



Sanmarg Shikshan Sanstha's
SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING
AN AUTONOMOUS INSTITUTE

NAAC ACCREDITED

Recognized by Government of Maharashtra & AICTE New Delhi
Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
Near Dighori Naka, Umrer Road, Nagpur - 440 034
Mob. : 9881014701, 9823464644, 8983550843
Email : admin@srpce.ac.in • website : www.srpce.ac.in

CIVIL ENGINEERING DEPARTMENT

Vision

To be a center of excellence in Civil Engineering education, research, and innovation by producing competent engineers who contribute to sustainable infrastructure and societal development.

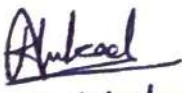
Mission

- Provide high-quality education through a strong foundation in civil engineering principles and modern technologies.
- Promote research, innovation, and lifelong learning to solve real-world engineering problems.
- Foster ethical values, environmental responsibility, and professional excellence among students.
- Strengthen industry-academia collaboration through internships, projects, and consultancy.
- Encourage community service and sustainable development practices for societal benefit.

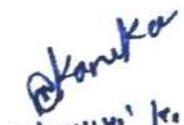
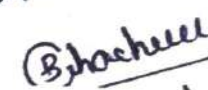
Objectives

1. To promote research, innovation, and sustainable engineering solutions.
2. To strengthen industry collaboration through internships, training, and live projects.
3. To develop technical competence, leadership, and ethical values.
4. To enhance employability through skill development and career guidance.
5. To encourage lifelong learning and professional excellence.


Dr. A.S. Moon


A.A. Kukade


Dr. P.S. Lanjewar


Ms. Dipika Kamble

Mayumi K.

chah



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Program Specific Outcomes (PSOs)

PSO1: Structural and Infrastructure Engineering

Apply the principles of structural engineering, geotechnical engineering, transportation engineering, environmental engineering, and water resources engineering to analyze, design, construct, and maintain safe, sustainable, and economical civil engineering infrastructure.

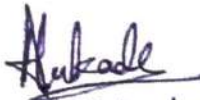
PSO2: Modern Engineering Tools and Project Management

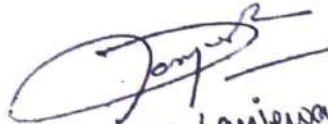
Use modern software tools such as AutoCAD, STAAD.Pro, ETABS, Revit, Civil 3D, and GIS, along with project management techniques, to solve real-world civil engineering problems and execute projects efficiently.

PSO3: Sustainable and Professional Practice

Plan, design, and implement civil engineering solutions that address societal needs while adhering to professional ethics, environmental sustainability, quality standards, and safety regulations.

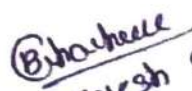

Dr. A.S. Moon
Chairman BOS


A.A. Kulkarni


Dr. P.S. Lanjewar
Dean Aca.


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Ms. Dipsha Kamble


Bhagyesh Chaudhary



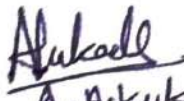
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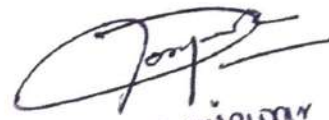
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Program Educational Objectives (PEOs)

1. **Professional Competence:** Graduates will apply civil engineering knowledge and modern engineering tools to solve real-world infrastructure and construction problems.
2. **Successful Career:** Graduates will establish successful careers in industry, government organizations, higher education, or entrepreneurship in the field of civil engineering.
3. **Ethics and Social Responsibility:** Graduates will practice engineering with professional ethics, environmental awareness, and a commitment to sustainable development.
4. **Leadership and Teamwork:** Graduates will demonstrate leadership qualities, effective communication, and the ability to work collaboratively in multidisciplinary teams.
5. **Lifelong Learning:** Graduates will engage in continuous learning through advanced studies, professional certifications, research, and skill development to adapt to technological advancements.

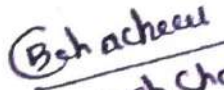

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Rajesh Kumar


Ms. Divisha Kamble


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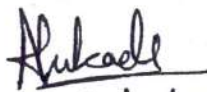
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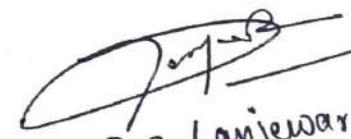
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Program Outcome (POs):

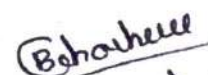
- PO1: Engineering Knowledge: Apply knowledge of mathematics, science, engineering fundamentals, and civil engineering principles to solve complex engineering problems
- PO2: Problem Analysis: Identify, formulate, review research literature, and analyze complex civil engineering problems using first principles.
- PO3: Design/Development of Solutions: Design systems, components, or processes that meet specified needs while considering public health, safety, cultural, societal, and environmental factors.
- PO4: Investigations of Complex Problems: Conduct investigations using research-based knowledge, including designing experiments, analyzing data, and drawing valid conclusions.
- PO5: Modern Tool Usage: Use appropriate engineering and IT tools, including modeling and simulation software, with an understanding of their limitations.
- PO6: Engineer and Society: Apply contextual knowledge to assess societal, health, safety, legal, and cultural issues relevant to engineering practice.
- PO7: Environment and Sustainability: Understand the impact of engineering solutions on the environment and apply sustainable development principles.
- PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities.
- PO9: Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and multidisciplinary settings.
- PO10: Communication: Communicate effectively through reports, presentations, drawings, and interactions with the engineering community and society.
- PO11: Project Management and Finance: Apply engineering and management principles to manage projects and understand financial aspects.
- PO12: Life-long Learning: Recognize the need for and engage in independent, lifelong learning to adapt to technological advancements

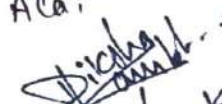

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Ms. Dipika Kamble

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CREDIT FRAMEWORK STRUCTURE as per NEP & UGC Regulations(W.e.f.2026-27)

Credits as per Govt.	SEMESTER	COURSE CATEGORY	I	II	III	IV	V	VI	VII	VIII	Total Credits	Condition in which semester is to be used.
14---18	Basic Science Course	[30] BSC/ESC	7	8							15	B.Tech- I & II Sem ONLY
			6---8	8---10							14---18	
16---12	Engineering Science Course		9	6							15	B.Tech- I & II Sem ONLY
			10---8	6---4							16---12	
44---56	Program Core Course (PCC)	[64---76] PCC		2	10	10	10	8	4		44	B.Tech-III, IV,V,VI,VII & VIII Sem.
		{Professional Core Courses}		2	8---10	8---10	10---12	8---10	4---6	4---6	44---56	
20	Program Elective Course (PEC)						4	8	2	6	20	B.Tech-V, VI, VII & VIII Sem.
							4	8	2	6	20	
14	Multidisciplinary Minor (MDM) Multidisciplinary	[22] MDM			2	2	3	3			14	B.Tech-III, IV, V, VI, VII & VIII Sem.
	Open Elective (OE) Other than a particular program				2	2	4	2	2	2	14	
8					3	3	2				8	B.Tech-III, IV & V Sem.
					4	2	2				8	
4+4=8	Vocational and Skill Enhancement Course (VSEC)	VSEC(Skill Courses [4+4=08])	VSEC-I=2	VSEC-II=2		VSEC-III=2		VSEC-IV=2			8	B.Tech-I, II Sem & III, IV Sem & V, VI Sem.
			VSEC-I=2	SEC-I=2		VSEC-II=2		SEC-II=2			8	
4	Ability Enhancement Course (AEC-01, AEC-02) (AEC)	Humanities Social Science and Management (HSSM) [14]	2			2					4	B.Tech-I, II Sem & III, IV Sem
			AEC-I=2			AEC-II=2					4	
4	Entrepreneurship/Economic/Management Courses				2	2					4	B.Tech- III & IV Sem ONLY.
2	Indian Knowledge System (IKS)			2							2	B.Tech- I Or II Sem ONLY
				2							2	
4	Value Education Course (VEC)				2	2					4	B.Tech- III & IV Sem ONLY.
					2	2					4	
4	Research Methodology	Experiential Learning Courses [22]							4		4	B.Tech- VIII Sem. ONLY.
									4		4	
2	Comm.Engg.Project (CEP)/Field Project (FP)				2						2	B.Tech- III Or IV Sem ONLY.
					2						2	
4	Project								4		4	B.Tech-VII & VIII Sem.
									4		4	
12	Internship/OJT									12	12	B.Tech-VII Or VIII Sem.
										12	12	
4	Co-curricular Courses (CC)	Liberal Learning Courses	2	2							4	B.Tech- I & II Sem ONLY
			2	2							4	
164---176	Total Credits										164	
											164-176	

NOTE:- In Colour row credits indicates as per NEP/UGC Circular. Whereas in white row credits are allotted

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Chairman BOS

Dr. S.M. Gajbhiye

D.L. Budhani

Purey
E& P.K. Morey

F.M. Hingane

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S.V. Pathan



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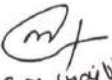
SRPCE/ Dean Academics/2026-27/

Date: 20/08/2026

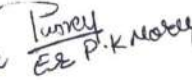
All BOS Chairmans of various department are advised to maintain the credit structure of different semesters are as given below

Semester	Total credits	CREDITS															CC	Cumulative credit
		BSC	ESC	PCC	PEC	MDM	OE	VSEC	AEC	ENTR/ ECO/ MANAG.	IKS	VEC	RM	CEP/FP	PROJECT	INTER/ OJT		
B.Tech- I SEM	22	7	9	-	-	-	-	2	2	-	-	-	-	-	-	-	2	22
B.Tech- II SEM	22	8	6	2	-	-	-	2	-	-	2	-	-	-	-	-	2	44
B.Tech- III SEM	21	-	-	10	-	2	3	-	-	2	-	2	-	2	-	-	-	65
B.Tech- IV SEM	23	-	-	10	-	2	3	2	2	2	-	2	-	-	-	-	-	88
B.Tech- V SEM	19	-	-	10	4	3	2	-	-	-	-	-	-	-	-	-	-	107
B.Tech- VI SEM	21	-	-	8	8	3	-	2	-	-	-	-	4	-	4	-	-	128
B.Tech- VII SEM	20	-	-	4	8	-	-	-	-	-	-	-	-	-	-	12	-	148
B.Tech- VIII SEM	16	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	164
TOTAL CREDITS	164	15	15	44	20	14	8	8	4	4	2	4	4	2	4	12	4	164

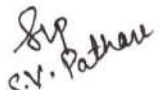

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Dr. B. Sontakke


Dr. S.V. Pathare

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR-440034

An Autonomous Institute

Teaching Scheme of Examination for

B.Tech. Semester-I Civil Engineering-NEP (Choice Based Credit System)

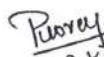
Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs./W)			Total Hrs per Week	Total Credits	Examination Scheme						
					L	T	P			Theory			Practical		Min. Pass Marks	Total Marks
										Exam. Hrs.	CIE	ESE	CIE	ESE		
1	BSC-I	BT1CV01T	Applied Mathematics-I	ASH	3	—	—	3	3	3	40	60	—	—	50	100
2	BSC-II	BT1CV02T	Applied Chemistry	ASH	3	—	—	3	3	3	40	60	—	—	50	100
3	BSC-II	BT1CV02P	Applied Chemistry Lab	ASH	—	—	2	2	1	—	—	—	25	25	25	50
4	ESC-I	BT1CV03T	Civil Engineering Graphics	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100
5	ESC-I	BT1CV03P	Civil Engineering Graphics Lab	CIVIL	—	—	2	2	1	—	—	—	25	25	25	50
6	ESC-II	BT1CV04T	Vedic Vastushatra	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100
7	ESC-II	BT1CV04P	Vedic Vastushatra Lab	CIVIL	—	—	2	2	1	—	—	—	25	25	25	50
8	ESC-III	BT1CV05P	Fundamentals of 'C' Programming	CSE	—	—	2	2	1	—	—	—	25	25	25	50
9	AEC-I	BT1CV06T	Communication Skill	ASH	2	—	—	2	2	2	20	30	—	—	25	50
10	VSEC-I	BT1CV07P	Construction Workshop Practices	CIVIL	—	—	4	4	2	—	—	—	50	50	50	100
11	CC-I	BT1CV08P	Refer CC-I Basket	ASH	—	—	4	4	2	—	—	—	100	—	50	100
Total					14		16	30	22		180	270	250	150		850

Total Credits till B.Tech-I Sem = 22

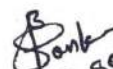

Dr. A.S. Meen
Chairman BOS


Dr. S.M. Hajbhik


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Dr. P.K. More


Dr. M. Hingane


Dr. B. Sontakke
S.V. Patkar

CIE:- Continuous Internal Evaluation.

ESE:- End Semester Examination.

BSC:- Basic Science Course

ESC:- Engineering Science Course

AEC:- Ability Enhancement Course

VSEC:- Vocational & Skill Enhancement Course

CC:- Co-Curricular Course

VSC:- (Vocational skill course)

SEC:- Skill enhancement course

VSEC:-	→ VSC	(Vocational skill course)
	→ SEC	(Skill enhancement course)

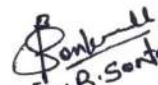

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B.Tech. Semester-I Civil Engineering NEP (Choice Based Credit System)**List of HSSM-I Course (Humanities Social Science and Management):- AEC-I Course**

Course Category	Course Code	Name of Course	Total Credits	Semester
Ability Enhancement Course (AEC-I)	BT1CV06T	Communication Skill	2	I

List of VSEC-I Course (Vocational and Skill Enhancement Course):- VSC-I (Vocational Skill Course).

Course Category	Course Code	Name of Course	Total Credits	Semester
Vocational Skill Enhancement Course (VSEC-I)	BT1CV07P	Construction Workshop Practices	2	I

List of CC-I Basket (Liberal Learning Courses).

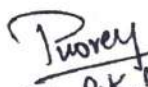
Course Category	Course Code	Name of Course	Total Credits	Semester
Liberal Learning Courses(CC-I)	BT1CV08P	National Social Services(NSS)	2	I
	BT1CV08P	Games & Sports	2	
	BT1CV08P	Cultural Activities	2	
	BT1CV08P	Yoga	2	
	BT1CV08P	Elements of Japanese Language(NPTEL Online)	2	
	BT1CV08P	Elements of German Language(NPTEL Online)	2	
	BT1CV08P	Elements of French Language(NPTEL Online)	2	
	BT1CV08P	Elements of Spanish Language(NPTEL Online)	2	

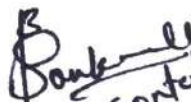

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Teaching Scheme of Examination for

B.Tech. Semester-II Civil Engineering-NEP (Choice Based Credit System)

Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs./Week)			Total Hrs per Week	Total Credits	Examination Scheme							
					L	T	P			Theory			Practical		Min. Pass Marks	Total Marks	
										Exam. Mee	CIE	ESE	CIE	ESE			
1	BSC-III	BT2CV01T	Applied Mathematics-II	ASH	3	—	—	3	3	3	40	60	—	—	50	100	
2	BSC-III	BT2CV01P	Applied Mathematics-II Lab	ASH	—	—	2	2	1	—	—	—	25	25	25	50	
3	BSC-IV	BT2CV02T	Applied Physics	ASH	3	—	—	3	3	3	40	60	—	—	50	100	
4	BSC-IV	BT2CV02P	Applied Physics Lab	ASH	—	—	2	2	1	—	—	—	25	25	25	50	
5	ESC-IV	BT2CV03T	Engineering Mechanics (Civil & Mechanical)	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100	
6	ESC-IV	BT2CV03P	Engineering Mechanics Lab (Civil & Mechanical)	CIVIL	—	—	2	2	1	—	—	—	25	25	25	50	
7	ESC-V	BT2CV04T	Basics of Electrical & Electronics Engineering	ELEC.	2	—	—	2	2	2	20	30	—	—	25	50	
8	PCC-I	BT2CV05T	Basics of Civil Engineering	CIVIL	2	—	—	2	2	2	20	30	—	—	25	50	
9	IKS	BT2CV06T	Refer IKS Basket	ASH	2	—	—	2	2	2	20	30	—	—	25	50	
10	VSEC-II	BT2CV07P	Applications of CAD In Civil Engineering	CIVIL	—	—	4	4	2	—	—	—	50	50	50	100	
11	CC-II	BT2CV08P	Refer CC-II Basket(Liberal Learning Courses)	ASH	—	—	4	4	2	—	—	—	100	—	50	100	
Total						15		14	29	22		180	270	225	125		800

Cummulative Total Credits till B.Tech-II Sem = 44

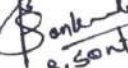
Exit Option: Award of UG Certificate in major With 40 credits and an additional 8 credits in skill based courses, internship, mini projects etc.


Dr. A.S. Moon
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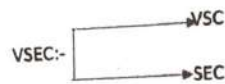

Dr. B. Sontakke
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VERSION:-1.0

Effective From:- 2026-27

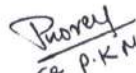
CIE:- Continuous Internal Evaluation.
 ESE:- End Semester Examination.
 BSC :- Basic Science Course
 ESC:- Engineering Science Course
 PCC:- Programme Core Course
 IKS:- Indian Knowledge System
 SEC:- Skill Enhancement Course
 CC:- Co-Curricular Course
 VSEC:- Vocational & Skill Enhancement Course




 Dr. A.S. Moon
 Chairman BOS


 Dr. S.M. Gajbhiye


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 S.V. Rathore

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Effective From:- 2026-27

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR

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B.Tech. Semester-II Civil Engineering NEP (Choice Based Credit System)**List of Indian Knowledge System Courses (IKS)**

Course Category	Course Code	Name of Subject	Credits	Semester
Indian Knowledge System (IKS)	BT2CV06T	Consciousness Studies	2	II SEM
	BT2CV06T	Preserving Art, Cultural & Traditional	2	
	BT2CV06T	Wellness , Tradition Medicines & Yoga	2	
	BT2CV06T	Glimses of Ancient Science & Technology	2	

List of VSEC-II (Vocational Skill Enhancement Courses)

Course Category	Course Code	Name of Subject	Credits	Semester
Vocational Skill Enhancement Courses VSEC-II	BT2CV07P	Applications of CAD In Civil Engineering	2	II SEM

List of CC-II Basket(Liberal Learning Courses).

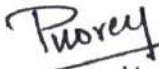
Course Category	Course Code	Name of Subject	Credits	Semester
Liberal Learning Courses(CC-II)	BT2CV08P	National Social Services(NSS)	2	II SEM
	BT2CV08P	Games & Sports	2	
	BT2CV08P	Cultural Activities	2	
	BT2CV08P	Yoga	2	
	BT2CV08P	Elements of Japanese Language(NPTEL Online)	2	
	BT2CV08P	Elements of German Language(NPTEL Online)	2	
	BT2CV08P	Elements of French Language(NPTEL Online)	2	
	BT2CV08P	Elements of Spanish Language(NPTEL Online)	2	


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Chairman BOS


Dr. S.M. Wajbhaye


D.L. Budhlani


Er. Mahalingam


P.K. Morey


Er. B.S. Sontakke
S.V. Pathan

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR-440034

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Teaching Scheme of Examination for

B.Tech. Semester-III Civil Engineering-NEP (Choice Based Credit System)

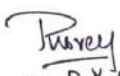
Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs./Week)			Total Hrs per Week	Total Credits	Examination Scheme						
					L	T	P			Theory			Practical		Min. Pass Marks	Total Marks
										Exam. Hrs.	CIE	ESE	CIE	ESE		
1	PCC-II	BT3CV01T	Solid Mechanics	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100
2	PCC-II	BT3CV01P	Solid Mechanics Lab	CIVIL	—	—	2	2	1	—	—	—	25	25	25	50
3	PCC-III	BT3CV02T	Concrete Technology	CIVIL	2	—	—	2	2	2	20	30	—	—	25	50
4	PCC-III	BT3CV02P	Concrete Technology Lab	CIVIL	—	—	2	2	1	—	—	—	25	25	25	50
5	PCC-IV	BT3CV03T	Transportation Engineering	CIVIL	2	—	—	2	2	2	20	30	—	—	25	50
6	PCC-IV	BT3CV03P	Transportation Engineering Lab	CIVIL	—	—	2	2	1	—	—	—	25	25	25	50
7	MDM-I	BT3CV04T	Refer MDM basket	CIVIL	2	—	—	2	2	2	20	30	—	—	25	50
8	OE-I	BT3CV05T	Refer open elective basket	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100
9	HSSM-I	BT3CV06T	Entrepreneurship in Civil Engineering	CIVIL	2	—	—	2	2	2	20	30	—	—	25	50
10	VEC-I	BT3CV07T	Constitution of India	ASH	2	—	—	2	2	2	20	30	—	—	25	50
11	CEP	BT3CV08P	Community Project/Mini Project	CIVIL	—	—	4	4	2	—	—	—	50	50	50	100
Total					16		10	26	21		180	270	125	125		700

Cummulative Total Credits till B.Tech-II Sem = 65

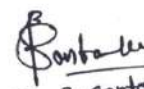

Dr. A. S. Moon
Chairman BOS


Dr. S. M. Chavhan


Dr. M. K. Kumbhar


Dr. P. K. More


Dr. L. Budhlani


Dr. B. Sontakke
Sr. Prof. Hare

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR

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B.Tech.Civil Engineering NEP (Choice Based Credit System)

For Students of Computer Engineering (CE), Computer Science Engineering (CSE), Electrical Engineering (EE), Mechanical Engineering (ME) and Electronics & Telecommunication Engineering (ETC) and Artificial Intelligence & Data Science (AIDS)

(Students of Civil Engineering will not be able to opt these MDM courses)

List of Multidisciplinary Minor (MDM) Offered by Civil Engineering BOS

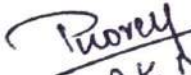
Sr. No	Semester	Category	Course Code	Course Name			Credits
				Track: 1 Environment	Track: 2 Building Planning	Track: 3 Construction Technology	
1	III Sem	MDM- I	BT3CV04T	Environmental Science	Introduction to Vastu shashtra	Building Construction	2
2	IV Sem	MDM- II	BT4CV04T	Environmental Engineering-I	Introduction to civil Engineering	Concrete Technology	2
3	V Sem	MDM- III	BT5CV05T	Environmental Engineering -II	Building Planning & Design	Construction Management	3
4	VI Sem	MDM- IV	BT6CV07T	Environmental Management System	Housing and Community planning	Estimation & Costing	3
5	VIII Sem	MDM- V#	BT8CV01T	Non conventional Energy Resources #	Building By laws & Building Regulation#	Building Services#	2
6		MDM- VI#	BT8CV02T	Environmental Economics & Management#	GIS & Remote sensing#	Construction Planning & Management#	2

#Indicates that Online Courses to be done from NPTEL/SWYAM/MOOCs. Examination will be conducted by NPTEL/INSTITUTE.


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Dr. S.M. Wajbhaye


Dr. M. K. Ingane


Dr. P.K. Murey


Dr. B. Sontakke
S.V. Pathan


Dr. L. B. Chikani

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR

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B.Tech.Civil Engineering NEP (Choise Based Credit System)

For Students of Civil Engineering (CV) Electrical Engineering (EE), Mechanical Engineering (ME) and Electronics & Telecommunication Engineering (ETC)

MDM Category:-Open Elective Basket

LIST OF OPEN ELECTIVES (OE) OFFERED BY MANAGEMENT BOS

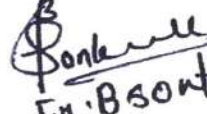
Sr. No.	Semester	Category	Course Code (For CV)	Course name	Credits
1	3rd Sem	OE-I	BT3CV05T	Stress Management	3
2	4th Sem	OE-II	BT4CV05T	Principles of Management	3
3	5th Sem	OE-III	BT5CV06T	IPR Development & Training	2

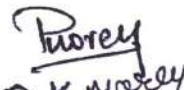

Dr. A.S. Moon
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Dr. B. Sontakke


P.K. More


S.V. Patil

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR-440034

An Autonomous Institute

Teaching Scheme of Examination for

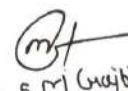
B.Tech. Semester-IV Civil Engineering-NEP (Choice Based Credit System)

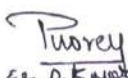
Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs./Week)			Total Hrs per Week	Total Credits	Examination Scheme						
					L	T	P			Theory			Practical		Min. Pass Marks	Total Marks
										Exam. Hrs.	CIE	ESE	CIE	ESE		
1	PCC-V	BT4CV01T	Structural Analysis	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100
2	PCC-VI	BT4CV02T	Geotechnical Engineering	CIVIL	2	—	—	2	2	2	20	30	—	—	25	50
3	PCC-VI	BT4CV02P	Geotechnical Engineering Lab	CIVIL	—	—	2	2	1	—	—	—	25	25	25	50
4	PCC-VII	BT4CV03T	Fluid Mechanics	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100
5	PCC-VII	BT4CV03P	Fluid Mechanics Lab	CIVIL	—	—	2	2	1	—	—	—	25	25	25	50
6	MDM-II	BT4CV04T	Refer MDM basket	CIVIL	2	—	—	2	2	2	20	30	—	—	25	50
7	OE-II	BT4CV05T	Refer open elective basket	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100
8	AEC-II	BT4CV06P	Civil Engineering Report Writing	CIVIL	—	—	2	2	1	—	—	—	25	25	25	50
9	AEC-III	BT4CV07P	Communication Skill II	CIVIL	—	—	2	2	1	—	—	—	25	25	25	50
10	HSSM-II	BT4CV08T	Construction Planning & Management	CIVIL	2	—	—	2	2	2	20	30	—	—	25	50
11	VEC-II	BT4CV09T	Environmental Science	CIVIL	2	—	—	2	2	2	20	30	—	—	25	50
12	VSEC-III	BT4CV10P	Building Design & Drawing	CIVIL	—	—	4	4	2	—	—	—	50	50	50	100
Total					17		12	29	23		200	300	150	150		800

Cumulative Total Credits till B.Tech-IV Sem = 88

Exit Option: Award of UG Diploma in major With 8 credits and an additional 8 credits in skill-based courses, internship, mini projects etc.


Dr. A.S. Moon
Chairman BOS


Dr. S.M. Gajbhiye
Er. Mohan K. Kadam


Dr. P. K. Kulkarni
Dr. Budhiani


Dr. B. Santakke
S.V. Pathan

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B.Tech. Semester- IV Civil Engineering NEP (Choice Based Credit System)

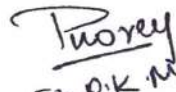
List of VSEC-III (Vocational Skill Enhancement Courses)

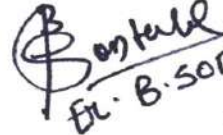
Course Category	Course Code	Name of Subject	Credits	Semester
Vocational Skill Enhancement Courses VSEC-III	BT4CV10P	Building Design & Drawing	2	IV SEM


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Dr. L. Budhlani

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR-440034

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Teaching Scheme of Examination for

B.Tech. Semester-V Civil Engineering-NEP (Choice Based Credit System)

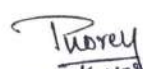
Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs./Week)			Total Hrs per Week	Total Credits	Examination Scheme						
					L	T	P			Theory			Practical		Min. Pass Marks	Total Marks
										Exam. Hrs.	CIE	ESE	CIE	ESE		
1	PCC-VIII	BT5CV01T	Reinforced Cement Concrete	CIVIL	3	—	—	3	3	4	40	60	—	—	50	100
2	PCC-IX	BT5CV02T	Surveying and Geomatics	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100
3	PCC-IX	BT5CV02P	Surveying and Geomatics Lab	CIVIL	—	—	2	2	1	—	—	—	25	25	25	50
4	PCC-X	BT5CV03T	Environmental Engineering	CIVIL	2	—	—	2	2	2	20	30	—	—	25	50
5	PCC-X	BT5CV03P	Environmental Engineering Lab	CIVIL	—	—	2	2	1	—	—	—	25	25	25	50
6	PEC-I	BT5CV04T	Programme Elective-I Refer Programme Elective Basket	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100
7	PEC-I	BT5CV04P	Programme Elective-I Refer Programme Elective Basket	CIVIL	—	—	2	2	1	—	—	—	25	25	25	50
8	MDM-III	BT5CV05T	Refer MDM basket	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100
9	OE-III	BT5CV06T	Refer open elective basket	CIVIL	2	—	—	2	2	2	20	30	—	—	25	50
Total					16		6	22	19		200	300	75	75		650

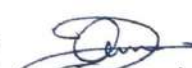
Cummulative Total Credits till B.Tech-V Sem = 107

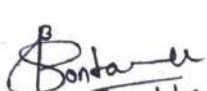

Dr. A.S. Moon
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B.Tech. Semester-V Civil Engineering NEP (Choice Based Credit System)

Programme Elective Courses -I:- PEC-I Basket

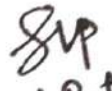
Course Category	Course Code	Name of Subject	Credits	Semester
Programme Elective Courses -I (PEC-I)	BT5CV04T(A)	Structural Analysis II	3	V Sem
	BT5CV04P(A)	Structural Analysis II Lab	1	
	BT5CV04T(B)	Geotechnical Engineering II	3	
	BT5CV04P(B)	Geotechnical Engineering II Lab	1	
	BT5CV04T(C)	Advanced Building Material	3	
	BT5CV04P(C)	Advanced Building Material Lab	1	

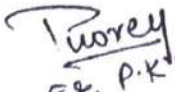

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S.V. Patkar


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SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR-440034

An Autonomous Institute

Teaching Scheme of Examination for

B.Tech. Semester-VI Civil Engineering-NEP (Choice Based Credit System)

Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs./Week)			Total Hrs per Week	Total Credits	Examination Scheme							
					L	T	P			Theory			Practical		Min. Pass Marks	Total Marks	
										Exam. Hrs.	CIE	ESE	CIE	ESE			
1	PCC-XI	BT6CV01T	Design of Steel Structure	CIVIL	3	—	—	3	3	4	40	60	—	—	50	100	
2	PCC-XI	BT6CV01P	Design of Steel Structure	CIVIL	—	—	2	2	1	—	—	—	25	25	25	50	
3	PCC-XII	BT6CV03T	Hydraulic Engineering	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100	
4	PCC-XII	BT6CV03P	Hydraulic Engineering	CIVIL	—	—	2	2	1	—	—	—	25	25	25	50	
5	PEC-II	BT6CV04T	Programme Elective -II Refer Programme Elective Basket	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100	
6	PEC-III	BT6CV05T	Programme Elective -III Refer Programme Elective Basket	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100	
7	PEC-IV	BT6CV06T	Programme Elective -IV Refer Programme Elective Basket	CIVIL	2	—	—	2	2	2	20	30	—	—	25	50	
8	MDM-IV	BT6CV07T	Refer MDM basket	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100	
9	VSEC-IV	BT6CV08P	Computer Aided Drawing with STAAD Pro	CIVIL	—	—	4	4	2	—	—	—	50	50	50	100	
Total						17		8	25	21		220	330	100	100		750

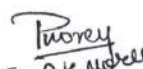
Cummulative Total Credits till B.Tech-VI Sem = 128

Exit Option: Award UG Degree B.Voc./ B.sc. In major with 120 credits and an additional 8 credits in skill-based course, internship, mini project etc.

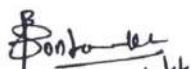

Dr. A.S. Moon
Chairman BOS


Dr. S.M. Chajbhaye


Dr. M.G. Hingane


Dr. P.K. Nigley


Dr. L. Budhani


Dr. B. Santakke


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B.Tech. Semester-VI Civil Engineering NEP (Choice Based Credit System)

Programme Elective Courses - II : PEC-II (Theory) Basket

Course Category	Course Code	Name of Subject	Credits	Semester
Programme Elective Courses - II (PEC-II)	BT6CV04T (A)	Digital Land Surveying & Mapping	3	VI SEM
	BT6CV04T (B)	Advanced Traffic Engineering	3	
	BT6CV04T (C)	Water Resources Engineering	3	
	BT6CV04T (D)	Prefabrication & Modular Construction	3	

Programme Elective Courses - III:- PEC-III (THEORY) Basket

Course Category	Course Code	Name of Subject	Credits	Semester
Programme Elective Courses - III (PEC-III)	BT6CV05T (A)	GIS & Digital Surveying	3	VI SEM
	BT6CV05T (B)	Railway Engineering	3	
	BT6CV05T (C)	Repair & Rehabilitation of Civil Engineering	3	
	BT6CV05T (D)	Advanced Reinforced Cement Concrete Design	3	

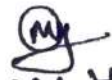
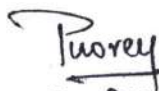
Programme Elective Courses - IV:- PEC-IV (THEORY) Basket

Course Category	Course Code	Name of Subject	Credits	Semester
Programme Elective Courses - IV (PEC-IV)	BT6CV06T (A)	Construction Surveying with Total Station	2	VI SEM
	BT6CV06T (B)	Tunnel & Bridge Engineering	2	
	BT6CV06T (C)	Disaster Management	2	
	BT6CV06T (D)	Foundation Engineering	2	

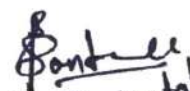
Vocational Skill Enhancement Courses -IV:- VSEC-IV Basket

Course Category	Course Code	Name of Subject	Credits	Semester
Vocational Skill Enhancement Courses -IV	BT6CV08P	Computer Aided Drawing with STAAD Pro	2	VI SEM


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Chairman BOS


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Gr. M.G. Hingane

Puroey
Ex. P.K. Morey


D.L. Buehlani


Ex. B. Santakke
S.V. Pathan

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR

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Teaching Scheme of Examination for

B.Tech.Semester-VII Civil Engineering-NEP(Choice Based Credit System)

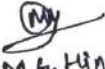
Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs./Week)			Total Hrs per Week	Total Credits	Examination Scheme						
					L	T	P			Theory			Practical		Min. Pass Marks	Total Marks
										Exam. Hrs.	CIE	ESE	CIE	ESE		
1	PCC-XIII	BT7CV01T	Estimating & Costing	CIVIL	2	—	—	2	2	2	20	30	—	—	25	50
2	PCC-XIV	BT7CV02T	Irrigation Engineering	CIVIL	2	—	—	2	2	2	20	30	—	—	25	50
3	PEC-V	BT7CV03T	Program Elective -V Refer Program Elective Basket	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100
4	PEC-VI	BT7CV04T	Program Elective -VI Refer Program Elective Basket	CIVIL	2	—	—	2	2	2	20	30	—	—	25	50
5	PEC-VII	BT7CV05T	Program Elective -VII Refer Program Elective Basket	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100
6	RM	BT7CV06T	RM	CIVIL	3	—	—	3	3	3	40	60	—	—	50	100
7	RM	BT7CV06P	RM lab	CIVIL	—	—	2	2	1	—	—	—	25	25	25	50
8	ELC-I	BT7CV07P	Project	CIVIL	—	—	8	8	4	—	—	—	100	100	100	200
Total					15		10	25	20		180	270	125	125		700

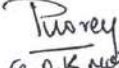
Cummulative Total Credits till B.Tech-VII Sem = 148

#Indicates that Online Courses to be done from NPTEL. Examination will be conducted by NPTEL/RTMNU

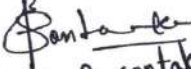

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Dr. S. M. Gajbhar


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Er. P. K. Nigam


Dr. L. B. Bhatnagar


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SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR

An Autonomous Institution

B.Tech. Semester-VII Civil Engineering NEP (Choice Based Credit System)

Programme Elective Courses-V:- PEC-V (Theory) Basket

Course Category	Course Code	Name of Subject	Credits	Semester
Programme Elective Courses-V (PEC-V)	BT7CV04T (A)	Advanced Transportation Engineering	3	VII SEM
	BT7CV04T (B)	Water & Waste Water treatment	3	
	BT7CV04T (C)	Advanced Steel Design	3	

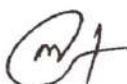
Programme Elective Courses-VI:- PEC-VI (Theory) Basket

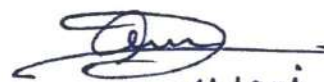
Course Category	Course Code	Name of Subject	Credits	Semester
Programme Elective Courses-VI (PEC-VI)	BT7CV05T (A)	Pavement Analysis & Design	2	VII SEM
	BT7CV05T (B)	Climate Changes & its mitigation	2	
	BT7CV05T (C)	Prestress Concrete	2	

Programme Elective Courses-VII:- PEC-VII (Theory) Basket

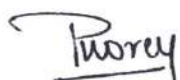
Course Category	Course Code	Name of Subject	Credits	Semester
Programme Elective Courses-VII (PEC-VII)	BT7CV06T (A)	Urban Transportation Planning	3	VII SEM
	BT7CV06T (B)	Flood Control & Drainage	3	
	BT7CV06T (C)	Design of Earthquake Resistance structure	3	


Dr. A.S. Moon
Chairman BOS


Dr. S.M. Waghmare


D.L. Budhlani


Er. M.G. Hingane


Er. P.K. Morey


Er. B. Sontakke
Sip
S.V. Patil

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, NAGPUR-440034

An Autonomous Institute

Teaching Scheme of Examination for

B.Tech. Semester-VIII Civil Engineering-NEP (Choice Based Credit System)

Sr. No.	Course Category	Course Code	Name of Course	BoS	Teaching Scheme(hrs./Week)			Total Hrs per Week	Total Credits	Examination Scheme						
					L	T	P			Theory			Practical		Min. Pass Marks	Total Marks
										Exam. Hrs.	CIE	ESE	CIE	ESE		
1	MDM-V#	BT8CV01T	Refer MDM basket	CIVIL	2	—	—	2	2	2	20	30	—	—	25	50
2	MDM-VI#	BT8CV02T	Refer MDM basket	CIVIL	2	—	—	2	2	2	20	30	—	—	25	50
3	ELC-II	BT8CV03P	Internship & Training	CIVIL	—	—	24	24	12	—	—	—	200	200	200	400
Total					4		24	28	16		40	60	200	200		500

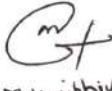
Cummulative Total Credits till B.Tech-VII Sem = 164

4- Year Bachelor's degree (B.Tech). In Engg./ Tech. with Multidisciplinary Minor

Cummulative Total Credits till B.Tech.VIII Semester=164

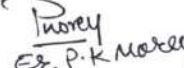
NOTE:- # Indicates that Online Courses to be done from NPTEL/SWYAM/MOOCs. Examination will be conducted by NPTEL/INSTITUTE. Minimum 12 Weeks Internship is Mandatory. Submission of Internship Certificate is mandatory for evaluation. Final evaluation will be based on Internship report, presentation and viva-voce.

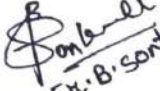

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Chairman BOS


Dr. S.M. Vajbhaye


D.L. Budhlani


Er. M. Indirgane


Er. P.K. Morey


Er. B. Sontakke


S.V. Rathore

**SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BAHADURA, UMRER
ROAD, NAGPUR**

An Autonomous Institute Affiliated to RTMNU, Nagpur

Faculty of Science & Technology

**B.Tech. Mechanical Engineering/Civil Engineering/Electronics & Telecommunication
/Electrical Engineering (NEP) (CBCS)**

Sem-I	Total Hours Distribution Per Week		
Total Credits : 3	Lecture (L) : 3 Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT1ME01T/BT1CV01T/BT1ET01T/ BT1EE01T	Applied Mathematics-I	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
40 Marks	60 Marks	50	3 Hours

Course Objectives	
1	Engineering Mathematics intent to equip first-year engineering students with fundamental mathematical tools.
2	To promote and develop the basic mathematics skills of engineering students that is essential for effective understanding of engineering subjects.

Course Outcomes	
After completion of syllabus, students would be able to	
1	Learn the concept of successive differentiation; express the function in series form and evaluation of indeterminate forms.
2	Study the nature of linear system of equations using rank and identify the special properties of a matrix such as the eigen values, eigen vectors.
3	Understand the concept of Partial differentiation which is used to find the solution of real life problems.
4	Solve first-order ordinary differential equations applicable to engineering problems and apply it to formulate mathematical models for simple electrical circuits.
5	Understand and solve the different types of higher order differential equations by using various techniques and apply it to solve the problems in engineering field.

(Dr. Yusuf Owazi)
09/07/2026

Dr. D. Khan
09/07/2026

Dr. D. P. Shastri
09/07/2026

Dr. Ranjana Harane
09/07/2026

Dr. M. S. Patil
09/07/2026

Contd.

SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1: Differential Calculus			
Successive differentiation: Leibnitz's Rule, Taylor's and Maclaurin's series for function of one variable, Indeterminate forms and L'Hospital's Rule.	7		1
Unit-2 Matrices			
Rank of a matrix, Consistency of linear system of non-homogeneous and homogeneous equations, Linear dependence of vectors, Eigen values and Eigen vectors, Cayley- Hamilton theorem (Statement only, Sylvester's theorem (Statement only).	8		2
Unit-3 Multivariable Calculus (Partial Differentiation)			
Functions of several variables, First and Higher order partial derivatives, Euler's theorem, Chain rule and Total differential coefficient, Jacobians, Lagrange's method of undetermined multipliers.	8		3
Unit-4 First Order Ordinary Differential Equations			
Review of Linear differential equations, Reducible to linear and Bernoulli's differential equations, Exact differential equations (Excluding the cases of integrating factors), Application of first order differential equation to simple electrical circuits.	5		4
Unit-5 Higher Order Ordinary Differential Equations			
Higher order ordinary linear differential equations with constant coefficients, Method of variation of parameters, Cauchy's and Legendre's homogeneous differential equations, Equations of the type $d^2y/dx^2 = f(y)$. Applications of higher order differential equations to simple electrical circuits.	8		5

Text/Reference Books:

- (1) Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
- (2) Ramana B.V., Higher Engineering Mathematics, Tata Mc-Graw Hill, New Delhi, 11th Reprint, 2010.
- (3) N.P. Bali and Manish Goyal, A Text Book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
- (4) B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
- (5) P. N. Wartikar and J. N. Wartikar, Applied Mathematics, Volume I and II.
- (6) H.K. Dass, Rama Verma, Rajnish Verma, V.J. Dagwal, Sajid Anwar and D.F. Shastrakar, Engineering Mathematics, Volume I and II, S. Chand.

Dr. R. S. Khun
09/07/2026

Dr. D. F. Shastrakar
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Mr. S. S. Palani
09/07/2026

Dr. S. Khun
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Dr. Ranjana Hanare
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Faculty of Science & Technology

B. Tech. Civil Engineering (NEP) (CBCS)

Sem-I	Total Hours Distribution Per Week		
Total Credits : 3	Lecture (L) : 3 Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT1CV02T	Applied Chemistry	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
40 Marks	60 Marks	50	3 Hours

Course Objectives	
1	To provide fundamental knowledge of electrochemistry necessary to understand the function of batteries and understanding of the rare earth metals
2	To make students learn about the environment and ensuring sustainable development.
3	Analyze properties, composition, and performance of construction materials such as cement.

Course Outcomes	
After completion of syllabus, students would be able to	
1	Students will inculcate the use of instrumentation techniques and interpret its applications in material characterization.
2	Know about fuels and lubricants and analyze the situation for their appropriate applications
3	Analyze the various industrial problems arising due to water quality and their remediation.
4	Develop the environmental awareness from the basics of green chemistry and its application
5	Students will able to solve problems regarding rare earth elements, the correct disposal methods of e-wastes and while creating any tool they will keep this environmental aspect in mind.

SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1: Fundamentals of Spectroscopy and instrumentation			
UV-visible Spectroscopy (Beer-Lambert's law and its numerical),(IR) Infrared spectroscopy and (NMR)Nuclear Magnetic Resonance spectroscopy,(XRD) X-ray Diffraction Analysis,), Gas Chromatography.	7		1

M.S. Palani
ms.m.s. Palani
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Dr. D. K. ...
09/07/2026

Dr. D. P. Shastri
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09/07/2026

Dr. A. Vaidya
Dr. A. Vaidya
09/07/2026

D. P. Chaulke
D. P. Chaulke
09/07/2026

P. A. Patil
P. A. Patil
09/07/2026

Unit-2: Fuels & Lubricants			
A] Fuels: Introduction: HCV& LCV, numerical based on calorific value determination by Bomb and Boy's calorimeter; Liquid fuels – fractional distillation of crude petroleum. B] Lubricants: Lubrication, Mechanism of lubrication, types of lubricants and its properties (viscosity & viscosity index, flash & fire point, aniline point) C] Cement: Chemical composition of cement, Manufacturing by wet process, properties of microscopic constituent of cement.	8		2
Unit 3: Water Chemistry			
Introduction, potable water quality parameters hardness types of hardenss sterilization desalination of water by RO softening of water by zeolite process and ion exchange, demineralization of water, numerical based on zeolite process, boiler trouble –Scale and slugde	7		3
Unit- 4: Electrochemical Power system			
Battery: Introduction, charactriestic and general application, H ₂ -O ₂ fuel cells, Lithium ion battery. Super capacitors: definition, types, characteristics and application. amorphous Si and quantum dye sensitized solar cells. Corrosion: Defination cause & Theories of Corrosion (Dry, Wet and Differential Aeration), PillingBedworth Rule & Numerical, Types of Corrosion (Intergranular & Stress), Corrosion Protection methods.	7		4
Unit 5:Sustainable material and E-waste			
Introduction source composition characteristic and need of E waste management, E- waste environmental and health risks, Extraction of rare earth and precious metals from e-wastes, Twelve principles of Green Chemistry. Green Computing, Role of Green Computing in Environment and Research, Green devices and Green data Servers	7		5

Text/Reference Books:

1. M AfsharAlam, Sapna Jain, HenaParveen, Green Computing Approach Towards Sustainable Development, Wiley Interscience Publications.
2. 2. S. S. Dara, A Textbook of Engineering Chemistry, S. Chand Publications
3. 3. ShikhaAgrawal, Engineering Chemistry: Fundamentals and Applications, Cambridge University Press.
4. 4. Supercapacitors and Their Applications Fundamentals, Current Trends, and Future Perspectives, Edited By Anjali Paravannoor, Baiju K.V, CRC Press
5. 5. The Rare Earth Elements: An Introduction, JHL Voncken, Springer Link

ms. m. s. polam
09/07/2026
Dr. A. K. Sharma

Dr. S. Kumar
09/07/26

Dr. D. F. Shastri
09/07/2026

P.A. Patel
09/07/26

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Faculty of Science & Technology
B.Tech. Civil Engineering**

	Total Hours Distribution Per Week		
Total Credits : 1	Lecture (L) : 0 Hrs	Tutorial T : 0 Hr	Practical P: 2Hr
Subject Code	BT1CV02P	Applied Chemistry Lab	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
25 Marks	25 Marks	25 Marks	3 Hours

Practical Course Objectives	
1	Analyze experimental data, interpret results and draw scientifically valid conclusion.
2	Use modern laboratory techniques analytical tools for the characterization of chemical system and materials.

Practical Course Outcomes	
After completion the Practical course, students would be able to	
1	Estimate the concentration soluble impurities present in the given water sample.
2	Operate laboratory instrument safely and accurately to evaluate fuel and lubricant.
3	Perform quantitative chemical analysis using standard laboratory Procedure with accuracy.

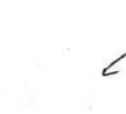
Sr. no.	List of Practicals (Any 6 performance based and 1 virtual lab experiment)
1	Proximate Analysis of coal
2	Estimation of viscosity of oil by Redwood Viscometer 1 or 2
3	Estimation of Flash point of lubricating oil by open/ closed cup apparatus
4	Estimation of Hardness of water (Total, Permanent & Temporary) by complexometry
5	Estimation of Alkalinity of water (Warder's Method)
6	Estimate the amount of dissolved oxygen present in water sample.
7	Estimation of Ni by complexometry
8	Fe(II)/ (III) estimation by redox titration.
9	Virtual Lab: Experiment on Calorimetry
10	Virtual Lab: Beer's Law verification by spectrophotometer.


09/07/2026.
(Dr. D. F. Shastri)


09/07/26


09/07/26
Dr. S. Khan


09/07/26


09/07/26
Ms. M. S. Paley
09/07/2026.

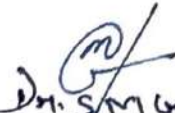
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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. CIVIL ENGINEERING

Course Category	ESC-I		
Sem: I	Total Hours Distribution per week		
Total Credit: 3	Lecture (L): 3 Hrs	Tutorial/Activity(T/A): 0 Hr.	
Subject Code	BT1CV03T (Th)	Civil Engineering Graphics	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Minimum Passing Marks	Examination Duration
40	60	-	3 Hours

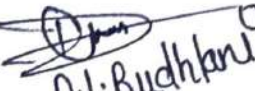
Course Objectives	
1	To acquire basic knowledge about engineering drawing.
2	To acquire basic knowledge about physical realization of engineering.
3	To visualize residential and public buildings and shall be able to draw their plan and Elevations.
4	To understand different components and services of a residential building and shall be able to draw their plan and elevations
5	To improve the visualization skill.

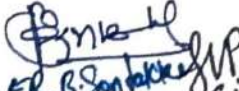
Course Outcomes	
After successful completion of this course the student will be able to:	
CO1	understand the basic knowledge of lines, dimension techniques, scales, sheet layout, construct the orthographic projection and also will be able to draw free hand sketches of building elements
CO2	apply the visualization skill to draw a simple isometric projection/view using drawing equipment and draw single line plan and elevation of a single room building
CO3	prepare drawings (e. g. plan, elevation) of the residential and public buildings
CO4	draw different components and services of a residential buildings
CO5	prepare simple perspective drawings


 Dr. A.S. Moon
 Chairman BOS
 BOS-CIVILB-TECH


 Dr. S.M. Gajbhiye


 Er. M.G. Hingane
 Er. P.K. Morey


 D.L. Budhkar


 Er. B. Santak
 S.V. Pathare
 Session-2026-27

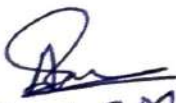
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SYLLABUS	
Contents	No. of hours
Unit 1: Introduction to Engineering Graphics and Building elements Introduction to Engineering Graphics, Use of various drawing instrument, Sizes of drawing sheets, different types of lines used in drawing practice, Dimensioning linear, angular, aligned system, unidirectional system. Introduction to scales & scale factor (RF) Free hand sketches of basic building elements	7
Unit 2: Projections and Building Drawing Terms related to building drawing, Single line plan of a building elevation of single room building with verandah (Flat roof according to given line plan and specification) Layout plan, site plan of a building	8
Unit 3: Single line Plan and elevation of buildings Residential Buildings- Bungalows, Apartments/Flats etc Public Buildings - Building for education: schools, colleges, institutions, libraries etc Public Buildings -Buildings for health: hospitals, primary health centers etc. Public Buildings -Office buildings: banks, post offices, commercial complexes etc. Public Buildings -Building for public residence: hostels, boarding houses, guest houses etc.	7
Unit 4: Components and Services of a residential Building Staircase: (dog legged & open newel type) Foundations: stepped footing, isolated sloped footing and combined footing Openings: doors and windows Types of pitched roof (plan and elevation) Building services: Water supply, sanitary and electrical layouts	7
Unit 5: Perspective drawing One-point perspective	7

References

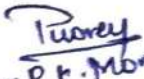
Text Books Recommended:

1. Engineering Drawing, Bhatt, N. D. and Panchal, V.M., Charotar Publication, 2016
2. A Textbook of Engineering Drawing, Dhawan, R.K, S. Chand, New Delhi, 2000
3. Building Drawing with an Integrated Approach to Built Environment, M. G. Shah, C.M. Kale, S. Y. Patki, Tata McGraw-Hill Education, Sixth, 2020
4. Civil Engineering Drawing (including Architectural aspect), M. Chakraborti, Monojit Chakraborti Publications, Kolkata, 2015


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 Er. M. A. Hingane


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 S.V. Patthate
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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. CIVIL ENGINEERING

Course Category	ESC-I		
Sem: I	Total Hours Distribution per week		
Total Credit: 1	Practical(P): 2 Hrs	Tutorial/Activity(T/A): 0 Hr.	
Subject Code	BT1CV03P (Practical)	Civil Engineering Graphics Lab	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Minimum Passing Marks	Examination Duration
25	25	25	-

Course Outcomes

After successful completion of this course the student will be able to:

CO1	Understand the basic knowledge of engineering graphics such as instruments, lines, dimensioning techniques, scales, sheet layout, construct the various engineering curves using the drawing instruments and basic of orthographic projection through drawing the projection of point and line
CO2	Apply the visualization skill to draw a simple isometric projection/ view from given Orthographic views precisely using drawing equipment and draw single line plan and elevation of a single room building
CO3	Prepare drawings (e.g. plan, elevation) of the residential and public buildings
CO4	Draw different components and services of a residential buildings
CO5	Prepare simple perspective drawings

Sr. No.	List of Practical's
01	Types of lines used in drawing practices.
02	Dimensioning, free hand building components
03	Draw a Single line plan of a single room residential building
04	Draw a Single line plan and elevation of a single room residential building with verandah
05	Minimum 2 drawings of Single line plan of public buildings
06	Minimum 2 drawings of Single line plan and elevation of public buildings
07	Minimum 2 problems on one-point

P. K. Mancy
 Er. P. K. Mancy

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Dr. S. M. Gajbhar
 Dr. A. S. Moon
 Chairman BOS.

Version:-1

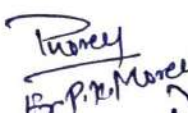
Dr. M. N. Gajbhar
D. L. Budhlani

Dr. B. S. Patil
 Er. B. S. Patil
 Session-2026-27

	about any inclined axis for a composite figure using Mohr's circle and hand calculation.,
11	To determine the coefficient of friction of Coil Friction Apparatus.
12	Kinetics of particles (collision of bodies)
13	To find support reactions of a simply supported beam using graphical method and hand calculation.

Note:

6. Conduct minimum 08 practical's out of above list and practical no. 1 is mandatory.
7. Viva-voce question should be included in each of the practical.
8. During Continuous Internal Evaluation (CIE) practical Marks, regular performance of practical's for 10 marks, 05 Marks for Journal submission and 10 Marks for internal viva-voce examination.
9. During End Semester Exam (ESE) practical Marks, external practical examination performance must be conducted for 15 marks and 10 Marks for viva.
10. For Eligibility of ESE Practical examination, internal submission of Journal (Practical File) is mandatory.


 Dr. P. R. Morey

 Dr. S. M. Gajbhiye

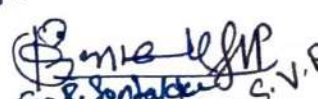
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 D. L. Budhiani


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B.TECH. CIVIL ENGINEERING

Course Category	ESC-II		
Sem: I	Total Hours Distribution per week		
Total Credit: 3	Lecture (L): 3 Hrs	Tutorial/Activity(T/A): 0 Hr.	
Subject Code	BT1CV04T (Th)	VEDIC VASTUSHASHTRA	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Minimum Passing Marks	Examination Duration
40	60	-	3 Hours

Course Objectives

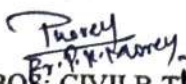
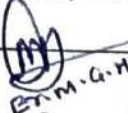
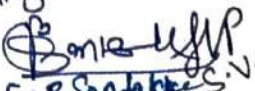
1	Basic ideology behind the use of vastushastra is to have better life.
2	The whole purpose of vastushastra is to create and attract positive cosmic energy.

Course Outcomes

After successful completion of this course the student will be able to:

CO - 1	Understand the fundamentals of vastushastra
CO - 2	Understand the basics of interior and exterior of various building units
CO - 3	Understand the orientations of various rooms of residential as per vastushastra
CO - 4	Understand the defects as per vastu and remedial measures to rectify.
CO - 5	Understand the basis of principle planning

SYLLABUS	
Contents	No. of hours
UNIT 1: Introduction of Vaastu Scientific background of Vaastu, Understanding Life force Energy, Importance of Five Elements, Use of Magnetic Compass.	1
UNIT 2: Interiors and Exteriors Open Space planning and Building Design, Verandas, Balconies, Porch, Borings, Boundary Walls, Parking, Overhead Tanks, Septic Tanks, Water flow, Plants and Greenery.	2

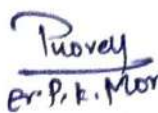
      
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 Dr. L. Budhiani
 Dr. B. S. Patil
 Session-2026-27

UNIT 3: Orientation of Home Master Bed Room, Kids room, Living Room, Kitchen, Dining Room, Bathroom, drawing room, Study Room, Puja Room, Library, Furniture making, Doors, Windows and ventilators, Main Entrance, Staircase, Guest room.	3
UNIT 4: Remedial Vaastu Identifying the Vastu Defects, Rectification of Vastu Defects in Existing Building, Color therapy	5
UNIT 5: Building Planning Introduction to Building by Building Planning, Principle of Planning, Discussion on different building plans, Types, shapes and selection of Land, Types of Soil Testing Vastu Methods	5

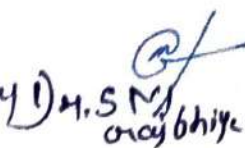
References

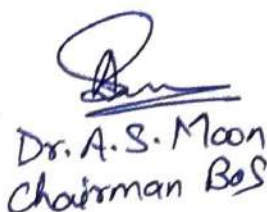
Text Books Recommended:

1. Ancient Science of Vastu by Siddharth Board and Dr. Jayshree Om.
2. Remedial Vaastu for home by Janhavi N. Sahasrabuddhe and Narendra Hari Sahasrabuddhe.
3. Scientific Vaastu Shastra in Home by Patel Sarjoo


Dr. P. K. Morey

BOS:-CIVILB-TECH


Dr. A. S. Moon


Chairman BOS

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D. L. Budhlani


Dr. M. A. Hingane


Dr. B. S. Patil
Session-2026-27

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Course Category	ESC-III		
Sem: I	Total Hours Distribution per week		
Total Credit: 1	Practical(P): 2 Hrs	Tutorial/Activity(T/A): 0 Hr.	
Subject Code	BT1CV04P (Practical)	Vedic Vastushashtra Lab	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Minimum Passing Marks	Examination Duration
25	25	25	-

Course Outcomes

After successful completion of this course the student will be able to:

CO1	Understand the fundamentals of vastushastra
CO2	Understand the basics of interior and exterior of various building units
CO3	Understand the orientations of various rooms of residential as per vastushastra
CO4	Understand the defects as per vastu and remedial measures to rectify.
CO5	Understand the basis of principle planning

Sr. No.	List of Practical's
01	Planning of interior components of residential building by Vastushastra
02	Planning of exterior components of residential building by Vastushastra
03	Review of residential building plan as per Vastushastra
04	Remedial plan as per Vastushastra
05	Planning of interior components of residential building by Vastushastra

Note:

1. Conduct minimum 08 practical's out of above list and practical no. 1 is mandatory.
2. Viva-voce question should be included in each of the practical.
3. During Continuous Internal Evaluation (CIE) practical Marks, regular performance of practical's for 10 marks, 05 Marks for Journal submission and 10 Marks for internal viva-voce examination.
4. During End Semester Exam (ESE) practical Marks, external practical examination performance must be conducted for 15 marks and 10 Marks for viva.
5. For Eligibility of ESE Practical examination, internal submission of Journal (Practical File) is mandatory.

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Session-2026-27
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Note:

1. Conduct minimum 08 practical's out of above list and practical no. 1 is mandatory.
2. Viva-voce question should be included in each of the practical.
3. During Continuous Internal Evaluation (CIE) practical Marks, regular performance of practical's for 10 marks, 05 Marks for Journal submission and 10 Marks for internal viva-voce examination.
4. During End Semester Exam (ESE) practical Marks, external practical examination performance must be conducted for 15 marks and 10 Marks for viva.
5. For Eligibility of ESE Practical examination, internal submission of Journal (Practical File) is


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Dr. S. D. S. Nayabhiye


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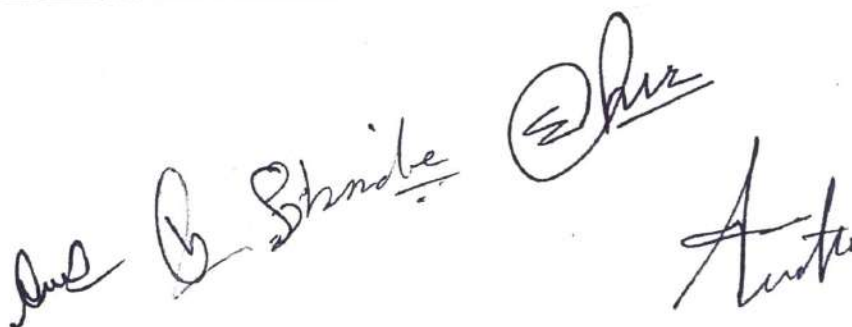

Er. M. G. Hingane


Er. B. P. Patil
Session-2026-27 S. V. Pathar

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING NAGPUR
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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. CIVIL ENGINEERING

Course Category	Engineering Science Course –III(ESC-III)		
Sem:I	Total Hours Distribution per week- 2		
Total Credit: 1	Practical(P): 2.Hrs	Tutorial/Activity(T/A):	
Subject Code	BT1CV05P (Practical)	Fundamentals of 'C' Programming (Lab)	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	Semester End Exam(SEE)Marks	Minimum Passing Marks	Examination Duration
25	25	25	–

Course Outcomes	
After successful completion of this course the student will be able to:	
CO1	Write simple programs using input and output functions, decision making and loopin constructs.
CO2	Implement various concepts of arrays and strings and pointers.
CO3	Create programs using user defined data types and functions in C.
CO4	Develop, Debug and Execute programs to demonstrate the basic concepts of pointers in C
CO5	Implement various concepts of files.



List of Practical's

List of Practical's

Minimum Eight out of the following practical's shall be performed:

Sr. No.	List of Practical's
01	Execute a program to swap two variables values with and without using third variable
02	Develop a C Program to implement a simple calculator to perform addition, subtraction, multiplication and division operations using switch construct.
03	Develop a C Program to find the roots of quadratic equation for non-zero co-efficient using if-else ladder construct.
04	Program to calculate the factorial of given number.
05	Program to generate Fibonacci sequence upto n terms.
06	Develop a recursive C function to find the factorial of a number, $n!$, defined by $\text{fact}(n)=1$, if $n=0$. Otherwise $\text{fact}(n)=n*\text{fact}(n-1)$. Using this function, develop a C program to compute the Binomial coefficient nCr . Perform input validation as well.
07	Develop a C program to find the smallest and largest elements in an array using pointers and then swap these elements and display the resultant array
08	Develop a C program to count the vowels & consonants in a given string.
09	Write a C program with a recursive function to calculate the factorial of a given positive integer.
10	Program to create and display employee details using structures.
11	Program to write text to a file.
12	Program to copy contents from one file to another file.

Note:

1. Conduct minimum 08 practical's out of above list and practical no. 1 is mandatory.
2. Viva-voce question should be included in each of the practical.
3. During Continuous Internal Evaluation (CIE) practical Marks, regular performance of practicals for 10 marks, 05 Marks for Journal submission and 10 Marks for internal viva-voce examination.
4. During Semester End Exam(SEE) practical Marks, external practical examination performance must be conducted for 15 marks and 10 Marks for viva.
5. For Eligibility of SEE Practical examination, Internal submission of Journal (Practical File) is mandatory.

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Faculty of Science & Technology

**B. Tech.Mechanical Engineering/CivilEngineering/Electrical Engineering/
Electronics & Telecommunication/ Computer Engineering/ Computer Science &
Engineering(NEP) (CBCS)**

Sem-I	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L): 2Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT1ME06T/BT1CV06T/BT1EE05T /BT1ET07T/BT1CE07T/BT1CS07T	Communication Skill	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
20 Marks	30 Marks	25	2 Hours

Course Objectives	
1	To apply tools and techniques for better communication.

Course Outcomes	
After completion of syllabus, students would be able	
1	To apply grammaticallycorrect formation of sentences.
2	To make use of verbal and non verbal communication effectively.
3	To identify and overcome barriers to communication.
4	To apply Public speaking and extempore skills.

M. G. G. G.
09/10/2026.

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09/07/2026

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Dr. D. P. Shinde
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(S. A. E. H.)
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(Dr. Monu Aich)
9/7/2026

SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1 : Grammar & Composition			
Subject-Verb Agreement, <u>Types Of Tenses</u> & Question Tags, <u>Voice</u> : Active & Passive, <u>Narration</u> : Direct & Indirect. <u>Types Of Sentences</u> : Simple, Compound & Complex Sentences Imperative, Affirmative, Negative & Interrogative. <u>E-Mail Etiquettes, Paragraph & Letter Writing.</u>	6		1
Unit 2:			
Communication Nature & Process, Types Of Communication (Verbal & Non-Verbal), Effective Communication, Types Of Verbal (Written & Oral), Types Of Non-Verbal Communication (Kinesics, Vocalics, Paralanguage, Chronemics, Haptics, Proxemics)	6		2
Unit 3			
Barriers To Communication, Types Of Barriers & Remedies. 7 C's Of Communication (Clear, Concise, Correct, Coherent, Complete & Courteous)	6		3
Unit 4:			
Public Speaking, Necessary Components, Do's & Don'ts, Reading, Hearing, Listening & Debating Skills. Group Discussion: Necessary Components, Do's & Don'ts.	6		4

Text/Reference Books: -

- 1) High School English Grammar & Composition by Wren & Martin. S. Chand & Company Ltd.
- 2) Professional Communication Skills. Dr. A.K. Jain, Dr. Pravin S.R. Bhatia Dr. A. M. Sheikh. S. Chand & Company Ltd.
- 3) Functional English. Dr. M. Sabir. Das Ganu Prakashan,
- 4) Functional English For Technical Students. Dr. Pratibha Mahato, Dr. Dora. Thompson. Himalaya Publishing House.

(Dr. Yusuf Qureshi)

09.07.26

Dr. Anmol V. Musale

09/07/2026
Dr. D. F. Shastheda

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Dr. S. Khan

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M. S. Patil

(Supriya Aiche)

09/07/2026
(Dr. Monami Aiche)

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FACULTY OF SCIENCE & TECHNOLOGY

B.TECH. CIVIL ENGINEERING

Course Category	ESC-III		
Sem: I	Total Hours Distribution per week		
Total Credit: 2	Practical(P): 4 Hrs	Tutorial/Activity(T/A): 0 Hr.	
Subject Code	BT1CV07P (Practical)	Construction Workshop Practices Lab	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Minimum Passing Marks	Examination Duration
50	50	50	-

Course Outcomes

After successful completion of this course the student will be able to:

CO1	Perform setting out of simple building layouts using basic surveying tools and measuring tape.
CO2	Construct masonry work using English bond for different wall thicknesses.
CO3	Prepare mortar and concrete mixes and conduct basic material strength tests.
CO4	Understand plumbing fittings and perform installation of common fixtures and pipe joints.
CO5	Identify and use various construction tools and understand practical site operations through field visits.

Minimum Eight out of the following practical's shall be performed:

Sr. No.	List of Practical's
01	Setting out of a building: The student should set out a building (two room only) as per the given building plan using tape only.
02	Construct a wall of height 60 cm and wall thickness 1½ bricks using English bond (Without mortar) - corner portion – length of side walls 100cm.
03	Construct a wall of height 60 cm and wall thickness 2 bricks using English bond (Without mortar) -corner portion – length of side walls 100 cm
04	Installation of plumbing and fixtures like Tap, T-Joint, Elbow, Bend, etc
05	Preparation of mortar.
06	Preparation of concrete & testing for compressive strength
07	Casting and testing of Fly ash bricks.
08	Study of various construction tools.
09	Casting of paver block
10	Site visit on ongoing construction site.

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Dr. A. S. M. ...
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Dr. M. A. Hingane
D. L. Budhlani

Dr. B. S. ...
Session-2026-27
S. V. Pathare

Note:

1. Conduct minimum 08 practical's out of above list and practical no. 1 is mandatory.
2. Viva-voce question should be included in each of the practical.
3. During Continuous Internal Evaluation (CIE) practical Marks, regular performance of practical's for 10 marks, 05 Marks for Journal submission and 10 Marks for internal viva-voce examination.
4. During End Semester Exam (ESE) practical Marks, external practical examination performance must be conducted for 15 marks and 10 Marks for viva.
5. For Eligibility of ESE Practical examination, internal submission of Journal (Practical File) is mandatory.


Dr. P. R. Moray
BOS:-CIVIL B-TECH


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Dr. L. Budhkar


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Faculty of Science & Technology

**B.Tech. Mechanical Engineering/Civil Engineering/Electronics & Telecommunication
/Electrical Engineering/**

Computer Science & Engineering/Computer Engineering (NEP) (CBCS)

Sem-I	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L) :	Tutorial/Activity (T/A) : 4Hrs	
Subject Code	BT1ME08P/BT1CV08P/ BT1ET08P/BT1EE08P/BT1CS08P/BT1CE08P	CC Basket-I (Games & Sports)	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
100 Marks	-	50	-

Course Objectives	
1	Improved knowledge of rules and strategies of particular games and sports.
2	To develop physical fitness, strength, flexibility, and coordination.

SYLLABUS

•**Basics of Games and Sports:** History of games, Classification of games, Importance of games.

•**Indoor Games:** Chess, Carrom, Table-Tennis and Badminton.

•**Outdoor Games:** Cricket, Football, Volleyball, Athletic (track and field), Kabaddi, Tug of war.

•**Role of Sports in Education and Society:** Physical benefits, Safety measure and Injury prevention, Emotional & Mental health.

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Dr. D. Khan
09/07/2026

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Dr. D. F. Shetye
09/07/2026

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Sandeep R. Grandhe

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Mr. M. S. Patil
09/07/2026

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Faculty of Science & Technology
B.Tech. Civil Engineering (NEP) (CBCS)

Sem-II	Total Hours Distribution Per Week		
Total Credits : 3	Lecture (L) : 3 Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2CV01T	Applied Mathematics-II	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
40 Marks	60 Marks	50	3 Hours

Course Objectives	
1	To introduce the basic concepts of solving algebraic, transcendental equations, Simultaneous and Differential equations.
2	To understand techniques of interpolation, polynomial fitting, numerical differentiation and integration.

Course Outcomes	
After completion of syllabus, students would be able to	
1	The concept to solve the Algebraic and Transcendental Equations.
2	Solve the simultaneous linear equations.
3	To apply the different methods to solve Ordinary differential equations.
4	To find the value of the function at particular point for the data of equal and unequal interval.
5	To understand the concept to solve numerical differentiation and numerical integration.

Dr. Yusuf Qazi
09/07/2026

Dr. D.F. Shinde
09/07/2026

Dr. M.S. Patil
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Dr. R.V. Hanare

SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1: Solution of Algebraic and Transcendental Equations			
Types of iterative methods: Bisection method, Method of False position, Newton Raphson method and their convergence, Newton Raphson method for multiple roots, Direct iteration method.	7		1
Unit 2: Solution of system of simultaneous linear equations			
Gauss elimination method, Gauss Seidel method, Gauss Jordan method, Crout's method Largest Eigen value and its corresponding Eigen vector by iteration method.	7		2
Unit 3: Numerical solution of Ordinary differential equations			
Taylor's series method, Picards method, Euler's modified method, Runge Kutta method of 4 th order, Milne's Predictor-Corrector method, Runge Kutta method to solve simultaneous first order differential equations.	8		3
Unit-4 Finite Differences and Statistics			
Newton's Forward and backward difference formula, Lagranges interpolation formula for unequal intervals, Fitting of a Curve by Method of Least Squares: Straight line $y = a + b x$, Second degree parabola $y = a + bx + cx^2$ and curves of the type $y = ae^{bx}$, $y = ab^x$ and $y = ax^b$, Coefficient of correlation and Lines of regression, Rank correlation.	8		4
Unit-5: Numerical Differentiation and Integration			
Numerical Differentiation: Newton's Forward and Backward difference Numerical Integration: Trapezoidal rule, Simpson's 1/3 rd rule, Simpson's 3/8 th rule.	6		5

Text/Reference Books:

- (1) Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
- (2) Ramana B.V., Higher Engineering Mathematics, Tata Mc-Graw Hill, New Delhi, 11th Reprint, 2010.
- (3) N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
- (4) B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
- (5) P. N. Wartikar and J. N. Wartikar, Applied Mathematics, Volume I and II.
- (6) H.K Dass, Rama Verma, Rajnish Verma, V.J. Dagwal, Sajid Anwar and D.F. Shastrakar, Engineering Mathematics, Volume II, S. Chand.

Dr. R. V. Harne
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B.Tech. Civil Engineering (NEP) (CBCS)

Sem-II	Total Hours Distribution Per Week		
Total Credits : 1	Practical (P) : 2 Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2CV01P	Applied Mathematics-II Lab	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
25 Marks	25 Marks	25 Marks	3 Hours

Practical Course Objectives

Solving problems using Open-Source Software Programming Language

Practical Course Outcomes

After completing the practical course, students will be able to solve the following using Open-Source Software Programming Language.

- 1 Problems on the Algebraic and Transcendental Equations.
- 2 Problems on the simultaneous linear equations.
- 3 Problems by using the different methods to solve Ordinary differential equations.
- 4 Problems to find the value of the function at particular point for the data of equal and unequal interval.
- 5 Problems on numerical differentiation and numerical integration.

Sr. No.	List of the Practical: Performance of at least SIX practical is compulsory in a semester.
Unit-1: Solution of Algebraic and Transcendental Equations (6 Hours)	
1	Write a Program to solve Algebraic and Transcendental Equations by one of the iterative methods: Bisection method, and Method of False position.
2	Write a Program to solve Algebraic and Transcendental Equations by one of the iterative methods: Newton Raphson method, Newton Raphson method for multiple roots and Direct iteration method.
Unit 2: Solution of system of simultaneous linear equations: (04 Hours)	
3	Write a Program to solve the system of simultaneous linear equations by one of the iterative methods: Gauss Jordan method, and Gauss seidel method.
4	Write a Program to solve the system of simultaneous linear equations by one of the direct methods: Gauss elimination method, and Crout's method
5	Write a Program to find the Largest Eigen value and its corresponding Eigen vector of a matrix by iteration method.
Unit 3: Numerical solution of Ordinary differential equations: (04 Hours)	
6	Write a Program to solve ordinary differential equations numerically by the iterative method: Euler's modified method
7	Write a Program to solve ordinary differential equations numerically by the iterative method: Rungekutta method of 4th order

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Dr. R. V. Hanane

8	Write a Program to solve ordinary differential equations numerically by the iterative method: Milne's Predictor-Corrector method
Unit-4 Finite Differences and Statistics	
9	Write a Program to solve the Interpolation Problems for unequal interval data by the formula: Lagranges interpolation formula
10	Write a Program to fit a given curve.
Unit-5: Numerical Differentiation and Integration	
11	Write a Program to solve the problem of Numerical Differentiation by one of the formulas: Forward, Backward and Central difference formula
12	Write a Program to solve the problem of Numerical Integration by one of the formulas: Trapezoidal rule, Simpson's 1/3rd rule, Simpson's 3/8th rule.

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Faculty of Science & Technology
**B.Tech. Second Semester Computer Engineering, Computer Science & Engineering, Civil
Engineering (NEP)(CBCS)**

Sem-II	Total Hours Distribution Per Week		
Total Credits : 3	Lecture (L) : 3 Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2CE02T/BT2CS02T BT2CV02T	Applied Physics	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
40 Marks	60 Marks	50	3 Hours

Course Objectives	
1	To Provide a Strong Foundation in physics to provide technical knowledge
2	To gain an understanding of the phenomenon of Optical Fibre used for advanced applications in Engineering
3	To familiarize prospective engineers with fundamental concepts of semi-conductors and their applications in semiconductor technology
4	To gain an understanding of the total internal reflection in electron optical system
5	To make acquainted with the Nano technology

Course Outcomes	
After completion of syllabus, students would be able to	
1	Learn the basic concepts of the dual nature of matter and wave packet and apply them to analyze various relevant phenomena and to solve related numerical problems.
2	Apply concepts in optical fibre to solve relevant numerical problems and to relate to relevant engineering applications
3	Identify and explain different types of diodes, transistors, and its applications.
4	Learn and explain Motion Of Electron in Various Electrical Devices.
5	Learn Various types of Nonmaterial and their different types.

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Sanket Londe

SYLLABUS

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1 Quantum Mechanics & Quantum Computing			
De-Broglie Hypothesis, Concept of wave-particle duality, Matter Waves, Davisson-Germer Experiment. Concept of wave packets, Heisenberg Uncertainty Principle, Significance of Wave function Ψ and normalization condition, Schrodinger wave equation (Expression for time dependent and time independent), Application to one dimensional infinite potential well, Introduction about Quantum Computer, Explain Bit & Qubits, Quantum Entanglement, & Numerical	7		1
Unit 2: Optical Fibre			
Structure of optical fiber, total internal reflection, modes of propagation, Classification of Fibre, Graded index profile, Single Mode and Multi Mode Numerical aperture, classification of optical fiber, Acceptance angle and cone, attenuation and dispersion, fiber optic communication system. & Numerical.	7		2
Unit 3: Semiconductor Devices			
Basic idea of free electron theory of metals, expression of conductivity of a metals Semiconductor, Classification, Pure and doped semiconductors. Types of Semiconductor diodes - P-N junction Diode, Tunnel Diode, Zener Diode, Light Emitting Diode (LED). Transistors and it's type PNP and NPN transistors, Hall Effect, Hall voltage, and Hall coefficient; its applications. & Numericals	8		3
Unit 4: Electron optics			
Motion of electron in magnetic and electric field, Bethe's law, Electrostatic lens, CRT: Block diagram and functions of each part of CRT. CRO: Block diagram and functions of each part like trigger circuit and time base circuit. Applications of CRO	7		4
Unit 5: Nanotechnology			
Basic Concept of nanotechnology, Classification of Nano Materials, Comparison Of Properties Of Nonmaterial's With Bulk Materials, Top-down and bottom-up approach, comparison of properties of bulk and nano-materials, sol gel process and ball mill process, special types of materials, Zeolite and Graphene, applications of nanotechnology.	7		5

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(09/07/2026)

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Mrs. M. S. Patel

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Ashutosh Raut
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Santosh Lale

Text/Reference Books:

1. P. M. Mathews and K. Venkatesan, A Textbook of Quantum Mechanics, Tata Mc Graw Hill (1977).
2. J. L. Powell and B. Crasemann, Quantum Mechanics, Narosa Publishing House (1993).
3. Applied Physics, M. N. Avdhanulu, Shilpa A. Pande, Arti R. Golhar, Mohan Giriya, S. Chand
4. D. J. Griffiths, Quantum mechanics, Prentice Hall of India Private Limited, New Delhi
5. Charles Kittel, Introduction to Solid State Physics, Wiley Eastern, 5th edition, (1983).
6. Engineering Physics - Dr.N. S. Ugemuge, Dr. (Mrs.) S.U.Bhonsule and Dr.ShrutiPatle DNA Publication(2019)
7. David Halliday, Robert Resnick, Jearl Walker, Principles of Physics, 10th Edition, John Wiley and Sons (2017)
8. A. J. Dekker, Solid State Physics, Prentice Hall of India (1971).
9. A Textbook of Engineering Physics, Dr. M. N. Avdhanulu, Dr. P. G. Kshirsagar, S. Chand Publication
10. A Text Book of Engineering Physics Dr. DevashreeHardas& Dr. Ashish Panat, Das Ganu Publication ISBN-978-81-921757-7-5 (2011)
11. Applied Physics, - Dr. (Mrs)S.P. Wankhede, Dr.ShrutiPatle, Dr.(Mrs.)S.U.Bhonsule and Dr.N. S. Ugemuge DNA Publication ISBN-978-81-945174-6-7 (2020)
12. Quantum Physics of Atoms, Molecules, Solids, Nuclei, and Particles by R. Eisberg and R. Resnick, Wiley and Sons
13. Text book of Applied Physics, Dr. D. S. Hardas, Dr. D. S. Bhounmik, Dr.S. Shastri, Das Ganu Publication ISBN-978-93-84336-59-2 (2021)
14. Engineering Physics, second edition, Sanjay Jain, G. Sahasrabudhe, University's Press(India) Pvt. Ltd.(2016)
15. L. I. Schiff, Quantum Mechanics, TMH Publications
16. Advanced Engineering Materials - Dr. Sangeeta G. Itankar, Dr. Manjusha Dandekar, Dr. Tushar R. Shelke, Dr. Swati Fartode, Alliance & Co. ISBN 978-93-91322-12-0 (2023)
17. Applied Physics- Dr. Sangeeta G. Itankar, Dr. Manjusha Dandekar, Dr. Tushar R. Shelke, Dr. Swati Fartode, Alliance &Co. ISBN 978-93-91322-97-7 (2023)
18. Advanced physics - Dr.ShrutiPatle, Dr.(Mrs.)S.U.Bhonsule, Dr.Ashish N. Bodhaye, Dr.ManoharD.Mehare DNA Publication (2019)
19. Text book of Advanced Engineering Physics – Alliance & Company Publication by Dr. Chandrakant Khobragade (2025-26)

[Signature]
Dr. C. L. Khobragade
(09/07/2026)

[Signature]
Dr. D. S. Shastri
09/07/2026
(Dr. S. Shastri)

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Mrs. M. S. Palani

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Ashutosh Raut
09/07/2026

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09/07/2026
Santosh Lunde

**SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BAHADURA,
UMRER ROAD, NAGPUR**

An Autonomous Institute Affiliated to RTMNU, Nagpur

Faculty of Science & Technology

**B. Tech. Second Semester Computer Engineering, Computer Science & Engineering, Civil
Engineering (NEP) (CBCS) (Practical)**

Sem-II	Total Hours Distribution Per Week		
Total Credits :1	Lecture (L) : 0Hrs	Tutorial/Activity (T/A) : 2 Hrs	
Subject Code	BT2CE02P/BT2CS02P /BT2CV02P	Applied Physics Lab	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
25 Marks	25 Marks	25	3 Hours

List of Experiments: Performance of at least eight experiments is compulsory in a semester.

Name of the Experiments	
1	Energy gap of semiconductor /thermistor.
2	To Study the V-I characteristics of PN junction diode.
3	To Study the V-I characteristics of Zener diode.
4	To Study the Input/Output of PNP/NPN transistor in CB and CE mode
5	To Study the V-I Characteristics of Tunnel diode..
6	To Study V-I Characteristics of Light Emitting Diodes/ Determination of Plank's constant by using LEDs.
7	Study the Diode rectification
8	Study of Hall Effect and determination of Hall Voltage of a given sample.
9	To determine the Hall coefficient (RH) with temperature
10	To study the B-H curve and find out the values of coercivity, retentivity, and saturation magnetization of the experimental material..
11	Determination of NA in optical fiber
12	Calibration of Time Base circuit of CRO and determination of AC, DC voltage & frequency of electrical signals using CRO
13	To determine the Wavelength of laser by using diffraction grating
Virtual Lab	
14	Experiment on the determination of the thickness of a thin foil using an air wedge arrangement
15	Experiment on the determination of the refractive indices of the material corresponding to ordinary and extra - ordinary rays.

Sanket Lankar
09/07/2026

C.L. Chaudhary
09/07/2026

Dr. D.F. Shastri
09/07/2026

Dr. D.F. Shastri
09/07/2026

Ashutosh Raut
09/07/2026

Ms. M. S. Patel

Sanket Lankar
09/07/2026

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING NAGPUR
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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. CIVIL ENGINEERING

Course Category	ESC-IV		
Sem: II	Total Hours Distribution per week		
Total Credit: 3	Lecture (L): 3 Hrs	Tutorial/Activity(T/A): 0 Hr.	
Subject Code	BT2CV03T (Th)	ENGINEERING MECHANICS	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Minimum Passing Marks	Examination Duration
40	60	-	3 Hours

Course Objectives

1	To Understand the force systems and draw free body diagram to analyze rigid body equilibrium.
2	To Comprehend the principles of friction and solve engineering mechanics problems associated with frictional force.
3	To introduce the concept of centriod and moment of inertia of plane area.
4	To make student aware about the method of joint and method of section to analyse the truss.
5	To Understand the concept of motion of particles and rigid bodies.

Course Outcomes

After successful completion of this course the student will be able to:

CO1	Analyse a given force system and apply the knowledge of force system and moment to determine resultant of various force system & apply the knowledge of equilibrium of force system.
CO2	To apply the basics of friction
CO3	Locate Centroid and compute area Moment of Inertia for standard shapes and composites areas.
CO4	Analyze simple determinate trusses
CO5	Analyze the connected system of particles using concept of dynamic equilibrium

S.A.S. Moon
Chairman BOS

BOS:-CIVILB-TECH

Dr. S. M. Chabhiye
Dr. P. K. Moray

D.L. Budhlani

Version:-1

Er. M. G. Hingane

Er. B. Santalekar
Er. V. Padhate
 Session-2026-27

SYLLABUS

Contents	No. of hours
UNIT 1: Basics Concepts and equilibrium of force systems Introduction to Engineering Mechanics: Force Systems, Basic concepts, Rigid Body equilibrium; System of Forces, Coplanar Concurrent Forces, Resultant Moment of Forces and its Applications. Equilibrium of System of Forces, Free body diagrams, Equilibrium of Coplanar Systems. Simple beams and support reactions. Diagram of Statically Determinate Beams.	7
UNIT 2: Friction Types of friction, Limiting friction, Laws of Friction, Static Friction; Motion of Bodies, wedge friction.	5
UNIT 3: Centroid and Moment of Inertia Centroid and Centre of Gravity, Centroid of standard shapes and application to composite plane shapes; Area moment of inertia: formula of area moment of inertia of standard shapes, parallel and perpendicular axis theorem, application to composite plane shapes	7
UNIT 4: Analysis of structures- Trusses Assumption and Analysis of simple trusses by method of joints & method of sections	5
UNIT 5: Kinetics of Particles Kinetics of particles D'Alemberts principle and its application in connected system of particles, Impulse Momentum, Collision of bodies.	5

References

Text Books Recommended:

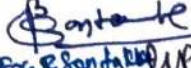
1. Vector Mechanics for Engineers: Statics and Dynamics, Johnston. R.E., Beer. F., Eisenberg. E. R., & Mazurek. D., McGraw Hill
2. Engineering Mechanics: Principles of Statics and Dynamics, R. C. Hibbler, Pearson Press
3. Engineering Mechanics, S S Bhavikatti, Newage International publication


 Dr. S.M. Gajbhiye

 Dr. A.S. Moan
 Chairman BOS


 Dr. M.G. Hingane


 D.L. Budhkar


 Dr. B. Santale

 S.V. Patil
 Session-2026-27

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FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. CIVIL ENGINEERING

Course Category	ESC-IV		
Sem:II	Total Hours Distribution per week		
Total Credit: 1	Practical(P): 2 Hrs	Tutorial/Activity(T/A): 0 Hr.	
Subject Code	BT2CV03P (Practical)	Engineering Mechanics Lab	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Minimum Passing Marks	Examination Duration
25	25	25	-

Course Outcomes	
After successful completion of this course the student will be able to:	
CO1	Analyse a given force system and apply the knowledge of force system and moment to determine resultant of various force system & apply the knowledge of equilibrium of force system.
CO2	To apply the basics of friction
CO3	Locate Centroid and compute area Moment of Inertia for standard shapes and composites areas.
CO4	Analyze simple determinate trusses
CO5	Analyze the connected system of particles using concept of dynamic equilibrium

Minimum Eight out of the following practical's shall be performed:

Sr. No.	List of Practical's
01	To verify law of polygon of forces using Law of Polygon Apparatus
02	To determine the forces in the members of a Jib Crane Apparatus experimentally and graphically
03	Parallel Forces Apparatus
04	Law Of Moment
05	Rolling Friction Apparatus
06	Equilibrium Forces Apparatus
07	To find determine the support reactions of a Simply Supported Beam experimentally and analytically
08	To determine the coefficient of friction between two surfaces of different material on Plane Friction Apparatus.
09	To find the forces in the member of truss using graphical method and hand calculation.

Dr. A.S. Man
Chairman BOS

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Dr. M. A. Hingane
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D.L. Budhkar

Dr. P. K. Karmay

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Dr. B. Sonkamble

S.V. Pathase

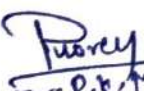
Note:

1. Conduct minimum 08 practical's out of above list and practical no. 1 is mandatory.
2. Viva-voce question should be included in each of the practical.
3. During Continuous Internal Evaluation (CIE) practical Marks, regular performance of practical's for 10 marks, 05 Marks for Journal submission and 10 Marks for internal viva-voce examination.
4. During End Semester Exam (ESE) practical Marks, external practical examination performance must be conducted for 15 marks and 10 Marks for viva.
5. For Eligibility of ESE Practical examination, internal submission of Journal (Practical File) is mandatory.


Dr. S. M. Wajbhaye


Dr. A. S. Moon
Chairman BOS


Er. M. G. Hingane


Er. P. K. Torrey


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S. V. Patil
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NAGPUR
FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. CIVIL ENGINEERING

Course Category	Engineering Science Course (ESC-V)		
Sem.: II	Total Hours Distribution per week		
Total Credit: 2	Lecture (L): 2 Hrs.	Tutorial/Activity(T/A):...Hr.	
Subject Code	BT2CV04T (Theory)	Basics of Electrical & Electronics Engineering	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	Semester End Exam(SEE)Marks	Minimum Passing Marks	Examination Duration
20	30	25	2 Hours

Course Objectives:	
1	Understand basic electrical circuit concepts and laws.
2	Learn magnetic circuit principles.
3	To Understand basic operation and working of single-phase Transformer.
4	Develop basic problem-solving skills in electrical and electronics.

Course Outcomes:	
After successful completion of this course the student will be able to:	
CO1	Apply basic circuit laws to analyze DC circuits.
CO2	Explain and solve simple magnetic circuit problems.
CO3	Explain the construction, working, performance, and applications of single-phase transformers.
CO4	Describe the operation and applications of PN junction diodes, Zener diodes, and BJTs.

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SYLLABUS	
Contents	No. of hours
Unit I: Circuit Elements and Parameters: Active and passive elements, Ideal and practical voltage and current sources, source transformation; -DC Circuits: Types Series, Parallel, Star Delta and transformation, Energy Sources and Circuit Reduction, Kirchhoff's Laws & Applications, Ohm's laws.	6 HRS
Unit II: Magnetic Circuits: Ampere's law, Magnetic field intensity, Magnetic flux and flux density, MMF, Magnetic circuit, Permeability, Reluctance and Permeance, Leakage and fringing; concepts of magnetic circuit, analogy between electric and magnetic circuit, Series & Parallel magnetic circuits, numerical on series magnetic circuit	8 HRS
Unit III: Single Phase Transformer: Transformer: Basic Principles, Construction, Phasor Diagram for Transformer under no load conditions, OC and SC Test (Theory Only) Voltage, Regulation and Efficiency,	8 HRS
Unit IV : Introduction to Electronic Components Introduction to Semiconductor P-N junction diodes, Biasing, operation, V-I Characteristics and applications. Zener diode: Characteristics and Application. Introduction to BJT-NPN and PNP. Modes of Operation and working.	8 HRS

Text Books:

1. **D.P. Kothari & I.J. Nagrath** – Basic Electrical Engineering.
2. **V.K. Mehta & Rohit Mehta** – Principles of Electronics.

Reference Books:

1. **B.L. Theraja & A.K. Theraja** – Electrical Technology (Vol. I).
2. **Robert L. Boylestad & Louis Nashelsky** – Electronic Devices and Circuit Theory.
3. **William H. Hayt Jr., Jack E. Kemmerly & Steven M. Durbin** – Engineering Circuit Analysis.

S. Bhargava

Dr A.M. Mendhe

V.A. Hanchikhe

A.V. Wanjari

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B.TECH. CIVIL ENGINEERING

Course Category	Program Core Course –I (PCC-I)		
Sem: II	Total Hours Distribution per week		
Total Credit: 2	Lecture (L): 2 Hrs	Tutorial/Activity(T/A): 0 Hr.	
Subject Code	BT2CV05T (Th)	Basics Of Civil Engineering	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Minimum Passing Marks	Examination Duration
20	30	-	2 Hours

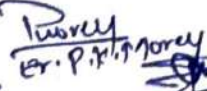
Course Objectives	
1	To-study the role of civil engineers in infrastructure planning, design, and development & apply fundamental principles of building planning.
2	Identify and classify different types of loads acting on buildings, different types of foundations and their suitability for various soil conditions, types of concrete and their specific applications in construction
3	sources of water its requirements and different types of wastes and outline methods of their collection and disposal, function of basic hydraulic structures and water conveyance systems
4	The course will provide students knowledge regarding different aspects of air pollutants, its sources and effects, meteorological parameters, air sampling

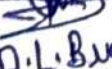
Course Outcomes	
After successful completion of this course the student will be able to:	
CO1	Studied various civil engineering design planning principals
CO2	Studied different types of loads, foundations, concrete and their applications
CO3	Studied Sources of water, types of waste and its methods, basics of water conveyance system
CO4	Students will be able to understand different aspects of air pollutants, its sources and effects on man & materials and Meteorological parameters


 Dr. A.S. Moon
 Chairman BOS

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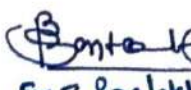

 Dr. S.M. Gajbhiye


 Dr. P.R. Jadhav


 D.L. Budhlani

Version:-1


 Dr. M.V. Ningane


 Dr. B. B. Patil

Session-2026-27

SYLLABUS		
	Contents	No. of hours
UNIT 1	Introduction and scope of Civil Engineering. Role of Engineers in the infrastructure development. Selection of site, basic functions of buildings, types of buildings – Residential, Public, Commercial, and Industrial. Principles of planning, orientation of buildings, introduction to bye-laws regarding building line, Height of building, open space requirement, F.S.I., Carpet area, built up area, setbacks, ventilation	7
UNIT 2	Introduction to Types of loads on buildings. Substructure – Types of soils; rocks and foundation strata, concept of bearing capacity, Types of foundation and their suitability. Superstructure –Types of construction: Load Bearing, Framed, and Composite. Introduction to basic construction materials; cement, bricks, stone, aggregates, reinforcing steel, structural glazing, structural steel; Concrete types: PCC, RCC, Prestressed, Precast and Ready Mix Concrete. Use of various eco- friendly materials in construction.	8
UNIT 3	Water supply - Sources, drinking water requirements, impurities in water and their effects; Purification of water, modern purification processes; Standards of purified water. Waste Management: Collection and Disposal methods of Liquid, solid and gaseous wastes. Introduction to Hydraulic structures of storage; water conveyance systems; Watershed management: Definition, Necessity and methods; Roof top rain water harvesting and Ground water recharge: relevance and methods.	8
UNIT 4	Introduction to air pollution: Definition, atmosphere & its zones, Classification and sources of air pollutants, Impacts of air pollution on human health, vegetation, animals, building materials, structures, and atmosphere, soil and water bodies. solid waste management(SWM): Structure , necessity and responsibility, Sources, Quantity and quality, Sources of solid waste, classification and components, physical and chemical characteristics, Collection and transportation of solid waste: Method of collection, equipment used for collection and transportation, transfer stations, Optimization of transport route.	4

References

Text Books Recommended:

1. Elements of Civil Engineering:By S. S. Bhavikatti
2. Basic Civil Engineering:By Dr. B. C. Punmia, Ashok Kumar Jain, Arun Kumar Jain.
3. Concrete Technology:By M.S.Shetty
4. Surveying And Levelling:By Kanetkar and Kulkarni
5. Irrigation And Hydraulic Structures:By S.K.Garg
6. Water Supply And Sanitary Engineering: Including Environmental Engineering, Water And Air Pollution
- Laws And Ecology:By G. S. Birdie, J. S. Birdie
7. Building Construction:By Sushil Kumar
8. Transportation Engineering:By Khanna & Justo
9. Building Drawing Design:By Shah and Kale
10. Construction Planning ,Equipments And Methods:Robert Peurifoy, Clifford J. Schexnayder,

Dr. A.S. Meon
Chairman BOS
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Session-2026-27
Er. B. Pandey
S.V. Pathare

**SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BAHADURA, UMRED
ROAD, NAGPUR**

An Autonomous Institute Affiliated to RTMNU, Nagpur

Faculty of Science & Technology

**B. Tech. Mechanical Engineering/Civil Engineering/Electrical Engineering/
Electronics & Telecommunication/Computer Sci. Engineering/Computer Engineering
(NEP) (CBCS)**

Sem-II	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L): 2Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2ME06T/BT2CV06T/BT2EE06T /BT2ET07T/BT2CS06T/BT2CE06T	REFER TO IKS (Preserving Art, Culture and Traditions)	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
20 Marks	30 Marks	25 Marks	2 Hours

Course Objectives	
1	To recognize the perspective of Indian Knowledge System v(IKS) for national pride.
2	Sensitize the students to the contributions made by Indians in the field of philosophy, art and health.

Course Outcomes	
After completion of syllabus, students would be able	
1	Interpret basics of Indian Knowledge system.
2	Integrate the teaching of Indian culture and civilization.
3	Appreciate Indian artistic tradition.
4	Analyze Indian health and wellness system for healthy living.

DR. AMOL MUSALE

Dr. D. P. Shastri
09/07/2026

(Supriya Hegde)
09/07/2026

Ms. M. S. Patel

SYLLABUS.(REFER TO IKS)

DETAILS OF TOPIC	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1			
Introduction to Indian Knowledge System: Introduction and overview of Indian Knowledge Sysatem , Vedic Corpus-Vedas, Types of Vedas, Upvedas, Types of Upvedas.	6		1
Unit-2			
Indian Culture and Civilization: Indian Culture and Civilization, Its characteristics, Difference between Culture and Civilization, Indus Valley Civilization, Vedic Civilization.	6		2
Unit-3			
Indian Artistic Traditions: Indian Artistic Traditions, Chitrakala- Indian Style Painting (Madhubani, Warli, Phad, Kalamkari, Gond, Mandana), Nritya: Indian Dance Forms(Bharat natyam , Kathak, Kathakali, Kuchipudi, Manipuri, Mohiniattayam). Sangeet: Carnatic Music & Hindustani Music.	6		3
Unit-4			
Health And Wellness: Wellbeing, Mental And Physical, Dimensions of Wellness, Concept of Healthy Living In Ayurveda, Tri-Doshas-Relationship To Health.	6		4

Text/Reference Books: -

- 1) Indian Knowledge Systems Ancient Wisdom For The Modern World, Dr. Madhukar Nikam, DATTSONS.
- 2) Indian Knowledge Systems Concepts And Applications. B. Mahadevan, Vinayak Rajat Bhat, Nagendra Pavana R.N.PHI Learning Private Limited.
- 3) Indian Knowledge Systems. Dr. Vilas Gajbe. Dr. Sanjiv Khondekar. Dr. Vinay Upadhayay. Dr. Prashant Raut. Nutan Akash Publication.

DR. AMOL MUSACE

(Signature)
Dr. D. F. Shastri
09/07/2026

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Mrs. M. S. Palal

**SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BAHADURA, UMRED
ROAD, NAGPUR**

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Faculty of Science & Technology

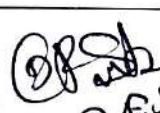
**B. Tech. Mechanical Engineering/Civil Engineering/Electrical Engineering/
Electronics & Telecommunication/Computer Sci. Engineering/Computer Engineering
(NEP) (CBCS)**

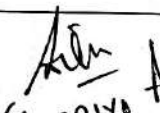
Sem-II	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L): 2Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2ME06T/BT2CV06T/BT2EE06T /BT2ET07T/BT2CS06T/BT2CE06T	REFER TO IKS (Consciousness Studies)	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
20 Marks	30 Marks	25	2 Hours

Course Objectives	
1	To recognize the perspectives of Consciousness Studies

Course Outcomes	
After completion of syllabus, students would be able	
1	To define the primary fundamentals of Consciousness Studies.
2	To explain the pros and cons of the effects of Consciousness Studies.
3	To classify the consequences of Consciousness studies to promote behavioural science.
4	To relate the basics of Consciousness Studies to better understanding the problems of individual and society.


DR. AMOL MURAGE
 Mrs. M. S. Patel.
 09/07/2026
 (Dr. Shrin)


 Dr. D. P. Shrin
 09/07/2026


 (Supriya Arun)
 09/07/2026

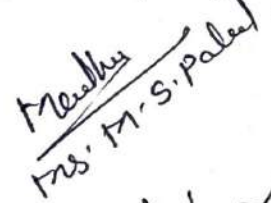
SYLLABUS (REFER TO IKS)

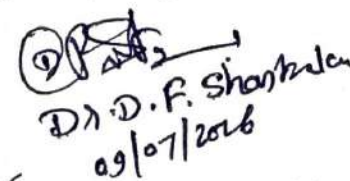
DETAILS OF TOPIC	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1			
Introduction to Psychology: An introduction to Psychology, Definition of Psychology, History of Psychology, Psychological methods, Sub-divisions of Psychology, Application of Psychology.	6		1
Unit-2			
Basic Cognitive Processes Sensory Process-general characteristics of senses, visual sense, auditory sense, other senses, Perpetual organization-principles of Perceptual organization, object perception and perceptual, object perception and perceptual constancies, influences upon perception, extra sensory perception.	6		2
Unit-3			
Classical conditioning, theories about classical conditioning, Reinforcement and Punishment.	6		3
Unit-4			
Theories about memory, brain and memory, long term memory, forgetting.	6		4

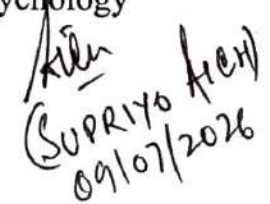
Text/Reference Books: -

1. Clifford T Morgan, King, Weiss and Schopler, Introduction to Psychology, McGraw Hill Education (India) Private Limited.
2. Hilliard Atkinson and Atkinson, (1977) Introduction to Psychology, Tatty McGraw Hill.
3. Kao H.S.R. & Sin had. (Ends) (1977) Asian Perspectives on Psychology


DR AMOR MUSALE


Mrs. M. S. Paley


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Dr. S. K. Sin
 09/07/2026

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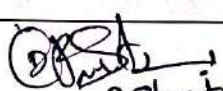
**B. Tech. Mechanical Engineering/Civil Engineering/Electrical Engineering/
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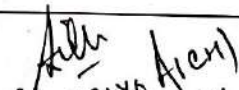
Sem-II	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L): 2Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2ME06T/BT2CV06T/BT2EE06T /BT2ET07T/BT2CS06T/BT2CE06T	REFER TO IKS (Glimpse of Ancient Science & Technology)	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
20 Marks	30Marks	25 Marks	2 Hours

Course Objectives	
1	To recognize the Glimpse of Ancient Science & Technology

Course Outcomes	
After completion of syllabus, students would be able	
1	To understand about great mathematicians and to help students to trace, indentify, practice, and develop the significant Indian mathematics
2	To understand the concept of motion and its application in Indian ancient physics literature.
3	To understand the concept of basic chemicals & metallurgical process of ancient and medieval India.


SR Anur Musage
 09/07/2026
 (Dr. S. K. Khan)


Dr. D. F. Shastri
 09/07/2026


Supriya Aich
 09/07/2026


Dr. A. B. Gurusamy
 09/07/2026

SYLLABUS (REFER TO IKS)

DETAILS OF TOPIC	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1			
Mathematics in India: Introduction of inception of Mathematics from Vedic periods. Great mathematician and their contribution (e.g. Aryabhatta, Bhaskara, Bhramagupta, Ramanujan, Pingala, Bhaskara-II, Sulabhasutras (Pythagoras theorem), Square, Square root of imperfect squares, Value of Pi.	6		1
Unit-2			
India: Vaisheshikadarshan Atomic Theory & law of motion, Theory of Panchamahabhoota, BrihatShathaka (division of time, unit of distance), Bhaskaracharya (Introduction to theory of gravity, Suryasidhanta & Sidhantasjhiromani), Lilavati (Gurutvakarshan shakti)	6		2
Unit-3			
Chemistry of India: Vatsyayana, Nagarjuna, Vagbhata – building of Theras-Shala (laboratory), working arrangements of Ras-Shala, material and equipment, YashoDharaBhatta-process of distillation, apparatus. Metallurgy in India, Suvarna(gold) and its different types of properties, Rajata (Silver), Tamra (Copper) , Loha (Iron), Jasta (Zinc) Naga/Sisa (lead), Pittala (brass)	6		3
Unit- 4			
Medicines and yog in India : Importance and benefits of yoga purpose of yoga traditional knowledge of medicinal plant, use of home available herbs and spices.	6		4

Text/Reference Books: -

1. R. P Kularani, Glimpse of Indian Engineering and Technology (Ancient & Medieval period, Munshiram Manoharlal Publishers Pvt. Ltd, 2018
2. A.K. Pathak, Science and Technology in India, Anshikaprakashnpratapgarh ,2016.
3. PB Sharma, S Narnia, Doctors Scientists and Engineers of Ancient India, Kalpaz Publications 2017.
4. NVP, Unithiri.Indian Scientific Traditions(Professor K.N. NeelkantanElayath Felicitation Volume), publication9n division, University of Calicut,2006.
5. Anonymous, History of Science in India-Volume-I, Part-I(Physics, Mathematics & Statistics), the national academy of science, India & the Ramakrishna Mission Institute of culture, 2014.
6. Kaptur K and Singh A.K.(Eds 2005), Indian Knowledge Systems, Vol-1, Indian Institute of Advanced Study, Shimla. Tatvabodh of Snakaracharya, Central Chimney Mission Trust, Bombay, 1995.
7. Dharmpal, Indian Science & Technology in the 18th century, Rashtrottahanasahitya, 1983.
8. S Biswal, B L Ray, Vedic Science and Technology, DK Porint world, 2009.

DR. AMR MUSACE

*Members
Mrs. M. S. Palani*

*Dr. D. F. Shastri
09/07/2026*

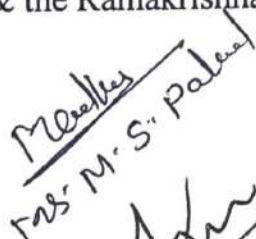
*(Supriya Aeri)
09/07/2026*

*(Dr. Moumuni Aich)
09/07/26*

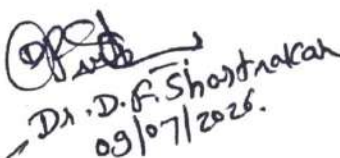
9. A. K. Bag, History of technology in India, (Set 3 vol), Indian Nation Science Academy, 1997.
10. A Gosh, History of Science in India (Volume-I Part-II Astronomy), the national academy of science, India & the Ramakrishna mission institute of culture, 2014.

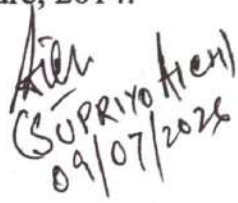


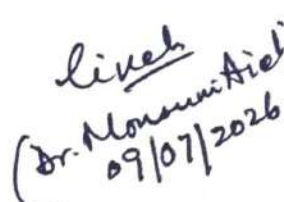
DR. ANMOL MISRA


Mrs. M. S. Patel


09/07/2026
(Dr. S. K. Choudhary)


Dr. D. R. Shastri
09/07/2026


SUPRIYA
09/07/2026


Dr. Monu
09/07/2026

**SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING, BAHADURA, UMRED
ROAD, NAGPUR**

An Autonomous Institute Affiliated to RTMNU, Nagpur

Faculty of Science & Technology

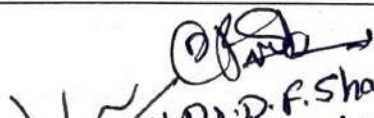
**B. Tech. Mechanical Engineering/Civil Engineering/Electrical Engineering/
Electronics & Telecommunication/Computer Sci. Engineering/Computer Engineering
(NEP)(CBCS)**

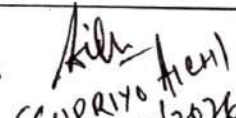
Sem-II	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L): 2Hrs	Tutorial/Activity (T/A) : 0 Hr	
Subject Code	BT2ME06T/BT2CV06T/BT2EE06T /BT2ET07T/BT2CS06T/BT2CE06T	REFER TO IKS (Wellness, traditional medicines & yoga)	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
20 Marks	30 Marks	25 Marks	2 Hours

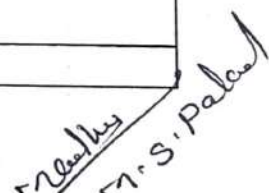
Course Objectives	
1	To recognize the perspective

Course Outcomes	
After completion of syllabus, students would be able	
1	To define the primary fundamentals Wellness, Traditional Medicines & Yoga.
2	To relate the overall elements of nature around human life & livelihood.
3	To classify and rectify the problems related to body .
4	To explain benefits of wellness.


**DR. ANURAG
MUSACE**


Dr. D. F. Shastri
09/07/2026
(Dr. S. K. Kulkarni)


Supriya Heni
09/07/2026


Mrs. M. S. Palani

SYLLABUS (REFER TO IKS)

DETAILS OF TOPIC	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Unit-1			
Importance of health and wellness, Essential components of balance diet for healthy living, Processed foods and unhealthy eating habits.	6		1
Unit-2			
Body systems and common disease, Sedentary lifestyle and its risk of disease, Stress, Anxiety and depression, Factors affecting mental health.	6		2
Unit-3			
Importance and benefits of Yoga, Purpose of Yoga, traditional knowledge of medicinal plant, use of home available herbs and spices.	6		3
Unit-4			
Vedas and its types, Social change in Indian society, Social stratification and class conflicts.	6		4

Text/Reference Books:

1. Sociology in India- Surendra Sharma, Rawat Publication.
2. Bradford B, Strand and Others, Fitness Education Arizona GorsuchSeani; sbrick Publishers, 1997.
3. Scott K Powers and Stephen L Dodd. Total Fitness; Exercise; Nutrition and wellness Boston: Ally and Bacon, 1999.
4. RigvedaSamhita with SayanaBhashya, VaidikSamshodhanMandal, Pune.
5. Riksuktashati, H. D. Velankar, Bharatiya VidyaBahavan, Mumbai.


 Dr. D. P. Shandekar
 09/07/2026
 09/07/2026
 (SUPRIYO HEN)
 09/07/2026
 Ms. M. S. Paley
 09/07/2026
 DR. AMRUMISALE

SMT. RADHIKATAI PANDAV COLLEGE OF ENGINEERING NAGPUR
AN AUTONOMOUS INSTITUTE
 AFFILIATED TO RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR
FACULTY OF SCIENCE & TECHNOLOGY
B.TECH. CIVIL ENGINEERING

B.TECH. CIVIL ENGINEERING			
Course Category	SEC-I		
Sem:II	Total Hours Distribution per week		
Total Credit: 2	Practical(P): 4 Hrs	Tutorial/Activity(T/A): 0 Hr.	
Subject Code	BT2CV07P (Practical)	Application Of Cad In Civil Engineering	
Examination Scheme			
Continuous Internal Evaluation (CIE)Marks	End Semester Exam(ESE)Marks	Minimum Passing Marks	Examination Duration
50	50	50	-

Course Outcomes	
After successful completion of this course the student will be able to:	
CO1	Understand and use drafting software and apply basic drawing commands to create simple geometrical figure and engineering drawing.
CO2	Apply editing, dimensioning, scaling and plotting command for accurate engineering drawing.
CO3	Prepare detailed drawing of building components such as brick bonds, arches, doors, windows and stairs according to standard practices.
CO4	Develop double line plans of residential buildings such as 1BHK and 2 BHK houses with appropriate room layouts and sanitary provisions.
CO5	Prepare layout plans for public buildings such as schools, colleges, banks, clinics and post offices using standard drafting conventions.

Minimum Eight out of the following practical's shall be performed:

Sr. No.	List of Practical's
01	Introduction to drafting software and basic commands to draft various shapes like line, square, rectangle circle, arc, etc
02	Use of editing and dimensioning commands with special emphasis on the use of scale, page set – up for plotting a drawing
03	Drafting of various types of bonds in brickwork.
04	Drafting of various types of arches.
05	Drafting of various types of doors and windows.
06	Drafting of various types of stairs
07	Drafting sketches of Spread footing and Reinforced Cement Concrete Column Footing
08	Drafting of a double line plan for a One Bed Room, Hall and Kitchen residential building (including bath and water closet)
09	Drafting of a double line plan for a Two Bed Rooms Hall and Kitchen residential building

BOS:-CIVIL B-TECH

Version:-1

Session-2026-27

Dr. A.S. Moon
Chairman BOS

D.H. S.M. Gajbhiye

D.L. Budhlaji

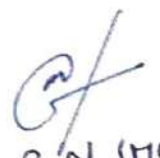
Dr. P.R. Moray

En. B. Santakrishna
S.V. Pathase

10	S To find (1) Principle moment of inertia and (2) Moment of inertia and product of inertia about any inclined axis for a composite figure using Mohr's circle and hand calculation.
11	To determine the coefficient of friction of Coil Friction Apparatus.
12	Kinetics of particles (collision of bodies)
13	To find support reactions of a simply supported beam using graphical method and hand calculation.

Note:

1. Conduct minimum 08 practical's out of above list and practical no. 1 is mandatory.
2. Viva-voce question should be included in each of the practical.
3. During Continuous Internal Evaluation (CIE) practical Marks, regular performance of practical's for 10 marks, 05 Marks for Journal submission and 10 Marks for internal viva-voce examination.
4. During End Semester Exam (ESE) practical Marks, external practical examination performance must be conducted for 15 marks and 10 Marks for viva.
5. For Eligibility of ESE Practical examination, internal submission of Journal (Practical File) is mandatory.


 Dr. S. N. Majhi

 Dr. A. S. Moon
 Chairman BOS


 D. L. Budhlani


 Dr. M. A. Hingane

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ROAD, NAGPUR**

An Autonomous Institute Affiliated to RTMNU, Nagpur

Faculty of Science & Technology

**B.Tech. Mechanical Engineering/Civil Engineering/Electronics & Telecommunication
/Electrical Engineering/**

Computer Science & Engineering/Computer Engineering (NEP) (CBCS)

Sem-II	Total Hours Distribution Per Week		
Total Credits : 2	Lecture (L) :	Tutorial/Activity (T/A) : 4Hrs	
Subject Code	BT2ME08P/BT2CV08P/ BT2ET08P/BT2EE08P/BT2CS08P/ BT2CE08P	CC Basket-II (Yoga & Cultural Activities)	
Examination Scheme			
CIE	ESE	Minimum Passing Marks:	Examination Duration:
100 Marks	-	50	-

Course Objectives

1	To understand the fundamental and benefits of yoga and cultural activities.
2	To develop physical fitness, strength, flexibility, and coordination.

SYLLABUS

- 1. Yoga Practices:** Importance and types of yoga, Warm up and stretching exercise, Pranayam techniques, Suryanamaskar, safety precaution during yogapractice.
- 2. Health and Wellness:** Stress management through yoga, Healthy lifestyle and nutrition, mindfulness and emotional balance.
- 3. Cultural Activities:** Meaning and importance of culture activities, Indian art, music, dance, drama, folk tradition.
- 4. Cultural Excellence and Creative Expression:** National festival, Regional festivals, college cultural festivals and competitions and Innovation.

Teacher
Mrs. M. S. Palani

Dr. D. F. Shrivastava
09/07/2026

Sandesh R. Grandhe
09/07/2026