well you finish it.

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Source: BTEUP 1st Year common curriculum (folder2627), corrected and approved in the C.D.C. meeting held on 16.07.2026 — scheme and subject areas verified. Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text. Please confirm with your own polytechnic for any local changes.





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Construction Materials — Complete Syllabus

BTEUP Diploma in Civil Engineering • 3rd Semester • Session 2026-27
Subject 3.1 (Practicum/Theory) • Total 100 Marks • 3 Credits • L 2 – P 2

Note: The 3rd-semester scheme totals imply this subject's 40 internal marks sit under Practical assessment (the extracted table's column alignment is garbled — see NOTES). The lab work listed here is part of subject 3.1 itself.

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
3.1	Construction Materials	Practicum/ Theory	2 – 2	3	40	Theory 60 (3 hrs)	100
Construction Materials Total				3	40	60	100

What This Subject Aims To Do

To learn about various construction materials and their relevant characteristics, to judge which material suits which construction purpose, and to know the natural, artificial and processed materials available for construction work.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Overview of Construction Materials	4	15%
2	Natural Construction Materials	6	20%

3	Artificial Construction Materials	8	30%
4	Special Construction Materials	4	15%
5	Processed Construction Materials	6	20%

Unit 1 — Overview of Construction Materials (4 Periods, 15%)

Topics: Scope of construction materials in Building Construction, Transportation Engineering, Environmental Engineering, Irrigation Engineering (applications only); selection of materials for different civil engineering structures on the basis of strength, durability, eco-friendly nature and economy; broad classification of materials — Natural, Artificial, special, finishing and recycled.

Unit 2 — Natural Construction Materials (6 Periods, 20%)

Topics: Requirements of good building stone; general characteristics of stone; quarrying and dressing methods and tools for stone; classification of rocks — geological, physical and chemical classification; structure of timber, general properties and uses of good timber, different methods of seasoning for preservation of timber, defects in timber, use of bamboo in construction; asphalt, bitumen and tar used in construction, properties and uses; types of lime, properties of lime and uses, slaking of lime; properties of sand and uses; classification of aggregate according to size.

Unit 3 — Artificial Construction Materials (8 Periods, 30%)

Topics: Constituents of brick earth; conventional/traditional bricks, modular and standard bricks; special bricks — fly ash bricks; characteristics of good brick, field tests on bricks, classification of burnt clay bricks and their suitability; manufacturing process of burnt clay brick, fly ash bricks, aerated concrete blocks (AAC); flooring tiles — types, uses; manufacturing process of cement — dry and wet (only flow chart), types of cement and its uses, field tests on cement; pre-cast concrete blocks — hollow, solid, pavement blocks — and their uses; plywood, particle board, veneers, laminated board and their uses; types of glass — soda lime glass, lead glass, borosilicate glass, toughened glass, reinforced glass, fibre glass — and their uses; ferrous and non-ferrous metals and their uses.

Unit 4 — Special Construction Materials (4 Periods, 15%)

Topics: Types of material and suitability in construction works of: water proofing, termite proofing; thermal and sound insulating materials; fibres and its types — jute, glass, plastic, asbestos fibres (only uses).

Unit 5 — Processed Construction Materials (6 Periods, 20%)

Topics: Constituents and uses of POP (Plaster of Paris), POP finishing boards, sizes and uses; gypsum and gypsum based material; paints — whitewash, cement paint, distempers, oil paints and varnishes — with their uses (situations where used); industrial waste materials — fly ash, blast furnace slag, granite and marble polishing waste — and their uses; agro waste materials — rice husk, bagasse, coir fibres — and their uses; special processed construction materials — geo-synthetic, ferrocrete, artificial timber, artificial sand — and their uses.

Practical Work

- Identify various sizes of available coarse aggregates from sample of 10 kg in laboratory and prepare report (60, 40, 20, 10 mm).
- Identify the available construction materials in the laboratory on the basis of their sources.
- Prepare the lime putty by mixing lime (1 kg) with water in appropriate proportion and prepare report on slaking of lime.
- Select first class, second class and third-class bricks from the stake of bricks and prepare report on the basis of its properties.
- Measure dimensions of 10 bricks and find average dimension and weight. Perform field tests — dropping, striking and scratching by nail — and correlate the results obtained.
- Identify different types of flooring tiles such as vitrified tiles, ceramic tiles, glazed tiles, mosaic tiles, anti-skid tiles, chequered tiles, paving blocks and prepare report about the specifications.
- Apply the relevant termite chemical on given damaged sample of timber.
- Identify the type of glasses from the given samples.
- To determine the compressing strength of bricks, CLC and AAC blocks.
- To determine the water absorption of bricks and efflorescence of bricks.
- Construct a brick masonry 3D models of Flemish / English bonds.
- Construct a 3D models on sustainable construction practices.

Reference Books (as listed in the syllabus)

- Ghose, D. N., Construction Materials, Tata McGraw Hill, New Delhi.
- S.K. Sharma, Civil Engineering Construction Materials, Khanna Publishing House, Delhi.
- Varghese, P.C., Building Materials, PHI learning, New Delhi.
- Rangwala, S.C., Engineering Materials, Charator publisher, Ahemdabad.
- Somayaji, Shan, Civil Engineering Materials, Pearson education, New Delhi.
- D.V.Gupta, Vikram Singh, Construction Materials, Asian Publishers, Muzaffarnagar, ISBN no. 978-93-5502-020-8.
- Rajput, R.K, Engineering Materials, S. Chand and Co., New Delhi.

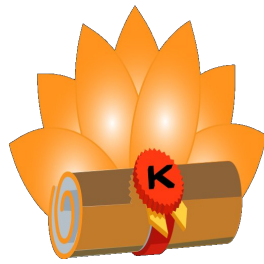
- Sood H., Laboratory Manual on Testing of Engineering Materials, New Age Publishers, New Delhi.
- Sharma C. P., Engineering Materials, PHI Learning, New Delhi.
- Duggal, S. K, Building Materials, New International, New Delhi.

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Basic Surveying — Complete Syllabus

BTEUP Diploma in Civil Engineering • 3rd Semester • Session 2026-27

Subject 3.2 (Theory) + 3.3 (Lab) • Total 200 Marks • 3 Credits

About this document: Basic Surveying appears twice in the 3rd semester — as a theory paper (3.2) and as a lab (3.3). Both are covered here, completely, in the official order.

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
3.2	Basic Surveying	Theory	1 - 0	1	Theory 40	Theory 60 (3 hrs)	100
3.3	Basic Surveying Lab.	Practical	0 - 4	2	Practical 60	Practical 40 (3 hrs)	100
Basic Surveying Total				3	100	100	200

What This Subject Aims To Do

To understand the types of surveying work required, the equipment and methods used for different surveys, and the use and operational details of various surveying equipment — so that you can select the right survey for a situation, measure areas with chain and tape, run a compass traverse, level ground for contour maps, and measure areas with a digital planimeter.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Overview and Classification of Survey	2	10%
2	Chain Surveying	3	25%
3	Compass Traverse Survey	3	25%
4	Levelling and Contouring	4	25%
5	Measurement of Area and Volume	2	15%

Unit 1 — Overview and Classification of Survey (2 Periods, 10%)

Topics: Survey — purpose and use; types of surveying — primary and secondary; classification: plane, geodetic, cadastral, hydrographic, photogrammetry and aerial; principles of surveying; scales: engineer's scale, Representative Fraction (RF) and diagonal scale.

Unit 2 — Chain Surveying (3 Periods, 25%)

Topics: Instruments used in chain survey: types of chains, tapes, arrow, ranging rod, line ranger, off-set rod, open cross staff, optical square; chain survey station, base line, check line, tie line, offset, tie station; ranging: direct and indirect ranging; methods of chaining, obstacles in chaining and ranging; errors in length: instrumental error, personal error, error due to natural cause, random error, tape corrections; principles of triangulation; types of offsets: perpendicular and oblique; conventional signs, recording of measurements in a field book.

Unit 3 — Compass Traverse Survey (3 Periods, 25%)

Topics: Compass traversing — open, closed; technical terms: geographic/true magnetic meridians and bearings, Whole Circle Bearing system and Reduced Bearing system and examples on conversion of given bearing to another bearing (from one form to another), fore bearing and back bearing, calculation of internal and external angles from bearings at a station, dip of magnetic needle, magnetic declination; components of prismatic compass and surveyor compass and their functions, methods of using prismatic compass — temporary adjustments and observing bearings; local attraction, methods of correction of observed bearings — correction at station and correction to included angles; methods of plotting a traverse and closing error, graphical adjustment of closing error.

Unit 4 — Levelling and Contouring (4 Periods, 25%)

Topics: Basic terminologies: level surfaces, horizontal and vertical surfaces, datum, bench marks — GTS, permanent, arbitrary and temporary — reduced level, rise, fall, line of collimation, station, back sight, fore sight, intermediate sight, change point, height of instruments; types of levels: dumpy, tilting, auto level, digital level; components of dumpy level and its fundamental axes, temporary and permanent adjustments of level; types of levelling staff: self-reading staff and target staff; reduction of level by line of collimation and rise and fall method; levelling types: simple, differential, fly, profile and reciprocal levelling; curvature and refraction correction; contour, contour intervals, horizontal equivalent; uses of contour maps, characteristics of contours, methods of contouring: direct and indirect.

Unit 5 — Measurement of Area and Volume (2 Periods, 15%)

Topics: Components and use of digital planimeter; measurement of area using digital planimeter; measurement of volume of reservoir and earthwork calculation from contour map.

Practical Work

- Measure distance between two survey stations using chain, tape and ranging rods when two stations are inter visible.
- Undertake reciprocal ranging and measure the distance between two stations.
- Determine area of open field using chain and cross staff survey.
- Measure fore bearing and back bearing of survey lines of open traverse using prismatic compass.
- Measure fore bearing and back bearing of a closed traverse of 5 or 6 sides and correct the bearings and included angles for the local attraction.
- Undertake survey project with chain and compass for closed traverse for minimum 5 sides around a building and plot the traverse on A1 size imperial drawing sheet for data collected in survey project mentioned in practical 6.
- Undertake simple leveling using dumpy level / auto level and leveling staff.
- Undertake differential leveling and determine reduced levels by height of instrument method and rise and fall method using dumpy level / auto level and leveling staff and set up gradient.
- Undertake fly leveling with double check using dumpy level / auto level and leveling staff.
- Undertake survey project with leveling instrument for profile leveling and cross-sectioning for a road/canal/railways length of 500 m with cross-section at 30 m interval.
- Plot the L-section with minimum 3 cross-sections on A1 size imperial sheet for data collected in survey project mentioned in practical 10.

- Undertake survey project for plotting contour map using block contouring method for a block of 150 m x 150 m with grid of 10 m x 10 m.
- Plot the contours on A1 size imperial drawing sheet for data collected in survey project mentioned in practical 12. (In the PDF this item is split across two numbered lines, 13 and 14.)

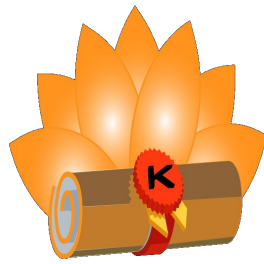
Reference Books (as listed in the syllabus)

- Punmia, B.C.; Jain, Ashok Kumar; Jain, Arun Kumar, Surveying I, Laxmi Publications, New Delhi.
- Basak, N. N., Surveying and Leveling, McGraw Hill Education, New Delhi.
- Kanetkar, T. P.; Kulkarni, S. V., Surveying and Levelling volume I, Pune Vidyarthi Gruh Prakashan.
- Duggal, S. K., Survey I, McGraw Hill Education, New Delhi.
- Saikia, M D.; Das. B.M.; Das. M.M., Surveying, PHI Learning, New Delhi.
- Subramanian, R., Fundamentals of Surveying and Levelling, Oxford University Press, New Delhi.
- D.V.Gupta, Vikram Singh, Land Surveying-I, Asian Publishers, Muzaffarnagar, ISBN no. 978-93-5502-121-2.
- Rao, P. Venugopala Akella, Vijayalakshmi, Textbook of Surveying, PHI Learning, New Delhi.
- Bhavikatti, S. S., Surveying and Levelling, Volume 1, I. K. International, New Delhi.
- Arora K R, Surveying Vol. I, Standard Book House.

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Mechanics of Material — Complete Syllabus

BTEUP Diploma in Civil Engineering • 3rd Semester • Session 2026-27

Subject 3.4 (Theory) + 3.5 (Lab) • Total 200 Marks • 3 Credits

About this document: Mechanics of Material appears twice in the 3rd semester — as a theory paper (3.4) and as a lab (3.5). Both are covered here, completely, in the official order.

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
3.4	Mechanics of Material	Theory	2 - 0	2	Theory 40	Theory 60 (3 hrs)	100
3.5	Mechanics of Material Lab.	Practical	0 - 2	1	Practical 60	Practical 40 (3 hrs)	100
Mechanics of Material Total				3	100	100	200

What This Subject Aims To Do

To learn properties of area and structural material properties, understand stress and strain, calculate shear force and bending moment for different shapes of structural elements and the corresponding stresses, and understand buckling loads for short and long columns.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
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1	Simple Stresses and Strains	6	20%
2	Moment of Inertia	6	20%
3	Shear Force and Bending Moment	6	20%
4	Bending and Shear Stresses in Beams	6	20%
5	Columns	4	20%

Unit 1 — Simple Stresses and Strains (6 Periods, 20%)

Topics: Properties of materials, classification of materials, elastic materials, plastic materials, ductile materials, brittle materials; introduction to tensile test, compressive test, impact test, fatigue test, torsion test on metals; concept of stress, normal and shear stresses; concept of strain and deformation, longitudinal and transverse strain, Poisson's ratio, volumetric strain, Hooke's law, moduli of elasticity and rigidity, bulk modulus of elasticity, relationship between the elastic constants; stresses and strains in bars subjected to tension and compression; extension of uniform bar under its own weight, stress produced in compound and tapering bars due to axial load; stress-strain diagram for mild steel and HYSD steel, proof stress, mechanical properties, factor of safety; temperature stresses and strains.

Unit 2 — Moment of Inertia (6 Periods, 20%)

Topics: Concept of moment of inertia and second moment of area and radius of gyration, theorems of parallel and perpendicular axis, second moment of area of common geometrical sections: rectangle, triangle, circle (without derivations); second moment of area for L, T and I sections, section modulus.

Unit 3 — Shear Force and Bending Moment (6 Periods, 20%)

Topics: Concept of a beam and supports (hinges, roller and fixed), types of beams: simply supported, cantilever, propped, overhang, fixed and continuous beams (only concept); types of loads (dead load, live load, snow load, wind load, seismic load as per IS Codes etc.) and types of loading (point, uniformly distributed and uniformly varying loads); concept of bending moment and shear force, sign conventions, bending moment and shear force diagrams for cantilever, simply supported and overhanging beams subjected to concentrated, uniformly distributed and varying loads; relationship between load, shear force and bending moment, point of maximum bending moment, and point of contraflexure; fixed and continuous beams — simple numerical problems.

Unit 4 — Bending and Shear Stresses in Beams (6 Periods, 20%)

Topics: Bending stresses in beams, concept of pure/simple bending, assumptions made in the theory of simple bending, derivation and application of bending equation to circular cross-section, I section, T and L sections only, moment of resistance, calculations of bending stresses; shear stresses in beams, concept of shear stresses in beams, shear stress distribution in rectangular, circular, I, T, L sections for beams.

Unit 5 — Columns (4 Periods, 20%)

Topics: Theory of columns — long and short columns, slenderness ratio, problem solving using Euler's and Rankine formula.

Practical Work

- Study and understand the use and components of Universal Testing Machine (UTM).
- Perform tension test on mild steel as per IS:432(1) and compute value of Young's modulus.
- Perform tension test on Tor steel as per IS:1608, IS:1139.
- Conduct compression test on sample test piece using Compression Testing Machine.
- Conduct Izod Impact test on three metals, e.g. mild steel / brass / aluminum / copper / cast iron etc. as per IS:1598.
- Conduct Charpy Impact test on three metals, e.g. mild steel / brass / aluminum / copper / cast iron etc. as per IS:1757.
- Plot shear force and bending moment diagrams for cantilever, simply supported beams.
- Plot shear force and bending moment diagrams for overhanging beams for different types of loads including moment loading.
- Conduct flexural test on timber beam on rectangular section in both orientation as per IS: 1708, IS:2408.

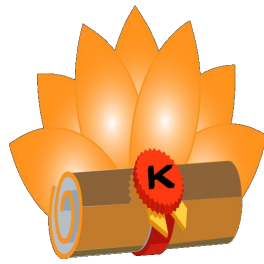
Reference Books (as listed in the syllabus)

- Bedi D.S., Strength of Materials, Khanna Publishing House, Delhi, Ed. 2018.
- Timoshenko, S., Strength of Materials, Vol. I, CBS, New Delhi.
- Khurmi, R.S., Strength of Materials, S Chand and Co. Ltd., New Delhi.
- Ramamurtham, S, Strength of Materials, Dhanpat Rai and sons, New Delhi.
- Punmia B C, Strength of Materials, Laxmi Publications (p) Ltd., New Delhi.
- Rattan S.S., Strength of Materials, McGraw Hill Education, New Delhi.
- Bansal R K, Strength of Materials, Laxmi Publications.
- Subramaniam R, Strength of Materials, Oxford University Press.

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Building Construction — Complete Syllabus

BTEUP Diploma in Civil Engineering • 3rd Semester • Session 2026-27

Subject 3.6 (Practicum/Theory) • Total 100 Marks • 3 Credits • L 2 – P 2

Note: The 3rd-semester scheme totals imply this subject's 40 internal marks sit under Theory assessment (the extracted table's column alignment is garbled — see NOTES).

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
3.6	Building Construction	Practicum/ Theory	2 - 2	3	40	Theory 60 (3 hrs)	100
Building Construction Total				3	40	60	100

What This Subject Aims To Do

To identify the different components of a building, understand different types of foundation and their significance, know different types of masonry and their construction, and understand the importance of communications (doors, windows, stairs) in building planning.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Overview of Building Components	4	15%
2	Construction of Substructure	5	20%

3	Construction of Superstructure	6	20%
4	Building Communication and Ventilation	7	25%
5	Building Finishes	6	20%

Unit 1 — Overview of Building Components (4 Periods, 15%)

Topics: Classification of buildings as per National Building Code Group A to I; as per types of constructions — load bearing structure, framed structure, composite structure; building components — functions of building components; substructure — foundation, plinth; superstructure — walls, partition wall, cavity wall, sill, lintel, doors and windows, floor, mezzanine floor, roof, columns, beams, parapet.

Unit 2 — Construction of Substructure (5 Periods, 20%)

Topics: Job layout: site clearance, layout for load bearing structure and framed structure by centre line and face line method, precautions; earthwork: excavation for foundation, timbering and strutting, earthwork for embankment, material for plinth filling, tools and plants used for earthwork; foundation: functions of foundation, types of foundation — shallow foundation, stepped footing, wall footing, column footing, isolated and combined column footing, raft foundation, grillage foundation; deep foundation — pile foundation, well foundation and caissons; pumping methods of dewatering, deep wells, well points, cofferdams (introduction only).

Unit 3 — Construction of Superstructure (6 Periods, 20%)

Topics: Stone masonry: terms used in stone masonry — facing, backing, hearting, through stone, corner stone, cornice; types of stone masonry: rubble masonry, ashlar masonry and their types; joints in stone masonry and their purpose; selection of stone masonry, precautions to be taken in stone masonry construction; brick masonry: terms used in brick masonry — header, stretcher, closer, quoins, course, face, back, hearting, bat bond, joints, lap, frog line, level and plumb; bonds in brick masonry — header bond, stretcher bond, English bond and Flemish bond; requirements of good brick masonry; junctions in brick masonry and their purpose and procedure; precautions to be observed in brick masonry construction; comparison between stone and brick masonry; tools and plants required for construction of stone and brick masonry; hollow concrete block masonry and composite masonry; scaffolding and shoring: purpose, types of scaffolding, process of erection and dismantling; purpose and types of shoring, underpinning; formwork: definition of formwork, requirements of formwork, materials used in formwork, types of formwork for slabs, beams, columns, stripping time for removal of formwork as per IS 456.

Unit 4 — Building Communication and Ventilation (7 Periods, 25%)

Topics: Horizontal communication: doors — components of doors, full paneled doors, partly paneled and glazed doors, flush doors, collapsible doors, rolling shutters, revolving doors, glazed doors; sizes of door recommended by BIS; windows: component of windows, types of windows — full paneled, partly paneled and glazed, wooden, steel, aluminum windows, sliding windows, louvered window, bay window, corner window, clear-storey window, gable and dormer window, skylight; sizes of windows recommended by BIS; ventilators; fixtures and fastenings for doors and windows — material used and functions of window sill and lintels, shed / chajja; vertical communication: means of vertical communication — stair case, ramps, lift, elevators and escalators; terms used in staircase — steps, tread, riser, nosing, soffit, waist slab, baluster, balustrade, scotia, hand rails, newel post, landing, headroom, winder; types of stair case (on the basis of shape): straight, dog-legged, open well, spiral, quarter turn, bifurcated, three quarter turn and half turn; (on the basis of material): stone, brick, R.C.C., wooden and metal.

Unit 5 — Building Finishes (6 Periods, 20%)

Topics: Floors and roofs: types of floor finishes and its suitability — Kota, marble, granite, ceramic tiles, vitrified, chequered tiles, paver blocks, concrete floors, wooden flooring, skirting and dado; process of laying and construction, finishing and polishing of floors; roofing materials — RCC, Mangalore tiles, AC sheets, G.I. sheets, corrugated G.I. sheets, plastic and fibre sheets; types of roof: flat roof, pitched roof — king post truss, queen post truss, terms used in roofs; wall finishes: plastering — necessity of plastering, procedure of plastering, single coat plaster, double coat plaster, rough finish, neeru finishing and Plaster of Paris (POP); special plasters — stucco plaster, sponge finish, pebble finish; plaster board and wall claddings; precautions to be taken in plastering, defects in plastering; pointing — necessity, types of pointing and procedure of pointing; painting — necessity, surface preparation for painting, methods of application.

Practical Work

- Demonstration of tools and plants used in building construction.
- To prepare layout of a building: two rooms building with front verandah.
- To construct brick bonds (English bond only) in one, one and half and two brick thick: (a) walls for L, T and cross junction; (b) columns.
- Demonstration of the following items of work at a construction site (a report of these activities will be submitted by the students): (a) timbering of excavated trenching; (b) laying damp proof courses; (c) construction of masonry walls; (d) laying of tile flooring on an already prepared lime concrete base; (e) plastering and pointing exercise; (f) constructing RCC work; (g) pre-construction and post construction termite treatment of building and woodwork; (h) interlocking tiles.

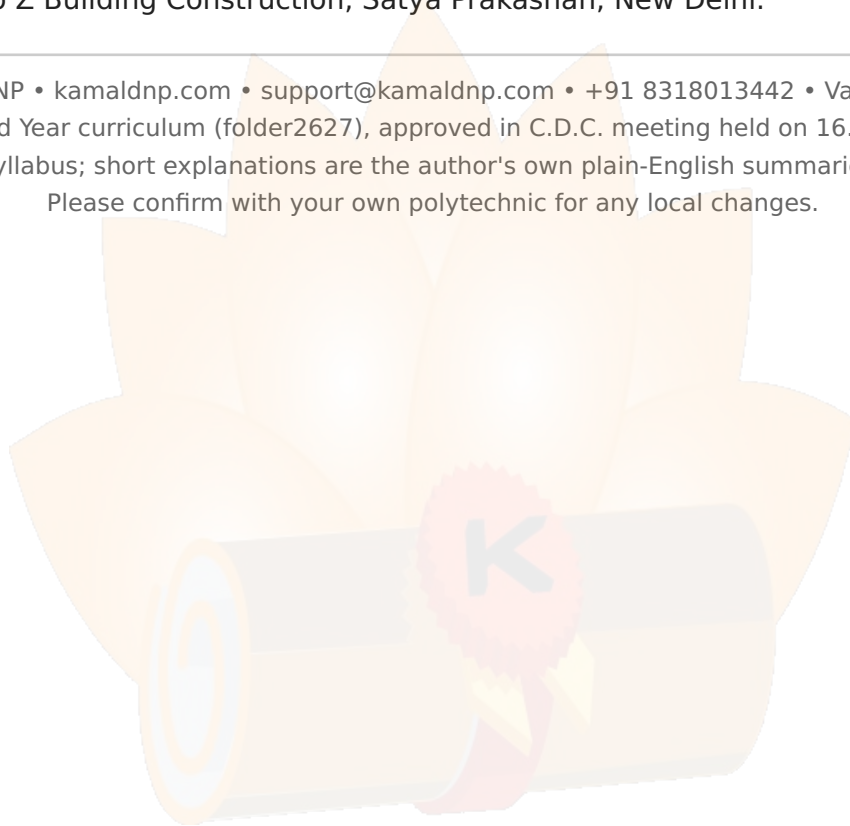
Reference Books (as listed in the syllabus)

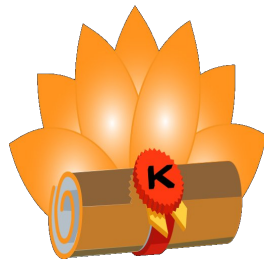
- S. P. Arora and Bindra., Building Construction, Dhanpat Rai Publication, Delhi.
- Sushil Kumar., Building Construction, Standard Publication.
- Rangawala, S. C., Building Construction, Charotar Publication, Anand.
- Punmia B. C., and Jain A. K., Building Construction, Firewall Media.
- D.V. Gupta, Vikram Singh, Building Construction, Asian Publishers, Muzaffarnagar, ISBN: 978-93-91541-27-9.
- Sharma S. K., Building Construction, S. Chand and Co. Pvt. Ltd., New Delhi.
- Janardan Zha, Building Construction, Khanna Publication.
- Bhavikatti S. S., Building Construction, Vikas Publication House Pvt. Ltd., Delhi.
- Mantri S., A to Z Building Construction, Satya Prakashan, New Delhi.

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Building Planning and Drawings — Complete Syllabus

BTEUP Diploma in Civil Engineering • 3rd Semester • Session 2026-27
Subject 3.7 (Practicum/Practical) • Total 100 Marks • 3 Credits • L 1 - P 4

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
3.7	Building Planning and Drawings	Practicum/ Practical	1 - 4	3	Practical 60	Practical 40 (3 hrs)	100
Building Planning and Drawings Total				3	60	40	100

What This Subject Aims To Do

To learn the basic principles of building planning and drawing, know the graphical representation of various components of buildings, draw a complete plan and elevation of a building, and learn the basics of perspective drawings and computer aided drawings.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Planning of Building	4	20%
2	Drawings 1-3: Foundations, Wall Junctions, Arches	3	20%
3	Drawings 4-6: Doors, Small Building, Two-Room Building	3	20%
4	Drawings 7-8: Floors, Flat Roof	2	20%

5	Drawings 9-10: Damp Proofing	2	20%
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Unit 1 — Planning of Building (4 Periods, 20%)

Topics: Conventions as per IS 962, symbols for different materials such as earthwork, brickwork, stonework, concrete, woodwork and glass; graphical symbols for doors and windows, abbreviations, symbols for sanitary and electrical installations; principles of planning for residential and public building — aspect, prospect, orientation, grouping, privacy, elegance, flexibility, circulation, furniture requirements, sanitation, economy; space requirement and norms for minimum dimension of different units in the residential and public buildings as per IS 962; rules and bye-laws of sanctioning authorities for construction work; plot area, built up area, super built up area, plinth area, carpet area, floor area and FAR (Floor Area Ratio).

Unit 2 — Drawings 1-3: Foundations, Wall Junctions, Arches (3 Periods, 20%)

Topics: Drawing No. 1: Details of spread footing foundations for a load bearing and non-load bearing wall for given thickness of walls with the help of given data or rule of the thumb, showing offsets, position of DPC; the details of the concrete and brick apron have to be shown in the drawing. Drawing No. 2: Plans of 'T' and corner junction of walls of 1 brick, 1-1/2 brick and 2 brick thick in English bond. Drawing No. 3: Drawing plan, elevation of arches: circular arch, segmental arch.

Unit 3 — Drawings 4-6: Doors, Small Building, Two-Room Building (3 Periods, 20%)

Topics: Drawing No. 4: Elevation, sectional plan and sectional side elevation of flush door, fully glazed door, fully panelled door with wire gauge shutter, partly panelled and partly glazed door. Drawing No. 5: Drawing plan, elevation of a small building by measurement and foundation detail and sectional elevation. Drawing No. 6: Drawing detailed working plan, elevation and section of a two rooms residential building from a given line plan or given data showing details of foundations, roof and parapet.

Unit 4 — Drawings 7-8: Floors, Flat Roof (2 Periods, 20%)

Topics: Drawing No. 7: Drawings of following floors: (1) cement concrete floors at ground level and at first floor level; (2) brick floors — (a) diagonal bond, (b) herring bone bond; (3) bonded cement concrete flooring / marble flooring / terrazzo flooring; (4) ceramic/vitrified tile flooring. Drawing No. 8: Drawing of flat roof, showing the heat/thermal insulation provisions.

Unit 5 — Drawings 9-10: Damp Proofing (2 Periods, 20%)

Topics: Drawing No. 9: Drawing details of damp proofing arrangement of roofs and walls as per BIS Code; show the rain water drainage arrangement also. Drawing No. 10: Drawing damp proofing details in basement of buildings.

Practical Work

- Introduction to Computer Aided Drafting (2D) commands of any one software (Auto CAD, ProE, Solid works, Unigraphics etc.): concept of AutoCAD, tool bars in CAD software, coordinate system, snap, grid, and ortho mode (absolute, relative and polar), setting of units and layout; drawing commands — point, line, arc, circle, ellipse; editing commands — scale, erase, copy, stretch, lengthen and explode; dimensioning and placing text in drawing area; sectioning and hatching; inquiry for different parameters of drawing entity; create layers within a drawing; specifying Geometrical Dimensioning & tolerance (GD&T) parameters in drawing.
- 2-D plan of a two-room building.
- Isometric drawing by CAD using any part modeling software (3D) — drawings of: cone, cylinder, cube, sphere, isometric view of objects.
- Draw submission drawing to the scale of 1:100, of (G+1) framed structure residential building (2BHK) with flat roof and staircase showing using CAD software: (a) developed plan; (b) elevation; (c) section passing through staircase, W.C. and bath; (d) foundation plan; (e) site plan (1:200), area statement, schedule of openings and construction notes.
- Draw working drawing to the scale of 1:100, of (G+1) framed structure residential building (2BHK) with flat roof and staircase showing using CAD software: (a) foundation plan to the scale 1:50; (b) detailed enlarged section of RCC column and footing with plinth filling; (c) detailed enlarged section of RCC beam, lintel and chajjas; (d) detailed enlarged section of RCC staircase and slab.
- Draw two point perspective drawing of small objects — steps, monuments, pedestals (any one) scale 1:50 using CAD software: (a) draw plan, elevation, eye level, picture plane and vanishing points; (b) draw perspective view.

Reference Books (as listed in the syllabus)

- Shah. M.G. Kale, CM, Patki, S.Y., Building Drawing, Mcgraw Hill Publishing.
- Malik and Mayo, Civil Engineering Drawing, Computech Publication Ltd.
- M. G. Shah and C. M. Kale, Principles of Perspective Drawing, Mcgraw Hill.
- Swamy, Kumara; Rao, N, Kameshwara, A., Building Planning and Drawing, Charotar Publication, Anand.
- Bhavikatti, S. S., Building Construction, Vikas Publication House Pvt. Ltd., Delhi.
- Mantri, Sandip, A to Z Building Construction, Satya Prakashan, New Delhi.
- Singh, Ajit, Working with Auto CAD 2000, Mcgraw Hill Publishing company Ltd.

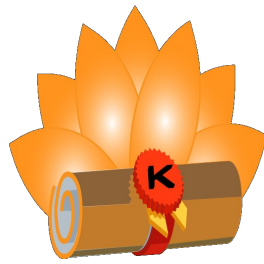
- M.K. Varshney, Building Drawing, Asian Publishers, Muzaffarnagar, ISBN: 978-93-91541-28-6.
- Sane, Y.S., Planning and design of Building, Allied Publishers, New Delhi.

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Concrete Technology — Complete Syllabus

BTEUP Diploma in Civil Engineering • 3rd Semester • Session 2026-27

Subject 3.8 (Theory) + 3.9 (Lab) • Total 200 Marks • 4 Credits

About this document: Concrete Technology appears twice in the 3rd semester — as a theory paper (3.8) and as a lab (3.9). Both are covered here, completely, in the official order.

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
3.8	Concrete Technology	Theory	2 - 0	2	Theory 40	Theory 60 (3 hrs)	100
3.9	Concrete Technology Lab.	Practical	0 - 4	2	Practical 60	Practical 40 (3 hrs)	100
Concrete Technology Total				4	100	100	200

What This Subject Aims To Do

To know the properties of cement, aggregate and water used in concrete, understand the different characteristics of concrete, and learn about the role of admixtures in concrete — so that you can prepare concrete of the desired strength and specification and maintain its quality under different conditions.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Cement, Aggregates and Water	6	20%
2	Concrete	6	20%
3	Concrete Mix Design and Testing of Concrete	4	20%
4	Quality Control of Concrete	6	20%
5	Chemical Admixture, Special Concrete and Extreme Weather Concreting	6	20%

Unit 1 — Cement, Aggregates and Water (6 Periods, 20%)

Topics: Physical properties of OPC and PPC: fineness, standard consistency, setting time, soundness, compressive strength; different grades of OPC and relevant BIS codes; testing of cement: laboratory tests — fineness, standard consistency, setting time, soundness, compressive strength; storage of cement and effect of storage on properties of cement; BIS specifications and field applications of different types of cements: rapid hardening, low heat, Portland pozzolana, sulphate resisting, blast furnace slag, high alumina and white cement; aggregates: requirements of good aggregate, classification according to size and shape; fine aggregates: properties, size, specific gravity, bulk density, water absorption and bulking, fineness modulus and grading zone of sand, silt content and their specification as per IS 383; concept of crushed sand; coarse aggregates: properties, size, shape, surface texture, water absorption, soundness, specific gravity and bulk density, fineness modulus of coarse aggregate, grading of coarse aggregates, crushing value, impact value and abrasion value of coarse aggregates with specification; water: quality of water, impurities in mixing water and permissible limits for solids as per IS: 456-2000.

Unit 2 — Concrete (6 Periods, 20%)

Topics: Concrete: different grades of concrete, provisions of IS 456; Duff Abraham water cement (w/c) ratio law, significance of w/c ratio, selection of w/c ratio for different grades, maximum w/c ratio for different grades of concrete for different exposure conditions as per IS 456; properties of fresh concrete: workability — factors affecting workability of concrete; determination of workability of concrete by slump cone, compaction factor, Vee-Bee consistometer; value of workability requirement for different types of concrete works; segregation, bleeding and preventive measures; properties of hardened concrete: strength, durability, impermeability.

Unit 3 — Concrete Mix Design and Testing of Concrete (4 Periods, 20%)

Topics: Concrete mix design: objectives, methods of mix design, study of mix design as per IS 10262-2009 (only procedural steps); testing of concrete, determination of compressive strength of concrete cubes at different ages, interpretation and co-relation of test results; non-destructive testing of concrete: rebound hammer test, working principle of rebound hammer and factor affecting the rebound index, ultrasonic pulse velocity test as per IS 13311 (part 1 and 2), importance of NDT tests.

Unit 4 — Quality Control of Concrete (6 Periods, 20%)

Topics: Concreting operations: storage, batching, mixing, transportation, placing, compaction, curing and finishing of concrete; joints in concrete construction: types of joints, methods for joining old and new concrete, materials used for filling joints; defects in concrete: identification of defects and methods of removing defects.

Unit 5 — Chemical Admixture, Special Concrete and Extreme Weather Concreting (6 Periods, 20%)

Topics: Admixtures in concrete: purpose, properties and application for different types of admixture such as accelerating admixtures, retarding admixtures, water reducing admixtures, air entraining admixtures and super plasticizers; special concrete: properties, advantages and limitation of following types of special concrete — ready mix concrete, fibre reinforced concrete, high performance concrete, self-compacting concrete and light weight concrete; cold weather concreting: effect of cold weather on concrete, precautions to be taken while concreting in cold weather condition; hot weather concreting: effect of hot weather on concrete, precautions to be taken while concreting in hot weather condition; under water concrete.

Practical Work

- Determine fineness of cement by Blaine's air permeability apparatus or by sieving.
- Determine specific gravity, standard consistency, initial and final setting times of cement.
- Determine compressive strength of cement.
- Determine silt content in sand.
- Determine bulking of sand.
- Determine bulk density of fine and coarse aggregates.
- Determine water absorption of fine and coarse aggregates.
- Determine fineness modulus of fine aggregate by sieve analysis.
- Determine impact value of aggregate.

- Determine crushing value of aggregate.
- Determine abrasion value of aggregate.
- Determine elongation and flakiness index of coarse aggregates.
- Determine workability of concrete by slump cone test.
- Determine workability of concrete by compaction factor test.
- To prepare concrete mix of a particular grade and determine compressive strength of concrete for 7 and 28 days.
- Demonstration of NDT equipments.

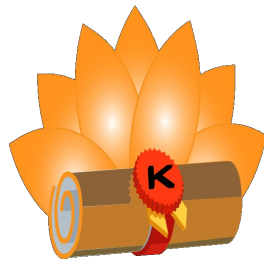
Reference Books (as listed in the syllabus)

- Gambhir, M.L., Concrete Technology, Tata McGraw Hill Publishing Co. Ltd., Delhi.
- Shetty, M.S., Concrete Technology, S.Chand and Co. Pvt. Ltd., Ram Nagar, Delhi.
- D.V. Gupta, Vikram Singh, Concrete Technology, Asian Publishers, Muzaffarnagar, ISBN: 978-93-91541-22-4.
- Santhakumar, A. R., Concrete Technology, Oxford University Press, New Delhi.
- Neville, A. M. and Brooks, J.J., Concrete Technology, Pearson Education Pvt. Ltd.
- Neville, A. M., Concrete Technology, Pearson Education Pvt. Ltd., New Delhi.
- Sood, H., Kulkarni P. D., Mittal L. N., Laboratory Manual in Concrete Technology, CBS Publishers, New Delhi.

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Summer Internship-I & Student Centred Activities — 3rd Semester

BTEUP Diploma in Civil Engineering • 3rd Semester • Session 2026-27
Subject 3.10 (Internship) 50 Marks • SCA 50 Marks • Total 100 Marks • 1 Credit

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
3.10	Summer Internship-I (4 weeks after IInd Sem.)	Internship	—	1	50	—	50
—	Student Centred Activities (SCA)	Activity	0 - 8	—	50	—	50
Internship-I + SCA Total				1	100	—	100

Summer Internship-I — What It Is

Guided and supervised professional training of a minimum of 4 weeks duration, organised during the semester break after the IInd semester examinations. It gives students an opportunity to experience the environment and culture of corporate construction offices / government construction and design departments / construction agencies / builders' organisations / design consultation units and commercial activities undertaken in field organisations, and to integrate theory with practice. The concerned HOD, along with other teachers, guides students in arranging appropriate training places relevant to their branch. A training schedule is drawn up for each student before starting, in consultation with the training provider, and students are briefed in advance about the organisational setup, working environment, designing and drafting process, and important machines and drafting tools used in the training organisation. A minimum of one visit by the teacher is recommended. Students

keep a daily report in a diary during training, which later becomes the final report and its presentation. Students present a seminar on their summer internship along with certificate and project report.

How Internship-I Is Marked (50 Marks)

- Punctuality and regularity — 15%
- Initiative in learning new things / field exposure — 20%
- Presentation and viva — 40%
- Industrial training report — 25%

Evaluation of the professional training report through viva-voce/presentation aims at assessing the student's understanding of drafting various working drawings, designing process, practices in offices/field organisations and their ability to engage in activities related to problem solving in a professional setup, as well as understanding of application of knowledge and skills learnt in real life situations. Evaluation is recommended to be carried out by a team comprising the concerned HOD, teachers and a representative from the organisation.

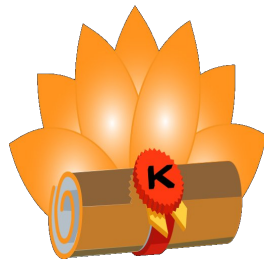
Student Centred Activities (SCA) — 50 Marks

A provision for overall personality development, including co-curricular activities such as extension lectures, games, hobby clubs (for example photography, painting and singing), seminars, declamation contests, educational field visits, NCC, NSS, library work, cultural activities and self-study. Maximum marks for SCA: 50, distributed as: (i) 15 marks for general behaviour and discipline (by HODs in consultation with all the teachers of the department); (ii) 10 marks for attendance — 75-80% = 6 marks, 80-85% = 8 marks, above 85% = 10 marks; (iii) 25 marks maximum for sports / NCC / cultural / co-curricular / NSS activities — 25 for state/national level participation, 20 for participation in two of the above activities, 15 for inter-polytechnic level participation. Note: there should be no marks for attendance in the internal sessional of different subjects.

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Hydraulics — Complete Syllabus

BTEUP Diploma in Civil Engineering • 4th Semester • Session 2026-27

Subject 4.1 (Theory) + 4.2 (Lab) • Total 200 Marks • 3 Credits

About this document: Hydraulics appears twice in the 4th semester — as a theory paper (4.1) and as a lab (4.2). Both are covered here, completely, in the official order.

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
4.1	Hydraulics	Theory	2 - 0	2	Theory 40	Theory 60 (3 hrs)	100
4.2	Hydraulics Lab.	Practical	0 - 2	1	Practical 60	Practical 40 (3 hrs)	100
Hydraulics Total				3	100	100	200

What This Subject Aims To Do

To understand the parameters associated with fluid flow and hydrostatic pressure, know head loss and water hammer in fluid flowing through pipes, and learn the different types of pumps and their uses — so that you can measure pressure, work out head loss, find flow in open channels, and select the right pump for a job.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Pressure Measurement and Hydrostatic Pressure	6	20%
2	Fluid Flow Parameters	4	15%

3	Flow through Pipes	8	25%
4	Flow through Open Channel	5	20%
5	Hydraulic Pumps	5	20%

Unit 1 — Pressure Measurement and Hydrostatic Pressure (6 Periods, 20%)

Topics: Technical terms used in hydraulics — fluid, fluid mechanics, hydraulics, hydrostatics and hydrodynamics — ideal and real fluid, application of hydraulics; physical properties of fluid — density-specific volume, specific gravity, surface tension, capillarity, viscosity — Newton's law of viscosity; various types of pressure — atmospheric pressure, gauge pressure, absolute pressure, vacuum pressure; concept of pressure head and its unit, Pascal's law of fluid pressure and its uses; measurement of differential pressure by different methods; variation of pressure with depth, pressure diagram, hydrostatic pressure and centre of pressure on immersed surfaces and on tank walls; determination of total pressure and centre of pressure on sides and bottom of water tanks, sides and bottom of tanks containing two liquids, vertical and inclined surface in contact with liquid on either side.

Unit 2 — Fluid Flow Parameters (4 Periods, 15%)

Topics: Types of flow — gravity and pressure flow, laminar, turbulent, uniform, non-uniform, steady, unsteady flow; stream line, stream tube, streak line, path line; Reynolds number; discharge and its unit, continuity equation of flow; energy of flowing liquid: potential, kinetic and pressure energy; Bernoulli's theorem: statement, assumptions, equation (without proof of theorem).

Unit 3 — Flow through Pipes (8 Periods, 25%)

Topics: Major head loss in pipe: frictional loss and its computation by Darcy's Weisbach equation, use of Moody's diagram and nomograms; critical velocity and velocity distribution in a pipe for laminar flow; minor losses in pipe: loss at entrance, exit, sudden contraction, sudden enlargement and fittings; flow through pipes in series, pipes in parallel and Dupuit's equation for equivalent pipe; hydraulic gradient line and total energy line; water hammer in pipes: causes and remedial measures; discharge measuring device for pipe flow: venturimeter — construction and working; discharge measurement using orifice, hydraulic coefficients of orifice.

Unit 4 — Flow through Open Channel (5 Periods, 20%)

Topics: Geometrical properties of channel section: wetted area, wetted perimeter, hydraulic radius for rectangular and trapezoidal channel section; determination of discharge by Chezy's equation and Manning's equation; conditions for most economical rectangular and trapezoidal channel section; discharge measuring devices: triangular and rectangular notches; velocity measurement devices: current meter, floats and Pitot tube; specific energy diagram, Froude's number, hydraulic jump.

Unit 5 — Hydraulic Pumps (5 Periods, 20%)

Topics: Concept of pump, types of pump — centrifugal, reciprocating, submersible; centrifugal pump: components and working; reciprocating pump: single acting and double acting, components and working; suction head, delivery head, static head, manometric head; power of centrifugal pump; selection and choice of pump; introduction of impulse and reaction turbine.

Practical Work

- Use piezometer to measure pressure at a given point.
- Use U-tube differential manometer to measure pressure difference between two given points.
- Use Reynold's apparatus to determine type of flow.
- Use Bernoulli's apparatus to apply Bernoulli's theorem to get total energy line for a flow in a closed conduit of varying cross sections.
- Determine minor losses in pipe fittings due to sudden contraction and sudden enlargement.
- Calibrate venturimeter to find out the discharge in a pipe.
- Calibrate the orifice to find out the discharge through a tank.
- Use current meter to measure the velocity of flow of water in open channel.
- Use Pitot tube to measure the velocity of flow of water in open channel.
- Use rectangular and triangular notch to measure the discharge through open channel.

Reference Books (as listed in the syllabus)

- Modi, P. N. and Seth, S.M., Hydraulics and Fluid Mechanics, Standard book house, Delhi.
- S.S. Rattan, Fluid Mechanics & Hydraulic Machines, Khanna Book Publishing Co., New Delhi.
- Ramamrutham, and Narayan, R., Hydraulics, Fluid Mechanics and Fluid Machines, Dhanpat Rai Publishing, New Company Delhi.
- Khurmi R S, Hydraulics, Fluid Mechanics, Hydraulic machines, S. Chand Publishers.
- Rajput, R K, Fluid Mechanics, S Chand, New Delhi.

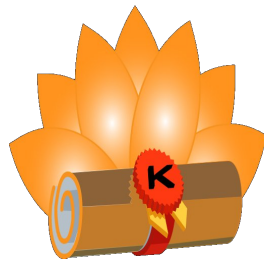
- Ojha, C S P, Berndtsson, R, and Chandramoulli P. N., Fluid Mechanics and Machinery, Oxford University Press, New Delhi.

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Advance Surveying — Complete Syllabus

BTEUP Diploma in Civil Engineering • 4th Semester • Session 2026-27

Subject 4.3 (Theory) + 4.4 (Lab) • Total 200 Marks • 4 Credits

About this document: Advance Surveying appears twice in the 4th semester — as a theory paper (4.3) and as a lab (4.4). Both are covered here, completely, in the official order. (Spelling “Advance Surveying” is as printed in the PDF.)

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
4.3	Advance Surveying	Theory	2 - 0	2	Theory 40	Theory 60 (3 hrs)	100
4.4	Advance Surveying Lab.	Practical	0 - 4	2	Practical 60	Practical 40 (3 hrs)	100
Advance Surveying Total				4	100	100	200

What This Subject Aims To Do

To know the methods of plane table surveying and theodolite surveying and their uses, learn tachometric surveying and curve setting, understand the principles of electronic distance measurement equipment and total station and their use, and know the concept of remote sensing, GPS and GIS.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Plane Table Surveying	4	20%
2	Theodolite Surveying	6	20%
3	Tacheometric Surveying and Curve Setting	6	20%
4	Advanced Surveying Equipments	6	20%
5	Remote Sensing, GPS and GIS	6	20%

Unit 1 — Plane Table Surveying (4 Periods, 20%)

Topics: Principles of plane table survey; accessories of plane table and their use, telescopic alidade; setting of plane table; orientation of plane table — back sighting and magnetic meridian method, true meridian method; methods of plane table surveys — radiation, intersection, traversing and resection (two point and three point methods); merits and demerits of plane table survey.

Unit 2 — Theodolite Surveying (6 Periods, 20%)

Topics: Types and uses of theodolite, components of transit theodolite and their functions, reading the vernier of transit theodolite; technical terms — swinging, transiting, face left, face right; fundamental axes of transit theodolite and their relationship; temporary adjustment of transit theodolite; measurement of horizontal angle — direct and repetition method and reiteration methods; measurement of magnetic bearing of a line, prolonging and ranging a line, deflection angle; measurement of vertical angle; theodolite traversing by included angle method and deflection angle method; checks for open and closed traverse, calculations of bearing from angles; traverse computation — latitude, departure, consecutive coordinates, independent coordinates, balancing the traverse by Bowditch's rule and transit rule, Gale's traverse table computation; errors and precautions in theodolite surveying.

Unit 3 — Tacheometric Surveying and Curve Setting (6 Periods, 20%)

Topics: Principles of tacheometry, tacheometer and its component parts, anallactic lens; tacheometric formula for horizontal distance with telescope horizontal and staff vertical; field method for determining constants of tacheometer, determining horizontal and vertical distances with tacheometer by fixed hair method and staff held vertical, limitations of tacheometry; simple circular curve: basic definitions, designation of curves, types of curves used in roads and railway alignments; transition curves: definition and requirement; setting simple circular curve by offsets from long chord, tangent and Rankine's method of deflection angles; introduction of vertical circular curve.

Unit 4 — Advanced Surveying Equipments (6 Periods, 20%)

Topics: Principle of Electronic Distance Meter (EDM), its component parts and their functions, use of EDM; use of micro optic theodolite and electronic digital theodolite; use of total station, use of function keys; measurements of horizontal angles, vertical angles, distances and coordinates using total station, traversing, profile survey and contouring with total station.

Unit 5 — Remote Sensing, GPS and GIS (6 Periods, 20%)

Topics: Remote sensing — overview, remote sensing system, applications of remote sensing in civil engineering, land use / land cover, mapping, disaster management; use of Global Positioning System (G.P.S.) instruments; Geographic Information System (GIS): overview, components, applications, software for GIS; introduction to drone surveying.

Practical Work

- Use plane table survey to prepare plans of a plot of seven sided closed traverse by radiation method.
- Use plane table survey to prepare plans, locate details by intersection method and resection method (two point problem and three point problem).
- Use plane table survey to prepare plans, locate details by traversing method.
- Use plane table survey to carry out survey project for closed traverse for minimum five sides around a building.
- Use transit theodolite to measure horizontal and vertical angle by direct method.
- Plot the traverse on A1 size imperial drawing sheet for the collected data from preceding theodolite survey project.
- Set out a circular curve by Rankine's method of deflection angles.
- Use EDM to measure horizontal distance.
- Use total station instrument to measure horizontal distances.

- Use total station instrument to measure vertical angle.
- Use total station instrument to carry out survey project for closed traverse for minimum five sides.
- Plot the traverse on A1 size imperial drawing sheet for the collected data from preceding total station survey project.
- Use GPS to locate the coordinates of a station.

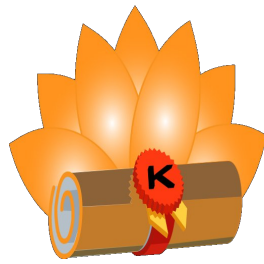
Reference Books (as listed in the syllabus)

- Kanetkar, T. P.; Kulkarni, S. V., Surveying and Levelling Part I and II, Pune Vidyarthi Gruh Prakashan, Pune.
- Basak, N. N., Surveying and Levelling, McGraw Hill Education (India) Pvt. Ltd., Noida.
- Duggal, S. K., Survey I and Survey II, Tata McGraw Hill Education Pvt. Ltd., Noida.
- Saikia, M D.; Das. B.M.; Das. M.M., Surveying, PHI Learning Pvt. Ltd., New Delhi.
- D.V. Gupta, Vikram Singh, Land Surveying-II, Asian Publishers, Muzaffarnagar, ISBN: 978-93-91541-59-0.
- Subramanian, R., Surveying and Levelling, Oxford University Press, New Delhi.
- Punmia, B.C.; Jain, Ashok Kumar; Jain, Arun Kumar, Surveying Vol. I and Surveying Vol. II, Laxmi Publications Pvt. Ltd., New Delhi.
- Rao, P. Venugopala Akella, Vijayalakshmi, Textbook of Surveying, PHI Learning Pvt. Ltd., New Delhi.
- Venkatramaiah, C, Textbook of Surveying, Universities Press, Hyderabad.
- Anderson, James M and Mikhail, Edward M, Surveying theory and practice, McGraw Hill Education, Noida.
- De, Alak, Plane Surveying, S.Chand Publications, New Delhi.

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Theory of Structure — Complete Syllabus

BTEUP Diploma in Civil Engineering • 4th Semester • Session 2026-27

Subject 4.5 (Theory) • Total 100 Marks • 3 Credits • L 2 - T 1

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
4.5	Theory of Structure	Theory	2 - 0	3	Theory 40	Theory 60 (3 hrs)	100
Theory of Structure Total				3	40	60	100

What This Subject Aims To Do

To learn the concept of eccentric loading and stresses in vertical members like columns, chimneys and dams, analyse beams using methods like slope deflection, three moment and moment distribution, and understand different methods of finding axial forces in trusses.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Principal Stress and Strain	6	20%
2	Combined Direct and Bending Stress	6	20%
3	Strain Energy	6	20%
4	Moment Distribution Method and Slope Deflection Method	5	20%
5	Simple Trusses	5	20%

Unit 1 — Principal Stress and Strain (6 Periods, 20%)

Topics: Stress on inclined planes, principal plane and principal stress in elements subjected to direct and shear stress and their combinations; Mohr circle for calculation of stress on inclined planes and principal strain for above cases.

Unit 2 — Combined Direct and Bending Stress (6 Periods, 20%)

Topics: Eccentric loading, middle third rule, columns subjected to uni-axial and bi-axial eccentric loading; dams — application of middle third rule for fixing the base width, calculation of stresses at the base of dam and stability of dam against overturning and sliding; vertical structures like chimney subjected to movement due to wind forces.

Unit 3 — Strain Energy (6 Periods, 20%)

Topics: Strain energy stored in a member due to axial loading and bending; strain energy stored by a beam due to uniform bending moment; work done by a force on a member, law of reciprocal deflection, Betti's law; the first theorem of Castigliano; deflection of truss joints.

Unit 4 — Moment Distribution Method and Slope Deflection Method (5 Periods, 20%)

Topics: Moment distribution method: basic proposition, relative stiffness, continuous beams with and without fixed ends; sinking of support, portal frames with and without sway (simple problem only). Slope deflection method: basic concepts, stiffness of members with far end fixed or hinged; development of slope deflection equations and their application to beam and frames.

Unit 5 — Simple Trusses (5 Periods, 20%)

Topics: Types of trusses (simple, Fink, compound Fink, French truss, Pratt truss, Howe truss, north-light truss, king post and queen post truss); calculate support reactions for trusses subjected to point loads at joints; calculate forces in members of truss using method of joints and method of sections.

Reference Books (as listed in the syllabus)

- Ramamrutham. S, Theory of structures, Dhanpatrai & Sons.
- Khurmi, R. S., Theory of Structures, S. Chand and Co., New Delhi.
- Bhavikatti, S S, Structural Analysis Vol-1, Vikas Publishing House Pvt Ltd., New Delhi.

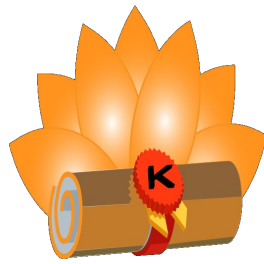
- Dr. Vijay Mittal, Amit Verma, Structural Mechanics, Asian Publishers, Muzaffarnagar, ISBN: 978-93-91541-23-1.
- Junnarkar, S. B., Mechanics of structures, Volume-I and II, Charotar Publishing House, Anand.
- Pandit, G.S. and Gupta, S.P., Theory of Structures, Tata McGraw Hill, New Delhi.
- Agor R, Structural Analysis, Khanna Publishing House, Delhi.

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Design of Reinforced Cement Concrete Structures — Complete Syllabus

BTEUP Diploma in Civil Engineering • 4th Semester • Session 2026-27

Subject 4.6 (Theory) • Total 100 Marks • 3 Credits • L 2 - T 1

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
4.6	Design of Reinforced Cement Concrete Structures	Theory	2 - 0	3	Theory 40	Theory 60 (3 hrs)	100
Design of RCC Structures Total				3	40	60	100

What This Subject Aims To Do

To learn the concept of limit state design for tension and compression members and steel beams, understand the design of RCC elements, and know the design of short and long RCC columns.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Introduction	8	20%
2	Concept of Limit State Method	8	20%

3	Design of Reinforced Concrete Beams by Limit State Method	9	20%
4	Design of One Way and Two Way Slab	9	20%
5	Design of Axially Loaded RCC Column and Pre-stressed Concrete	9	20%

Unit 1 — Introduction (8 Periods, 20%)

Topics: Concept of Reinforced Cement Concrete (RCC); reinforcement materials: suitability of steel as reinforcing material, properties of mild steel, HYSD steel and TMT bars; loading on structures as per IS: 875; introduction to following methods of RCC design: working stress method — definition and basic assumptions; limit state method — definition and basic assumptions; working stress method: shear and development length; problems of singly, doubly and T beam analysis by working stress method; shear as per IS: 456-2000 by working stress method — (i) shear strength of concrete without shear reinforcement, (ii) maximum shear stress, (iii) shear reinforcement, (iv) development length.

Unit 2 — Concept of Limit State Method (8 Periods, 20%)

Topics: Concept of limit state method: definitions and assumptions made in limit state of collapse (flexure); partial factor of safety for materials; partial factor of safety for loads; design loads; stress block, parameters.

Unit 3 — Design of Reinforced Concrete Beams by Limit State Method (9 Periods, 20%)

Topics: Singly reinforced beam: theory and design of singly reinforced beam by limit state method; doubly reinforced beams: theory and design of simply supported doubly reinforced rectangular beam by limit state method; behaviour of T beam, inverted T beam, isolated T beam and 'L' beams; simple problems related to moment capacity.

Unit 4 — Design of One Way and Two Way Slab (9 Periods, 20%)

Topics: One way slab: theory and design of simply supported one way slab including sketches showing reinforcement details (plan and section) by limit state method; two way slab: theory and design of two-way simply supported slab with corners free to lift, no provisions for torsional reinforcement by limit state method including sketches showing reinforcement details (plan and two sections).

Unit 5 — Design of Axially Loaded RCC Column and Pre-stressed Concrete (9 Periods, 20%)

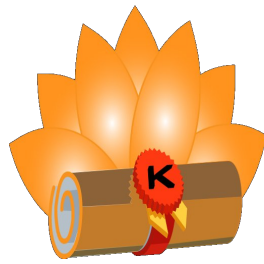
Topics: Axially loaded column: definition and classification of columns; effective length of column; specifications for longitudinal and lateral reinforcement; design of axially loaded square, rectangular and circular short columns by limit state method including sketching of reinforcement (sectional elevation and plan). Pre-stressed concrete: concept of pre-stressed concrete; methods of pre-stressing: pre-tensioning and post-tensioning; advantages and disadvantages of pre-stressing; losses in pre-stress.

Reference Books (as listed in the syllabus)

- Shah, V. L., and Karve, S.R., Limit State Theory and Design of Reinforced Concrete Structures, Structures Publications, Pune, 2014.
- Sinha N.C., and Roy S.K., Fundamentals of Reinforced Concrete, S. Chand & Co., New Delhi.
- D.V. Gupta, Vikram Singh, Reinforced Concrete Technology, Asian Publishers, Muzaffarnagar, ISBN: 978-93-5502-123-6.
- Krishna Raju, and N. Pranesh, R.N., Reinforced Concrete Design Principles and Practice, New Age International, Mumbai.
- Pillai, S.U., and Menon, Devdas, Reinforced Concrete Design, McGraw Hill Publications, New Delhi.
- Varghese, P. C., Limit State Design of Reinforced Concrete, Prentice Hall India Learning Private Limited, Delhi.

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Reinforced Cement Concrete Structures Drawing — Complete Syllabus

BTEUP Diploma in Civil Engineering • 4th Semester • Session 2026-27
Subject 4.7 (Practicum/Practical) • Total 100 Marks • 3 Credits • L 1 - P 4

Note: The PDF gives no unit-wise periods or marks distribution for this subject — its content is a list of drawings (see Practical Work). No unit table is given, so none is recorded.

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
4.7	Reinforced Cement Concrete Structures Drawing	Practicum/ Practical	1 - 4	3	Practical 60	Practical 40 (3 hrs)	100
RCC Structures Drawing Total				3	60	40	100

What This Subject Aims To Do

To learn the concept of limit state design of tension and compression members and steel beams, understand the design of RCC beams and columns, and draw their reinforcement details with bar bending schedules.

Practical Work

- Reinforcement details from the given data for the following structural elements with bar bending schedules.
- General instruction and rules, Drawing 1 — lap, joint, development drawing: length, rings, hook etc.
- Drawing No. 2: RC Slabs — one way slab, two way slab and cantilever slab.
- Drawing No. 3: Beams — singly and doubly reinforced rectangular beams and cantilever beam (all beams with vertical stirrups), T beam, tapered beam.
- Drawing No. 4: Columns and footings — square, rectangular and circular columns with lateral ties and their isolated sloped column footings, column and beam junction.
- Drawing No. 5: Portal frame — three bay two storey RC portal frame with blow up of column beam junctions.
- Drawing of cantilever retaining wall showing details of all the members and reinforcement.
- Drawing of Intze type water tank showing details of all the members and reinforcement.

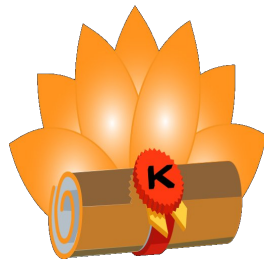
Reference Books (as listed in the syllabus)

- Shah, V. L., and Karve, S.R., Limit State Theory and Design of Reinforced Concrete Structures, Structures Publications, Pune, 2014.
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- Krishna Raju, and N. Pranesh, R.N., Reinforced Concrete Design Principles and Practice, New Age International, Mumbai.
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Water Resource Engineering — Complete Syllabus

BTEUP Diploma in Civil Engineering • 4th Semester • Session 2026-27

Subject 4.8 (Theory) • Total 100 Marks • 2 Credits • L 2

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
4.8	Water Resource Engineering	Theory	2 - 0	2	Theory 40	Theory 60 (3 hrs)	100
Water Resource Engineering Total				2	40	60	100

What This Subject Aims To Do

To learn estimation of hydrological parameters, understand water demand of crops and provisions to meet the same, know planning of reservoirs and dams, and design irrigation projects, canals and other diversion works.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Introduction to Hydrology	5	20%
2	Crop Water Requirement	6	20%
3	Methods of Irrigation	5	20%
4	Diversion Head Works & Canals	6	20%

5	Dams and Spillways and River Training Works	6	20%
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Unit 1 — Introduction to Hydrology (5 Periods, 20%)

Topics: Hydrological cycle: rainfall, definition, rain-gauges — automatic and non-automatic, methods of estimating average rainfall, advantages of keeping rainfall records (arithmetic system); catchment area, runoff, factors affecting runoff, hydrograph, basic concept of unit hydrograph.

Unit 2 — Crop Water Requirement (6 Periods, 20%)

Topics: Principal crops in India and their water requirements, crop seasons — Kharif and Rabi; soil water, soil crop and crop water relationships, duty, delta and base period, their relationship, gross commanded area (GCA), culturable commanded area (CCA), intensity of irrigation, paleo irrigation, Kor, crop ratio, crop period, base period, duty, delta; relation between duty-delta and base period; definition of water logging — its causes and ill effects, detection, prevention and remedies, surface and sub-surface drains and their layout.

Unit 3 — Methods of Irrigation (5 Periods, 20%)

Topics: Definition of irrigation, necessity of irrigation, role of irrigation in country's economy; history of development of irrigation in India, major, medium and minor irrigation projects of India; flow irrigation — its advantages and limitations; lift irrigation — tubewell, submersible and well irrigation, advantages and disadvantages; sprinkler irrigation — conditions favourable and essential requirements for sprinkler irrigation, sprinkler system — classification and component parts; drip irrigation, suitability of drip irrigation, layout, component parts, advantages; tubewell irrigation comparison with canal irrigation; tubewells, explanation of terms: water table, radius of influence, depression head, cone of depression, confined and unconfined aquifers; types of tubewells (cavity type, strainer type and slotted type) and their choice; method of boring, installation of well assembly, development of well, pump selection and installation and maintenance; water harvesting techniques: need and requirement of various methods, run-off from roof top and ground surface, construction of recharge pits and recharge wells and their maintenance.

Unit 4 — Diversion Head Works & Canals (6 Periods, 20%)

Topics: Canals: factors to be considered in canal alignment; functions/purpose of various components of canal; classification of canals and their functions, sketches of different canal cross-sections; various types of canal lining — their related advantages and disadvantages, sketches of different lined canal cross-sections; breaches — causes, method to plug canal breaches and their control, maintenance of lined and unlined canals; canal head works and regulatory works: choice of location of canal head works, definition, object, general layout, functions of different parts of head works; difference between weir and barrage; cross drainage works: functions and necessity of cross drainage works, types of cross drainage works: aqueduct, super passage, level crossing, inlet and outlet, sketches of the above cross drainage works; introduction of Kennedy and Lacey theory.

Unit 5 — Dams and Spillways and River Training Works (6 Periods, 20%)

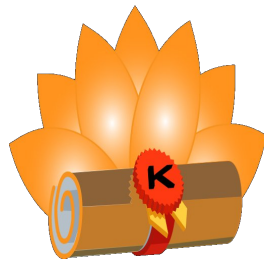
Topics: Dams: classification of dams; earthen dams — types, causes of failure; cross-section of homogeneous, zoned and diaphragm type earthen dams, method of construction; gravity dams — types, cross-sections of a dam, method of construction; concept of small and micro dams, concept of spillways and energy dissipators; river training works: various river stages, purpose/functions of river training works, meandering of rivers, methods of river training, guide banks, marginal embankment, retired (levees) embankments, groynes and spurs, pitched island, cut-off.

Reference Books (as listed in the syllabus)

- Punmia, B.C., Pande, B, Lal, Irrigation and Water Power Engineering, Laxmi Publications.
- Subramanian, Engineering Hydrology, McGraw Hill.
- D.V. Gupta, Vikram Singh, Irrigation Engineering, Asian Publishers, Muzaffarnagar, ISBN: 978-93-5502-115-1.
- Mutreja K N, Applied Hydrology, McGraw Hill.
- Sharma, R.K. and Sharma, T.K., Irrigation Engineering, S.Chand.
- Basak, N.N., Irrigation Engineering, McGraw Hill Education.
- Asawa, G.L., Irrigation and water resource Engineering, New Age.
- Dahigaonkar, J.G., Irrigation Engineering, Asian Book Pvt. Ltd., New Delhi.
- Garg, S K, Irrigation and Hydraulic Structures, Khanna Publishers, Delhi.
- Priyani V.B., Irrigation Engineering, Charotar Book Stall, Anand.

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Public Health Engineering — Complete Syllabus

BTEUP Diploma in Civil Engineering • 4th Semester • Session 2026-27

Subject 4.9 (Practicum/Theory) • Total 100 Marks • 2 Credits • L 1 – P 2

Note: The 4th-semester scheme totals imply this subject's 40 internal marks sit under Practical assessment, while its 60 external marks sit under Theory (the extracted table's column alignment is garbled — see NOTES). The lab work listed here is part of subject 4.9 itself.

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
4.9	Public Health Engineering	Practicum/ Theory	1 - 2	2	40	Theory 60 (3 hrs)	100
Public Health Engineering Total				2	40	60	100

What This Subject Aims To Do

To learn the principles for identification of sources of surface and subsurface water, learn calculation of population and requirement of drinking water, understand the plotting of a water supply scheme highlighting different features, and know evaluation of characteristics and treatment of sewage.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
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1	Sources, Demand and Quality of Water	3	20%
2	Purification of Water	3	20%
3	Conveyance and Distribution of Water	2	20%
4	Domestic Sewage and Sewerage System	3	20%
5	Characteristics and Treatment of Sewage	3	20%

Unit 1 — Sources, Demand and Quality of Water (3 Periods, 20%)

Topics: Water supply schemes — objectives, components; sources of water: surface and subsurface sources of water, intake structures, definition and types, factors governing the location of an intake structure, types of intakes; demand of water: factors affecting rate of demand, variations of water demands, forecasting of population, methods of forecasting of population (simple problems on forecasting of population), design period, estimating of quantity of water supply required for city or town; quality of water: need for analysis of water, characteristics of water — physical, chemical and biological, testing of water for total solids, hardness, chlorides, dissolved oxygen, pH, fluoride, nitrogen and its compounds, bacteriological tests, E. coli, B. coli index, MPN, sampling of water, water quality standards as per IS 10500.

Unit 2 — Purification of Water (3 Periods, 20%)

Topics: Purification of water: objectives of water treatment, aeration — objects and methods of aeration, plain sedimentation, sedimentation with coagulation, principles of coagulation, types of coagulants, jar test, process of coagulation, types of sedimentation tanks, clariflocculator; filtration — mechanism of filtration, classification of filters: slow sand filter, rapid sand filter, pressure filter; construction and working of slow sand filter and rapid sand filter, operational problems in filtration; disinfection: objects, methods of disinfection, chlorination — application of chlorine, forms of chlorination, types of chlorination practices, residual chlorine and its importance, flow diagram of water treatment plants; miscellaneous water treatments: introduction to water softening, dechlorination and defluoridation techniques.

Unit 3 — Conveyance and Distribution of Water (2 Periods, 20%)

Topics: Conveyance: types of pipes used for conveyance of water, choice of pipe material, types of joints and types of valves — their use, location and function on a pipeline and other related appurtenances; distribution of water: methods of distribution of water — gravity, pumping, and combined system, service reservoirs — functions and types, layouts of distribution of water — dead end system, grid iron system, circular system, radial system; their suitability, advantages and disadvantages; laying of pipe, testing of pipe lines, building water supply (practical aspect only).

Unit 4 — Domestic Sewage and Sewerage System (3 Periods, 20%)

Topics: Introduction: purpose of sanitation, necessity of systematic collection and disposal of waste, definition of terms in sanitary engineering, collection and conveyance of sewage, conservancy and water carriage systems, their advantages and disadvantages; (a) surface drains (only sketches): various types, suitability; (b) types of sewage: domestic, industrial, storm water and its seasonal variation; sewerage system: types of sewerage systems, materials for sewers, their sizes and joints; appurtenance: location, function and construction features — manholes, drop manholes, tank hole, catch basin, inverted siphon, flushing tanks, grease and oil traps, storm regulators, ventilating shafts; laying and construction of sewers: setting out/alignment of sewers, excavations, checking the gradient with boning rods, preparation of bedding, handling and jointing, testing and back filling of sewers/pipes; construction of surface drains and different sections required.

Unit 5 — Characteristics and Treatment of Sewage (3 Periods, 20%)

Topics: Sewage characteristics: properties of sewage and IS standards for analysis of sewage, physical, chemical and bacteriological parameters; natural methods of sewerage disposal: general composition of sewage and disposal methods, disposal by dilution, self purification of stream, disposal by land treatment, nuisance due to disposal; sewage treatment: meaning and principle of primary and secondary treatment and activated sludge process, their flow diagrams, introduction and uses of screens, grit chambers, detritus tanks, skimming tanks, plain sedimentation tanks, primary clarifiers, secondary clarifiers, filters, control beds, intermittent sand filters, trickling filters, sludge treatment and disposal, oxidation ponds (visit to a sewage treatment plant), oxidation ditch, duckweed pond, vermiculture; building drainage: aims of building drainage and its requirements, different sanitary fittings and installations, traps; introduction to smart water supply and waste water management: a field visit may be planned to explain and show the relevant things.

Practical Work

- Determine pH value of given sample of water.
- Determine the turbidity of the given sample of water.
- Determine residual chlorine in a given sample of water.
- Determine suspended, dissolved solids and total solids of given sample of water.
- Determine the dissolved oxygen in a sample of water.
- Determine the optimum dose of coagulant in a given raw water sample by jar test.
- Determine B.O.D. of given sample of sewage.
- Determine pH value of given sample of sewage.
- Determine suspended solids, dissolved and total solids for sample of sewage.
- Determine the dissolved oxygen in the given sample of sewage.
- Determine C.O.D. of given sample of sewage.
- Prepare a report of a field visit to sewage treatment plant or water treatment plant.

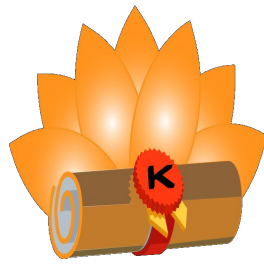
Reference Books (as listed in the syllabus)

- Sharma S.C, Environmental Engineering, Khanna Publishing House, New Delhi.
- Garg, S.K., Environmental Engineering Vol. I and Vol. II, Khanna Publishers.
- Birdie, G. S. and Birdie, J. S., Water Supply and Sanitary Engineering, Dhanpat Rai.
- Gupta, O.P., Elements of Environmental Pollution Control, Khanna Publishing House, Delhi.
- Rao, C.S., Environmental Pollution Control Engineering, New Age International.
- Punmia, B C, Environmental Engineering, vol. I and II, Laxmi Publishers.
- D.V. Gupta, Vikram Singh, Water & Waste Water Engineering, Asian Publishers, Muzaffarnagar, ISBN: 978-93-91541-52-1.
- Peavy H S, Rowe D R, and Tchobanoglous G, Environmental Engineering, McGraw.
- Basak N N, Environmental Engineering, McGraw Hill Publishers.

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Essence of Indian Knowledge and Tradition — Complete Syllabus

BTEUP Diploma in Civil Engineering • 4th Semester • Session 2026-27
Subject 4.10 (Audit Course, Q) • 50 Marks Internal (Qualifying) • SCA 50 Marks • No
Credits • L 2

Note: (Q) — It is compulsory to appear and to pass in this examination, but marks will not be included for division and percentage of obtained marks. No books list is given in the PDF for this subject.

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
4.10	Essence of Indian Knowledge and Tradition (Q)	Audit Course	2 - 0	—	50*	—	—
—	Student Centred Activities (SCA)	Activity	0 - 8	—	50	—	50
Qualifying Subject + SCA Total				—	100	—	50

What This Subject Aims To Do

To understand the fundamental aspects of the Indian Knowledge System, its integration with modern science, principles of Yoga and holistic healthcare, and practical applications in contemporary contexts.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Introduction to Indian Knowledge System	7	30%
2	Modern Science and Indian Knowledge System	7	25%
3	Yoga and Holistic Healthcare	7	25%
4	Case Studies / Assignment	7	20%

Unit 1 — Introduction to Indian Knowledge System (7 Periods, 30%)

Topics: Overview of Indian Knowledge System; importance and relevance; introduction to the Vedas; Upavedas; Vedangas; Upangas.

Unit 2 — Modern Science and Indian Knowledge System (7 Periods, 25%)

Topics: Relevance of science and spirituality; science and technology in ancient India.

Unit 3 — Yoga and Holistic Healthcare (7 Periods, 25%)

Topics: Basic principles of yoga; benefits of holistic healthcare practices; integration with modern healthcare.

Unit 4 — Case Studies / Assignment (7 Periods, 20%)

Topics: Practical applications / case studies demonstrating the relevance of Indian Knowledge System in modern times.

Student Centred Activities (SCA) — 50 Marks

A provision for overall personality development, including co-curricular activities such as extension lectures, games, hobby clubs (for example photography, painting and singing), seminars, declamation contests, educational field visits, NCC, NSS, library work, cultural activities and self-study. Maximum marks for SCA: 50, distributed as: (i) 15 marks for general behaviour and discipline (by HODs in consultation with all the teachers of the department); (ii) 10 marks for attendance — 75-80% = 6 marks, 80-85% = 8 marks, above 85% = 10 marks; (iii) 25 marks maximum for sports / NCC / cultural / co-curricular / NSS activities — 25 for state/national level participation, 20 for participation in two of the above activities, 15 for

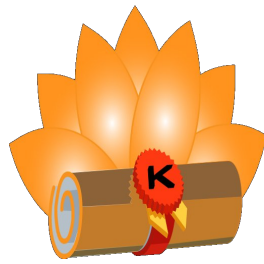
inter-polytechnic level participation. Note: there should be no marks for attendance in the internal sessional of different subjects.

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Transportation Engineering — Complete Syllabus

BTEUP Diploma in Civil Engineering • 5th Semester • Session 2026-27

Subject 5.1 (Theory) + 5.7 (Lab) • Total 200 Marks • 4 Credits

About this document: Transportation Engineering appears twice in the 5th semester — as a theory paper (5.1) and as a lab (5.7). Both are covered here, completely, in the official order. The scheme table spells the subject “TRANSPORATION ENGG.”; the subject pages spell it “TRANSPORTATION ENGINEERING”.

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
5.1	Transportation Engineering	Theory	2 - 0	2	Theory 40	Theory 60 (3 hrs)	100
5.7	Transportation Engineering Lab.	Practical	0 - 4	2	Practical 60	Practical 40 (3 hrs)	100
Transportation Engineering Total				4	100	100	200

What This Subject Aims To Do

To identify the types of roads as per IRC recommendations, understand the geometrical design features of different highways, perform different tests on road materials, and identify the components of railway tracks.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Overview of Transportation Engineering	3	15%
2	Geometric Design of Highway	8	20%
3	Construction of Road Pavements	8	30%
4	Basics of Railway Engineering	5	15%
5	Track Geometrics, Construction and Maintenance	4	20%

Unit 1 — Overview of Transportation Engineering (3 Periods, 15%)

Topics: Role of transportation in the development of nation, scope and importance of roads in India and its characteristics; functions of IRC, CRRI, MoRT & H, NHAI; different modes of transportation — land way, waterway, airway; general classification of roads; selection and factors affecting road alignment.

Unit 2 — Geometric Design of Highway (8 Periods, 20%)

Topics: Camber: definition, purpose, types as per IRC — recommendations; kerbs: road margin, road formation, right of way; design speed and various factors affecting design speed as per IRC — recommendations; gradient: definition, types as per IRC — recommendations; sight distance (SSD): definition, types, intermediate sight distance and over taking sight distance, IRC — recommendations, simple numerical; curves: necessity, types: horizontal, vertical curves; extra widening of roads: numerical examples; super elevation: definition, formula for calculating minimum and maximum super elevation and method of providing super-elevation; standards cross-sections of national highway in embankment and cutting.

Unit 3 — Construction of Road Pavements (8 Periods, 30%)

Topics: Different types of road materials in use: soil, aggregate and binders and their tests — CBR, test on aggregates — flakiness and elongation index tests, impact value, abrasion value, aggregate crushing value; test on bitumen — penetration, ductility, flash and fire point test and softening point test; pavement — definition, types, structural components of pavement and their functions; construction of WBM road; merits and demerits of WBM and WMM road; construction of flexible pavement / bituminous road, types of bitumen and its properties, emulsion, cutback, tar, terms used in bituminous road — prime coat, tack coat, seal coat, merits and demerits of bituminous road; cement concrete road — methods of construction, alternate and continuous bay method, construction joints, filler and sealers, merits and demerits of concrete roads, types of joints; pavement maintenance and highway drainage; road construction machinery: paver, roller, excavator, grader, bulldozer, hot mix plant, dumper, drag line, backhoe etc.

Unit 4 — Basics of Railway Engineering (5 Periods, 15%)

Topics: Classification of Indian Railways, zones of Indian Railways; mass transit system; permanent way: ideal requirement, components; rail gauge, types, factors affecting selection of a gauge; rail, rail joints — requirements, types; creep of rail: causes and prevention; sleepers — functions and requirement, types — concrete sleepers and their density; ballast — function and types, suitability; rail fixtures and fastenings — fish plate, spikes, bolts, keys, bearing plates, chairs — types of anchors and anti-creepers.

Unit 5 — Track Geometrics, Construction and Maintenance (4 Periods, 20%)

Topics: Alignment — factors governing rail alignment; track cross sections — standard cross section of single and double line in cutting and embankment; important terms — permanent land, formation width, side drains; railway track geometrics: gradient, curves — types and factors affecting, grade compensation, super elevation, limits of super elevation on curves, cant deficiency, negative cant, coning of wheel, tilting of rail; branching of tracks, points and crossings, turn out — types, components, functions and inspection; track junctions: crossovers, scissor cross over, diamond crossing, track triangle; station — purpose, requirement of railway station, important technical terms, types of railway station, factors affecting site selection for railway station; station yard: classification — passenger, goods, locomotive and marshalling yards; function and drawbacks of marshalling yards; track maintenance — necessity, classification, tools required for track maintenance with their functions, organisation of track maintenance, duties of permanent way inspector, gang mate and key man.

Practical Work

- California Bearing Ratio (CBR) Test.
- Flakiness and Elongation Index of aggregates.
- Angularity Number of aggregates.
- Aggregate impact test.
- Los Angeles Abrasion test.
- Aggregate crushing test.
- Softening point test of bitumen.
- Penetration test of bitumen.
- Flash and Fire Point test of bitumen.
- Ductility test of bitumen.
- Visit to railway track for visual inspection of fixtures, fasteners and yards.
- Prepare the photographic report containing details for experiment No. 11.

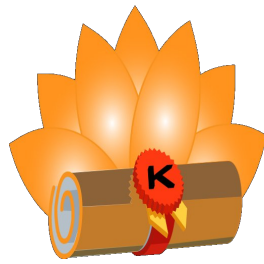
Reference Books (as listed in the syllabus)

- L.R. Kadiyali, Transportation Engineering, Khanna Book Publishing Co., Delhi (ISBN: 978-93-82609-858), Edition 2018.
- Khanna S.K., Justo, C E G and Veeraragavan, A., Highway Engineering, Nem Chand and Brothers, Roorkee.
- Arora, N. L., Transportation Engineering, Khanna Publishers, Delhi.
- Saxena S C and Arora S P, A Textbook of Railway Engineering, Dhanpat Rai Publication.
- Birdi, Ahuja, Road, Railways, Bridge and Tunnel Engg, Standard Book House, New Delhi.
- Sharma, S.K., Principles, Practice and Design of Highway Engineering, S. Chand Publication, New Delhi.
- Duggal, Ajay K. and Puri, V. P., Laboratory Manual in Highway Engineering, New Age International (P) Limited, Publishers, New Delhi.
- Subramanian, K.P., Highway, Railway, Airport and Harbour Engineering, Scitech Publications, Hyderabad.
- D.V.Gupta, Vikram Singh, Transport Engineering -I, Asian Publishers, Muzaffarnagar, ISBN No. 978-93-5502-113-7.

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Estimating Costing and Valuation — Complete Syllabus

BTEUP Diploma in Civil Engineering • 5th Semester • Session 2026-27
Subject 5.2 (Practicum/Theory) • Total 100 Marks • 3 Credits • L 1 – P 4

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
5.2	Estimating Costing and Valuation	Practicum/ Theory	1 - 4	3	Theory 20 + Practical 20	Theory 60 (3 hrs)	100
Estimating Costing and Valuation Total				3	40	60	100

What This Subject Aims To Do

To learn the procedure for estimating and costing of civil engineering works, perform rate analysis for different items associated with construction projects, and use software for detailed estimates related to civil infrastructural projects.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Fundamentals of Estimating and Costing	10	10%
2	Estimate	20	25%

3	Rate Analysis	15	25%
4	Tender and Contractorship	15	25%
5	Real Estate (Regulation and Development) Act-2016 and Valuation	10	15%

Unit 1 — Fundamentals of Estimating and Costing (10 Periods, 10%)

Topics: Estimating and costing — meaning, purpose, administrative approval, technical sanction and budget provision; measurement: units of measurement for various items of work, rules for deduction in different category of work as per IS:1200; types of estimates — approximate and detailed estimate; types and uses of estimates: revised estimate, supplementary estimate, repair and maintenance estimate, renovation estimate; roles and responsibility of estimator; standard formats of measurement sheet, abstract sheet, face sheet; modes of measurement and desired accuracy in measurements for different items of work as per IS:1200.

Unit 2 — Estimate (20 Periods, 25%)

Topics: Detailed estimate — definition and purpose, data required for detailed estimate — civil cost, GST, contingencies, supervision charges, agency charges, work charged establishment, procedure for preparation of detailed estimate — taking out quantities and abstracting; long wall and short wall method, centre line method; bar bending schedule for footing, column, beam, lintel, chajja and slab elements; earthwork — quantities for roads, embankment and canal by — mid sectional area method, mean sectional area method, prismoidal and trapezoidal formula method; a small residential building with a flat roof comprising of — two rooms with W.C., bath, kitchen and verandah; WBM road and pre-mix carpeting; single span RCC slab culvert; earthwork for plain and hill roads; RCC work in beams, slab, column and lintel, foundation; 10 users septic tank.

Unit 3 — Rate Analysis (15 Periods, 25%)

Topics: Calculation of quantities of materials for: cement mortars of different proportion, cement concrete of different proportion, brick/stone masonry in cement mortar of different proportion, plastering, pointing and painting, D.P.C. and flooring; categories of labours, their daily wages, types and number of labours for different items of work; rate analysis: definition, purpose and importance, procedure for rate analysis; preparing rate analysis of different items of work pertaining to buildings and roads.

Unit 4 — Tender and Contractorship (15 Periods, 25%)

Topics: Tender, tender forms and documents, tender notice, submission of tender and deposit of earnest money, security deposit, retention money, maintenance period; meaning of contract, types of contracts, their advantages, disadvantages and suitability, system of payment; exercises on writing detailed specifications of different types of building works: earthwork, brick work and RCC work.

Unit 5 — Real Estate (Regulation and Development) Act-2016 and Valuation (10 Periods, 15%)

Topics: Introduction: purpose and salient features of Act; definition and functions of real estate projects, promoter, agent and allottees; registration of real estate projects; valuation: purpose of valuation, principles of valuation; definition of various terms related to valuation like depreciation, sinking fund, salvage and scrap value, market value, fair rent, year's purchase etc.

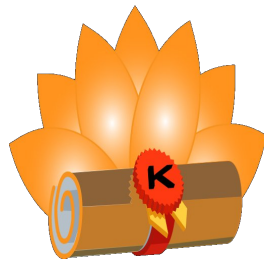
Reference Books (as listed in the syllabus)

- Datta, B.N., Estimating and Costing in Civil engineering, UBS Publishers Distributors Pvt. Ltd., New Delhi.
- Peurifoy, Robert L., Oberlender, Garold, Estimating construction cost (fifth edition), McGraw Hill Education, New Delhi.
- Rangwala, S.C., Estimating and Costing, Charotar Publishing House Pvt. Ltd., Anand.
- Birdie, G.S., Estimating and Costing, Dhanpat Rai Publishing Company (P) Ltd., New Delhi.
- Patil, B.S., Civil Engineering Contracts and Estimates, Orient Longman, Mumbai.
- Chakraborti, M., Estimating and costing, specification and valuation in civil engineering, Monojit Chakraborti, Kolkata.
- CPWD and PWD Schedule of Rates.
- Ministry of Road Transport and Highways (MORT&H) Specifications and Analysis of Schedule of Rates.
- D.V.Gupta, Vikram Singh, Quantity Surveying & valuation of Building & Civil Works, Asian Publishers, Muzaffarnagar, ISBN No. 978-93-5502-154-0.

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Geotechnical Engineering — Complete Syllabus

BTEUP Diploma in Civil Engineering • 5th Semester • Session 2026-27

Subject 5.3 (Theory) + 5.8 (Lab) • Total 200 Marks • 4 Credits

About this document: Geotechnical Engineering appears twice in the 5th semester — as a theory paper (5.3) and as a lab (5.8). Both are covered here, completely, in the official order.

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
5.3	Geotechnical Engineering	Theory	2 - 0	2	Theory 40	Theory 60 (3 hrs)	100
5.8	Geotechnical Engineering Lab.	Practical	0 - 4	2	Practical 60	Practical 40 (3 hrs)	100
Geotechnical Engineering Total				4	100	100	200

What This Subject Aims To Do

To understand and determine physical and index properties and classification of soil, estimate permeability and shear strength of soil, know the load bearing capacity of soil, and learn various soil stabilisation and compaction methods.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
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1	Overview of Geology and Geotechnical Engineering	3	10%
2	Physical and Index Properties of Soil	7	25%
3	Permeability and Shear Strength of Soil	7	25%
4	Compaction and Consolidation	5	20%
5	Bearing Capacity of Soil and Stabilization of Soil	6	20%

Unit 1 — Overview of Geology and Geotechnical Engineering (3 Periods, 10%)

Topics: Introduction of geology, branches of geology, importance of geology for civil engineering structure and composition of earth; definition of a rock: classification based on their genesis (mode of origin), formation; classification and engineering uses of igneous, sedimentary and metamorphic rocks; importance of soil as construction material in civil engineering structures and as foundation bed for structures.

Unit 2 — Physical and Index Properties of Soil (7 Periods, 25%)

Topics: Soil as a three-phase system, water content, determination of water content by oven drying method as per BIS code, void ratio, porosity and degree of saturation, density index; unit weight of soil mass — bulk unit weight, dry unit weight, unit weight of solids, saturated unit weight, submerged unit weight; determination of bulk unit weight and dry unit weight by core cutter and sand replacement method, determination of specific gravity by pycnometer; consistency of soil, Atterberg limits of consistency: liquid limit, plastic limit and shrinkage limit, plasticity index; particle size distribution test and plotting of curve, determination of effective diameter of soil, well graded and uniformly graded soils, BIS classification of soil; effective stress (concept only), stresses in subsoil, definition and meaning of total stress, effective stress and neutral stress, principle of effective stress, importance of effective stress in engineering problems.

Unit 3 — Permeability and Shear Strength of Soil (7 Periods, 25%)

Topics: Definition of permeability, Darcy's law of permeability, coefficient of permeability, factors affecting permeability, determination of coefficient of permeability by constant head and falling head tests, simple problems to determine coefficient of permeability; seepage through earthen structures, seepage velocity, seepage pressure, phreatic line, flow lines, application of flow net (no numerical problems); shear failure of soil, concept of shear strength of soil; components of shearing resistance of soil — cohesion, internal friction; Mohr-Coulomb failure theory, strength envelope, strength equation for purely cohesive and cohesion less soils; direct shear and vane shear test — laboratory methods.

Unit 4 — Compaction and Consolidation (5 Periods, 20%)

Topics: Concept of compaction and consolidation, standard and modified Proctor test as per IS code, plotting of compaction curve for determining: optimum moisture content (OMC), maximum dry density (MDD), zero air voids line; factors affecting compaction, field methods of compaction — rolling, ramming and vibration; suitability of various compaction equipments — smooth wheel roller, sheep foot roller, pneumatic tyred roller, rammer and vibrator; difference between compaction and consolidation; definition of earth pressure, active and passive earth pressure for no surcharge condition, coefficient of earth pressure, Rankine's theory and assumptions made for non-cohesive soils.

Unit 5 — Bearing Capacity of Soil and Stabilization of Soil (6 Periods, 20%)

Topics: Bearing capacity and theory of earth pressure; concept of bearing capacity, ultimate bearing capacity, safe bearing capacity and allowable bearing pressure; introduction to Terzaghi's analysis and assumptions, effect of water table on bearing capacity; field methods for determination of bearing capacity — plate load and standard penetration test; test procedures as per IS:1888 and IS:2131; concept of soil stabilisation, necessity of soil stabilisation, different methods of soil stabilisation; California bearing ratio (CBR) test — meaning and utilisation in pavement construction; necessity of site investigation and soil exploration: types of exploration, criteria for deciding the location and number of test pits and bores; field identification of soil — dry strength test, dilatancy test and toughness test.

Practical Work

- Identification of rocks from the given specimen.
- Determine water content of given soil sample by oven drying method as per IS: 2720 (Part- II).
- Determine specific gravity of soil by pycnometer method as per IS 2720 (Part- III).
- Determine dry unit weight of soil in field by core cutter method as per IS 2720 (Part- XXIX).
- Determine dry unit weight of soil in field by sand replacement method as per IS 2720 (Part- XXVIII).
- Determine plastic and liquid limit along with plasticity index of given soil sample as per IS 2720 (Part- V).
- Determine shrinkage limit of given soil sample as per IS 2720 (Part- V).
- Determine grain size distribution of given soil sample by mechanical sieve analysis as per IS 2720 (Part- IV).
- Use different types of soil to identify and classify soil by conducting field tests — through visual inspection, dry strength test, dilatancy test and toughness test.

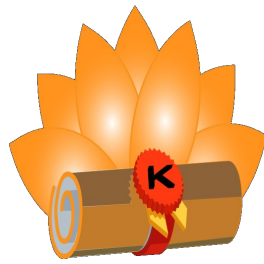
- Determine coefficient of permeability by constant head test as per IS 2720 (Part- XVII).
- Determine coefficient of permeability by falling head test as per IS 2720 (Part- XVII).
- Determine shear strength of soil by direct shear test as per IS 2720 (Part- XIII).
- Determine shear strength of soil by vane shear test as per IS 2720 (Part- XXX).
- Determine MDD and OMC by standard Proctor test of given soil sample as per IS 2720 (Part- VII).
- Determination of CBR value on the field as per IS 2720 (Part- XVI).

Reference Books (as listed in the syllabus)

- Punmia, B.C., Soil Mechanics and Foundation Engineering, Laxmi Publication, Delhi.
- Murthy, V.N.S., A text book of soil mechanics and foundation Engineering, CBS Publishers & Distributors Pvt. Ltd., New Delhi.
- Ramamurthy, T.N. & Sitharam, T.G., Geotechnical Engineering (Soil Mechanics), S Chand and Company Ltd., New Delhi.
- Raj, P. Purushothama, Soil Mechanics and Foundation Engineering, Pearson India, New Delhi.
- Kasamalkar, B. J., Geotechnical Engineering, Pune Vidyarthi Griha Prakashan, Pune.
- Arora K R, Soil Mechanics and Foundation Engineering, Standard Publisher.
- S.K.Sharma, Soil Mechanics & Foundation Engineering, Asian Publishers, Muzaffarnagar, ISBN No. 978-93-91541-60-6.

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Design of Steel Structure and Drawing — Complete Syllabus

BTEUP Diploma in Civil Engineering • 5th Semester • Session 2026-27
Subject 5.4 (Practicum/Theory) • Total 100 Marks • 3 Credits • L 1 – P 4

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
5.4	Design of Steel Structure and Drawing	Practicum/ Theory	1 - 4	3	Theory 20 + Practical 20	Theory 60 (3 hrs)	100
Design of Steel Structure and Drawing Total				3	40	60	100

What This Subject Aims To Do

An applied engineering subject for diploma holders who will supervise steel construction and fabrication and may have to design simple structural elements or change a design as materials allow. It deals with elementary design principles as per BIS code of practice IS: 800 — structural steel, connections, tension and compression members, beams, trusses and column bases, with drawings.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Introduction	5	10%

2	Riveted, Bolted and Welded Connections	20	25%
3	Tension and Compression Members	15	20%
4	Beams, Roof Trusses and Column Bases	10	10%
5	Steel Structure Drawings	20	35%

Unit 1 — Introduction (5 Periods, 10%)

Topics: Structural steel and sections: properties of structural steel, designation and classification of structural steel sections as per IS handbook and IS: 800:2007; tubular sections; types of sections used for beams, tension and compression members.

Unit 2 — Riveted, Bolted and Welded Connections (20 Periods, 25%)

Topics: Riveted connections: types of rivet, permissible stresses in rivets, types of riveted joints, specifications as per IS 800, failure of riveted joint, strength and efficiency of riveted joint, design of riveted connection only axially loaded member (no staggered riveting). Bolt connections: types of bolt, permissible stresses in bolt, types of bolted joints, specifications for bolted joints as per IS 800, failure of a bolted joint, assumptions in the theory of bolted joints, strength and efficiency of a bolted joint, design of bolted joints for axially loaded members (no staggered bolts). Welded connections: types of welds and welded joints, advantages and disadvantages of welded joints, design of fillet and butt weld for axially loaded members.

Unit 3 — Tension and Compression Members (15 Periods, 20%)

Topics: Tension members: analysis and design of single and double section tension members and their rivetted and welded connections with gusset plate as per IS: 800-2007; introduction to lug angle and tension splice. Compression members: angle struts, type of section used, effective length, radius of gyration, slenderness ratio and its limits, permissible compressive stress; analysis and design of single and double angle sections compression members subjected to axial load; introduction to analysis and design of axially loaded column; introduction to lacing and battening (no numerical problem on lacing and battening).

Unit 4 — Beams, Roof Trusses and Column Bases (10 Periods, 10%)

Topics: Beams: analysis and design of single section simply supported laterally restrained steel beams; introduction to plate girder and functions of various elements of a plate girder. Roof trusses: form of trusses, pitch of roof truss, spacing of trusses, spacing of purlins, connection between purlin and roof covering; connection between purlin and principal rafter (no design, only concept). Column bases: types of column bases i.e. slab base, gusseted base; design of slab base and concrete block; introduction to gusseted base (no numerical problems on gusseted base); introduction to beam columns, design of simple built up beams (symmetrical I section with cover plates only).

Unit 5 — Steel Structure Drawings (20 Periods, 35%)

Topics: (i) Drawing No. 1: Roof truss — drawing of Fink roof truss with details of joints, fixing details of purlins and roof sheets. (ii) Drawing No. 2: Column and column bases — drawing of splicing of steel columns; drawings of slab base, gusseted base and grillage base for single section steel columns. (iii) Drawing No. 3: Column beam connections — (a) sealed and framed beam to beam connections, (b) sealed and framed beam to column connections. (iv) Drawing No. 4: Plate girder (bolted) — plan and elevation of plate girder with details at supports and connection of stiffness, flange angles and cover plate with web highlighting curtailment of plates. (v) Drawing No. 5: Draw at least one sheet using CAD software.

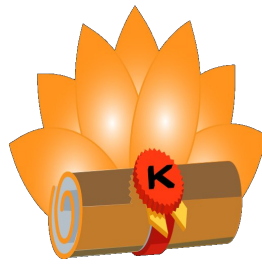
Reference Books (as listed in the syllabus)

- Civil Engineering Drawing by Loyal JS; SatyaParkashan, New Delhi.
- Civil Engineering Drawings by Chandel RP.
- Civil Engineering Drawing by Kumar; NS; IPH, New Delhi.
- Civil Engineering Drawing by Malik RS and Meo GA; Asian Publishing House, New Delhi.
- Steel Structures Design and Drawing by Singh Birinder; Kaption Publishing House, New Delhi.
- e-books/e-tools/relevant software to be used as recommended by AICTE/NITTTR, Chandigarh.
- Gharpure, D.V.Gupta, Vikram Singh, Design Of Steel Structures, Asian Publishers, Muzaffarnagar, ISBN No. 978-93-5502-160-1.

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Green Building and Energy Conservation — Complete Syllabus (Program Elective-1, Option A)

BTEUP Diploma in Civil Engineering • 5th Semester • Session 2026-27
Subject 5.5 (Program Elective-1, Option A) • Total 100 Marks • 2 Credits • L 2 • Choose
this OR Repair and Maintenance of Building

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
5.5	Program Elective-1: Green Building and Energy Conservation	Theory	2 - 0	2	Theory 40	Theory 60 (3 hrs)	100
Green Building and Energy Conservation Total				2	40	60	100

What This Subject Aims To Do

To know various aspects of green buildings, use the steps involved in measuring environmental impact assessment, relate the construction of green buildings with prevailing energy conservation policy and regulations, identify different green building construction materials, and learn different rating systems and their criteria.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks	Share
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1	Introduction to Green Building and Design Features	5	10%
2	Energy Audit and Environmental Impact Assessment (EIA)	6	25%
3	Energy and Energy Conservation	6	25%
4	Green Building	6	25%
5	Rating System	5	15%

Unit 1 — Introduction to Green Building and Design Features (5 Periods, 10%)

Topics: Definition of green building, benefits of green building, components/features of green building, site selection, energy efficiency, water efficiency, material efficiency, indoor air quality; site selection strategies, landscaping, building form, orientation, building envelope and fenestration, material and construction techniques, roofs, walls, fenestration and shaded finishes, advanced passive heating and cooling techniques, waste reduction during construction.

Unit 2 — Energy Audit and Environmental Impact Assessment (EIA) (6 Periods, 25%)

Topics: Energy audit: meaning, necessity, procedures, types, energy management programs. Environmental Impact Assessment (EIA): introduction, EIA regulations, steps in environmental impact assessment process, benefits of EIA, limitations of EIA, environmental clearance for the civil engineering projects.

Unit 3 — Energy and Energy Conservation (6 Periods, 25%)

Topics: Renewable energy resources: solar energy, wind energy, ocean energy, hydro energy, bio-mass energy, geo thermal energy. Non-renewable energy resources: coal, petroleum, natural gas, nuclear energy, chemical sources of energy, fuel cells, hydrogen, biofuels. Energy conservation: introduction, specific objectives, present scenario, need of energy conservation, LEED India Rating System and energy efficiency.

Unit 4 — Green Building (6 Periods, 25%)

Topics: Introduction: definition of green building, benefits of green building. Principles: principles and planning of green building. Features: salient features of green building, environmental design (ED) strategies for building construction. Heating Ventilation Air Conditioning (HVAC) unit in green building. Process: improvement in environmental quality in civil structure. Materials: green building materials and products — bamboo, rice husk ash concrete, plastic bricks, bagasse particle board, insulated concrete forms; reuse of waste material — plastic, rubber, newspaper wood, nontoxic paint, green roofing.

Unit 5 — Rating System (5 Periods, 15%)

Topics: Introduction to (LEED) criteria; Indian Green Building Council (IGBC) green rating; Green Rating for Integrated Habitat Assessment (GRIHA) criteria; functions of government organisation working for Energy Conservation and Audit (ECA): National Productivity Council (NPC), Ministry of New and Renewable Energy (MNRE), Bureau of Energy Efficiency (BEE).

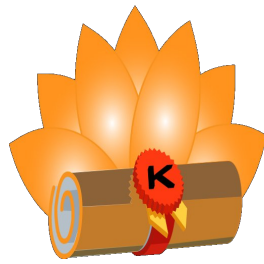
Reference Books (as listed in the syllabus)

- Kibert, C.J., Sustainable construction: Green Building design and Delivery, John Wiley, Hoboken, New Jersey.
- Chauhan, D S, Sreevasthava, S K., Non-conventional Energy Resources, New Age International Publishers, New Delhi.
- O.P. Gupta, Energy Technology, Khanna Publishing House, New Delhi.
- Jagadeesh, K S, Reddy Venkatta Rama & Nanjunda Rao, K S., Alternative Building Materials and Technologies, New Age International Publishers, Delhi.
- Sam Kubba., Handbook of Green Building Design and Construction, Butterworth-Heinemann.
- Means R S, Green Building - Project Planning and Cost Estimating, John Wiley & Sons.
- Sharma K V, Venkateshaiah P., Energy Management and Conservation, IK International.

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Repair and Maintenance of Building — Complete Syllabus (Program Elective-1, Option B)

BTEUP Diploma in Civil Engineering • 5th Semester • Session 2026-27

Subject 5.5 (Program Elective-1, Option B) • Total 100 Marks • 2 Credits • L 2 • Choose this OR Green Building and Energy Conservation

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
5.5	Program Elective-1: Repair and Maintenance of Building	Theory	2 - 0	2	Theory 40	Theory 60 (3 hrs)	100
Repair and Maintenance of Building Total				2	40	60	100

What This Subject Aims To Do

To learn about types of maintenance techniques, understand causes of various types of damages, know about relevant materials for repair, and learn methods of retrofitting for different structures.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Basics of Maintenance	5	15%
2	Damages: Causes and Its Detection	6	20%

3	Defects and Their Root Causes	5	20%
4	Materials for Repair, Maintenance and Protection	3	15%
5	Remedial Measures for Building Defects	9	30%

Unit 1 — Basics of Maintenance (5 Periods, 15%)

Topics: Need for maintenance: importance and significance of repair and maintenance of buildings, meaning of maintenance, objectives of maintenance, factors influencing the repair and maintenance.

Unit 2 — Damages: Causes and Its Detection (6 Periods, 20%)

Topics: Agencies causing deterioration (sources, causes, effects): definition of deterioration/decay; factors causing deterioration, their classification, human factors causing deterioration, chemical factors causing deterioration, environmental conditions causing deterioration, miscellaneous factors; effects of various agencies of deterioration on various building materials i.e. bricks, timber, concrete, paints, metals, plastics, stones; investigation and diagnosis of defects: systematic approach/procedure of investigation, sequence of detailed steps for diagnosis of building defects/problems, list of non-destructive and other tests on structural elements and materials to evaluate the condition of the building, and study of three most commonly used tests.

Unit 3 — Defects and Their Root Causes (5 Periods, 20%)

Topics: Define defects in buildings, classification of defects; main causes of building defects in various building elements: foundations, basements and DPC, walls, column and beams, roof and terraces, joinery, decorative and protective finishes, services, defects caused by dampness.

Unit 4 — Materials for Repair, Maintenance and Protection (3 Periods, 15%)

Topics: Compatibility aspects of repair materials; state application of following materials in repairs: anti-corrosion coatings, adhesives/bonding aids, repair mortars, curing compounds, joints sealants, waterproofing systems for roofs, protective coatings.

Unit 5 — Remedial Measures for Building Defects (9 Periods, 30%)

Topics: Preventive maintenance considerations; surface preparation techniques for repair; crack repair methods: epoxy injection, grooving and sealing, stitching, adding reinforcement and grouting, and flexible sealing by sealant; repair of surface defects of concrete: bug holes, form tie holes, honey comb and larger voids; repair of corrosion in RCC elements: steps in repairing and prevention of corrosion in reinforcement; material placement techniques with sketches: pneumatically applied (the gunite techniques), open top placement, pouring from the top to repair bottom face, birds mouth, dry packing, form and pump, preplaced-aggregate concrete, trowel applied method; repair of DPC against rising dampness: physical methods, electrical methods, chemical methods; repair of walls: repair of mortar joints against leakage and efflorescence removal; waterproofing of wet areas and roofs: waterproofing of wet areas, waterproofing of flat RCC roofs, various waterproofing systems and their characteristics; repair of joints in buildings: types of sealing joints with different types of sealants, techniques for repair of joints, and repair of overhead and underground water tanks.

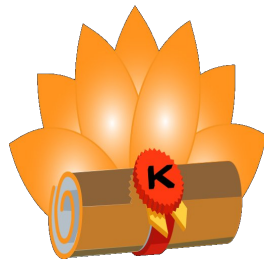
Reference Books (as listed in the syllabus)

- Gahlot, P. S., Sharma, S., Building Repair and Maintenance Management, CBS Publishers & Distributors Pvt. Ltd., New Delhi.
- Guha, P. K., Maintenance and Repairs of Buildings, New Central Book Agencies.
- Hutchin Son, B. D., Maintenance and Repairs of Buildings, Newnes-Butterworth.
- Relevant BIS codes.
- Aarti Chaurasiya, Repair & Maintenance of Buildings, Asian Publishers, Muzaffarnagar, ISBN No. 978-93-5502-178-6.

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Disaster Management — Complete Syllabus (Open Elective-01, Option A)

BTEUP Diploma in Civil Engineering • 5th Semester • Session 2026-27

Subject 5.6 (Open Elective-01, Option A) • 50 Marks Internal Only • 2 Credits • L 2 • Total
NA — not counted in semester total • Choose this OR Project Management (OR Advance
Skill Development)

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
5.6	Open Elective-01: Disaster Management	Theory	2 - 0	2	50	—	NA
Open Elective-01 Total				2	50	—	NA

What This Subject Aims To Do

To learn about various types of natural and man-made disasters, know pre- and post-disaster management for some of the disasters, know about various information and organisations in disaster management in India, and get exposed to technological tools and their role in disaster management.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Understanding Disaster	5	15%

2	Types, Trends, Causes, Consequences and Control of Disasters	6	25%
3	Disaster Management Cycle and Framework	6	25%
4	Disaster Management in India	5	15%
5	Applications of Science and Technology for Disaster Management	6	20%

Unit 1 — Understanding Disaster (5 Periods, 15%)

Topics: Understanding the concepts and definitions of disaster, hazard, vulnerability, risk, capacity — disaster and development, and disaster management.

Unit 2 — Types, Trends, Causes, Consequences and Control of Disasters (6 Periods, 25%)

Topics: Geological disasters (earthquakes, landslides, tsunami, mining); hydro-meteorological disasters (floods, cyclones, lightning, thunder-storms, hail storms, avalanches, droughts, cold and heat waves); biological disasters (epidemics, pest attacks, forest fire); technological disasters (chemical, industrial, radiological, nuclear) and manmade disasters (building collapse, rural and urban fire, road and rail accidents, nuclear, radiological, chemicals and biological disasters); global disaster trends — emerging risks of disasters — climate change and urban disasters.

Unit 3 — Disaster Management Cycle and Framework (6 Periods, 25%)

Topics: Disaster management cycle — paradigm shift in disaster management. Pre-disaster — risk assessment and analysis, risk mapping, zonation and micro-zonation, prevention and mitigation of disasters, early warning system; preparedness, capacity development; awareness. During disaster — evacuation — disaster communication — search and rescue — emergency operation centre — incident command system — relief and rehabilitation. Post-disaster — damage and needs assessment, restoration of critical infrastructure — early recovery — reconstruction and redevelopment; IDNDR, Yokohama Strategy, Hyogo Framework of Action.

Unit 4 — Disaster Management in India (5 Periods, 15%)

Topics: Disaster profile of India — mega disasters of India and lessons learnt; Disaster Management Act 2005 — institutional and financial mechanism, National Policy on Disaster Management, National Guidelines and Plans on Disaster Management; role of government (local, state and national), non-government and inter-government agencies.

Unit 5 — Applications of Science and Technology for Disaster Management (6 Periods, 20%)

Topics: Geo-informatics in disaster management (RS, GIS, GPS and RS); disaster communication system (early warning and its dissemination); land use planning and development regulations, disaster safe designs and constructions, structural and non-structural mitigation of disasters; S&T institutions for disaster management in India.

Instead of This Elective — Advance Skill Development

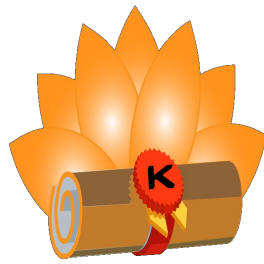
The 5th-semester scheme allows an **Advance Skill Development** certification course to be taken **instead of** Open Elective-01. The course named in the scheme is **Advanced Plumbing (TATA TECH.)**. No detailed contents for this certification course are given in the PDF. Students present a seminar/viva on their Advance Skill Certification along with certificate, project and report.

Reference Books (as listed in the syllabus)

- Publications of National Disaster Management Authority (NDMA) on Various Templates and Guidelines for Disaster Management.
- Bhandani, R. K., An overview on natural & man-made disasters and their reduction, CSIR, New Delhi.
- Srivastava, H. N., and Gupta G. D., Management of Natural Disasters in developing countries, Daya Publishers, Delhi.
- Alexander, David, Natural Disasters, Kluwer Academic London.
- Ghosh, G. K., Disaster Management, A P H Publishing Corporation.
- Murthy, D. B. N., Disaster Management: Text & Case Studies, Deep & Deep Pvt. Ltd.
- D.V.Gupta, Vikram Singh, Earthquake Engineering & Disaster Management, Asian Publishers, Muzaffarnagar, ISBN No. 978-93-91541-54-5.

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Project Management — Complete Syllabus (Open Elective-01, Option B)

BTEUP Diploma in Civil Engineering • 5th Semester • Session 2026-27

Subject 5.6 (Open Elective-01, Option B) • 50 Marks Internal Only • 2 Credits • L 2 • Total NA — not counted in semester total • Choose this OR Disaster Management (OR Advance Skill Development)

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
5.6	Open Elective-01: Project Management	Theory	2 - 0	2	50	—	NA
Open Elective-01 Total				2	50	—	NA

What This Subject Aims To Do

To develop the idea of a project plan — from defining and confirming the project goals and objectives, identifying tasks and how goals will be achieved — and to develop an understanding of key project management skills and strategies.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Concept of a Project	5	15%
2	Capital Budgeting Process	5	15%

3	Financial Estimates and Projections	5	20%
4	Basic Techniques in Capital Budgeting	5	20%
5	Project Administration	8	30%

Unit 1 — Concept of a Project (5 Periods, 15%)

Topics: Classification of projects — importance of project management — the project life cycle — establishing project priorities (scope-cost-time), project priority matrix — work break down structure.

Unit 2 — Capital Budgeting Process (5 Periods, 15%)

Topics: Planning — analysis — selection — financing — implementation — review; generation and screening of project ideas — market and demand analysis — demand forecasting techniques; market planning and marketing research process — technical analysis.

Unit 3 — Financial Estimates and Projections (5 Periods, 20%)

Topics: Cost of projects — means of financing — estimates of sales and production — cost of production — working capital requirement and its financing — profitability, projected cash flow statement and balance sheet; break even analysis.

Unit 4 — Basic Techniques in Capital Budgeting (5 Periods, 20%)

Topics: Non-discounting and discounting methods — pay-back period — accounting rate of return — net present value — benefit cost ratio — internal rate of return; project risk; social cost benefit analysis and economic rate of return; non-financial justification of projects.

Unit 5 — Project Administration (8 Periods, 30%)

Topics: Progress payments, expenditure planning, project scheduling and network planning, use of Critical Path Method (CPM), schedule of payments and physical progress, time-cost trade off; concepts and uses of PERT, cost as a function of time, Project Evaluation and Review Techniques/cost mechanisms; determination of least cost duration; post project evaluation; introduction to various project management softwares.

Instead of This Elective — Advance Skill Development

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Reference Books (as listed in the syllabus)

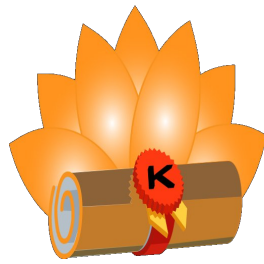
- Project planning, analysis, selection, implementation and review — Prasannachandra — Tata McGraw Hill.
- Project Management — the Managerial Process — Clifford F. Gray & Erik W. Larson — McGraw Hill.
- Project management — David I Cleland — Mcgraw Hill International Edition, 1999.
- Project Management — Gopala krishnan — Mcmillan India Ltd.
- Project Management — Harry-Maylor — Peason Publication.

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Indian Constitution — Complete Syllabus

BTEUP Diploma in Civil Engineering • 5th Semester • Session 2026-27

Subject 5.9 (Audit Course, Q) • 50 Marks Internal (Qualifying) • No Credits • L 2 • Must Appear and Pass

Note: (Q) — It is compulsory to appear and to pass the examination, but marks will not be included for percentage and division of obtained marks.

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
5.9	Indian Constitution (Q)	Audit Course	2 - 0	—	50	—	—
Indian Constitution Total				—	50	—	—

What This Subject Aims To Do

To understand the history, principles and key interpretations of the Indian Constitution; the structure and key roles of the Union Government; the composition, powers and functions of the Lok Sabha, Rajya Sabha and the Supreme Court; the roles and powers of the Governor, Chief Minister, Council of Ministers and the State Secretariat; the structure and functions of local administration; and the structure, role and functions of the Election Commission of India.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	The Constitution — Introduction	5	20%

2	Union Government	6	20%
3	Indian Legislature & Judiciary	6	20%
4	State Government	5	20%
5	Local Administration	3	10%
6	Election Commission	3	10%

Unit 1 — The Constitution: Introduction (5 Periods, 20%)

Topics: The history of the making of the Indian Constitution; preamble and the basic structure, and its interpretation; fundamental rights and duties and their interpretation.

Unit 2 — Union Government (6 Periods, 20%)

Topics: Structure of the Indian Union Government; President — election, role and power; Prime Minister and Council of Ministers.

Unit 3 — Indian Legislature & Judiciary (6 Periods, 20%)

Topics: Composition of Lok Sabha and Rajya Sabha; powers and functions of Lok Sabha and Rajya Sabha; structure of Supreme Court including appointment of judges; powers and functions of Supreme Court.

Unit 4 — State Government (5 Periods, 20%)

Topics: Governor — role and power; Chief Minister and Council of Ministers; State Secretariat.

Unit 5 — Local Administration (3 Periods, 10%)

Topics: District administration; municipal corporation; Zila Panchayat.

Unit 6 — Election Commission (3 Periods, 10%)

Topics: Structure of Election Commission of India; role and function of Election Commission.

Reference Books (as listed in the syllabus)

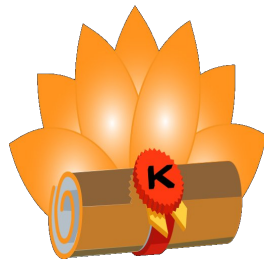
- Ethics and Politics of the Indian Constitution, Rajeev Bhargava, Oxford University Press, New Delhi, 2008.
- The Constitution of India, B.L. Fadia, Sahitya Bhawan; New edition (2017).
- Introduction to the Constitution of India, DD Basu, Lexis Nexis; Twenty-Third 2018 Edition.
- Our Constitution, Subhash Chand Kashyap, NBT New Delhi.
- Indian Polity, M. Laxmikant, McGraw Hill.

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Summer Internship-II & Student Centred Activities — 5th Semester

BTEUP Diploma in Civil Engineering • 5th Semester • Session 2026-27
Subject 5.10 (Internship) 100 Marks • SCA 50 Marks • Total 150 Marks • 2 Credits

Note: The scheme row reads “SUMMER INTERNSHIP** (4–6 WEEKS)” ; the internship text in the PDF describes Summer Internship-II as 6 weeks after the IVth semester, assessed in the Vth semester with 100 marks. Marks are shown with * in the scheme (see extra).

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
5.10	Summer Internship-II (4–6 weeks after IVth Sem.)	Internship	—	2	60*	40* (3 hrs)	100*
—	Student Centred Activities (SCA)	Activity	0 - 8	—	50	—	50
Internship-II + SCA Total				2	110	40	150

Summer Internship-II — What It Is

Guided and supervised professional training of a minimum of 6 weeks duration, organised during the semester break after the IVth semester examinations (the 5th-semester scheme row says 4–6 weeks). It gives students an opportunity to experience the environment and culture of corporate construction offices / government construction and design departments / construction agencies / builders' organisations / design consultation units and commercial activities undertaken in field organisations, and to integrate theory with practice. The concerned HOD, along with other teachers, guides students in arranging appropriate training

places relevant to their branch. A training schedule is drawn up for each student before starting, in consultation with the training provider, and students are briefed in advance about the organisational setup, working environment, designing and drafting process, and important machines and drafting tools used in the training organisation. A minimum of one visit by the teacher is recommended. Students keep a daily report in a diary during training, which later becomes the final report and its presentation. * Students will submit the certificate. ** Students will present a seminar/viva on their summer internship / Advance Skill Certification along with certificate, project and report.

How Internship-II Is Marked (100 Marks)

Internal assessment 60 marks, external assessment 40 marks (3 hrs). The evaluation components given in the PDF are: punctuality and regularity — 15%; initiative in learning new things / field exposure — 20%; presentation and viva — 40%; industrial training report — 25%. Evaluation of the professional training report through viva-voce/presentation aims at assessing the student's understanding of drafting various working drawings, designing process, practices in offices/field organisations and their ability to engage in activities related to problem solving in a professional setup, as well as understanding of application of knowledge and skills learnt in real life situations. Evaluation is recommended to be carried out by a team comprising the concerned HOD, teachers and a representative from the organisation.

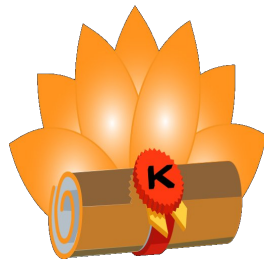
Student Centred Activities (SCA) — 50 Marks

A provision for overall personality development, including co-curricular activities such as extension lectures, games, hobby clubs (for example photography, painting and singing), seminars, declamation contests, educational field visits, NCC, NSS, library work, cultural activities and self-study. Maximum marks for SCA: 50, distributed as: (i) 15 marks for general behaviour and discipline (by HODs in consultation with all the teachers of the department); (ii) 10 marks for attendance — 75–80% = 6 marks, 80–85% = 8 marks, above 85% = 10 marks; (iii) 25 marks maximum for sports / NCC / cultural / co-curricular / NSS activities — 25 for state/national level participation, 20 for participation in two of the above activities, 15 for inter-polytechnic level participation. Note: there should be no marks for attendance in the internal sessional of different subjects.

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Construction Management — Complete Syllabus (Program Elective-02, Option A)

BTEUP Diploma in Civil Engineering • 6th Semester • Session 2026-27

Subject 6.1 (Program Elective-02, Option A) • Total 100 Marks • 4 Credits • L 3 - T 1 •

Choose this OR Advance Construction Technology

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
6.1	Program Elective-02: Construction Management	Theory	3 - 0	4	Theory 40	Theory 60 (3 hrs)	100
Construction Management Total				4	40	60	100

What This Subject Aims To Do

To understand contract management and associated labour laws, prepare and understand the principles involved in site layout, know the procedure for scheduling of various activities in a construction project, understand labour laws and the procedure for arbitration and settlements, and know different safety measures in construction projects.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Construction Industry and Management	8	15%
2	Construction Planning	12	25%

3	Organization	10	20%
4	Accounts and Entrepreneurship	17	25%
5	Inspection, Quality Control and Safety in Construction	9	15%

Unit 1 — Construction Industry and Management (8 Periods, 15%)

Topics: Significance of construction management, main objectives of construction management and overview of the subject, functions of construction management — planning, organising, staffing, directing, controlling and coordinating, meaning of each of these with respect to construction job, classification of construction into light, heavy and industrial construction; stages in construction from conception to completion, the construction team: owner, engineer, architect and contractors, their functions and inter-relationship, resources for construction industry.

Unit 2 — Construction Planning (12 Periods, 25%)

Topics: Importance of construction planning — stages of construction planning — pre-tender stage, contract stage; contracts and e-tendering — different types of contracts — penalties and arbitration; scheduling construction works by bar charts — definition of activity, identification of activities, preparation of bar charts for simple construction work, preparation of schedules for labour, materials, machinery and finances for small works; scheduling by network techniques — introduction to network techniques; PERT and CPM, differences between PERT and CPM terminology; methods of recording progress: analysis of progress, taking corrective actions, keeping head office informed, cost time optimisation for simple jobs — direct and indirect cost, variation with time, cost optimisation.

Unit 3 — Organization (10 Periods, 20%)

Topics: Types of organisations: line, line and staff, functional and their characteristics; site organisation: principle of storing and stacking materials at site, location of equipment, preparation of actual job layout for a building, organising labour at site; important Acts for labour welfare: Labour Welfare Fund Act 1936 (as amended), Payment of Wages Act 1936 (as amended), Minimum Wages Act 1948 (as amended), Acts relating to labour safety.

Unit 4 — Accounts and Entrepreneurship (17 Periods, 25%)

Topics: Introduction, technical sanction, allotment of funds, re-appropriation of funds, bill, contractor ledger, measurement book, running and final account bills complete, preparation of bill of quantities (BOQ), completion certificate and report, hand receipt, acquittance roll, muster roll labour, casual labour roll, duties and responsibility of different cadres, budget-stores, returns, account of stock, misc. P.W. advances, T & P — verification, survey report, road metal material charged direct to works, account — expenditure and revenue head, remittance and deposit head, definition of cash, precaution in custody of cash book, imprest account, temporary advance, treasury challan, preparation of final bills; students must learn to prepare accounts register; definition and concept, role and significance, risk and awards, requirement of an entrepreneur, development programmes existing in India; GST — income tax — excise duty — labour cess.

Unit 5 — Inspection, Quality Control and Safety in Construction (9 Periods, 15%)

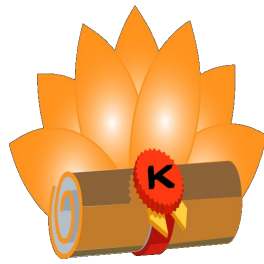
Topics: Need for inspection and quality control, principles of inspection, stages of inspection and quality control for — earth work, masonry, RCC, sanitary and water supply services; safety in construction industry — causes of accidents, remedial and preventive measures; safety campaign and safety devices, safety training, fire safety.

Reference Books (as listed in the syllabus)

- Sharma S C and Deodhar S V, Construction Engineering and Management, Khanna Book Publishing, New Delhi.
- Gahlot, P.S. and Dhir, B.M, Construction planning and management, New Age International (P) Ltd. Publishers, New Delhi.
- Shrivastava, U.K., Construction planning and management, Galgotia Publication Pvt Ltd., New Delhi.
- Mantri, S., The A To Z of Practical Building Construction and its Management, Satya Prakashan, New Delhi.
- Khanna, O.P., Industrial Engineering and management, Dhanpat Rai, New Delhi.
- Punmia, B.C. and Khandelwal, K.K., Project Planning and Controlling with PERT And CPM, Laxmi Publications (P) Ltd.
- Sengupta, B., Guha H., Construction Management and Planning, Tata-McGraw Hill.
- Harpal, Singh, Construction Management and accounts, Mc-Graw Hill.
- Sharma, S.C., Industrial Engineering and Management, Khanna Publications, New Delhi.

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Advance Construction Technology — Complete Syllabus (Program Elective-02, Option B)

BTEUP Diploma in Civil Engineering • 6th Semester • Session 2026-27

Subject 6.1 (Program Elective-02, Option B) • Total 100 Marks • 4 Credits • L 3 - T 1 •

Choose this OR Construction Management

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
6.1	Program Elective-02: Advance Construction Technology	Theory	3 - 0	4	Theory 40	Theory 60 (3 hrs)	100
Advance Construction Technology Total				4	40	60	100

What This Subject Aims To Do

To gain knowledge on different materials in advanced construction, know different methods in concreting, know the relevance of advanced construction methods for a particular site condition, and identify the requisite hoisting and conveying machinery for the given situation.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Advanced Construction Materials	9	15%
2	Advanced Concreting Methods and Equipments	12	20%

3	Advanced Technology in Constructions	15	25%
4	Hoisting and Conveying Equipments	10	20%
5	Miscellaneous Machineries and Equipments	10	20%

Unit 1 — Advanced Construction Materials (9 Periods, 15%)

Topics: Fibres: use and properties of steel, polypropylene, carbon and glass fibres; plastics: use and properties of PVC, RPVC, HDPE, FRP, GRP; miscellaneous materials: properties and uses of acoustics materials, wall claddings, plaster boards, micro-silica, waterproofing materials, adhesives; use of waste products and industrial by-products in bricks, blocks, concrete and mortar.

Unit 2 — Advanced Concreting Methods and Equipments (12 Periods, 20%)

Topics: Ready mix concrete: necessity and use of ready mix concrete; products and equipments for ready mix concrete plant; conveying of ready mix concrete, transit mixers; vibrators for concrete consolidation: internal, needle, surface, platform and form vibrators; underwater concreting: procedure and equipments required for Tremie method, drop bucket method; properties, workability and water cement ratio of the concrete; special concrete: procedure and uses of special concretes: roller compacted concrete, self-compacting concrete (SCC), steel fibre reinforced concrete, foam concrete, shotcreting.

Unit 3 — Advanced Technology in Constructions (15 Periods, 25%)

Topics: Construction of bridges, flyovers and tunnels: equipments and machineries required for foundation and super structure i.e. boom placer, hydraulic rig, slipform etc.; construction of multi-storeyed building: equipments and machinery required for construction of multi-storeyed building such as use of lifts, belt conveyers, pumping of concrete; prefabricated construction: methods of prefabrication, plant fabrication and site fabrication, all prefabricated building elements such as wall panels, slab panels, beams, columns, door and window frames etc.; equipments and machineries used for placing and jointing of prefabricated elements; strengthening of embankments by soil reinforcing techniques using geo-synthetics.

Unit 4 — Hoisting and Conveying Equipments (10 Periods, 20%)

Topics: Hoisting equipments: principles and working of derrick-pole, gin pole, crane, power driven scotch derrick crane, hand operated crane, locomotive crane, tower crane, lattice girder, winches, elevators, ladders, crawler cranes, truck mounted cranes, gantry cranes, mast cranes; conveying equipments: working of belt conveyers, types of belts and conveying mechanism; capacity and use of dumpers, tractors and trucks.

Unit 5 — Miscellaneous Machineries and Equipments (10 Periods, 20%)

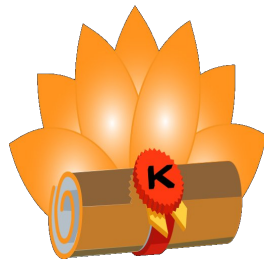
Topics: Excavation equipments: use, working and output of following machinery — bull dozers, scrapers, graders, clam shell, trenching equipment, tunnel boring machine, wheel mounted belt loaders, power shovels, JCB, and drag lines; compacting equipments: output of different types of rollers such as plain rollers, ship footed rollers, vibratory, pneumatic rollers, rammers; miscellaneous equipments: working and selection of equipments: pile driving equipments, pile hammers, hot mix bitumen plant, bitumen paver, grouting equipment, guniting equipments, floor polishing and cutting machine; selection of drilling pattern for blasting, bentonite/mud slurry in drilling, explosives for blasting, dynamite, process of using explosives.

Reference Books (as listed in the syllabus)

- Sharma S C and Deodhar S V, Construction Engineering and Management, Khanna Book Publishing, New Delhi.
- Chudly, R., Construction Technology Vol. I to II, ELBS-Longman Group.
- Peurifoy, R. L., Construction Planning Equipment and Methods, McGraw Hill Co. Ltd., New York.
- Seetharaman, S., Construction Engineering and Management, Umesh Publication, New Delhi.
- Sengupta, B. and Guha., Construction Management and Planning, McGraw Hill Education, New Delhi.
- Smith, R. C., Materials of Construction, McGraw Hill Co. Ltd.
- Satyanarayana, R, Saxena, S. C., Construction Planning and Equipment, Standard Publication, New Delhi.
- Rangawala, S. C., Construction of Structures and Management of works, Charotar Publication, Anand.
- Ghose, D. N., Materials of Construction, McGraw Hill Publishing Co, New Delhi.

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Entrepreneurship and Start-up — Complete Syllabus

BTEUP Diploma in Civil Engineering • 6th Semester • Session 2026-27

Subject 6.2 (Theory) • Total 100 Marks • 2 Credits • L 2

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
6.2	Entrepreneurship and Start-up	Theory	2 - 0	2	Theory 40	Theory 60 (3 hrs)	100
Entrepreneurship and Start-up Total				2	40	60	100

What This Subject Aims To Do

To acquire entrepreneurial spirit and resourcefulness; understand the concept and process of entrepreneurship, its contribution and role in the growth and development of the individual and the nation; acquire entrepreneurial quality, competency and motivation; and learn the process and skills of creation and management of an entrepreneurial venture.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Introduction to Entrepreneurship and Start-ups	5	20%
2	Business Ideas and Their Implementation	6	20%
3	Idea to Start-up	5	20%

4	Pricing and Cost Analysis	6	20%
5	Business Plan Preparation	6	20%

Unit 1 — Introduction to Entrepreneurship and Start-ups (5 Periods, 20%)

Topics: Concept of entrepreneurship — importance, myths about entrepreneurship, pros and cons of entrepreneurship, process of entrepreneurship, competencies and characteristics of an entrepreneur, ethical entrepreneurship, entrepreneurial values and attitudes, creativity, innovation and entrepreneurship — entrepreneurs as problem solvers, mindset of an employee and an entrepreneur — risk taking concepts.

Unit 2 — Business Ideas and Their Implementation (6 Periods, 20%)

Topics: Types of business: manufacturing, trading and services; stakeholders: sellers, vendors and consumers, and competitors; e-commerce business models, business idea generation — types of resources — human, capital and entrepreneurial tools and resources, etc.; setting business goals — patent, copyright and intellectual property rights; customer relations and vendor management — business ideas vs. business opportunities, opportunity — SWOT analysis of a business idea — business failure — causes and remedies — types of business risks.

Unit 3 — Idea to Start-up (5 Periods, 20%)

Topics: Market analysis — identifying the target market, competition evaluation and strategy development, marketing and accounting; an introduction to start-up — start-ups in India — procedure for registration of start-ups — business model — business plan — case studies — opportunities and challenges — funding supports from government schemes — MUDRA, CM Yuva Udyami Scheme, PMEGP — non-government schemes — CSR fund — angel investors, venture capitalist.

Unit 4 — Pricing and Cost Analysis (6 Periods, 20%)

Topics: Types of costs — variable — fixed — operational costs — break even analysis — for single product or service — financial business case study; understand the meaning and concept of the term cash inflow and cash outflow — pricing — calculate per unit cost of a single product; understand the importance and preparation of income statement, prepare a cash flow projection — factors affecting pricing — GST.

Unit 5 — Business Plan Preparation (6 Periods, 20%)

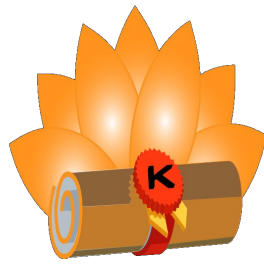
Topics: Feasibility report — technical analysis, financial analysis — market research — concept, importance and process — tools for market research — market sensing and testing, marketing and sales strategy, digital marketing, branding — business name, logo, tag line, promotion strategy, business plan preparation — concept and importance, execution of business plan.

Reference Books (as listed in the syllabus)

- The Startup Owner's Manual: The Step-by-Step Guide for Building a Great Company — Steve Blank and Bob Dorf, K & S Ranch, ISBN 978-0984999392.
- Entrepreneurship Development (A new Venture creation) — Vasant Desai, Himalaya Publication.
- Entrepreneurship Development — Khanka S.S., S Chand & Company Limited, New Delhi.
- Entrepreneurship Development — Gupta and Srinivasan, S Chand & Company Limited, New Delhi.
- Demand: Creating What People Love Before They Know They Want It — Adrian J. Slywotzky with Karl Weber, Headline Book Publishing, ISBN 978-0755388974.
- The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses — Eric Ries, Penguin UK, ISBN 978-0670921607.
- The Innovator's Dilemma: The Revolutionary Book That Will Change the Way You Do Business — Clayton M. Christensen, Harvard Business School Press, ISBN 978-142219602.
- G.K. Varshney, Fundamentals of Entrepreneurship, Sahitya Bhawan Publications, Agra, 2019.
- H. Nandan, Fundamentals of Entrepreneurship, Prentice Hall India Learning Private Limited, Third Edition, 2013.
- R.K. Singal, Entrepreneurship Development & Management, S K Kataria and Sons, 2013.
- Web reference: <https://ocw.mit.edu/courses/15-390-new-enterprises-spring-2013/resources/lecture-1/>
- Web reference: https://onlinecourses.nptel.ac.in/noc20_ge08/preview

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Renewable Energy Technology — Complete Syllabus (Open Elective-02, Option A)

BTEUP Diploma in Civil Engineering • 6th Semester • Session 2026-27

Subject 6.3 (Open Elective-02, Option A) • 50 Marks Internal Only • 2 Credits • L 2 • Total NA — not counted in semester total • Choose this OR Energy Conservation and Audit (OR Advance Skill Development)

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
6.3	Open Elective-02: Renewable Energy Technology	Theory	2 - 0	2	50	—	NA
Open Elective-02 Total				2	50	—	NA

What This Subject Aims To Do

To understand the present and future scenario of world energy use, understand the fundamentals of solar energy systems, understand the basics of wind energy, understand bio-energy and its usage in different ways, and identify different available non-conventional energy sources.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Introduction	5	20%
2	Solar Energy	6	20%

3	Wind Energy	5	20%
4	Bio-Energy	6	20%
5	Other Renewable Energy Sources	6	20%

Unit 1 — Introduction (5 Periods, 20%)

Topics: World energy use; reserves of energy resources; environmental aspects of energy utilisation; renewable energy scenario in India and around the world; potentials; achievements/applications; economics of renewable energy systems.

Unit 2 — Solar Energy (6 Periods, 20%)

Topics: Solar radiation; measurements of solar radiation; flat plate and concentrating collectors; solar direct thermal applications; solar thermal power generation; fundamentals of solar photo voltaic conversion; solar cells; solar PV power generation; solar PV applications.

Unit 3 — Wind Energy (5 Periods, 20%)

Topics: Wind data and energy estimation; types of wind energy systems; performance; site selection; details of wind turbine generator; safety and environmental aspects.

Unit 4 — Bio-Energy (6 Periods, 20%)

Topics: Biomass direct combustion; biomass gasifiers; biogas plants; digesters; ethanol production; bio diesel; cogeneration; biomass applications.

Unit 5 — Other Renewable Energy Sources (6 Periods, 20%)

Topics: Other renewable energy sources: tidal energy; wave energy; open and closed OTEC cycles; small hydro — geothermal energy; hydrogen and storage; fuel cell systems; hybrid systems.

Instead of This Elective — Advance Skill Development

The 6th-semester scheme allows an **Advance Skill Development** certification course to be taken **instead of** Open Elective-02. No course name is given for the 6th-semester option in the PDF (unlike the 5th semester, which names Advanced Plumbing, TATA TECH.). No detailed contents for this certification course are given in the PDF.

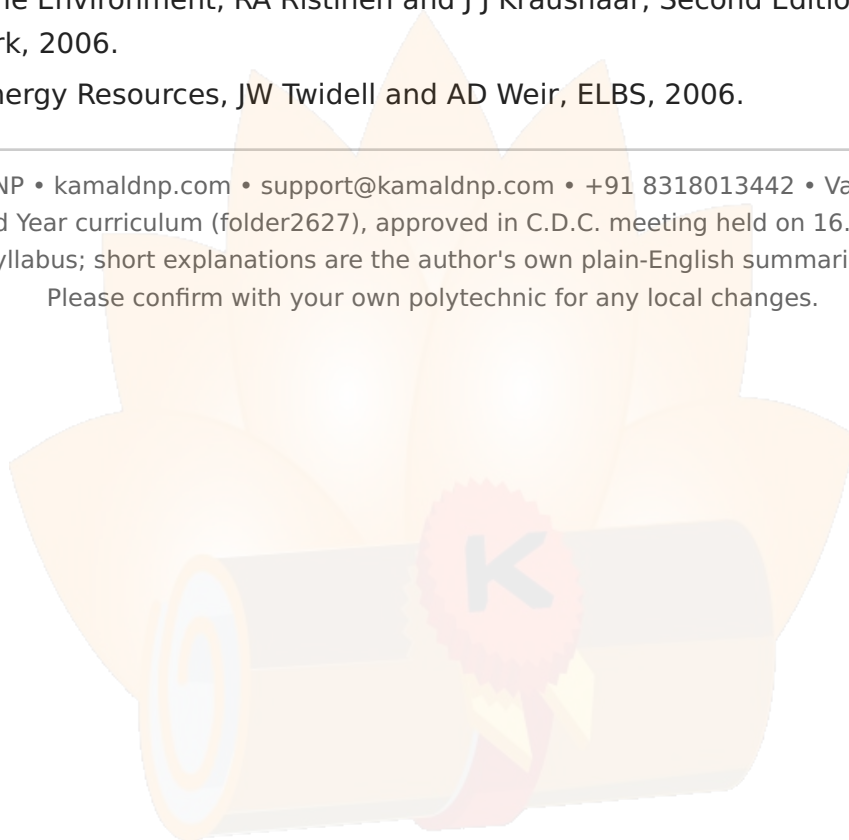
Reference Books (as listed in the syllabus)

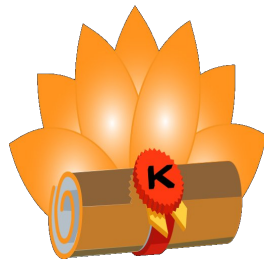
- O.P. Gupta, Energy Technology, Khanna Publishing House, Delhi (ed. 2018).
- Renewable Energy Sources, Twidell, J.W. & Weir, A., EFN Spon Ltd., UK, 2006.
- Solar Energy, Sukhatme, S.P., Tata McGraw Hill Publishing Company Ltd., New Delhi, 1997.
- Renewable Energy, Power for a Sustainable Future, Godfrey Boyle, Oxford University Press, U.K., 1996.
- Fundamental of Renewable Energy Sources, GN Tiwari and MK Ghoshal, Narosa, New Delhi, 2007.
- Renewable Energy and Environment — A Policy Analysis for India, NH Ravindranath, UK Rao, B Natarajan, P Monga, Tata McGraw Hill.
- Energy and The Environment, RA Ristinen and J J Kraushaar, Second Edition, John Willey & Sons, New York, 2006.
- Renewable Energy Resources, JW Twidell and AD Weir, ELBS, 2006.

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Energy Conservation and Audit — Complete Syllabus (Open Elective-02, Option B)

BTEUP Diploma in Civil Engineering • 6th Semester • Session 2026-27

Subject 6.3 (Open Elective-02, Option B) • 50 Marks Internal Only • 2 Credits • L 2 • Total NA — not counted in semester total • Choose this OR Renewable Energy Technology (OR Advance Skill Development)

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
6.3	Open Elective-02: Energy Conservation and Audit	Theory	2 - 0	2	50	—	NA
Open Elective-02 Total				2	50	—	NA

What This Subject Aims To Do

To identify demand supply gaps in the present scenario, understand conservation approaches to an industry, draw the energy flow diagram of an industry, identify energy wastage and suggest alternative methods, and understand the concepts of energy audit.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Basics of Energy	6	20%
2	Electrical Supply System and Motors	7	25%

3	Lighting and DG Systems	6	20%
4	Energy Conservation Building Code (ECBC)	4	15%
5	General Energy Saving Tips	5	20%

Unit 1 — Basics of Energy (6 Periods, 20%)

Topics: Classification of energy — primary and secondary energy, commercial and non-commercial energy, non-renewable and renewable energy with special reference to solar energy; capacity factor of solar and wind power generators; global fuel reserve; energy scenario in India and state of U.P.; sector-wise energy consumption (domestic, industrial, agricultural and other sectors); impact of energy usage on climate; Energy Conservation and EC Act 2001. Introduction to energy management: energy conservation, energy efficiency and its need; salient features of Energy Conservation Act 2001 and The Energy Conservation (Amendment) Act, 2010 and its importance; prominent organisations at centre and state level responsible for its implementation; standards and labelling: concept of star rating and its importance, types of product available for star rating.

Unit 2 — Electrical Supply System and Motors (7 Periods, 25%)

Topics: Types of electrical supply system, single line diagram, losses in electrical power distribution system, understanding electricity bill: transformers, tariff structure, components of power (kW, kVA and kVAR) and power factor, improvement of power factor, concept of sanctioned load, maximum demand, contract demand and monthly minimum charges (MMC). Transformers: introduction, losses in transformer, transformer loading, tips for energy savings in transformers. Electric motors: types of motors, losses in induction motors, features and characteristics of energy efficient motors, estimation of motor loading, variation in efficiency and power factor with loading, tips for energy savings in motors. Energy efficiency in electrical utilities. Pumps: introduction to pump and its applications, efficient pumping system operation, energy efficiency in agriculture pumps, tips for energy saving in pumps. Compressed air system: types of air compressor and its applications, leakage test, energy saving opportunities in compressors. Energy conservation in HVAC and refrigeration system: introduction, concept of Energy Efficiency Ratio (EER), energy saving opportunities in heating, ventilation and air conditioning (HVAC) and refrigeration systems.

Unit 3 — Lighting and DG Systems (6 Periods, 20%)

Topics: Lighting systems: basic definitions — lux, lumen and efficacy; types of different lamps and their features; energy efficient practices in lighting. DG systems: introduction, energy efficiency opportunities in DG systems, loading estimation. Energy efficiency in thermal utilities. Thermal basics: thermal energy, energy content in fuels, energy units and its conversions in terms of Metric Tonne of Oil Equivalent (MTOE). Energy conservation in boilers and furnaces: introduction and types of boilers, energy performance assessment of boilers, concept of stoichiometric air and excess air for combustion, energy conservation in boilers and furnaces, do's and don'ts for efficient use of boilers and furnaces. Cooling towers: basic concept of cooling towers, tips for energy savings in cooling towers, efficient steam utilisation.

Unit 4 — Energy Conservation Building Code (ECBC) (4 Periods, 15%)

Topics: ECBC and its salient features; tips for energy savings in buildings: new buildings, existing buildings; waste heat recovery and co-generation: concept, classification and benefits of waste heat recovery, concept and types of co-generation system.

Unit 5 — General Energy Saving Tips (5 Periods, 20%)

Topics: Energy saving tips in: lighting, room air conditioner, refrigerator, water heater, computer, fan, heater, blower and washing machine, colour television, water pump, cooking, transport; energy audit, types and methodology, energy audit instruments, energy auditing reporting format.

Instead of This Elective — Advance Skill Development

The 6th-semester scheme allows an **Advance Skill Development** certification course to be taken **instead of** Open Elective-02. No course name is given for the 6th-semester option in the PDF (unlike the 5th semester, which names Advanced Plumbing, TATA TECH.). No detailed contents for this certification course are given in the PDF.

Reference Books (as listed in the syllabus)

- Electric Energy Generation, Utilization and Conservation — Sivaganaraju, S, Pearson, New Delhi, 2012.
- Project Management, Prasanna Chandra, Tata Mcgraw Hill, New Delhi.
- Energy Conservations in Buildings, O.P. Jakhar, Khanna Publishing House, New Delhi.
- Financial Management, Prasanna Chandra, Tata Mcgraw Hill, New Delhi.
- Energy management Handbook, Prasanna Chandra, Tata Mcgraw Hill, New Delhi.
- Energy Technology, O.P. Gupta, Khanna Publishing House, New Delhi (ed. 2018).

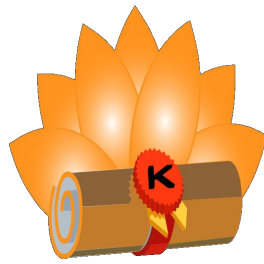
- E-books/e-tools to be used as recommended by AICTE/NITTTR, Chandigarh.
- Website for reference: <http://swayam.gov.in>

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Project & Student Centred Activities — 6th Semester

BTEUP Diploma in Civil Engineering • 6th Semester • Session 2026-27
Subject 6.4 (Project) 400 Marks • SCA 50 Marks • Total 450 Marks • 12 Credits

Note: The subject header in the PDF says L - T - P = - - 12, while the 6th-semester scheme says L 4 - P 16 (used here). The internal assessment criteria listed in the PDF add up to 290, not the printed total of 240 — see extra. The project selected in the 5th semester is continued in the 6th semester.

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
6.4	Project (Industry Internship or Major Project)	Practical	4 - 16	12	Practical 240	Practical 160 (3 hrs)	400
—	Student Centred Activities (SCA)	Activity	0 - 8	—	50	—	50
Project + SCA Total				12	290	160	450

Project — What It Is

Major projects for civil engineering diploma students are essential because they provide advantages like: applying theoretical knowledge to real-world problems; developing critical skills like problem-solving and teamwork; providing hands-on experience with tools and technologies; encouraging innovation and creativity; preparing students for their careers by demonstrating initiative and independence; familiarising students with industry standards.

Note: the project selected in the 5th semester will be continued in the 6th semester. As a major project activity each student is supposed to study the operations at site and prepare a detailed project report of the observations / processes / activities by him/her. The students should be guided by the respective subject teachers. Each teacher may guide a group of 4 to 5 students. The teachers along with field supervisors/engineers will conduct performance assessment of students.

Project Assessment — Internal (240 Marks as printed)

- Attendance and punctuality — 40
- Project Progress Presentation-I — 50
- Project Progress Presentation-II — 50
- Project Model & final Presentation — 90
- Report Writing — 60

Discrepancy in the PDF: these five criteria add up to 290 (40 + 50 + 50 + 90 + 60), not the printed total of 240. The scheme gives the project 240 internal + 160 external = 400 marks.

Sixth Semester — Industrial Pathway (Alternative to Classroom Route)

The 6th semester may instead be done as a one-semester **Industrial Training / Internship pathway** (optional, along with usual classroom training). Total: 20 credits, 650 marks. (1) **6.1 Entrepreneurship and Start-ups (ONLINE mode)** — Humanities & Social Science (Theory), 100 marks, external theory exam of 3 hrs conducted by the Board of Technical Education, Lucknow; this course is mandatory in the industrial mode and is conducted online by the student's polytechnic. (2) **6.2 Industrial Hands On Practice** — Industrial Training, 350 marks (150* evaluated by faculty mentor + 200** evaluated by industry). (3) **6.3 Industrial Project** — Industrial Training, 100 marks (50* faculty mentor + 50** industry). (4) **6.4 Seminar** — in-house, 100 marks internal, seminar presentation / viva-voce at the institute before an expert committee. **Rules:** the industrial training tenure should not be less than 14 weeks; the industry must be registered with MSME / Directorate of Industries / Limited Organisation / State/Central Government establishments; monthly progress reports of the intern/trainee should be attested and forwarded by the industrial supervisor during the internship; the industrial unit/organisation must evaluate students using the format provided by the polytechnic in the form of marks; the Industrial Hands On Practice, Industrial Project and Seminar must be evaluated on the basis of the AICTE Internship Policy: Guidelines and Procedures (Chapter 9, Procedures/format for organising internship). The institute will depute one faculty member as mentor for at least 20–30 students; mentors may make a surprise visit to the internship site to check the student's presence physically. Industry assesses attendance, discipline and punctuality, familiarity of tools and material, engineering skills, application of knowledge and problem-solving skills, comprehension and observation, professional ethics, safety and environmental consciousness, communication skills, supervisory skills and general conduct.

Student Centred Activities (SCA) — 50 Marks

A provision for overall personality development, including co-curricular activities such as extension lectures, games, hobby clubs (for example photography, painting and singing), seminars, declamation contests, educational field visits, NCC, NSS, library work, cultural activities and self-study. Maximum marks for SCA: 50, distributed as: (i) 15 marks for general behaviour and discipline (by HODs in consultation with all the teachers of the department); (ii) 10 marks for attendance — 75–80% = 6 marks, 80–85% = 8 marks, above 85% = 10 marks; (iii) 25 marks maximum for sports / NCC / cultural / co-curricular / NSS activities — 25 for state/national level participation, 20 for participation in two of the above activities, 15 for inter-polytechnic level participation. Note: there should be no marks for attendance in the internal sessional of different subjects.

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