



Fabtech Tecnical Campus
College of Engineering & Research

The Future Begins Here.

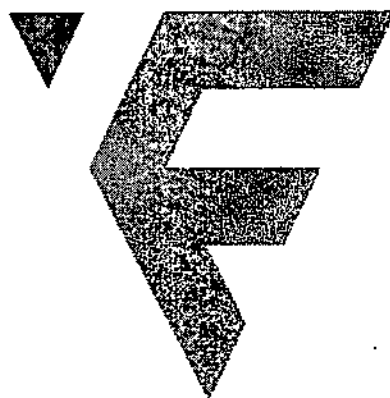
Approved by AICTE New Delhi, DTE (MS),
Mumbai & Affiliated to Dr. Babasaheb
Ambedkar Technological University,
Lonore, Dist. Raigad & M.S.B.T.E. Mumbai

DTE CODE- 6755 MSBTE Code-1515

FABTECH EDUCATION SOCIETY'S
FABTECH TECHNICAL CAMPUS
COLLEGE OF ENGINEERING & RESEARCH,
SANGOLA

(An Autonomous Institute)

Affiliated to Dr. Babasaheb Ambedkar Technological University (BATU), Lonere



In line with the
National Education Policy (NEP) 2020 Compliant
Curriculum
For

DEPARTMENT OF CIVIL ENGINEERING

Second Year B. Tech. to Fourth Year B. Tech.

(Sem. III to Sem. VIII)

(w.e.f. A.Y. 2026-27)



Semester Wise Credit Distribution as per NEP

Semester/Courses		I	II	III	IV	V	VI	VII	VIII	Total
Basic Science Course	BSC/ESC	06-08	08-10	-	-	-	-	-	-	14-18
Engineering Science Course		08-10	04-06	-	-	-	-	-	-	16-12
Programme Core Course (PCC)	Program Courses	-	02	08-10	08-10	10-12	08-10	04-06	04-06	44-56
Programme Elective Course (PEC)		-	-	-	-	04	08	02	06	20
Multidisciplinary Minor (MDM)	Multidisciplinary Courses	-	-	02	02	04	02	02	02	14
Open Elective (OE) Other than a particular program		-	-	04	02	02	-	-	-	08
Vocational and Skill Enhancement Course (VSEC)	Skill Courses	02	02	-	02	-	02	-	-	08
Ability Enhancement Course (AEC-01, AEC-02)	Humanities Social Science and Management (HSSM)	02	-	-	02	-	-	-	-	04
Entrepreneurship/Economics/Management Courses		-	-	02	02	-	-	-	-	04
Indian Knowledge System (IKS)		-	02	-	-	-	-	-	-	02
Value Education Course (VEC)		-	-	02	02	-	-	-	-	04
Research Methodology	Experiential Learning Courses	-	-	-	-	-	-	-	04	04
Comm. Engg. Project (CEP)/Field Project (FP)		-	-	02	-	-	-	-	-	
Project		-	-	-	-	-	-	-	04	04
Internship/ OJT		-	-	-	-	-	-	-	12	12
Co-curricular Courses (CC)	Liberal Learning Courses	02	02	-	-	-	-	-	-	04
Total Credits (Major)		20-22	20-22	20-22	20-22	20-22	20-22	20-22	20-22	160-176



Course Category Wise Credit Distribution

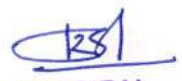
Semester/Courses		I	II	III	IV	V	VI	VII	VIII	Total
Basic Science Course	BSC/ESC	08	07	-	-	-	-	-	-	15
Engineering Science Course		08	07	-	-	-	-	-	-	15
Programme Core Course (PCC)	Program Courses	-	02	10	08	12	09	11	02	54
Programme Elective Course (PEC)		-	-	-	-	04	06	03	03	16
Multidisciplinary Minor (MDM)	Multidiscip inary Courses	-	-	03	03	03	03	02	-	14
Open Elective (OE) Other than a particular program		-	-	03	03	02	-	-	-	08
Vocational and Skill Enhancement Course (VSEC)	Skill Courses	02	02	-	02	-	02	-	-	08
Ability Enhancement Course (AEC-01, AEC-02)	Humanities Social Science and Management (HSSM)	02	-	01	01	-	-	-	-	04
Entrepreneurship/Economics/ Management Courses		-	-	02	02	-	-	-	-	04
Indian Knowledge System (IKS)		-	02	-	-	-	-	-	-	02
Value Education Course (VEC)		-	-	02	02	-	-	-	-	04
Research Methodology	Experientia Learning Courses	-	-	-	-	-	-	04	-	04
Comm. Engg. Project (CEP)/Field Project (FP)		-	-	01	-	01	-	-	-	02
Project		-	-	-	-	-	02	02	-	04
Internship/ OJT		-	-	-	-	-	-	-	12	12
Co-curricular Courses (CC)	Liberal Learning Courses	02	02	-	-	-	-	-	-	04
Total Credits (Major)		22	22	22	21	22	22	22	17	170

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Semester III													
Course Type	Course Code	Name of the Course	Engagement Hours			Credits	In Semester Evaluation Scheme			End Semester Evaluation Scheme		Total Marks	
			L	T	P		MSE	ICA	Total	ESE	OE/POE		
							M	M	M	M	M		
PCC	26UCE21101	Mechanics of Structures	03	-	-	03	30	10	40	60	-	100	
	26UCE21102	Mechanics of Structures Laboratory	-	-	02	01	-	25	25	-	25	50	
	26UCE21103	Building Materials	02	-	-	02	30	10	40	60	-	100	
	26UCE21104	Building Materials Laboratory	-	-	02	01	-	25	25	-	25	50	
	26UCE21105	Advanced Surveying	03	-	-	03	30	10	40	60	-	100	
MDM	-	Multidisciplinary Minor- I	03	-	-	03	30	10	40	60	-	100	
OE	-	Open Elective-I	03	-	-	03	30	10	40	60	-	100	
EMC	26UET21802	Start-up Ecosystem	01	-	-	01	-	25	25	-	-	25	
EMC	26UET21803	Start-up Ecosystem Laboratory	-	-	02	01	-	25	25	-	-	25	
VEC	26UET21804	Professional Ethics	01	-	-	01	-	25	25	-	-	25	
VEC	26UET21805	Professional Ethics Laboratory	-	-	02	01	-	25	25	-	-	25	
AEC	26UGS21403	Basic Quantitative Ability	01	-	-	01	-	50	50	-	-	50	
FP	26UCE21751	Field Project : Surveying	-	-	02	01	-	25	25	-	25	50	
Audit	26UME21901	Constitution of India	01	-	-	-	-	50	50	-	-	50	
Audit	26UCE21902	Technical Aptitude-I	-	-	02	-	-	50	50	-	-	50	
		Total	18	-	12	22	-	-	525	300	75	900	
Abbreviations: L= Lecture, T= Tutorial, P= Practical, M= Marks													

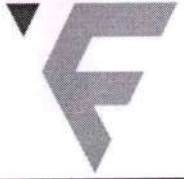

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Semester IV													
Course Type	Course Code	Name of the Course	Engagement Hours			Credits	In Semester Evaluation Scheme		Total	End Semester Evaluation Scheme		Total Marks	
			L	T	P		MSE	ICA		ESE	OE/POE		
							M	M		M	M		
PCC	26UCE22106	Structural Analysis- I	03	-	-	03	30	10	40	60	-	100	
	26UCE22107	Concrete Technology	02	-	-	02	30	10	40	60	-	100	
	26UCE22108	Concrete Technology Laboratory	-	-	02	01	-	25	25	-	25	50	
	26UCE22109	Building Planning and Design	02	-	-	02	30	10	40	60	-	100	
MDM	-	Multidisciplinary Minor- II	03	-	-	03	30	10	40	60	-	100	
OE	-	Open Elective - II	03	-	-	03	30	10	40	60	-	100	
VSEC	26UCE22251	Building Planning & Drawing using CAD	-	-	04	02	-	50	50	-	50	100	
EMC	26UET22806	Economics for Engineers	01	-	-	01	-	25	25	-	-	25	
EMC	26UET22807	Economics for Engineers Laboratory	-	-	02	01	-	25	25	-	-	25	
VEC	26UGS22801	Universal Human Values	02	-	-	02	-	50	50	-	-	50	
AEC	26UGS22404	Advanced Quantitative Ability	01	-	-	01	-	50	50	-	-	50	
Audit	26UCE22901	Environmental Studies	01	-	-	-	-	50	50	-	-	50	
Audit	26UCE22903	Technical Aptitude- II	-	-	02	-	-	50	50	-	-	50	
			18	-	10	21	-	-	525	300	75	900	
Abbreviations: L= Lecture, T= Tutorial, P= Practical, M= Marks													

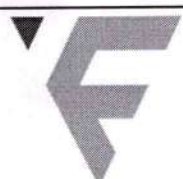

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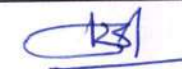


		FABTECH EDUCATION SOCIETY'S FABTECH TECHNICAL CAMPUS COLLEGE OF ENGINEERING & RESEARCH (An Autonomous Institute) Curriculum for Third Year B. Tech. (Civil Engineering) with effect from A.Y. 2027-28 Semester V										
Course Type	Course Code	Name of the Course	Engagement Hours			Credits	In Semester Evaluation Scheme		Total	End Semester Evaluation Scheme		Total Marks
			L	T	P		MSE	ICA		ESE	OE/POE	
							M	M		M	M	
PCC	27UCE31110	Structural Analysis - II	03	-	-	03	30	10	40	60	-	100
	27UCE31111	Design of Steel Structure	02	-	-	02	30	10	40	60	-	100
	27UCE31112	Steel Design Drawing of Steel Structure Laboratory	-	-	02	01	-	25	25	-	25	50
	27UCE31113	Geotechnical Engineering	02	-	-	02	30	10	40	60	-	100
	27UCE31114	Geotechnical Engineering Laboratory	-	-	02	01	-	25	25	-	25	50
	27UCE31115	Fluid Mechanics and Machines	02	-	-	02	30	10	40	60	-	100
	27UCE31116	Fluid Mechanics and Machines Laboratory	-	-	02	01	-	25	25	-	25	50
PEC	-	Program Elective Course- I	03	-	-	03		50	50	-	-	50
	-	Program Elective Course- I Laboratory	-	-	02	01	-	25	25	-	-	25
MDM	-	Multidisciplinary Minor- III	03	-	-	03	30	10	40	60	-	100
OE	-	Open Elective- III	02	-	-	02	30	10	40	60	-	100
FP	27UCE22752	Mini Project	-	-	02	01	-	25	25	-	-	25
Audit	27UGS31901	Logical Reasoning	02			-		50	50			50
Audit	26UCE31904	Technical Aptitude -III	-	-	02	-	-	50	50		-	50
			19	-	12	22	-	-	540	360	75	950
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Course Type	Course Code	Name of the Course	Engagement Hours			Credits	In Semester Evaluation Scheme		Total	End Semester Evaluation Scheme		Total Marks
			L	T	P		MSE	ICA		ESE	OE/POE	
							M	M		M	M	
PCC	27UCE32117	Design of RC Structure	02	-	-	02	30	10	40	60	-	100
	27UCE32118	Steel Design Drawing of Reinforcement Structure Laboratory	-	-	02	01	-	25	25	-	25	50
	27UCE32119	Estimation , Costing & Valuation	02	-	-	02	30	10	40	60	-	100
	27UCE32120	Estimation , Costing & Valuation Laboratory	-	-	02	01	-	25	25	-	25	50
	27UCE32121	Foundation Engineering	03	-	-	03	30	10	40	60	-	100
PEC	-	Program Elective Course- II	03	-	-	03	30	10	40	60	-	100
	-	Program Elective Course- III	03	-	-	03	30	20	50	-	-	50
MDM	-	Multidisciplinary Minor- IV	03	-	-	03	30	10	40	60	-	100
VSEC	27UCE32252	BIM using Revit Structure	01	-	-	01	-	50	50	-	-	50
	27UCE32253	BIM using Revit Structure Laboratory	-	-	02	01	-	50	50	-	-	50
Project	27UCE32753	Project Phase-I	-	-	04	02	-	50	50	-	50	100
Audit	27UCE32905	Technical Aptitude -IV	-	-	02	-	-	50	50	-	-	50
Audit	27UGS32902	Data Interpretation	02	-	-	-	-	50	50	-	-	50
			19	-	12	22	-	-	550	300	100	950
Abbreviations: L= Lecture, T= Tutorial, P= Practical, M= Marks , BIM= Building Information Modeling												


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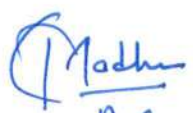

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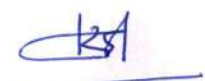


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		Curriculum for Final Year B. Tech. (Civil Engineering) with effect from A.Y. 2028-29										
Semester VII												
Course Type	Course Code	Name of the Course	Engagement Hours			Credits	In Semester Evaluation Scheme		Total	End Semester Evaluation Scheme		Total Marks
			L	T	P		MSE	ICA		ESE	OE/POE	
							M	M		M	M	
PCC	28UCE41122	Design of Reinforced and Pre-stressed Concrete Structure	03	-	-	03	30	10	40	60	-	100
	28UCE41123	Environmental Engineering	03	-	-	03	30	10	40	60	-	100
	28UCE41124	Environmental Engineering Laboratory	-	-	2	01	-	25	25	-	25	50
	28UCE41125	Transportation Engineering	03	-	-	03	30	10	40	60	-	100
	28UCE41126	Transportation Engineering Laboratory	-	-	02	01	-	25	25	-	25	50
PEC	-	Program Elective Course- IV	03	-	-	03	30	10	40	60	-	100
MDM	-	Multidisciplinary Minor- V	02	-	-	02	30	10	40	60	-	100
RM	28UCE41752	Research Methodology	03	01	-	04	-	100	100	-	-	100
Project	28UCE41754	Project Phase-II	-	-	04	02	-	50	50	-	50	100
Audit	26UCE41906	Technical Aptitude -V	-	-	02	-	-	50	50		-	50
			17	01	10	22	-	-	450	300	100	850
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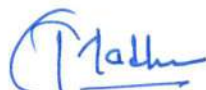
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		Semester VIII										
Course Type	Course Code	Name of the Course	Engagement Hours			Credits	In Semester Evaluation Scheme		Total	End Semester Evaluation Scheme		Total Marks
			L	T	P		MSE	ICA		ESE	OE/POE	
							M	M		M	M	
PCC	28UCE42127	Self Learning – I #	-	-	-	02	-	-	-	60	40	100
PEC	28UCE42206	Self Learning Course – II #	-	-	-	03	-	-	-	60	40	100
OJT	28UCE42755	Internship/OJT \$	-	-	-	12	-	100@	100	-	100	200
			-	-	-	17	-	-	100	120	180	400
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These subjects are to be studied using SWAYAM/NPTEL (8 weeks). (The list may alter and modify as per the availability of the subjects on the NPTEL/ SWYAM platform and usefulness, every year). Students who fail to satisfy the passing criteria of the course shall be required to appear for an offline examination for the same course and secure the minimum passing marks/grade as prescribed by the Institute.

\$ Twelve weeks of Internship in the industry.

@ Student has to submit monthly internship activity report as per prescribed format to department internship coordinator.


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List of Program Elective Course (PEC)

Semester	Course Code	Water Resources & Environment Engineering	Course Code	Geotechnical & Transport	Course Code	Structural Engineering
V	27UCE31201(A)	Water Resources Engineering	27UCE31201(B)	Geotechnical and Transport Engineering	27UCE31201(C)	Advanced Concrete Technology
V	27UCE31202(A)	Water Resources Engineering Lab	27UCE31202(B)	Geotechnical and Transport Engineering Lab	27UCE31202(C)	Advanced Concrete Technology Lab
VI	27UCE32203(A)	Water Supply and Wastewater Engineering	27UCE32203(B)	Ground Improvement and Pavement Materials	27UCE32203(C)	Earthquake Resistant Design of Structures
VI	27UCE32204(A)	Watershed and Irrigation Management	27UCE32204(B)	Advanced Foundation Engineering	27UCE32204(C)	Structural Analysis using Matrix Methods and FEM
VII	28UCE41205(A)	Environmental Pollution Control Engineering	28UCE41205(B)	Transportation Planning and Pavement Design	28UCE41205(C)	Structural Dynamics
VIII	28UCE42206(A)	Geosynthetics and Reinforced Soil Structures (NPTEL)	28UCE42206(B)	Environmental Impact Assessment (EIA) (NPTEL)	28UCE42206(C)	Structural Reliability (NPTEL)


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Course List of MDM

Department	MDM Domain	Semester	Courses in Domain	Subject Code	Offered to Programs
Civil	Construction Safety & Infrastructure Risk Management	III	Introduction to Construction Safety Engineering	26UCE21401	Mech, CSE, AIDS, Elect, E&TC
		IV	Construction Site Safety and Labour Welfare Regulations	26UCE22402	
		V	Infrastructure Risk Assessment and Hazard Management	27UCE31403	
		VI	Occupational Health and Safety in Construction Projects	27UCE32404	
		VII	Disaster-Resilient and Safe Infrastructure Planning	28UCE41405	
Mechanical	Product Design Engineering	III	Engineering Product Design	26UME21401	Civil, CSE, AIDS, Elect, E&TC
		IV	Computer Aided Product Design (CAD Modeling)	26UEM22402	
		V	Rapid Prototyping & Additive Manufacturing (3D Printing)	27UME31403	
		VI	Ergonomics & Aesthetics in Product Design	27UME32404	
		VII	Product Lifestyle Management & Sustainability	28UME41405	
Artificial Intelligence & Data Science	Web Engineering	III	Fundamentals of Web Technologies	26UAI21401	Civil, CSE, Mechanical, Elect, E&TC
		IV	Frontend Development using HTML, CSS & JS	26UAI22402	
		V	Backend Web Development using Node.js/Django	27UAI31403	
		VI	Full Stack Development with MERN/MEAN Stack	27UAI32404	
		VII	UI/UX Design & Web Development(Cloud+DevOps)	28UAI41405	
Computer Science & Engineering	Machine Learning	III	Prompt Engineering	26UCS21401	Civil, AIDS, Mechanical, Elect, E&TC
		IV	Computational Data Analytics	26UCS22402	
		V	Machine Learning	27UCS31403	
		VI	Deep Learning	27UCS32404	
		VII	Agentic AI	28UCS41405	
Electrical Engineering	EV Technology	III	Basics of Electric Motors and Converters	26UEE21401	Civil, AIDS, Mechanical, CSE, E&TC
		IV	Energy Storage System for EV	26UEE22402	
		V	Electric & Hybrid Vehicles	27UEE31403	
		VI	Electric Charging Systems for EV	27UEE32404	
		VII	IoT in EV Applications	28UEE41405	
Electronics & Telecommunication Engineering (E&TC)	Sensor Technology	III	Sensors & Transducers	26UET31401	Civil, AIDS, Mechanical, CSE, Elect.
		IV	Smart Sensors & MEMS Technology	26UET32402	
		V	IoT Enabled Sensors	27UET31403	
		VI	Automotive Sensor & Actuator Technology	27UET31404	
		VII	Biomedical Sensors	28UET31405	



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Course List of Open Electives

Department	Type	Semester	Name of Subjects	Subject Code
AIDS	Health & Management	III	Emotional Intelligences	26UOE21501 (A)
		IV	Leadership Skills	26UOE22502 (A)
		V	Stress Management	27UOE31503 (A)
Civil	Environment & Sustainability	III	Climate Change and Mitigation	26UOE21501 (B)
		IV	Waste Management Recycle	26UOE22502 (B)
		V	Green Technology	26UOE31503 (B)
CSE	Sustainable Development	III	Agriculture Systems and Digital Enablers	26UOE21501 (C)
		IV	Data-Driven Decision Making in Agriculture	26UOE22502 (C)
		V	AI Applications for Sustainable Food Systems	27UOE31503 (C)
Electrical	Humanities & Arts	III	Fundamental of IPR	26UOE21501 (D)
		IV	Legal Aspects of Innovation & Intellectual Property Rights	26UOE22502 (D)
		V	Patent search and Analytics	27UOE31503 (D)
E & TC	Management & Commerce	III	Behavioral Economics	26UOE21501 (E)
		IV	Financial Management for Engineers	26UOE22502 (E)
		V	Business Ethics	27UOE31503 (E)
Mechanical	Arts & Design	III	Design Thinking	26UOE21501 (F)
		IV	Management Innovation & Entrepreneurship	26UOE22502 (F)
		V	Product Development	27UOE31503 (F)

Course list of Self Learning

Sr.No	Course Type	Code	Subject Name
01	Self Learning I (PCC)	28UCE42127 (A)	Remote Sensing Essentials
02		28UCE42127 (B)	Sustainable River Basin Management
03		28UCE42127 (C)	Environmental Remediation of Contaminated Sites
04	Self Learning II (PEC)	28UCE42206(A)	Geosynthetics and Reinforced Soil Structures
05		28UCE42206(B)	Environmental Impact Assessment (EIA)
06		28UCE42206(C)	Structural Reliability



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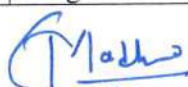


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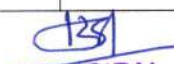
List of Courses and Course Code

Sr. No.	Semester	Course Name	Course Code
1	III	Mechanics of Structures	26UCE21101
2		Mechanics of Structures Laboratory	26UCE21102
3		Building Materials	26UCE21103
4		Building Materials Laboratory	26UCE21104
5		Advanced Surveying	26UCE21105
6		Multidisciplinary Minor- I	-
7		Open Elective-I	-
8		Start-up Ecosystem	26UET21802
9		Start-up Ecosystem Laboratory	26UET21803
10		Professional Ethics	26UET21804
11		Professional Ethics Laboratory	26UET21805
12		Basic Quantitative Ability	26UGS21403
13		Field Project : Surveying	26UCE21751
14		Constitution of India	26UME21901
15		Technical Aptitude-I	26UCE21902
16	IV	Structural Analysis- I	26UCE22106
17		Concrete Technology	26UCE22107
18		Concrete Technology Laboratory	26UCE22108
19		Building Planning and Design	26UCE22109
20		Multidisciplinary Minor- II	-
21		Open Elective - II	-
22		Building Planning & Drawing using CAD	26UCE22251
23		Economics for Engineers	26UET22806
24		Economics for Engineers Laboratory	26UET22807
25		Universal Human Values	26UGS22801
26		Advanced Quantitative Ability	26UGS22404
27		Environmental Studies	26UCE22901
28		Technical Aptitude- II	26UCE22903
29	V	Structural Analysis - II	27UCE31110
30		Design of Steel Structure	27UCE31111
31		Steel Design Drawing of Steel Structure Laboratory	27UCE31112
32		Geotechnical Engineering	27UCE31113
33		Geotechnical Engineering Laboratory	27UCE31114
34		Fluid Mechanics and Machines	27UCE31115
35		Fluid Mechanics and Machines Laboratory	27UCE31116
36		Program Elective Course- I	-
37		Program Elective Course- I Laboratory	-
38		Multidisciplinary Minor- III	-
39		Open Elective- III	-
40		Mini Project	27UCE22752
41		Logical Reasoning	27UGS31901
42		Technical Aptitude -III	26UCE31904
43	VI	Design of RC Structure	27UCE32117
44		Steel Design Drawing of Reinforcement Structure Laboratory	27UCE32118
45		Estimation , Costing & Valuation	27UCE32119
46		Estimation , Costing & Valuation Laboratory	27UCE32120
47		Foundation Engineering	27UCE32121
48		Program Elective Course- II	-

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49		Program Elective Course- III	-
50		Multidisciplinary Minor- IV	-
51		BIM using Revit Structure	27UCE32252
52		BIM using Revit Structure Laboratory	27UCE32253
53		Project Phase-I	27UCE32753
54		Technical Aptitude -IV	27UCE32905
55		Data Interpretation	27UGS32902
56	VII	Design of Reinforced and Pre-stressed Concrete Structure	28UCE41122
57		Environmental Engineering	28UCE41123
58		Environmental Engineering Laboratory	28UCE41124
59		Transportation Engineering	28UCE41125
60		Transportation Engineering Laboratory	28UCE41126
61		Program Elective Course- IV	-
62		Multidisciplinary Minor- V	-
63		Research Methodology	28UCE41752
64		Project Phase-II	28UCE41754
65		Technical Aptitude -V	26UCE41906
66	VIII	Self Learning – I	28UCE42127
67		Self Learning Course – II	28UCE42206
68		Internship/OJT	28UCE42755



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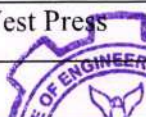
	FABTECH EDUCATION SOCIETY'S FABTECH TECHNICAL CAMPUS COLLEGE OF ENGINEERING & RESEARCH (An Autonomous Institute)			
	Second Year B. Tech. Civil Engineering			
	Semester-III (w.e.f. A.Y. 2025-26)			
	Mechanics of Structures (26UCE21101)			
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	3	3	MSE:	30 Marks
Tutorials:	-	-	ICA:	10 Marks
Practical:	-	-	ESE:	60 Marks
Total:	3	3	OE/POE:	-
Course Outcomes: At the end of this course, students shall be able to				Blooms Level
CO 1	Apply stress-strain concepts to analyze material behavior.			L3 (Apply)
CO 2	Analyze beams and draw SFD and BMD.			L4 (Analyze)
CO 3	Determine bending stresses and stress distribution in beams.			L4 (Analyze)
CO 4	Evaluate principal stresses, strains, and failure theories.			L5 (Evaluate)
CO 5	Analyze stresses in columns, shafts, and thin-walled members.			L4 (Analyze)
Unit	Course Contents			No. of lectures (hrs.)
Unit:1	Stresses & Strain Stresses and strains: Analysis of internal forces, normal stress, shearing stress, bearing stress, statically indeterminate members. Stress-strain diagram for different engineering materials. Hooke's law: axial and shearing deformations, Poisson's ratio, State of simple shear, Elastic constants and their inter-relation, introduction to strain measurement devices.			8
Unit:2	Axial Force, Shear Force and Bending Moment Axial force, shear force and bending moment in beams: concept of unbalanced forces and moments at a transverse section, axial forces, shear forces and bending moment diagram, relations among load shear and moment, introduction to moving loads.			9
Unit:3	Stresses in beams and Direct and Bending stresses Simple bending: assumptions and derivation of flexural formula, economic sections, analysis of flexural action, moment of resistance, section modulus. Shearing stress: Derivation of formula, shear stress distribution for various cross sections, concept of shear flow, shear lag and shear center. Direct and bending stresses: Combined axial loads and bending moment, uniaxial & biaxial eccentric load, Kern of a section.			10
Unit:4	Combined Stresses and strains and Theories of Failure Combined stresses and strains: Analytical and graphical representation of state of combined stress at a point, absolute maximum shearing stress, principal stresses and strains, application of Mohr's circle. Theories of Failure: maximum principal stress theory, maximum principal strain			9



	theory, maximum strain energy theory, maximum shear stress theory, maximum shear strain theory.	
Unit:5	Columns & Struts, Torsion of shafts Columns and Struts: Concept of short and long columns, formulae by Euler, Euler's Crippling load for different end conditions, limitations of Euler's formula, equivalent length, Rankine's formula and its applications Torsion: Introduction & Assumptions, derivation of torsion formulae, torsion of circular shafts, power transmission, stresses and deformation in determinate solid/hollow homogeneous shafts.	9
Text Books:		
1)	Singer F.L. and Pytle, 2011, "Strength of Materials", Harper Collins Publishers, 4th Edition	
2)	Junnarkar S.B., 2014, "Mechanics of Structures", Charotar Publishers, Anand, 31st edition,	
3)	Sadhu Singh, 1978, "Strength of Materials", Khanna Publishers, N. Dehli	
4)	Prasad I.B, 1988, "A text book of Strength of Materials", Khanna Publishers, N. Dehli	
5)	Timoshenko S.P. and Young D.H., 2002, "Elements of Strength of Materials", East West Press	
6)	Ramamrutham S., 2011, "Strength of Materials", Dhanpat Rai and Sons, Delhi	
7)	Ramamrutham S., and R. Narayanan 2020, "Theory of Structures", Dhanpat Rai and Sons	
Reference Books:		
1)	Beer F P., Jhonston E. R., John. T. D E wolf, 2017, "Mechanics of Materials" TMH	
2)	Popov E.P., 2015, "Introduction to Mechanics of Solids", Prentice-Hall, Second Edition 2005	
3)	Crandall S.H., Dahl N.C., & Lardner T.J., 1955, "An Introduction to Mechanics of Solids", Tata McGraw Hill, 2nd Edi, 1978	
4)	Nash W., 2005, "Strength of Materials Schaum's outline series", McGraw Hill, fourth edition	
5)	Punmia B. C., 2018, "Mechanics of Materials" Laxmi Publications, revised edition, 2016	
6)	Subramanian R., 2016, "Strength of Materials" Oxford University Press, 2nd edition	



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	Semester-III (w.e.f. A.Y. 2025-26)			
Mechanics of Structures Laboratory (26UCE21102)				
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	-	-	MSE:	-
Tutorials:	-	-	ICA:	25 Marks
Practical:	2	1	ESE:	-
Total:	2	1	OE/POE:	25 Marks
Course Outcomes: At the end of this course, students shall be able to				Blooms Level
CO 1	Perform tensile, compression, and shear tests on different materials and determine their mechanical properties.			BL: L3 Apply
CO 2	Analyze torsional and flexural behavior of materials and evaluate properties like shear stress and flexural strength.			BL:L4 Analyze
CO 3	Determine deflection in beams and compare experimental results with theoretical calculations.			BL:L4 Analyze
CO 4	Evaluate impact strength and thermal stresses in materials under different conditions.			BL:L5 Evaluate
CO 5	Measure and analyze strain using strain gauges and determine principal stresses using graphical methods.			BL:L4 Analyze
Exp. No.	Name of Experiment			
Exp.1	Tension test on ferrous and non-ferrous alloys (mild steel / cast iron /aluminum etc.)			
Exp.2	Compression test on mild steel/aluminum/ concrete/ and wood.			
Exp.3	Shear test on mild steel / aluminum (single and double shear tests).			
Exp.4	Torsion test on mild steel and cast iron solid bars / pipes.			
Exp.5	Flexure test on timber / cast iron beams.			
Exp.6	Deflection test on mild steel / wooden beam specimens.			
Exp.7	Graphical solution method for principal stress problems.			
Exp.8	Impact test on mild steel/ brass/ Aluminum/ and cast iron specimens.			
Exp.9	Experimental on thermal stresses.			
Exp.10	Strain measurement involving strain gauges / rosette			
Text Books:				
3)	Singer F.L. and Pytle, 2011, "Strength of Materials", Harper Collins Publishers, 4th Edition			
4)	Junnarkar S.B., 2014, "Mechanics of Structures", Charotor Publishers, Anand, 31st edition,			
3)	Sadhu Singh, 1978, "Strength of Materials", Khanna Publishers, N. Dehli			
4)	Prasad I.B, 1988, "A text book of Strength of Materials", Khanna Publishers, N. Dehli			
5)	Timoshenko S.P. and Young D.H., 2002, "Elements of Strength of Materials", East West Press			
6)	Ramamrutham S., 2011, "Strength of Materials", Dhanpat Rai and Sons, Delhi			

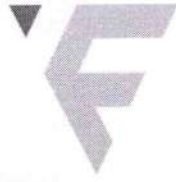




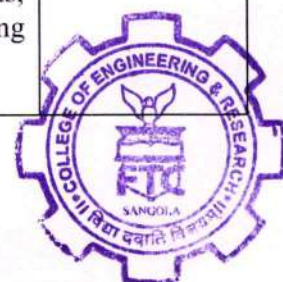
7)	Ramamrutham S., and R. Narayanan 2020, "Theory of Structures", Dhanpat Rai and Sons
Reference Books:	
7)	Beer F P., Jhonston E. R., John. T. D E wolf, 2017, "Mechanics of Materials" TMH
8)	Popov E.P., 2015, "Introduction to Mechanics of Solids", Prentice-Hall, Second Edition 2005
9)	Crandall S.H., Dahl N.C., & Lardner T.J., 1955, "An Introduction to Mechanics of Solids", Tata McGraw Hill, 2nd Edi, 1978
10)	Nash W., 2005, "Strength of Materials Schaum's outline series", McGraw Hill, fourth edition
11)	Punmia B. C., 2018, "Mechanics of Materials" Laxmi Publications, revised edition, 2016
12)	Subramanian R., 2016, "Strength of Materials" Oxford University Press, 2nd edition

Note: Students shall complete a minimum of **8 practicals out of the 12 practicals** prescribed in the course.



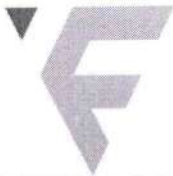
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	Second Year B. Tech. Civil Engineering			
	Semester-III (w.e.f. A.Y. 2026-27)			
Building Materials (26UCE21103)				
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	2	2	MSE:	30 Marks
Tutorials:	-	-	ICA:	10 Marks
Practical:	-	-	ESE:	60 Marks
Total:	2	2	OE/POE:	-
Course Outcomes: At the end of this course, students shall be able to				BL Level
CO1	Understand different types of masonry structures.			BL-II:Understand
CO2	Explain building components and their purposes.			BL-II:Understand
CO3	Draw plans, elevations and sections of various structures.			BL-III:Apply
CO4	Apply principles of planning and building bye-laws in building design.			BL-III:Apply
CO5	Prepare detailed working drawings of doors and windows.			BL-III:Apply
Unit	Course Contents			No. of Lectures (Hrs.)
Unit:1	Masonry Practices Stone masonry: Random rubble, uncoursed rubble, coursed rubble and ashlar masonry; brickwork and brick bonds – English and Flemish; guidelines to be followed during construction; composite masonry; different types of partition walls such as brick, aluminum and timber; solid concrete blocks, hollow concrete blocks and lightweight blocks (aerated autoclaved); soil stabilized blocks, fly ash blocks and cement concrete walls.			06
Unit:2	Concrete Materials and Properties Introduction to the ingredients of concrete and their properties; significance of admixture materials such as pozzolana and fly ash; use of chemical admixtures for specific purposes; properties of fresh concrete and hardened concrete			05
Unit:3	Arches and Lintel Elements Arches and their stability, technical terms in arches, types of arches, methods of construction; Lintel: Necessity, materials: wood, stone, brick, steel, R.C.C. and reinforced brick lintels, beams: types according to material, layout such as primary and secondary, continuous beams, formwork for RCC elements: function, requirements			06
Unit:4	Building Circulation Elements Doors and windows-Doors - classification based on parameters such as material, geometry, fixtures and fastening Windows - classification based on parameters such as material, geometry, fixtures and fastening Use of composite materials for doors and window frames and shutters, laying out of passages Stairs: Terminology, requirements of a good stair, functional aspects, various types, uses and limitations Ramps: Requirements and types, planning aspects for physically handicapped person . Elevators: Types and their Use			06





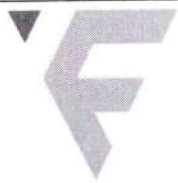
Unit:5	Building Finishes: Floors and Roofs Flooring: Types, factors for selections of floorings, flooring in ground and upper floors, various types of tiled flooring: natural, composite, synthetic, and special purpose flooring, concrete flooring for industrial purpose: tremix flooring Roof coverings: Terms used, roof and their selection, pitched roofs and their types, roof coverings and their selection. Natural, composite, synthetic, and special purpose roof coverings, timber trusses (King Post and Queen Post), steel trusses types and their Suitability Precast and Pre-engineered Building Advantages and disadvantages.	07
<i>Text Books:</i>		
1)	Punmia B.C., Jain A. K., 2008, "Building Construction", Laxmi Pub. Pvt. Ltd., 10th Edi, N. Delhi	
2)	Arora S. P. and Bindra S. P., 2010, "Text Book of Building Construction", Dhanpat Rai Publications	
3)	Kumar Sushil, 2010, "Building Construction" Standard Publishers, 20th Edition	
<i>Reference Books:</i>		
1)	NBC 2005, National Building Code of India, Parts III, IV, VII and IX, B.I.S. New Delhi	
2)	SP 7- National Building Code Group 1 to 5, B.I.S. New Delhi	
3)	I.S. 962 - 1989 Code for Practice for Architectural and Building Drawings, B.I.S. New Delhi	
4)	Mehta, Scarborough, Armpriest, 2007, "Building Construction", Pearson Education	

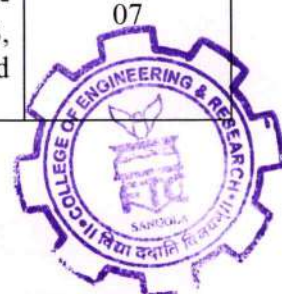


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	Semester-III (w.e.f. A.Y. 2026-27)			
	Building Materials Laboratory (26UCE21104)			
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	-	-	MSE:	-
Tutorials:	-	-	ICA:	25 Marks
Practical:	2	1	ESE:	-
Total:	2	1	OE/POE:	25
Course Outcomes: At the end of this course, students shall be able to				
				BL Level
CO1	Identify and classify various masonry materials, masonry systems, brick bonds and partition wall components used in building construction.			BL3: Apply
CO2	Analyze the properties of concrete ingredients, fresh concrete and admixtures used in construction practices.			BL4: Analyze
CO3	Prepare and interpret drawings of arches, stairs, ramps, elevators and other building components.			BL4: Analyze
CO4	Evaluate the suitability of flooring, roofing and construction materials for different building requirements.			BL5: Evaluate
CO5	Analyze field construction practices through site visits and prepare technical reports on building construction activities.			BL4: Analyze
Exp. No	Course Contents			No. of Hours (Hrs.)
1	Study and identification of different types of stone masonry (Random Rubble, Coursed Rubble and Ashlar Masonry).			02
2	Study of brick masonry and various brick bonds (English Bond and Flemish Bond) using models or drawings			02
3	Preparation of masonry bond layouts and sketches showing bonding arrangements.			02
4	Study and comparison of partition wall systems using brick, timber, aluminum, AAC blocks and fly ash blocks.			02
5	Determination of properties of concrete ingredients (cement, fine aggregate and coarse aggregate).			02
6	Demonstration of concrete mixing and study of fresh concrete properties (Workability by Slump Test).			02
7	Study of chemical admixtures and mineral admixtures (Fly Ash and Pozzolana) used in concrete.			04
8	Drawing and study of different types of arches showing technical terms and construction details.			02
9	Study of flooring and roofing systems including tiled floors, Tremix flooring, King Post Truss and Queen Post Truss.			02
10	Study and drawing of different types of stairs, ramps and elevators with dimensional requirements.			02
11	Study of flooring and roofing systems including tiled floors, Tremix flooring, King Post Truss and Queen Post Truss.			02
12	Site visit to observe masonry construction and preparation of report.			02

Note: Students shall complete a minimum of 8 Practicals out of the 12 Practicals prescribed in the course.



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	Second Year B. Tech. Civil Engineering			
	Semester-III (w. e. f. A.Y. 2026-27)			
	Advanced Surveying (26UCE21105)			
Teaching Scheme:			Evaluation Scheme(PCC):	
	No. of Hrs./week	No. of Credits		
Lectures:	3	3	MSE:	30 Marks
Tutorials:	-	-	ICA:	10 Marks
Practical:	-	-	ESE:	60 Marks
Total:	3	3	OE/POE:	-
Course Outcomes: At the end of this course, students shall be able to				BL Level
CO 1	Execute leveling and contouring operations using Auto Levels to prepare topographical maps and site profiles.			BL-III Apply
CO 2	Analyze and balance survey traverses using Gale's Table and solve numerical problems in Tacheometry for distance measurement.			BL-IV Analyze
CO 3	Operate Total Stations and EDM instruments to collect and process computerized survey data efficiently.			BL-III Apply
CO 4	Apply GIS and Remote Sensing principles to interpret geospatial data and manage spatial information layers.			BL-III Apply
CO 5	Select appropriate advanced equipment (LiDAR, DGPS, or Drones) based on project requirements, accuracy needs, and site constraints.			BL-V Evaluate
Unit	Course Contents			No. of Lectures(Hrs.)
Unit:1	Leveling Instruments and Applications Surveying: Introduction, Difference in Plane & Geodetic Survey. Surveying Levels: Construction, Temporary adjustments, and use of Auto Level Contouring: Direct and Indirect methods, Interpolation techniques and uses of contour maps.			06
Unit:2	Theodolite & Tacheometry Theodolite - Vernier - Description and uses – temporary. Measurement of Angles: Horizontal – Vertical. Traversing - Closing error and distribution - Gale's table - Omitted measurements. Tacheometry: Introduction, purpose, and principles of tacheometric surveying. Requirements of Tacheometry, Methods of Tacheometry. Fixed Hair Method, Numerical Problems: Determining constants of Tacheometer, Determine Horizontal & Vertical distances. Errors and precisions. Difference between Theodolite & Tacheometer			09
Unit:3	Total Station, Digital Theodolite and EDM Total Station: Introduction, Component parts, working principle, Overview of the computerized survey data system. Digital Theodolite: Introduction- principles, features, purpose & Applications Electronic Distance Meter (EDM): Introduction- Components of E.D.M and their functions. Basic principles and applications of E.D.M.			08
Unit:4	Remote Sensing & GIS Remote Sensing: Basic principles of Remote Sensing, applications, and limitations. Geographical Information System (GIS): Information systems, spatial and non-spatial information, geographical concepts and terminology, advantages of GIS, Platforms of GIS work. Concept and types of thematic layers in GIS. Concept and applications of geospatial data, types of spatial data, and available sources.			07



Unit:5	Advanced Surveying Equipment Introduction, advancements in surveying equipment. Ground-based Lidar technology for surveying, working, advantages and limitations. Global Positioning System: - Types i.e., Handheld and Differential Global Positioning System, advantages and disadvantages. Drone Surveying: Overview, applications, and limitations.	06
<i>Text Books:</i>		
4)	Surveying Vol. I & II, Author: Dr. B.C. Punmia, Ashok K. Jain & Arun K. Jain, Publication: Laxmi Publications, New Delhi.	
5)	Surveying Vol. I & II, Author: S. K. Duggal, Publication: Tata McGraw-Hill (TMH) Education, New Delhi	
6)	Advanced Surveying, Author: A. S. Shelar, Dr. M. V. Jadhav, Publication: Nirali Prakashan, Pune	
7)	Surveying & Leveling, Author: N. N. Basak, Publication: Tata McGraw-Hill (TMH) Education, New Delhi	
8)	Basic Civil Engineering (Surveying Section), Author: S. S. Bhavikatti, Publication: New Age International Publishers, New Delhi	
<i>Reference Books:</i>		
5)	Surveying and Levelling Vol. I & II, Author: T. P. Kanetkar and S. V. Kulkarni, Publication: Pune Vidyarthi Griha Prakashan, Pune	
6)	Advanced Surveying: Total Station, GPS, GIS & Remote Sensing, Author: Satheesh Gopi, R. Sathikumar, and N. Madhu, Publication: Pearson Education, Noida	
7)	Surveying (SI Units), Author: Dr. K. R. Arora, Publication: Standard Book House, New Delhi	
8)	Higher Surveying, Author: A. M. Chandra, Publication: New Age International Publishers, New Delhi	
9)	Remote Sensing and GIS, Author: Basudeb Bhatta, Publication: Oxford University Press, New Delhi	



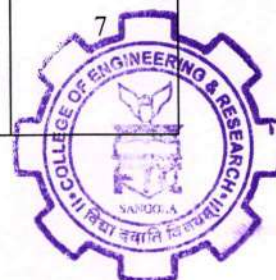
Course List of MDM

MDM offered by Civil Engineering

Department	MDM Domain	Semester	Courses in Domain	Subject Code	Offered to Programs
Civil	Construction Safety & Infrastructure Risk Management	III	Introduction to Construction Safety Engineering	26UCE21401	Mech, CSE, AIDS, Elect, E&TC
		IV	Construction Site Safety and Labour Welfare Regulations	26UCE22402	
		V	Infrastructure Risk Assessment and Hazard Management	27UCE31403	
		VI	Occupational Health and Safety in Construction Projects	27UCE32404	
		VII	Disaster-Resilient and Safe Infrastructure Planning	28UCE41405	



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	Second Year B. Tech. Civil Engineering			
	Semester-III (w.e.f. A.Y. 2025-26)			
	Introduction to Construction Safety Engineering(26UCE21401)			
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	3	3	MSE:	30 Marks
Tutorials:	-	-	ICA:	10 Marks
Practical:	-	-	ESE:	60 Marks
Total:	3	3	OE/POE:	-
Course Outcomes: At the end of this course, students shall be able to				Blooms Level
CO1	Recognize the importance of safety culture, accident theories, and the roles of various stakeholders in construction safety.			BL-II Understand
CO2	Interpret and comply with statutory acts, building bye-laws, and international standards (like OSHA/ISO) relevant to construction.			BL-II Understand
CO3	Perform Job Safety Analysis (JSA) and Hazard Identification and Risk Assessment (HIRA) for various construction activities.			BL-III Apply
CO4	Execute safe practices for hazardous operations such as scaffolding, excavation, tunneling, and heavy machinery handling.			BL-III Apply
CO5	Establish safety committees, execute safety audits, and manage PPE distribution and emergency response plans on site.			BL-IV Analyse
Unit	Course Contents			No. of lectures (hrs.)
Unit:1	Introduction to Construction Safety and Accident Theories: Evolution of Safety: Concepts of safety, health, and environment (SHE) in construction; Safety culture and climate; Socio-economic costs of accidents (Direct vs. Indirect costs). Accident Theories: Heinrich's Triangle (Bird's Triangle), Domino Theory, Human Factors Theory, and Accident Root Cause Analysis (RCA). Stakeholders' Roles: Responsibilities of owners, project managers, safety engineers, designers, and laborers in ensuring a safe working ecosystem.			8
Unit:2	Safety Legislation, Acts, and Standards: National Regulations: Overview of The Building and Other Construction Workers (BOCW) Act, Factories Act (relevant provisions), and National Building Code (NBC) of India guidelines on construction safety. International Standards: Introduction to OSHA (Occupational Safety and Health Administration) standards for construction, ISO 45001:2018 (Occupational Health and Safety Management Systems). Legal Obligations: Workman's Compensation Act, contract labor regulations, and statutory documentation/record-keeping for site accidents.			7
Unit:3	Risk Assessment and Hazard Identification: Hazard vs. Risk: Definitions, classification of hazards (Physical, Chemical, Biological, Ergonomic, and Psychosocial). Risk Management Framework: Hazard Identification and Risk Assessment (HIRA), Job Safety Analysis (JSA) methodology, and Risk Matrix (Likelihood vs. Severity analysis).			7



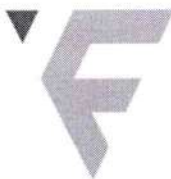
	Control Hierarchy: Elimination, Substitution, Engineering Controls, Administrative Controls, and Personal Protective Equipment (PPE).	
Unit:4	Operational Safety in Construction Activities: Working at Heights: Scaffolding types, erection, inspection, and dismantling; Fall protection systems (safety nets, life lines, safety harnesses); Ladder safety. Excavation and Piling: Shoring, shielding, sloping, and underpinning techniques; Hazard identification in trenching and deep foundations. Heavy Machinery & Electrical Safety: Safe operation of cranes, hoists, dumpers, and concrete mixers; Rigging and lifting hazards; Temporary electrical wiring regulations, lockout/tagout (LOTO) procedures, and prevention of electrocution. Confined Spaces & Demolition: Hazards and safety measures in confined spaces, tunneling, and structured demolition operations.	8
Unit:5	Safety Management Systems and Emergency Preparedness: Safety Organization: Structuring a site safety committee, safety policies, and safety budgets. Safety Auditing: Types of safety audits, safety inspection checklists, and safety performance indices (Frequency Rate, Severity Rate). Emergency Response: Design of Emergency Preparedness and Response Plans (EPRP); Fire safety on sites, fire classification, and extinguisher usage; First-aid management and safety promotional activities (Toolbox talks, safety posters, and mock drills).	8
Text Books:		
5)	Bhattacharjee, S. K. (2011). <i>Safety Management in Construction</i> . Khanna Publishers.	
6)	Reese, C. D., & Eidson, J. V. (2006). <i>Handbook of OSHA Construction Safety and Health</i> (2nd ed.). CRC Press.	
3)	Kapshe, P. (2019). <i>Construction Safety Engineering and Management</i> . Standard Publishers Distributors.	
Reference Books:		
13)	Davies, V. J., & Tomasin, K. (1996). <i>Construction Safety Handbook</i> (2nd ed.). Thomas Telford Publishing.	
14)	Holt, A. S. J. (2008). <i>Principles of Construction Safety</i> . Wiley-Blackwell.	
15)	Bureau of Indian Standards (BIS): <i>National Building Code of India (Part 7: Construction Management, Functions and Safety)</i> .	
16)	MacCollum, D. V. (2006). <i>Construction Safety Engineering Principles</i> . McGraw-Hill Professional.	



Course List of Open Electives

Department	Semester	Name of Subjects	Subject Code
Civil	III	Climate Change and Mitigation	26UOE21501 B
	IV	Waste Management Recycle	26UOE22502 B
	V	Green Technology	26UOE31503 B



	FABTECH EDUCATION SOCIETY'S FABTECH TECHNICAL CAMPUS COLLEGE OF ENGINEERING & RESEARCH (An Autonomous Institute)			
	Second Year B. Tech. Civil Engineering			
	Semester-III (w.e.f. A.Y. 2026-27)			
	Climate Change and Mitigation (25UCE21501B)			
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	3	3	MSE:	30 Marks
Tutorials:	-	-	ICA:	10 Marks
Practical:	-	-	ESE:	60 Marks
Total:	3	3	OE/POE:	-
Course Outcomes: At the end of this course, students shall be able to				BL Level
CO1	Identify key concepts of climate change science, greenhouse effect, and drivers			BL-I: Remember
CO2	Comprehend impacts of climate change on environment, society, and economy			BL-II: Understand
CO3	Analyze adaptation strategies for vulnerable sectors like water and agriculture			BL-IV: Analyze
CO4	Propose mitigation techniques including renewable energy and carbon sequestration			BL-V: Evaluate
CO5	Promote sustainable policies and technologies for climate resilience			BL-VI: Create
Unit	Course Contents			No. of Lectures (Hrs.)
Unit 1	Introduction to Climate Change: Basics of climate system, greenhouse gases, global warming potential, historical trends, anthropogenic drivers, carbon cycle			08
Unit 2	Climate Change Impacts: Effects on water resources, agriculture, biodiversity, health, urbanization; vulnerability assessment, carbon footprint			08
Unit 3	Adaptation Strategies: Urban heat islands, resilient infrastructure, nature-based solutions, disaster management, climate-resilient planning			07
Unit 4	Mitigation Techniques: Renewable energy transition, energy efficiency, GHG emission reduction (Kyoto mechanisms, CDM), circular economy			08
Unit 5	Policies and Sustainability: International agreements (Paris Accord), sustainable development goals, green technologies, case studies on mitigation			07
Text Books:				
9)	Lal, D.S., Climatology, Sharda Pustak Bhawan, ISBN 8186204121.			
10)	Intergovernmental Panel on Climate Change (IPCC), Climate Change 2022: Mitigation of Climate Change, Cambridge University Press.			
Reference Books:				
10)	Deshpande, Climate Change and Sustainable Development, KTU Syllabus Reference.			
11)	Council on Foreign Relations, Climate Change: Mitigation and Adaptation (Course Materials).			
12)	Han, Principles of Climate Change Mitigation, Wiley (adapted from ground improvement style).			

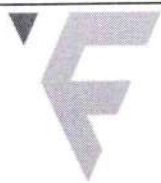


	FABTECH EDUCATION SOCIETY'S FABTECH TECHNICAL CAMPUS COLLEGE OF ENGINEERING & RESEARCH (An Autonomous Institute)			
	Second Year B. Tech. Civil Engineering			
	Semester-III (w.e.f. A.Y. 2025-26)			
	Start-up Ecosystem (26UET21802)			
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	1	1	MSE:	
Tutorials:	-	-	ICA:	25 Marks
Practical:	-	-	ESE:	
Total:	1	1	OE/POE:	-
Course Outcomes: At the end of this course, students shall be able to				Blooms Level
CO1	Explain the fundamental concepts, characteristics, and importance of entrepreneurship in economic and social development.			Understand (L2)
CO2	Identify business opportunities and generate innovative ideas to address real-world problems.			Create (L6)
CO3	Understand the process of establishing and managing a new venture, including basic business planning concepts.			Understand (L2)
CO4	Demonstrate awareness of government schemes, startup support systems, incubation centers, and funding opportunities available for entrepreneurs.			Understand (L2)
CO5	Develop an entrepreneurial mindset with skills related to creativity, innovation, leadership, teamwork, and risk-taking.			Create (L6)
Unit	Course Contents			No. of lectures (hrs.)
Unit:1	Introduction to Entrepreneurship - Entrepreneur vs Employee - Characteristics of Entrepreneurs - Success Stories of Indian Entrepreneurs - Start-up Ecosystem in India			04
Unit:2	Business Opportunities - Identifying Problems and Opportunities - Idea Generation Techniques - Local Business Opportunities - Innovation and Creativity			03
Unit:3	Basics of Business Planning - What is a Business Model? - Cost and Revenue Concepts - Value Proposition - Simple Business Plan			03
Unit:4	Government Support & Funding - Startup India - MSME Schemes			



	• Mudra Loan • Incubation Centers • Sustainable Development and Green Economy	
Text Books:		
1)	<i>Entrepreneurship Development</i> by S. S. Khanka	
2)	Entrepreneurship Development and Small Business Enterprises by Poornima M. Charantimath.	
3)	<i>Entrepreneurship Development</i> by C. B. Gupta and N. P. Srinivasan	
4)	<i>Entrepreneurship</i> by Robert D. Hisrich, Michael P. Peters, and Dean A. Shepherd.	
Reference Books:		
1)	<i>Innovation and Entrepreneurship</i> is a 1985 book by management thinker Peter F. Drucker	
2)	<i>The Lean Startup</i> by Eric Ries	
3)	Zero to One by Peter Thiel with Blake Masters .	
4)	<i>Business Model Generation</i> by Alexander Osterwalder and Yves Pigneur	
5)	<i>Start With Why: How Great Leaders Inspire Everyone to Take Action</i> by leadership expert Simon Sinek .	
6)	Disciplined Entrepreneurship by Bill Aulet	



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	Second Year B. Tech. Civil Engineering			
	Semester-IV (w.e.f. A.Y. 2025-26)			
	Start-up Ecosystem Lab (26UET21803)			
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	-	-	ISE:	-
Tutorials:	-	-	ICA:	25 Marks
Practical:	2	1	ESE:	-
Total:	2	1	OE/POE:	-
Course Outcomes: At the end of this course, students shall be able to				Blooms Level
CO 1	Explain entrepreneurial concepts and characteristics.			BL2- Understand
CO 2	Analyze business opportunities and market needs.			BL4-Analyse
CO 3	Develop a business model for a startup idea.			BL6-Create
CO 4	Estimate the financial viability of a business venture.			BL3-Apply
CO 5	Evaluate startup support systems and funding opportunities.			BL5-Evaluate

List of Experiments:

ExperimentNo.1	Entrepreneur vs Employee Comparison
ExperimentNo.2	Identifying Entrepreneurial Characteristics
ExperimentNo.3	Case Study of an Indian Entrepreneur
ExperimentNo.4	Study of the Indian Startup Ecosystem
ExperimentNo.5	Problem Identification Survey
ExperimentNo.6	Idea Generation Workshop.
ExperimentNo.7	Local Business Opportunity Analysis
ExperimentNo.8	Business Model Canvas Preparation
ExperimentNo.9	Cost, Revenue and Profit Estimation
ExperimentNo.10	Government Scheme and Funding Study

Text Books:

- 1) *Entrepreneurship Development* by **S. S. Khanka**
- 2) *Entrepreneurship Development and Small Business Enterprises* by Poornima M. Charantimath.

Reference Books:

- 1) *Innovation and Entrepreneurship* is a 1985 book by management thinker **Peter F. Drucker**
- 2) *The Lean Startup* by Eric Ries

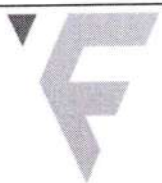


	FABTECH EDUCATION SOCIETY'S FABTECH TECHNICAL CAMPUS COLLEGE OF ENGINEERING & RESEARCH (An Autonomous Institute)			
	Second Year B. Tech. Civil Engineering			
	Semester-III (w.e.f. A.Y. 2026-27)			
	Professional Ethics (26UET21804)			
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	1	1	MSE:	
Tutorials:	-	-	ICA:	25 Marks
Practical:	-	-	ESE:	
Total:	1	1	OE/POE:	-
Course Outcomes: At the end of this course, students shall be able to			Blooms Level	
CO1	Explain the basic concepts of ethics and professional responsibility.			Understand (L2)
CO2	Identify ethical issues and apply ethical principles in decision-making.			Apply (L3)
CO3	Demonstrate professional behavior, integrity, and accountability in workplace situations.			Apply (L3)
CO4	Understand the social, environmental, and professional responsibilities of engineers.			Understand (L2)
CO5	Develop an ethical mindset and commitment towards sustainable and responsible engineering practices.			Create (L6)
Unit	Course Contents			No. of lectures (hrs.)
Unit:1	Introduction to Ethics (4 Hours) - Meaning and Importance of Ethics - Values, Morals, and Ethics - Personal and Professional Ethics - Ethical Decision-Making			04
Unit:2	Engineering Profession and Responsibilities - Role of Engineers in Society - Professional Responsibilities - Accountability and Integrity - Code of Professional Conduct			03
Unit:3	Workplace Ethics - Teamwork and Professional Relationships - Workplace Discipline and Etiquette - Conflict of Interest - Respect, Diversity, and Inclusion			03
Unit:4	Ethics, Society, and Sustainability - Social Responsibility - Environmental Ethics - Sustainable Development			03



	• Case Studies on Ethical Issues in Engineering	
Text Books:		
1)	<i>Professional Ethics and Human Values</i> by R. S. Naagarazan	
2)	Professional Ethics by R. Subramanian	
3)	<i>Engineering Ethics: Concepts and Cases</i> by Charles E. Harris Jr., Michael S. Pritchard, and Michael J. Rabins.	
Reference Books:		
1)	<i>Ethics in Engineering</i> is a textbook by Mike W. Martin and Roland Schinzinger	
2)	<i>Human Values and Professional Ethics</i> by A. Alavudeen, R. Kalil Rahman, and M. Jayakumaran	
3)	The Seven Habits of Highly Effective People is a self-help and leadership book by Stephen R. Covey,	
4)	Professional Ethics and Human Values by M. Govindarajan, S. Natarajan, and V. S. Senthil Kumar	



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	Second Year B. Tech. Civil Engineering			
	Semester-IV (w.e.f. A.Y. 2025-26)			
	Professional Ethics Lab (26UET21805)			
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	-	-	ISE:	-
Tutorials:	-	-	ICA:	25 Marks
Practical:	2	1	ESE:	-
Total:	2	1	OE/POE:	-
Course Outcomes: At the end of this course, students shall be able to				Blooms Level
CO 1	Explain personal values, ethical principles, and professional responsibilities relevant to engineering practice.			L2 – Understand
CO 2	Apply ethical decision-making frameworks to resolve engineering and workplace ethical issues.			L3 – Apply
CO 3	Demonstrate professional communication, teamwork, and ethical behavior in collaborative activities.			L3 – Apply
CO 4	Analyze professional ethics issues including conflicts of interest, diversity, inclusion, and environmental responsibilities			L4 – Analyze
CO 5	Evaluate engineering case studies and justify ethical and sustainable solutions in professional contexts			L5 – Evaluate

List of Experiments:

Experiment No.1	Identifying Personal Values and Ethical Principles
Experiment No.2	Ethical Decision-Making Using Case Scenarios
Experiment No.3	Role of Engineers in Society
Experiment No.4	Study of Professional Code of Conduct
Experiment No.5	Teamwork and Professional Communication Activity
Experiment No.6	Workplace Ethics Role Play
Experiment No.7	Conflict of Interest Analysis
Experiment No.8	Diversity and Inclusion Survey
Experiment No.9	Environmental Ethics and Sustainable Engineering Study
Experiment No.10	Case Study on Ethical Issues in Engineering
Text Books:	
1)	<i>Professional Ethics and Human Values</i> by R. S. Naagarazan
2)	<i>Professional Ethics</i> by R. Subramanian
Reference Books:	
1)	<i>Ethics in Engineering</i> is a textbook by Mike W. Martin and Roland Schinzinger
2)	<i>Human Values and Professional Ethics</i> by A. Alavudeen, R. Kalil Rahman, and M. Jayakumaran

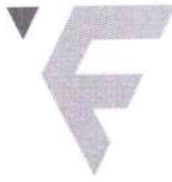


	FABTECH EDUCATION SOCIETY'S FABTECH TECHNICAL CAMPUS COLLEGE OF ENGINEERING & RESEARCH (An Autonomous Institute)			
	Second Year B.Tech. Civil Engineering			
	Semester-III (w.e.f.A.Y.2026-27)			
	Basic Quantitative Ability(26UGS21403)			
Teaching Scheme:			Evaluation Scheme:	
	No.of Hrs./week	No.of Credits		
Lectures:	1	1	MSE:	-
Tutorials:	-	-	ICA:	50 Marks
Practical:	-	-	ESE:	-
Total:	1	1	OE/POE:	-
Course Outcomes: At the end of this course, students shall be able to				
CO 1	Apply basic arithmetic copérations , surds, indices ,and progressions to solve quantitative problems efficiently.			L3 – Apply
CO 2	Use concepts of HCF, LCM, divisibility, remainders, unit digits, and number Properties in problem-solving.			L3 – Apply
CO 3	Solve real-life problems involving percentages, successive changes, and proportional increase/decrease.			L3 – Apply
CO 4	Apply concepts of averages,weighted averages , mixtures, and allegations in quantitative applications.			L3 – Apply
CO 5	Use ratio,proportion,variation,and scaling concepts to solve aptitude and application-based problems.			L3 – Apply
Course Contents				
Unit	Course Contents			No. of Lecture s (hrs.)
Unit :1	Basic Calculation Techniques Squares (1–30), Cubes (1 to 15), Multiplication (2×2, 3×3), Square roots, Cube roots, Conversion of decimals to fractions and vice-versa: Ratios {(1/1) to (1/30)}, BODMAS rule, Surds & Indices: Fundamental laws of indices, basic rules of surds, rationalization of denominators, and comparison of surds. Progressions: Arithmetic Progressions, Geometric Progressions, Harmonic Progressions, Useful results.			6
Unit :2	Number System GCD/HCF and LCM, Rules of divisibility, properties involving fractions, co-primes, and application-based word problems, Unit digit and Power Cycle, Remainder Theorem, Types of Numbers and their Properties, Useful results.			5
Unit :3	Percentage Concept of percentages, fraction-to-percentage equivalence, successive percentage changes, increase and decrease based on universally proportional, real-world applications.			5
Unit :4	Average Concept of arithmetic mean,weighted averages, inclusion/exclusionof elements, and replacement problems, Mixture and Alligations.			5



Unit :5	Ratio and Proportion Ratio and Proportion, Direct proportion, Inverse proportion, Mean proportion, Joint proportion, Scaling Concept, •Problems on Ages Useful results.	5
Text Books:		
1)	Quantitative Aptitude by R.S. Aggarwal, S.Chand Publishing.	
2)	Quantitative Aptitude for Competitive Examinations: Abhijit Guha, McGraw Hill India	
Reference Books:		
1)	Fast Track Objective Arithmetic: Rajesh Verma, Arihant Publications	
2)	Magical Book on Quicker Maths: M. Tyra, BSC Publishing Co. Pvt .Ltd.	
3)	Quantitative Aptitude Quantum CAT: Sarvesh Kumar Verma, Arihant Publications	
4)	Objective Arithmetic: R .S .Aggarwal ,S.Chand Publishing	
5)	How to Prepare for Quantitative Aptitude for CAT: Arun Sharma ,McGraw Hill India	

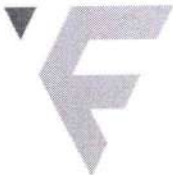


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	FABTECH TECHNICAL CAMPUS COLLEGE OF ENGINEERING & RESEARCH			
	(An Autonomous Institute)			
	Second Year B. Tech. Civil Engineering			
	Semester-III (w. e. f. A.Y. 2026-27)			
	Field Project-Surveying(26UCE21751)			
Teaching Scheme:			Evaluation Scheme (FP):	
	No. of Hrs./week	No. of Credits		
Lectures:	-	-	MSE:	--
Tutorials:	-	-	ICA:	25 Marks
Practical:	2	1	ESE:	--
Total:	2	1	OE/POE:	25 Marks
Course Outcomes: At the end of this course, students shall be able to				BL Level
CO1	Apply fundamental principles of surveying for leveling, angle measurement, and traversing.			BL-III: Apply
CO2	Perform field surveys using conventional instruments and compute RL, distances, and angles accurately.			BL-IV: Analyze
CO3	Analyze and adjust survey data (traverse, tacheometry, contouring) for error minimization.			BL-III: Apply
CO4	Use modern surveying tools like Total Station, EDM, and GPS for data collection and mapping.			BL-III: Apply
CO5	Prepare survey reports, contour maps, and plans and work effectively in teams during fieldwork			BL-V: Evaluate
Practical No.	Course Contents			No. of Practical Hrs.
Pr. No. 01	Study & Temporary Adjustment of Surveying Instruments (Auto Level, Theodolite)			02
Pr. No. 02	Fly Levelling & Differential Levelling (Transfer of BM & RL Calculations)			02
Pr. No. 03	Profile & Cross-Section Levelling (Road/canal alignment survey)			02
Pr. No. 04	Contouring and Contour Map Preparation (Grid/Radial method + interpolation)			02
Pr. No. 05	Measurement of Horizontal & Vertical Angles using Theodolite (Repetition Method)			02
Pr. No. 06	Theodolite Traversing & Gale's Table Adjustment (Gale's Traverse Table Adjustment)			02
Pr. No. 07	Tacheometric Survey (Fixed Hair Method) (Distance & elevation determination)			02
Pr. No. 08	Determination of Tacheometric Constants (Field calculation of Tacheometric constants)			02
Pr. No. 09	Total Station Survey (Distance, Angle, Coordinates) (Basic Field Operation)			02
Pr. No. 10	Topographic Survey using Total Station (Preparation of plan with coordinates)			02
Pr. No. 11	EDM Distance Measurement & Comparison (Compare with conventional methods)			02
Pr. No. 12	GPS Survey (Handheld) (Location mapping (Lat-Long-Elevation))			02
(Attempt/ Conduct min. 8 Practical to attain all COs) Total No. of Hrs.:				36
Text Books:				
1)	Surveying Vol. I & II, Author: Dr. B.C. Punmia, Ashok K. Jain & Arun K. Jain, Publication: Laxmi Publications, New Delhi.			
2)	Surveying Vol. I & II, Author: S. K. Duggal, Publication: Tata McGraw-Hill (TMH) Education, New Delhi			
3)	Advanced Surveying, Author: A. S. Shelar, Dr. M. V. Jadhav, Publication: Nirali Prakashan, Pune			
4)	Surveying & Levelling, Author: N. N. Basak, Publication: Tata McGraw-Hill (TMH) Education, New Delhi			



5)	Basic Civil Engineering (Surveying Section), Author: S. S. Bhavikatti, Publication: New Age International Publishers, New Delhi
Reference Books:	
1)	Surveying and Levelling Vol. I & II, Author: T. P. Kanetkar and S. V. Kulkarni, Publication: Pune Vidyarthi Griha Prakashan, Pune
2)	Advanced Surveying: Total Station, GPS, GIS & Remote Sensing, Author: Satheesh Gopi, R. Sathikumar, and N. Madhu, Publication: Pearson Education, Noida
3)	Surveying (SI Units), Author: Dr. K. R. Arora, Publication: Standard Book House, New Delhi
4)	Higher Surveying, Author: A. M. Chandra, Publication: New Age International Publishers, New Delhi
5)	Remote Sensing and GIS, Author: Basudeb Bhatta, Publication: Oxford University Press, New Delhi

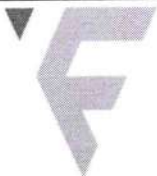


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	FABTECH TECHNICAL CAMPUS COLLEGE OF ENGINEERING & RESEARCH			
	(An Autonomous Institute)			
	Second Year B. Tech. Civil Engineering			
	Semester-III (w. e. f. A.Y. 2026-27)			
	Constitution of India(26UME21901)			
Teaching Scheme:			Evaluation Scheme (Audit):	
	No. of Hrs./week	No. of Credits		
Lectures:	1	Audit	MSE:	--
Tutorials:	-	-	ICA:	50 Marks
Practical:	-	-	ESE:	--
Total:	1	Audit	OE/POE:	--
<i>Course Outcomes:</i> At the end of this course, students shall be able to				<i>BL Level</i>
CO1	Identify and explore the basic features and modalities about Indian constitution.			BL-II: Understand
CO2	Differentiate and relate the functioning of Indian parliamentary system at the center and state level			BL-IV: Analyze
CO3	Differentiate different aspects of Indian Legal System and its related bodies.			BL-IV: Analyze
CO4	Discover and apply different laws and regulations related to engineering practices.			BL-III: Apply
CO5	Correlate role of engineers with different organizations and governance models			BL-IV: Analyze
Unit	<i>Course Contents</i>			<i>No. of Lectures (Hrs.)</i>
Unit:1	Introduction and Basic Information about Indian Constitution Meaning of the constitution law and constitutionalism, Historical Background of the Constituent Assembly, Government of India Act of 1935 and Indian Independence Act of 1947, Enforcement of the Constitution, Indian Constitution and its Salient Features, The Preamble of the Constitution, Fundamental Rights, Fundamental Duties, Directive Principles of State Policy, Parliamentary System, Federal System, Centre-State Relations, Amendment of the Constitutional Powers and Procedure, The historical perspectives of the constitutional amendments in India, Emergency Provisions: National Emergency, President Rule, Financial Emergency, and Local Self-Government – Constitutional Scheme in India			04
Unit:2	Union Executive and State Executive Powers of Indian Parliament Functions of Rajya Sabha, Functions of Lok Sabha, Powers and Functions of the President, Comparison of powers of Indian President with the United States, Powers and Functions of the Prime Minister, Judiciary – The Independence of the Supreme Court, Appointment of Judges, Judicial Review, Public Interest Litigation, Judicial Activism, LokPal, Lok Ayukta, The Lokpal and Lok ayuktas Act 2013, State Executives – Powers and Functions of the Governor, Powers and Functions of the Chief Minister, Functions of State Cabinet, Functions of State Legislature, Functions of High Court and Subordinate Courts.			04
Unit:3	Introduction and Basic Information about Legal System: The Legal System: Sources of Law and the Court Structure: Enacted law -Acts of Parliament are of primary legislation, Common Law or Case law, Principles taken from decisions of judges constitute binding legal rules. The Court System in India and Foreign Courtiers (District Court, District Consumer Forum, Tribunals, High Courts,			04



	Supreme Court). Arbitration: As an alternative to resolving disputes in the normal courts, parties who are in dispute can agree that this will instead be referred to arbitration. Contract law, Tort, Law at workplace.	
Unit:4	Intellectual Property Laws and Regulation to Information Intellectual Property Laws- Introduction, Legal Aspects of Patents, Filing of Patent Applications, Rights from Patents, Infringement of Patents, Copyright and its Ownership, Infringement of Copyright, Civil Remedies for Infringement, Regulation to Information- Introduction, Right to Information Act, 2005, Information Technology Act, 2000, Electronic Governance, Secure Electronic Records and Digital Signatures, Digital Signature Certificates, Cyber Regulations Appellate Tribunal, Offences, Limitations of the Information Technology Act.	04
Unit:5	Business Organizations and E-Governance Sole Traders, Partnerships: Companies: The Company's Act: Introduction, Formation of a Company, Memorandum of Association, Articles of Association, Prospectus, Shares, Directors, General Meetings and Proceedings, Auditor, Winding up. E-Governance and role of engineers in E-Governance, Need for reformed engineering serving at the Union and State level, Role of I.T. professionals in Judiciary, Problem of Alienation and Secessionism in few states creating hurdles in Industrial development.	04
Text Books:		
1)	Brij Kishore Sharma: Introduction to the Indian Constitution, PHI, New Delhi, latest edition	
2)	Granville Austin: The Indian Constitution: Cornerstone of a Nation. 1966, Oxford Clarendon Press	
3)	Subhash C. Kashyap: Our Constitution: An Introduction to India's Constitution and constitutional Law, NBT, 2018.	
4)	PM Bakshi: The Constitution of India, Latest Edition, Universal Law Publishing	
5)	V.K. Ahuja: Law Relating to Intellectual Property Rights (2007)	
Reference Books(Case Studies):		
1)	Keshavanand Bharati V. State of Kerala, AIR 1973 SC 1461.	
2)	Maneka Gandhi V. Union of India AIR, 1978 SC 597.	
3)	S.R. Bammai V. Union of India, AIR 1994 SC 1918.	
4)	Kuldip Nayyar V. Union of India, AIR 2006 SC312.	
5)	A.D.M. Jabalpur V. ShivkantShakla, AIR 1976 SC1207.	

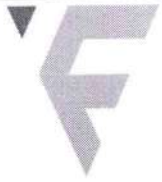


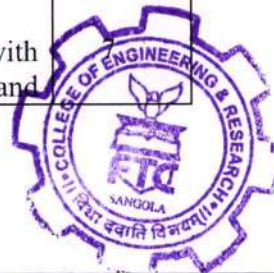
	FABTECH EDUCATION SOCIETY'S FABTECH TECHNICAL CAMPUS COLLEGE OF ENGINEERING & RESEARCH (An Autonomous Institute)			
	Second Year B. Tech. Civil Engineering			
	Semester-III (w.e.f. A.Y. 2026-27)			
	Technical Aptitude- I (26UCE21902)			
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	-	-	MSE:	-
Tutorials:	-	-	ICA:	50 Marks
Practical:	2	Audit	ESE:	-
Total:	2	Audit	OE/POE:	-
Course Outcomes: At the end of this course, students shall be able to				Blooms level
CO 1	Evaluate the engineering properties and suitability of sustainable building materials including timber, stones, bricks, lime, and mortar.			L5: Evaluate
CO 2	Analyze concrete mix design criteria, formwork requirements, and the properties of fresh, hardened, and bituminous materials.			L4: Analyze
CO 3	Determine structural forces, simple strains, principal stresses, bending moments, and shear forces under varying loads.			L3: Apply
CO 4	Evaluate flexural beam distributions, torsional behaviors, deflections, and buckling theories of columns.			L5: Evaluate
CO 5	Apply advanced surveying methodologies, curve setting techniques, and modern geospatial tools like Total Station, GPS, and GIS.			L3: Apply
Unit	Course Contents			No. of lectures (hrs.)
Unit:1	Building Materials & Construction: Sustainable building materials: Fly ash, stones, bricks, cement, lime, mortar, timber, plastic, concrete, steel, paints, and varnishes. Basic components of sub-structure and super-structure, building masonry, and surface finishes.			6
Unit:2	Concrete Technology & Bituminous Materials: Properties of wet and hardened concrete, tests on concrete, and factors affecting the strength of concrete. Water-cement ratio and aggregate-cement ratio. Concrete mix design and additives. Design of formwork and types of formwork. Bitumen, mastic asphalt, emulsion, cutback, and stone matrix asphalt.			6
Unit:3	Strength of Materials - Mechanics of Materials: Stresses, strains, and principal stresses. Hooke's law, elastic constants, and stress-strain relationships. Analysis of structural forces: Bending moments and shear forces across determinate structural elements.			6
Unit:4	Strength of Materials - Flexure & Columns: Bending theory of beams and deflection of beams. Shear stress distribution in beam cross-sections. Torsion theory of circular solid and hollow shafts. Theories of buckling of columns under different boundary end conditions.			6
Unit:5	Advanced Surveying & Geospatial Technology: Theodolite surveying, transit adjustments, and traverse computations. Tachometric principles and layout design of simple circular curves. Modern surveying frameworks: Total Station architecture.			6



	Global Positioning System (GPS), Remote Sensing, and Geographic Information System (GIS) mapping applications.	
Text Books:		
1)	S.K. Duggal, <i>Building Materials</i> , New Age International Publishers.	
2)	M.S. Shetty, <i>Concrete Technology: Theory and Practice</i> , S. Chand Publishing.	
3)	S. Ramamrutham, <i>Strength of Materials</i> , Dhanpat Rai Publishing Company.	
4)	B.C. Punmia, <i>Surveying (Vol. II)</i> , Laxmi Publications.	
Reference Books:		
1)	S. Timoshenko & D.H. Young, <i>Elements of Strength of Materials</i> , East-West Press.	
2)	K.R. Arora, <i>Surveying (Vol. II & III)</i> , Standard Book House.	

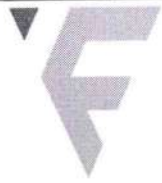


	FABTECH EDUCATION SOCIETY'S FABTECH TECHNICAL CAMPUS COLLEGE OF ENGINEERING & RESEARCH (An Autonomous Institute)			
	Second Year B. Tech. Civil Engineering			
	Semester-IV (w.e.f. A.Y. 2025-26)			
	Structural Analysis - I (26UCE22106)			
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	3	3	MSE:	30 Marks
Tutorials:	-	-	ICA:	10 Marks
Practical:	-	-	ESE:	60 Marks
Total:	3	3	OE/POE:	-
Course Outcomes: At the end of this course, students shall be able to				Blooms level
CO 1	Determine deflection and slope of beams using various methods.			L3 – Apply
CO 2	Apply energy methods to analyze structural systems.			L3 – Apply
CO 3	Analyze indeterminate structures using compatibility methods.			L4 – Analyze
CO 4	Determine support moments and internal forces in continuous beams and frames.			L3 – Apply
CO 5	Analyze indeterminate structures using the slope-deflection method.			L4 – Analyze
Unit	Course Contents			No. of lectures (hrs.)
Unit:1	Beam Deflections Calculations of deflection for determinate beams by double integration, Macaulay's method, moment area method, conjugate beam method, deflection by method of superposition.			6
Unit:2	Energy Principles Strain energy and strain energy density, strain energy in traction, shear, flexure and torsion - Castiglano energy theorem, principle of virtual work, application of energy theorems for computing deflections in beams, Maxwells reciprocal theorem, Williot Mohr diagrams.			8
Unit:3	Method of Consistent Deformation Different structural systems, concept of analysis, basic assumptions, indeterminacy, choice of unknowns, Castigliano's theorem, Indeterminate Beams: Analysis of indeterminate beams: Propped cantilever and fixed beams - fixed end moments and reactions for standard cases of loading – slopes and deflections in fixed beams.			8
Unit:4	Moment Distribution Method Analysis of continuous beams propped cantilevers, continuous beams - theorem of three moments - analysis of continuous beams settlement effects, thermal effect, Shear Force and Bending Moment diagrams for continuous beams, portal frames with and without sway.			8
Unit:5	Slope Deflection Method Analysis of continuous beams, analysis of rigid frames, frames without sway and with sway, settlement effects, introduction to difficulties in frames with sloping legs and			



	gabled frames	
Text Books:		
1)	Reddy C. S., “Basic Structural Analysis”, Tata McGraw Hill,3rd edition 2010	
2)	Wang C.K., “Statically Indeterminate Structures”, McGraw Hill	
3)	Vazirani V.N., Ratwani M.M and Duggal S.K., “Analysis of Structures - Vol. I”, ISBN NO: 978-817409-140-8	
4)	Khurmi R.S., “Theory of Structures”, S Chand, Delhi	
5)	Punmia B.C., “Structural Analysis”, Laxmi Publications	
Reference Books:		
1)	Timoshenko and Young, “Theory of structures”, McGraw Hill	
2)	Norris C. H. and Wilbur J. B., “Elementary Structural Analysis”, McGraw Hill	
3)	Kinney J. S., “Indeterminate Structural Analysis”, Oxford and IBH	
4)	Hibbler R. C., “Structural Analysis”, Pearson Publications, 9th Edition	
5)	Ramamrutham S. and Narayanan R., “Theory of Structures” Dhanpat Rai Publishers, Delhi	

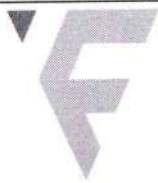


	FABTECH EDUCATION SOCIETY'S FABTECH TECHNICAL CAMPUS COLLEGE OF ENGINEERING & RESEARCH (An Autonomous Institute)			
	Second Year B. Tech. Civil Engineering			
	Semester-IV (w.e.f. A.Y. 2025-26)			
	Concrete Technology (26UCE22107)			
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	2	2	ISE:	30 Marks
Tutorials:	-	-	ICA:	10 Marks
Practical:	-	-	ESE:	60 Marks
Total:	2	2	OE/POE:	-
Course Outcomes: At the end of this course, students shall be able to				Blooms Level
CO 1	Explain the types and properties of ingredients of concrete.			BL2 – Understand
CO 2	Describe the properties of fresh concrete and factors affecting them..			BL2 – Understand
CO 3	Interpret the effect of admixtures on the properties of fresh and hardened concrete.			BL2 – Understand
CO 4	Analyze the properties and performance of hardened concrete.			BL2 – Understand
CO 5	Design concrete mixes for specified grades as per relevant standards.			BL6 – Create
Unit	Course Contents			No. of Lectures (hrs.)
Unit:1	Ingredients of Concrete Cement-manufacturing process, physical properties, hydration of cement, hydration products, chemical compounds in cement, types of cement. Aggregates- classification of aggregates, physical properties, mechanical properties, fineness and gradation of aggregates using sieve analysis, tests on aggregates. Water-specifications of water to be used for concrete, quality of water for use in concrete.			6
Unit:2	Properties of Fresh Concrete Nominal mix concrete, types of batching, mixing, transportation, placing including pumping and compaction techniques, workability, factors affecting workability, methods of measuring workability, segregation and bleeding, setting time, curing of concrete, types of curing, temperature effects on fresh concrete.			6
Unit:3	Properties of Hardened Concrete Desired properties of concrete ,strength , durability ,characteristic strength, compressive ,tensile and flexure strength of concrete ,stress-strain relationship tests on concrete ,modulus of elasticity ,effect of w/c ratio and admixtures on strength, creep and shrinkage of concrete, durability of concrete: minimum & maximum cement content, strength & durability relationship ,exposure to different conditions ,factors contributing to cracks in concrete ,sulphate attack, alkali aggregate reaction.			6
Unit:4	Admixtures & Special concretes Admixtures Role of admixture ,classification and types of admixtures like accelerators ,retarders ,plasticizers ,super plasticizers, mineral admixtures-fly ash, silica fume, ground granulated blast furnace slag .Special concretes – Lightweight concrete and its			



	types, self-compacting concrete, high density concrete, fiber reinforced concrete ,High Strength Concrete ,High Performance concrete, geo-polymer concrete and Ferrocement technique.	
Unit:5	Concrete Mix Design Factors Governing Mix Design ,Methods of Mix Design ,factors affecting the mix design ,Methods of Expressing Proportions ,Trial Mixes ,Acceptance Criteria ,Factors Causing Variations ,Quality Measurement in Concrete Construction, Non-destructive Testing of Concrete-rebound hammer test, ultrasonic pulse velocity test.	6
Text Books:		
1)	Gambhir M. L. "Concrete Technology", Tata Mc-Graw Hill 2015 15th edition	
2)	Shetty M. S. "Concrete Technology", S. Chand 2005	
3)	Krishna swamy, "Concrete Technology", Dhanapat Rai and Sons	
Reference Books:		
1)	Orchard, "Concrete Technology", Applied Science Publishers	
2)	Neville A. M., "Concrete Technology", Pearson Education	
3)	Neville A. M., "Properties of Concrete", Pearson Education	
4)	Relevant Publications by Bureau of Indian Standards, New Delhi	
5)	IS:10262(2009), IS:456 (2009), IS 4926 (2003)	



	FABTECH EDUCATION SOCIETY'S			
	FABTECH TECHNICAL CAMPUS COLLEGE OF ENGINEERING & RESEARCH			
	(An Autonomous Institute)			
	Second Year B. Tech. Civil Engineering			
	Semester-IV (w.e.f. A.Y. 2025-26)			
	Concrete Technology Lab (26UCE22108)			
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	-	-	ISE:	-
Tutorials:	-	-	ICA:	25 Marks
Practical:	2	1	ESE:	-
Total:	2	1	OE/POE:	25 Marks
Course Outcomes: At the end of this course, students shall be able to				Blooms Level
CO 1	Analyze the properties of concrete ingredients and aggregates through standard tests.			BL4-Analyse
CO 2	Determine the fresh properties of concrete using standard testing procedures.			BL3-Apply
CO 3	Evaluate the properties of hardened concrete through laboratory tests			BL2-Understand
CO 4	Design concrete mixes for specified grades as per relevant standards.			BL6-Create
CO 5	Perform quality control and verification tests on concrete and interpret the results.			BL3-Apply

List of Experiments:

ExperimentNo.1	Determination of Standard Consistency of Cement.
ExperimentNo.2	Determination of Fineness of Cement.
ExperimentNo.3	Determination of Initial and Final Setting Time of Cement.
ExperimentNo.4	Determination of Specific Gravity of Cement.
ExperimentNo.5	Soundness Test on Cement.
ExperimentNo.6	Compressive Strength Test on Cement Mortar Cubes.
ExperimentNo.7	Specific Gravity and Water Absorption Test of Coarse and Fine Aggregates.
ExperimentNo.8	Sieve Analysis of Fine and Coarse Aggregates.
ExperimentNo.9	Bulking of Fine Aggregate.
ExperimentNo.10	Workability Tests on Fresh Concrete (Slump Test, Compaction Factor Test, Flow Table Test).
ExperimentNo.11	Compression Test on Concrete Cubes.
ExperimentNo.12	Non-Destructive Testing of Concrete

Note:



1. A minimum of 08 experiments out of the above 12 experiments shall be performed and submitted in the journal by each student.
2. The journal shall contain detailed observations, calculations, results, and conclusions.
3. Practical/Oral examination shall be based on the experiments performed and the submitted journal.



	FABTECH EDUCATION SOCIETY'S FABTECH TECHNICAL CAMPUS COLLEGE OF ENGINEERING & RESEARCH (An Autonomous Institute)			
	Second Year B. Tech. Civil Engineering			
	Semester-IV (w.e.f. A.Y. 2026-27)			
	Building Planning and Design (26UCE22109)			
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	2	2	MSE:	30 Marks
Tutorials:	-	-	ICA:	10 Marks
Practical:	-	-	ESE:	60 Marks
Total:	2	2	OE/POE:	-
Course Outcomes: At the end of this course, students shall be able to				BL Level
CO1	Apply principles of building planning and relevant bye-laws of governing authorities in planning of buildings.			BL-III: Apply
CO2	Explain various utility requirements and services in buildings.			BL-II: Understand
CO3	Understand different techniques required to achieve good acoustics in buildings.			BL-V: Evaluate
CO4	Describe basic concepts of ventilation and environmental comfort in buildings.			BL-V: Evaluate
CO5	Understand principles of green building and sustainable construction practices			BL-III: Apply
Unit	Course Contents			No. of Lectures (Hrs.)
Unit :1	Principles of Building Planning Principles of building planning; importance of sun diagram and wind diagram; orientation of buildings; factors affecting orientation and criteria under Indian conditions; concept of green building – aspects at planning stage, construction stage and operational stage.			06
Unit :2	Building Service Systems Building planning bye-laws and regulations as per SP-7 and National Building Code of India (Group 1 to 5); planning of residential buildings including bungalows, row bungalows, apartments and twin bungalows; procedure for approval of building permission; significance of commencement certificate, plinth completion certificate and occupancy certificate.			06
Unit :3	Water Supply and Drainage Systems Different materials used in systems such as stoneware, GI, AC, CI, PVC and HDPE; various types of traps, fittings and inspection chambers; need for septic tank; concept of plumbing and drainage systems; introduction to rainwater harvesting; concept of rainwater gutters, outlets and downpipe systems. Electrification: wiring types, requirements & location of various points, and concept of earthing. Fire resistance in building: Fire protection precautions, confining of fire, fire hazards, characteristics of fire resisting materials, building materials and their resistance to fire.			06
Unit :4	Building Ventilation Definition, necessity of ventilation, functional requirements, various system & selection criteria. Air conditioning: Purpose, classification, principles, various systems			06

	Thermal Insulation: General concept, Principles, Materials, Methods, Computation of Heat loss & heat gain in Buildings.	
Unit:5	Principles of Acoustics and Green Construction Absorption of sound, various materials, Sabine's formula, optimum reverberation time, conditions for good acoustics Sound insulation: Acceptable noise levels, noise prevention at its source, transmission of noise, Noise control-general considerations. Green Building: Concept, Principles, Materials, Characteristics, Applications.	06
Text Books:		
1)	Shah, Kale, Pataki, "Building Drawing", Tata McGraw- Hill	
2)	Sane Y. S., "Building Design and Drawing", Allied Book Stall, Pune	
Reference Books:		
1)	Jain V.K., "Automation Systems in Smart and Green Buildings", Khanna Publishers, N. Dehli ISBN No 978-81-7409-237-3	
2)	Jain V.K., "Handbook of Designing and Installation of Services in High Rise Building Complexes", Khanna Publishers, N. Dehli, ISBN No. 978-81-7409-245-8	
3)	SP 7- National Building Code Group 1 to 5- B.I.S. New Delhi	
4)	I.S. 962 – 1989 Code for Practice for Architectural and Building Drawings	



Course List of MDM

MDM offered by Civil Engineering

Department	MDM Domain	Semester	Courses in Domain	Subject Code	Offered to Programs
Civil	Construction Safety & Infrastructure Risk Management	III	Introduction to Construction Safety Engineering	26UCE21401	Mech, CSE, AIDS, Elect, E&TC
		IV	Construction Site Safety and Labour Welfare Regulations	26UCE22402	
		V	Infrastructure Risk Assessment and Hazard Management	27UCE31403	
		VI	Occupational Health and Safety in Construction Projects	27UCE32404	
		VII	Disaster-Resilient and Safe Infrastructure Planning	28UCE41405	



	FABTECH EDUCATION SOCIETY'S FABTECH TECHNICAL CAMPUS COLLEGE OF ENGINEERING & RESEARCH (An Autonomous Institute)			
	Second Year B. Tech. Civil Engineering			
	Semester-IV (w.e.f. A.Y. 2025-26)			
	Construction Site Safety and Labour Welfare Regulations (26UCE22402)			
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	3	3	MSE:	30 Marks
Tutorials:	-	-	ICA:	10 Marks
Practical:	-	-	ESE:	60 Marks
Total:	3	3	OE/POE:	-
Course Outcomes: At the end of this course, students shall be able to				Blooms Level
CO1	Explain labour characteristics and issues in the construction industry.			BL II- Understand
CO2	Interpret labour laws and statutory provisions applicable to construction projects.			BL III- Apply
CO3	Apply labour welfare and safety provisions at construction sites.			BL III- Apply
CO4	Implement labour standards related to wages, working conditions, and social security.			BL III- Apply
CO5	Analyze labour disputes and industrial relations in construction projects.			BL IV- Analyse
Unit	Course Contents			No. of lectures (hrs.)
Unit:1	The Construction Labor Ecosystem & Administrative Framework Profile of Construction Labour: Nature of the construction workforce (unskilled, semi-skilled, skilled); Migrant labor issues, seasonal employment, and socio-economic vulnerabilities. Site Organization: Administrative hierarchy on a construction site; Roles of Principal Employer, Contractors, Sub-contractors, and Labour Enforcement Officers. Child Labour Prohibition: Definitions, provisions, and strict prohibition of child labor in hazardous construction occupations (as per Child Labour Prohibition and Regulation Acts).			7
Unit:2	Core Labour Legislation & Employment Terms: Contract Labour Regulation: Detailed study of the Contract Labour (Regulation and Abolition) Act—registration of establishments, licensing of contractors, and welfare obligations of principal employers. The BOCW Act: Central themes of The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act. Inter-State Migrant Workmen: Regulations governing the employment of interstate migrant workers, journeys allowances, and registration processes.			7
Unit:3	On-Site Welfare Facilities & Infrastructure Design: Mandatory Amenities: Statutory obligations for providing clean drinking water, adequate latrines and urinals (gender-segregated), washing facilities, and rest rooms on-site. Canteens and Creches: Criteria for mandatory provisioning of site canteens and creches for children of female construction workers.			7

	Temporary Labour Camps: Guidelines for humane labor housing—space requirements, ventilation, drainage, electricity, and vector-borne disease control.	
Unit:4	Wages, Social Security, and Employee Compensation: Wage Regulations: Understanding the Minimum Wages Act, Code on Wages, payment timelines, authorized deductions, and overtime calculations. Gender Pay Equity: Equal Remuneration Act principles—prevention of gender discrimination in wages and hiring practices. Social Security and Compensation: Employee’s Compensation Act—employer’s liability for accident/fatal compensation, calculation of compensation based on age and injury type; Overview of EPFO (Provident Fund) and ESIC applicability to construction sites.	8
Unit: 5	Industrial Relations, Grievances, and Compliance Audits: Industrial Disputes: Introduction to trade unions in construction, strike/lockout concepts, and dispute settlement machinery (Conciliation, Arbitration, and Adjudication). Statutory Compliance Management: Maintenance of mandatory site registers (Muster roll, Register of wages, Register of deductions, Register of fines, Accident register). Labour Auditing: Preparing for periodic visits from government labor inspectors, handling non-compliance notices, and conducting internal labor welfare audits.	7
Text Books:		
1)	Padhi, P. K. (2019). <i>Labour and Industrial Laws</i> (4th ed.). PHI Learning Pvt. Ltd.	
2)	Srivastava, S. C. (2022). <i>Industrial Relations and Labour Laws</i> . Vikas Publishing House.	
3)	Punmia, B. C., & Khandelwal, K. K. (2016). <i>Project Planning and Control with PERT/CPM</i> (Chapter on Construction Management &Labour Welfare). Laxmi Publications.	
Reference Books:		
1)	Ministry of Law and Justice, India: <i>The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996.</i>	
2)	Taxmann’s: <i>Labour Laws with Code on Wages and Social Security Code</i> (Latest Edition).	
3)	International Labour Organization (ILO): <i>Safety, Health and Welfare on Construction Sites: A Training Manual.</i>	
4)	Malik, P. L. (2021). <i>Handbook of Labour and Industrial Law</i> . Eastern Book Company.	



Course List of Open Electives

Department	Semester	Name of Subjects	Subject Code
Civil	III	Climate Change and Mitigation	26UOE21501 B
	IV	Waste Management Recycle	26UOE22502 B
	V	Green Technology	26UOE31503 B



	FABTECH EDUCATION SOCIETY'S FABTECH TECHNICAL CAMPUS COLLEGE OF ENGINEERING & RESEARCH (An Autonomous Institute)			
	Second Year B. Tech. Civil Engineering			
	Semester-IV (w.e.f. A.Y. 2026-27)			
	Waste Management Recycle (25UCE22502B)			
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	3	3	MSE:	30 Marks
Tutorials:	-	-	ICA:	10 Marks
Practical:	-	-	ESE:	60 Marks
Total:	3	3	OE/POE:	-
Course Outcomes: At the end of this course, students shall be able to				BL Level
CO1	Identify and classify different types of waste and explain fundamental concepts of waste management and recycling.			BL-II: Understand
CO2	Explain solid waste management systems and analyze regulatory frameworks and operational practices.			BL-IV: Analyze
CO3	Analyze recycling techniques and evaluate resource recovery methods from waste.			BL-V: Evaluate
CO4	Apply appropriate management strategies for hazardous, biomedical, and electronic waste.			BL-III: Apply
CO5	Design sustainable waste management solutions and propose innovative recycling strategies for environmental sustainability.			BL-VI: Create
Unit	Course Contents			No. of Lectures (Hrs.)
Unit 1	Introduction to Waste Management: Types of waste: solid, liquid, hazardous, biomedical, e-waste, Sources and classification of waste, Waste generation trends, Principles of waste management (3R, 5R, circular economy), Environmental and health impacts of waste			06
Unit 2	Solid Waste Management Systems: Municipal solid waste (MSW) management, Collection, segregation, storage, and transportation, Waste characterization and sampling, Role of smart technologies in waste management, Legal framework and policies in India (SWM Rules 2016)			06
Unit 3	Recycling and Resource Recovery: Recycling processes for paper, plastic, metal, glass, Composting and vermin composting, Material recovery facilities (MRF), Waste-to-energy technologies, Economic and environmental benefits of recycling			06
Unit 4	Hazardous, Biomedical and E-Waste Management Hazardous waste characteristics and treatment, Biomedical waste management systems, E-waste generation and recycling, National and international regulations, Risk assessment and safety measures			06
Unit 5	Sustainable Waste Management and Innovation: Sustainable waste management models, Zero-waste concept, Extended Producer Responsibility (EPR), Green technologies and smart cities, Case studies and project-based learning			06
Text Books:				
3)	Tchobanoglous, G., Theisen, H., & Vigil, S. <i>Integrated Solid Waste Management: Engineering Principles and Management Issues</i> , McGraw-Hill.			
4)	Peavy, H. S., & Row, D. R. <i>Environmental Engineering</i> , McGraw-Hill.			
5)	Kumar, S., & Bhattacharya, S. <i>Solid Waste Management</i> , Tata McGraw-Hill.			

Reference Books:	
5)	CPHEEO, Government of India <i>Manual on Municipal Solid Waste Management</i> , Ministry of Housing and Urban Affairs.
6)	UNEP (United Nations Environment Programme) <i>Global Waste Management Outlook</i> .
7)	WHO <i>Safe Management of Wastes from Health-Care Activities</i> .
In Semester Examination (MSE):	
MSE shall be based upon student's performance in three tests conducted and evaluated at institute level	



	FABTECH EDUCATION SOCIETY'S			
	FABTECH TECHNICAL CAMPUS COLLEGE OF ENGINEERING & RESEARCH			
	(An Autonomous Institute)			
	Second Year B. Tech. Civil Engineering			
	Semester-VI (w.e.f. A.Y. 2026-27)			
	Building Planning & Drawing using CAD (26UCE22251)			

Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	-	-	MSE:	-
Tutorials:	-	-	ICA:	50 Marks
Practical:	4	2	ESE:	-
Total:	4	2	OE/POE:	50Marks

Course Outcomes: At the end of this course, students shall be able to		BL Level
CO1	Prepare architectural drawings of residential buildings including plans, sections, elevations, and municipal submission drawings as per building bye-laws.	BL3: Apply
CO2	Develop center line plans and foundation layouts for residential buildings using standard drafting practices.	BL3: Apply
CO3	Design building service layouts including furniture arrangement, electrical wiring, lighting systems, and drainage networks.	BL3: Apply
CO4	Apply principles of building planning, anthropometry, and building services in preparing functional building drawings.	BL4: Analyze
CO5	Incorporate sustainable building concepts such as rainwater harvesting and environmentally responsible building practices into building design.	BL4: Analyze

Exp. No	Course Contents	No. of Hours (Hrs.)
1	Architectural drawing (Plan, section & elevation of a building) apartment, row house etc	02
2	Municipal drawing	02
3	Center line plan	02
4	Foundation plan	02
5	Furniture layout	02
6	Electrical / lighting layout	02
7	Drainage layout	02
8	Rain water Harvesting Drawing	02

Note: *Practicals for this course shall be conducted using both conventional drawing sheets and CAD software, and students shall complete and submit the assigned drawings in the prescribed mode.*



	FABTECH EDUCATION SOCIETY'S			
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	Second Year B. Tech. Civil Engineering			
	Semester-IV (w.e.f. A.Y. 2025-26)			
Economics for Engineers (26UET22806)				
Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	1	1	MSE:	
Tutorials:	-	-	ICA:	25 Marks
Practical:	-	-	ESE:	
Total:	1	1	OE/POE:	-
Course Outcomes: At the end of this course, students shall be able to				Blooms Level
CO1	Understand the fundamental concepts of economics and their relevance to engineering and technology.			Understand (L2)
CO2	Develop awareness of economic factors affecting engineering projects, industries, and society.			Apply (L3)
CO3	Apply basic economic principles in decision-making related to cost, resources, productivity, and efficiency.			Apply (L3)
CO4	Understand personal finance and financial planning, including saving, investment, and budgeting.			Understand (L2)
CO5	Recognize the importance of sustainable economic development and the role of engineers in contributing to economic growth and societal well-being.			Understand (L2)
Unit	Course Contents			No. of lectures (hrs.)
Unit :1	Introduction to Economics (4 Hours) - Basic Economic Concepts - Scarcity, Choice, and Opportunity Cost - Microeconomics and Macroeconomics - Role of Engineers in Economic Development			04
Unit :2	Demand, Supply, and Market (3 Hours) - Demand and Supply Concepts - Market Equilibrium - Consumer Behavior - Market Structures (Overview)			03
Unit :3	Personal Finance and Financial Awareness - Saving and Investment - Banking System - Digital Payments - Financial Planning for Young Professionals			03
Unit :4	Economics in Engineering Practice - Cost Concepts - Cost-Benefit Analysis - Productivity and Efficiency - Sustainable Development and Green Economy			03
Text Books:				
1)	Engineering Economics – R. Panneerselvam			
2)	Engineering Economics – S. C. Sharma			
3)	Engineering Economics, Estimation and Costing by S. K. Bhattacharya			

<i>Reference Books:</i>	
1)	<i>Engineering Economy</i> – William G. Sullivan et al.
2)	<i>Principles of Economics</i> – N. Gregory Mankiw
3)	Fundamentals of Engineering Economics is a textbook by Chan S. Park
4)	Engineering Economy by Leland Blank and Anthony Tarquin



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	(An Autonomous Institute)		
	Second Year B. Tech. Civil Engineering		
	Semester-IV (w.e.f. A.Y. 2025-26)		
	Economics for Engineers Lab (26UET22807)		

Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	-	-	ISE:	-
Tutorials:	-	-	ICA:	25 Marks
Practical:	2	1	ESE:	-
Total:	2	1	OE/POE:	-

Course Outcomes: At the end of this course, students shall be able to			Blooms Level
CO 1	Explain fundamental economic concepts and their relevance to engineering decisions.		BL2-Understand
CO 2	Analyze demand, consumer behavior, and market equilibrium using economic principles.		BL4-Analyse
CO 3	Apply financial planning and banking concepts for personal and professional decision-making.		BL3-Apply
CO 4	Evaluate the economic feasibility of engineering projects using cost-benefit analysis.		BL5-Evaluate
CO 5	Assess sustainable development practices and their economic implications.		BL5-Evaluate

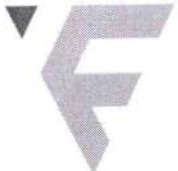
List of Experiments:

ExperimentNo.1	Understanding Scarcity and Opportunity Cost
ExperimentNo.2	Microeconomics vs Macroeconomics Case Analysis
ExperimentNo.3	Engineers and Economic Development Study
ExperimentNo.4	Demand Survey and Demand Curve Preparation
ExperimentNo.5	Market Equilibrium Simulation
ExperimentNo.6	Consumer Behavior Analysis
ExperimentNo.7	Personal Budget and Financial Planning
ExperimentNo.8	Comparative Study of Banking and Digital Payments
ExperimentNo.9	Cost-Benefit Analysis of an Engineering Project
ExperimentNo.10	Sustainable Development and Green Economy Assessment

Text Books:

1)	Engineering Economics – R. Panneerselvam
2)	Engineering Economics – S. C. Sharma



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	(An Autonomous Institute)			
	Second Year B. Tech. Civil Engineering			
	Semester-IV (w. e. f. A.Y. 2026-27)			
	Universal Human Values (26UGS22801)			
Teaching Scheme:			Evaluation Scheme (VEC):	
	No. of Hrs./week	No. of Credits		
Lectures:	2	2	MSE:	--
Tutorials:	-	-	ICA:	50 Marks
Practical:	-	-	ESE:	--
Total:	2	2	OE/POE:	--
Course Outcomes: At the end of this course, students shall be able to				
				BL Level
CO1	Explain the concept of value education, self-exploration, and the role of right understanding in achieving continuous happiness and prosperity.			BL-II: Understand
CO2	Analyze the relationship between the self and the body, distinguish their needs, and evaluate the importance of self-regulation and health for harmonious living.			BL-IV: Analyze
CO3	Examine human values such as trust and respect and illustrate their significance in establishing harmony within family, society, and the universal human order.			BL-IV: Analyze
CO4	Interpret the interconnectedness and mutual fulfillment among various orders of nature and explain the concept of harmony in existence.			BL-II: Understand
CO5	Apply the principles of universal human values and professional ethics to evaluate ethical issues and develop value-based approaches in personal and professional life.			BL-III: Apply
Unit	Course Contents			No. of Lectures (Hrs.)
Unit:1	Introduction to Value Education Understanding Value Education ,Self-exploration as the Process for Value Education, Continuous Happiness and Prosperity the Basic Human Aspirations ,Right Understanding, Relationship and Physical Facility ,Happiness and Prosperity – Current Scenario, Method to Fulfil the Basic Human Aspirations			04
Unit :2	Harmony in the Human Being Understanding Human being as the Co-existence of the Self and the Body ,Distinguishing between the Needs of the Self and the Body ,The Body as an Instrument of the Self ,Understanding Harmony in the Self ,Harmony of the Self with the Body, Programme to Ensure self-regulation and Health			04
Unit :3	Harmony in the Family and Society Harmony in the Family – the Basic Unit of Human Interaction ,Values in Human-to-Human Relationship ,‘Trust’ – the Foundational Value in Relationship ,‘Respect’ – as the Right Evaluation ,Understanding Harmony in the Society ,Vision for the Universal Human Order			04
Unit :4	Harmony in the Nature (Existence) Understanding Harmony in the Nature -Interconnectedness, Self-regulation and Mutual Fulfillment among the Four Orders of Nature ,Realizing Existence as Co-existence at All Levels ,The Holistic Perception of Harmony in Existence			04
Unit : 5	Implications of the Holistic Understanding – a Look at Professional Ethics Natural Acceptance of Human Values ,Definitiveness of (Ethical) Human Conduct A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order ,Competence in Professional Ethics ,Holistic Technologies, Production			



	Systems and Management Models-Typical Case Studies ,Strategies for Transition towards Value-based Life and Profession .	
Text Books:		
1)	Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1	
2)	Teachers' Manual for A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2	
Reference Books:		
1)	Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.	
2)	Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.	
3)	The Story of Stuff (Book).	
4)	The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi	





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Second Year B.Tech. Civil Engineering

Semester-IV (w.e.f.A.Y.2026-27)

Advanced Quantitative Ability (26UGS22404)

Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	1	1	MSE:	-
Tutorials:	-	-	ICA:	50 Marks
Practical:	-	-	ESE:	-
Total:	1	1	OE/POE:	-

Course Outcomes :At the end of this course, students shall be able to			Blooms Level
CO 1	Apply concepts of work efficiency, time rates, team work, and pipes &cisterns to solve practical work-based problems.		BL3 – Apply
CO 2	Solve problems involving speed, distance, relative motion, trains, boats & streams, and escalators.		BL3 – Apply
CO 3	Solve commercial mathematics problems involving profit-loss, discounts, partnerships, MRP, and faulty weights.		BL3 – Apply
CO 4	Apply simple and compound interest concepts in financial calculations, Population growth, and installment-based applications.		BL3 – Apply
CO 5	Use counting techniques, arrangements, selections, and probability concepts to solve analytical and real-life problems involving dice, cards, balls, and coins.		BL3 – Apply

Unit	Course Contents	No. of Lectures (hrs.)
Unit:1	Time and Work Time and Work, concept of work efficiency, individual vs. team work, alternate days work schedules, Problems based on number of person, combinations of two or more different type of persons, Multiple time rate problems, Useful results, Pipes and Cisterns.	6
Unit:2	Speed, Time and Distance Unit conversion, Average speed, Interrelation, Relative speed, Useful results, Problems on Trains, Problems on Boats and Streams, Problems on Escalators.	6
Unit:3	Profit and Loss Definitions of cost price and selling price, calculation of markup and discount, Successive discounts, and problems involving faulty weights, Partnership, Discount on MRP, Successive Discount.	5
Unit:4	Simple Interest and Compound Interest Simple interest and compound interest, finding the difference between them over multiple years, population growth models, and installment schemes.	4

Unit:5	Permutation and Combinations ,Probability Fundamental principle of counting, linear and circular arrangements, selection methods, permutations, combinations and distribution problems, Useful results, basic problems of probability based on Dice, Balls, Playing Cards, Coin.	5
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Text Books:

- 1) Quantitative Aptitude by R.S.Aggarwal, S.Chand Publishing.
- 2) Quantitative Aptitude for Competitive Examinations: Abhijit Guha, McGraw Hill India

Reference Books:

- 1) Fast Track Objective Arithmetic: Rajesh Verma, Arihant Publications
- 2) Magical Book on Quicker Maths : M.Tyra, BSC Publishing Co.Pvt.Ltd.
- 3) Quantitative Aptitude Quantum CAT: Sarvesh Kumar Verma, Arihant Publications
- 4) Objective Arithmetic :R.S.Aggarwal ,S.Chand Publishing
- 5) How to Prepare for Quantitative Aptitude for CAT: Arun Sharma,Mc Graw Hill India

In Semester Examination (MSE): MSE shall be based upon student's performance in three tests conducted and evaluated at institute level





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(An Autonomous Institute)**

Second Year B. Tech. Civil Engineering

Semester-IV (w.e.f. A.Y. 2025-26)

Environmental Studies (26UCE22901)

Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	1	-	MSE:	-
Tutorials:	-	-	ICA:	50 Marks
Practical:	-	-	ESE:	-
Total:	1	-	OE/POE:	-

Course Outcomes: At the end of this course, students shall be able to			Blooms Levels
CO 1	Apply the water treatment concept and methods.		BL3 (Apply)
CO 2	Prepare basic process designs of water and wastewater treatment plants.		BL6 (Create)
CO 3	Apply the wastewater treatment concept and methods.		BL3 (Apply)
CO 4	Apply the solid waste management concepts.		BL3 (Apply)
CO 5	Explain the sources, types, effects, and control measures of air pollution, and assess the role of atmospheric conditions in the dispersion of air pollutants.		BL4 (Analyze)

Unit	Course Contents	No. of lectures (hrs.)
Unit:1	Introduction Environment and its components, importance of water, role of environmental engineer, sources of water, water demand: Design flow, design period, design population, factors affecting water consumption, variation in demand, and design capacity for water supply components, quality of water: Physical, chemical, biological characteristics, Indian standard for quality of potable water	6
Unit:2	Treatment of Water Conveyance of raw water: Canals and pipelines, hydraulics of conduits, laying and jointing of pipelines, testing of pipe lines, designing of rising main, type of valves, types of pumps, intake structure, types of intake structures, necessity of water treatment processes Types of Treatments: Aeration: Necessity, methods, removal of taste and odour, design of aeration fountain Sedimentation: Suspended Solids, settling velocity, types of sedimentation tanks, surface loading, detention time, inlet and outlet arrangements Coagulation: Necessity, coagulant dosage, choice of coagulants, optimum pH Rapid Mixing: Necessity, gravitational, mechanical, pneumatic devices Slow Mixing and Flocculation: Design of flocculation chamber, mean velocity gradient, design of clari-flocculator, plate settler and tube settler Filtration: Theory of filtration, filter materials, types of filters, components, working and cleaning of filters Disinfection: Theory of disinfection, factors affecting, efficiency of disinfection, types of disinfectants, break point chlorination, bleaching powder estimation Water softening methods: Lime-soda, ion exchange method, demineralization	7

Unit:3	System of Water Supply Continuous and intermittent system, type of distribution systems, layouts, methods of supply: gravity, pumping and combination, hydraulic analysis of distribution system	6
Unit:4	Treatment Treatment of Waste Water Sources of wastewater flows, components of wastewater flows, wastewater constituents, characteristic of municipal waste water, necessity of treatment of waste water, sewerage systems, concept of sewage, sullage, storm water, introduction of preliminary treatment, primary treatment, secondary treatment, introduction to tertiary or advanced treatment fundamentals of anaerobic treatment, sewage and industrial waste of common origin, types Treatment of Solid Waste Types, sources, characteristics, ill-effects of improper solid waste management, collection, processing techniques, methods of treatment of solid waste-composting, incineration, pyrolysis and sanitary land filling. biodegradable, non-degradable segregation of solid waste, concept of hazardous waste management, e-waste disposal	7
Unit:5	Air Pollution Definition, sources of air pollution, types air pollutants, atmospheric stability, mixing heights, plume types and meteorological parameters, effects of air pollution, control measures of air pollution	4

Text Books:

1)	Rao and Rao, "Air Pollution ", Tata McGraw Hill Publications, New Delhi, 1990
2)	Garg S. K., "Water Supply Engineering", Khanna Publishers, New Delhi
3)	Birdi J. S. and Birdi G. S., "Water Supply & Sanitary Engineering", DhanpatRai Pub. Company, 8th edition, New Delhi

Reference Books:

1)	Peavy and Rowe, "Environmental Engineering", McGraw Hill Publications
2)	Stern, "Environmental Engineering", Vol. I to IV, McGraw Hill Publications
3)	Sharma and Kaur, "Environmental Chemistry", Goyal Publisher
4)	Government Of India Publication, "Water Supply and Treatment Manual"
5)	Fair and Geyr, "Environmental Engineering", McGraw Hill Publications

In Semester Examination (MSE): MSE shall be based upon student's performance in three tests conducted and evaluated at institute level





**FABTECH EDUCATION SOCIETY'S
FABTECH TECHNICAL CAMPUS COLLEGE OF ENGINEERING &
RESEARCH**

(An Autonomous Institute)

Second Year B. Tech. Civil Engineering

Semester-IV (w.e.f. A.Y. 2026-27)

Technical Aptitude- II (26UCE22903)

Teaching Scheme:			Evaluation Scheme:	
	No. of Hrs./week	No. of Credits		
Lectures:	-	-	MSE:	-
Tutorials:	-	-	ICA:	50 Marks
Practical:	2	Audit	ESE:	-
Total:	2	Audit	OE/POE:	-

Course Outcomes: At the end of this course, students shall be able to			Blooms Levels
CO 1	Evaluate the internal stresses, strains, principal planes, and shear force/bending moment behaviors for determinate structural elements.		BL3 – Apply
CO 2	Analyze flexural beam stresses, shear stress distributions, torsional configurations, and buckling parameters of columns.		BL3 – Apply
CO 3	Determine the engineering physical characteristics, test criteria, workability, and mechanical mix designs of fresh and hardened concrete.		BL3 – Apply
CO 4	Explain the core rules of integrated building planning, local building byelaws, and basic structural components of masonry and foundations.		BL3 – Apply
CO 5	Synthesize technical concepts across Structural Mechanics, Concrete Technology, and Building Planning to clear objective technical competitive aptitude assessments.		BL3 – Apply

Unit	Course Contents	No. of lectures (hrs.)
Unit:1	Stresses, strains, principal stresses, bending moments, shear forces across determinate structural elements, Hooke's law, elastic constants, cross-relationship interdependencies.	6
Unit:2	Bending theory of beams, deflection parameters of beams, theories of buckling of columns, struts under varying boundary end conditions, torsion theory of circular solid shafts, hollow shafts.	8
Unit:3	Properties of wet concrete, properties of hardened concrete, tests on concrete, factors affecting concrete strength, water-cement ratio, aggregate-cement ratio.	8
Unit:4	Concrete mix design guidelines, calculation parameters, chemical additives, mineral additives, design of formwork, types of formwork configurations.	8
Unit:5	Principles of building planning and design, integrated approach, building byelaws, vertical transportation, water supply sanitation, thermal ventilation, lighting, acoustics, fire protection, electrical fittings, types of foundations, stones, brick masonry, block masonry, steel structures, reinforced cement concrete structures, floors, doors, windows, roofs, finishing works, water proofing.	6

Text Books:

1)	S. Ramamrutham, Strength of Materials, Dhanpat Rai Publishing Company.
2)	M.S. Shetty, Concrete Technology: Theory and Practice, S. Chand Publishing.
3)	Y.S. Sane, Planning and Designing Buildings, Allies Book Stall.

4)	GATE Civil Engineering Chapter-wise Solved Papers, GK Publications.
Reference Books:	
1)	Civil Engineering: Through Objective Type Questions - S.P. Gupta and S.S. Gupta.

