Dr. Vasantraodada Patil Shetkari Shikshan Mandal's

Padmabhooshan Vasantraodada Patil Institute of Technology,
Budhgaon, Sangli (MS) – 416304

(An Autonomous Institute)

Affiliated to

Dr. Babasaheb Ambedkar Technological University,
Lonere, Raigad

(Accredited by NAAC)

Department of Civil Engineering

Structure Undergraduate Degree Programme

B. Tech. in Civil Engineering

In accordance with National Education Policy (NEP – 2020)

w. e. f.
Academic Year: 2026-27

Vision and Mission of the Institute

Vision

"To be a premier autonomous institute known for academic excellence, research innovation and transformative engineering education."

Mission

1. **Academic Excellence**
   Providing quality engineering education through an outcome-based curriculum, effective teaching–learning processes and continuous academic improvement.
2. **Research and Innovation**
   Promoting a strong research and innovation culture by encouraging faculty and students to engage in research projects, publications, patents and interdisciplinary collaborations.
3. **Industry-Oriented learning**
   Strengthening industry–institute collaboration through internships, industry-supported laboratories, expert lectures and real-world engineering projects to enhance employability.
4. **Holistic and Ethical Development**
   Developing competent engineers with professional ethics, leadership qualities, lifelong learning ability and commitment to social and sustainable development.

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H.O.D.	Dean Academics	Director

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Vision and Mission of the Department

Vision

"To excel in Civil Engineering education, research, and innovation by creating capable professionals devoted to sustainable infrastructure and community development."

Mission

Mission 1: Quality Education and Technical Competence

Providing quality Civil Engineering education through outcome-based learning, modern teaching practices, practical exposure and continuous academic improvement to build strong technical foundations.

Mission 2: Research, Innovation and Sustainable Solutions

Promoting research, innovation, consultancy and interdisciplinary collaboration in emerging areas of Civil Engineering with emphasis on sustainable and environmentally responsible infrastructure development.

Mission 3: Industry and Professional Engagement

Strengthening interaction with industry, government agencies and professional bodies through internships, field training, industry-supported laboratories, expert interactions and real-world projects for enhancing professional competence and employability.

Mission 4: Ethical, Social and Lifelong Learning

Developing socially responsible Civil Engineers with professional ethics, leadership qualities, teamwork, communication skills and lifelong learning attitude for serving society and addressing global challenges.

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Programme Educational Objectives (PEOs)

PEO 1: (Professional Career)

Graduates will establish successful career in Civil Engineering and allied fields by applying engineering knowledge, modern tools and professional skills in the planning, designing, construction, operation and maintenance of infrastructure.

PEO 2: (Research & Innovation)

Graduates will pursue higher education, research, innovation and interdisciplinary learning to address complex engineering problems and contribute to the advancement of Civil Engineering knowledge and sustainable development.

PEO 3: (Leadership, Ethics, Social Awareness)

Graduates will exhibit leadership qualities, professional ethics and teamwork while contributing responsibly to Civil Engineering industry and society.

PEO 4: (Lifelong Learning and Entrepreneurship)

Graduates will engage in lifelong learning, continuous professional development and entrepreneurial endeavours to adapt to emerging technologies, evolving industry practices, and global challenges in Civil Engineering.

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Knowledge and Attitude Profile (WK)

WK1: A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences.

WK2: Conceptually-based mathematics, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline.

WK3: A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline.

WK4: Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.

WK5: Knowledge, including efficient resource use, environmental impacts, whole-life cost, re-use of resources, net zero carbon, and similar concepts, that supports engineering design and operations in a practice area.

WK6: Knowledge of engineering practice (technology) in the practice areas in the engineering discipline.

WK7: Knowledge of the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development.

WK8: Engagement with selected knowledge in the current research literature of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues.

WK9: Ethics, inclusive behaviour and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes.

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Programme Outcome (POs)

PO1: Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization to develop to the solution of complex engineering problems (WK1 to WK4).

PO2: Problem Analysis: Identify, formulate, review research literature and analyse complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)

PO3: Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)

PO4: Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis and interpretation of data to provide valid conclusions. (WK8).

PO5: Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering and IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)

PO6: The Engineer and The World: Analyse and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).

PO7: Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national and international laws. (WK9)

PO8: Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

PO9: Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences

PO10: Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

PO11: Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

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Programme Specific Outcome (PSOs)

PSO1: Apply knowledge and skills of planning, design, drawing and estimation for infrastructure development.

PSO2: Apply Civil Engineering knowledge for higher education, competitive examinations, research, innovation, and entrepreneurship.

PSO3: Function effectively as a professional Civil Engineer through industrial exposure, multidisciplinary learning, ethical practices, communication skills, teamwork, and lifelong learning.

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Legends Used

L	*- Lecture Hours / Week*
T	*- Tutorial Hours / Week*
P	*- Practical Hours / Week*
CA	*- Continuous Assessment*
ISE 1	*- In Semester Evaluation – 1*
ISE 2	*- In Semester Evaluation – 2*
ESE	*- End Semester Examination*
MOOC	*- Massive Open Online Course*
NPTEL	*- National Programme on Technology Enhanced Learning*
FY	*- First Year*
SY	*- Second Year*
TY	*- Third Year*
B.Tech	*- Bachelor of Technology*
MDM	*- Multidisciplinary Minor*
OE	*- Open Elective*

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Semester-Wise Credit Distribution For
Four Year UG Engineering Programme in Civil (One Major, One Minor)

Semester		I	II	III	IV	V	VI	VII	VIII	Total Credits
Basic Science Course	BSC/ESC	08	08	-	-	-	-	-	-	16
Engineering Science Course		06	09	04	-	-	-	-	-	19
Programme Core Course (PCC)	Program Courses	--	-	12	15	13	15	09	03	67
Programme Elective Course (PEC)		--	--	-	-	03	03	03	03	12
Multidisciplinary Minor (MDM)	Multidisciplinary Courses		-	03	03	03	03	02	-	14
Open Elective (OE) Other than a particular program		--	--	-	02	02	-	-	-	04
Vocational and Skill Enhancement Course (VSEC)	Skill Courses	01	02	-	01	-	02	-	-	06
Ability Enhancement Course (AEC -01, AEC-02)	Humanities Social Science and Management (HSSM)	03	--	02	01	-	-	-	-	06
Entrepreneurship/Economics/ Management Courses		--	-	02	-	01	-	03	-	06
Indian Knowledge System (IKS)		02	-	-	-	-	-	-	-	02
Value Education Course (VEC)		--	--	-	02	-	-	-	-	02
Research Methodology	Experiential Learning Courses	--	--	-	-	-	-	02	-	02
Comm. Engineering. Project (CEP)/Field Project (FP)		--	--	-	-	-	01	-	-	01
Project		--	--	-	-	-		04	02	06
Internship/ OJT		--	--	-	-	-	-	-	10	10
Co-curricular Courses (CC)	Liberal Learning Courses	-	01	-	-	-	-	-	-	01
Total Credits (Major)		20	20	23	24	22	24	23	18	174

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Distribution of Credits

Course Category	Number of Subjects	Credit as per PVPIT
Humanities, Social Science, and Management Courses + **IKS (1) +VEC (2)**	08	**16**
Basic Science Course (BSC)	04	**16**
Engineering Science Course (ESC)	06	**19**
Professional Core Course (PCC)	28	**67**
Professional Elective Course (PEC)	03	**12**
Open Elective Course (OEC)	02	**04**
Project work, Seminar/CEP, and Internship in industry or elsewhere (PrSI) +RM	05	**19**
Mandatory Courses [Environmental Sciences, **Induction Program**, Indian Constitution, Essence of Indian Knowledge Tradition] (AUC) +**CC**	01	**01**
***VSEC**	04	**06**
Total Credit Point		**160**
Minor Courses	**05**	**14**
Honours Courses	--	--

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Department of Civil Engineering

Curriculum Structure and Evaluation Scheme

(Academic Year 2026-27 Onwards)

S.Y. B. Tech **Semester III** **Civil Engineering**

Course Code	Course Name	Teaching Scheme				Evaluation Scheme					Total
							Theory		Practical		
		L	T	P	Credit	Scheme	Max	Minimum Marks for Passing	Max	Minimum Marks for Passing	
0CVPCC201	Mechanics of Solid	3	0	0	3	ISE1 MSE ISE2 ESE	10 20 10 60	40*	-	-	100
0CVPCC202	Surveying	3	0	0	3	ISE1 MSE ISE2 ESE	10 20 10 60	40*	-	-	100
0CVPCC203	Building Materials and Construction	3	0	0	3	ISE1 MSE ISE2 ESE	10 20 10 60	40*	-	-	100
0CVMDM204	MDM-I	3	0	0	3	ISE1 MSE ISE2 ESE	10 20 10 60	40*	-	-	100
0CVVEC205	Environmental Studies	2	0	0	2	ISE	50	20	-	-	50
0CVES206	Engineering Mathematics-III	3	1	0	4	ISE1 MSE ISE2 ESE	10 20 10 60	40*	-	-	100
0CVHSSM207	Principles of Management	2	0	0	2	ISE	50	20	-	-	50
0CVPCC208	Strength of Materials Laboratory	0	0	2	1	ISE ESE	-	-	50 50	20 20	100
0CVPCC209	Surveying Laboratory	0	0	2	1	ISE ESE	-	-	50 50	20 20	100
0CVPCC210	Building Construction and Drawing Laboratory	0	0	2	1	ISE	-	-	50	20	50
Total		**19**	**1**	**6**	**23**	**TOTAL MARKS**					**850**
Total Contact Hours Per Week		**26**									

Course Category	Basic, Engineering Science		Program Courses		Multidisciplinary Minor		Skill courses	Humanities Social Science and Management				Experimental learning				Liberal learning	Total
	BSC	ESE	PCC	PEC	MDM	OE	VSEC	AEC	EEM	IKS	VEC	RM	CEP	Pr	Int	CC	
Credit	-	04	12	-	03	-	-	-	02	-	02	-	-	-	-	-	23
Cumulative	16	19	12	-	03	-	03	03	02	02	02	-	-	-	-	01	63

Multidisciplinary Minor offered by Civil Engineering Department

MDM-I (SEM-III)	0CVMDM204	Engineering Management

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Department of Civil Engineering

Curriculum Structure and Evaluation Scheme

(Academic Year 2026-27 Onwards)

S.Y. B.Tech **Semester IV** **Civil Engineering**

Course Code	Course Name	Teaching Scheme				Evaluation Scheme					Total
							Theory		Practical		
		L	T	P	Credit	Scheme	Max	Minimum Marks for Passing	Max	Minimum Marks for Passing	
0CVPCC251	Structural Mechanics-I	3	1	0	4	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVPCC252	Concrete Technology	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVPCC253	Fluid Mechanics	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVPCC254	Building Planning and Drawing	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVMDM255	MDM-II	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVOE256	Open Elective-I	2	0	0	2	ISE	50	20	-	-	50
0CVAEC257	Soft Skills	0	0	2	1	ISE	25	10	-	-	25
0CVVEC258	Universal Human Values	2	0	0	2	ISE	50	20	-	-	50
0CVVSEC259	Drawing and CAD Laboratory	0	0	2	1	ISE	-	-	75	30	75
0CVPCC260	Concrete Technology Laboratory	0	0	2	1	ISE	-	-	50	20	75
						ESE			25	10	
0CVPCC261	Fluid Mechanics Laboratory	0	0	2	1	ISE	-	-	50	20	75
						ESE			25	10	
TOTAL		**19**	**1**	**8**	**24**	**TOTAL MARKS**					**850**
Total Contact Hours Per Week		**28**									

Course Category	Basic Engineering Science		Program Courses		Multidisciplinary Minor		Skill Courses	Humanities Social Science and Management				Experimental Learning				Liberal Learning	Total
	BSC	ESE	PCC	PEC	MDM	OE	VSEC	AEC	EEM	IKS	VEC	RM	CEP	Pr	Int	CC	
Credit	-	-	15	-	03	02	01	01	-	-	02	-	-	-	-	-	24
Cumulative	20	15	27	-	06	02	04	06	02	02	02	-	-	-	-	01	87

Multidisciplinary Minor offered by Civil Engineering Department

MDM-II (SEM-IV)	0CVMDM255	Supply Chain Management

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List of Open Elective-I for Semester-IV

Sr. No.	Department offering Open Elective to other Departments	Course Code	Course Title
1	Artificial Intelligence and Data Science	0AIOE256	Prompt Engineering
2	Civil Engineering	0CVOE256	Disaster Management
3	Chemical Engineering	0CHOE256	Introduction of AIML in Process Industries
4	Computer Science and Engineering	0CSOE256	Information Security
5	Electrical and Computer Engineering	0ECEOE256	Sustainable Power Generation
6	Electronics and Computer Science	0ECSOE256	Intellectual Property Rights
7	Electronics and Telecommunication	0ETOE256	Digital Marketing
8	Instrumentation and Control Engineering	0ICOE256	Industrial Economics
9	Mechanical Engineering	0MEOE256	Industrial Safety

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(Academic Year 2027-28 Onwards)

T.Y. B.Tech. Semester V Civil Engineering

Course Code	Course Name	Teaching Scheme				Evaluation Scheme					Total
							Theory		Practical		
		L	T	P	Credit	Scheme	Max	Minimum Marks for Passing	Max	Minimum Marks for Passing	
0CVPCC301	Structural Mechanics-II	3	1	0	4	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVPCC302	Geotechnical Engineering	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVPCC303	Design of Steel Structures	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVPEC304	Program Elective Course-I	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVMDM305	MDM-III	3	0	0	3	ISE 1	10	40*	-	-	100
						MSE	20				
						ISE 2	10				
						ESE	60				
0CVOE306	Open Elective-II	2	0	0	2	ISE	50	20	-	-	50
0CVHSSM307	Entrepreneurship Development	1	0	0	1	ISE	50	20	-	-	50
0CVPCC308	Geotechnical Laboratory	0	0	2	1	ISE	-	-	50	20	100
						ESE			50	20	
0CVPCC309	Structural Design and Drawing-I Laboratory	0	0	2	1	ISE	-	-	50	20	100
						ESE			50	20	
0CVPCC310	Seminar	0	0	2	1	ISE	-	-	50	20	50
TOTAL		**18**	**1**	**6**	**22**						
Total Contact Hours Per Week		**25**				**TOTAL MARKS**					**850**

Course Category	Basic Engineering Science		Program Courses		Multidisciplinary Minor		Skill Courses	Humanities, Social Science and Management				Experimental Learning				Liberal Learning	Total
	BSC	ESE	PCC	PEC	MDM	OE	VSEC	AEC	EEM	IKS	VEC	RM	CEP	Pr	Int	CC	
Credit	-	-	13	03	03	02	-	-	01	-	-	-	-	-	-	-	22
Cumulative	20	15	39	03	09	04	04	06	04	02	02	-	-	-	-	01	109

Program Elective Course-I

PEC-I (SEM-V)	0CVPEC304	Select from the bucket

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Multidisciplinary Minor-III offered by Civil Engineering Department

MDM-III (SEM-V)	0CVMDM305	Engineering Procurement and Construction Contract

List of Open Elective-II for Semester-V

Sr. No.	Department offering Open Elective to other Departments	Course Code	Course Title
1	Artificial Intelligence and Data Science	0AIOE306	Generative AI
2	Civil Engineering	0CVOE306	Human Resources Development
3	Chemical Engineering	0CHOE306	Energy Audit and Conservation
4	Computer Science and Engineering	0CSOE306	Ethical Hacking
5	Electrical and Computer Engineering	0ECEOE306	Intelligent Energy Management
6	Electronics and Computer Science	0ECSOE306	Investment and Financial Planning
7	Electronics and Telecommunication	0ETOE306	Remote Sensing and GIS
8	Instrumentation and Control Engineering	0ICOE306	Principles of Finance and Economics
9	Mechanical Engineering	0MEOE306	Economics for Engineers

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Department of Civil Engineering

Curriculum Structure and Evaluation Scheme

(Academic Year 2027-28 Onwards)

T.Y. B.Tech. **Semester VI** **Civil Engineering**

Course Code	Course Name	Teaching Scheme				Evaluation Scheme					Total
							Theory		Practical		
		L	T	P	Credit	Scheme	Max	Minimum Marks for Passing	Max	Minimum Marks for Passing	
0CVPCC351	Design of Reinforced concrete Structures	3	1	0	4	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVPCC352	Water Resources Engineering	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVPCC353	Environmental Engineering	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVPCC354	Estimating and Costing	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVPEC355	Program Elective Course-II	3	0	0	3	ISE 1	10	40*	-	-	100
						MSE	20				
						ISE 2	10				
						ESE	60				
0CVMDM356	MDM-IV	3	0	0	3	ISE	50	20	-	-	50
0CVVSEC357	Civil Engineering Software (BIM)	0	0	4	2	ISE			50	20	50
0CVCEP358	Community Engagement/Field Project	0	0	2	1	ISE			50	20	50
0CVPCC359	Environmental Engineering Laboratory	0	0	2	1	ISE	-	-	50	20	100
						ESE			50	20	
0CVPCC360	Estimating and Costing Laboratory	0	0	2	1	ISE	-	-	50	20	100
						ESE			50	20	
TOTAL		**18**	**01**	**10**	**24**	**TOTAL MARKS**					**850**
Total Contact Hours Per Week		**29**									

Course Category	Basic, Engineering Science		Program Courses		Multidisciplinary Minor		Skill Courses	Humanities Social Science and Management				Experimental Learning				Liberal Learning	Total
	BSC	ESE	PCC	PEC	MDM	OE	VSEC	AEC	EEM	IKS	VEC	RM	CEP	Pr	Int	CC	
Credit	-	-	15	03	03	-	02	-	-	-	-	-	01	-	-	-	24
Cumulative	20	15	54	06	12	04	06	06	04	02	02	-	01	-	-	01	133

Program Elective Course-II offered by Civil Engineering Department

PEC-II (SEM-VI)	0CVPEC355	Select from the bucket

Multidisciplinary Minor-IV offered by Civil Engineering Department

MDM-IV (SEM-VI)	0CVMDM356	Project Management

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Department of Civil Engineering

Curriculum Structure and Evaluation Scheme

(Academic Year 2028-29 Onwards)

Final Year B.Tech **Semester VII** **Civil Engineering**

Course Code	Course Name	Teaching Scheme				Evaluation Scheme					TOTAL
							Theory		Practical		
		L	T	P	Credit	Scheme	Max	Minimum Marks for Passing	Max	Minimum Marks for Passing	
0CVPCC401	Earthquake Engineering	3	1	0	4	ISE1 MSE ISE2 ESE	10 20 10 60	40*	-	-	100
0CVPCC402	Transportation Engineering	3	0	0	3	ISE1 MSE ISE2 ESE	10 20 10 60	40*	-	-	100
0CVPEC403	Program Elective Course–III	3	0	0	3	ISE1 MSE ISE2 ESE	10 20 10 60	40*	-	-	100
0CVHSSM404	Project Management	3	0	0	3	ISE1 MSE ISE2 ESE	10 20 10 60	40*	-	-	100
0CVMDM405	MDM-V	0	0	4	2	ISE	-	-	50	20	50
0CVRM406	Research Methodology	2	0	0	2	ISE	-	-	50	20	50
0CVPCC407	Transportation Engineering Laboratory	0	0	2	1	ISE ESE	-	-	50 50	20 20	100
0CVPCC408	Structural Design and Drawing-II Laboratory	0	0	2	1	ISE	-	-	50	20	50
0CVPR409	Project Phase- I	0	0	8	4	ISE ESE	-	-	100 100	40 40	100
TOTAL		**14**	**01**	**16**	**23**	**TOTAL MARKS**					**850**
Total Contact Hours Per Week		**31**									

Course Category	Basic, Engineering Science		Program Courses		Multidisciplinary Minor		Skill Courses	Humanities Social Science and Management				Experimental Learning				Liberal Learning	Total
	BSC	ESE	PCC	PEC	MDM	OE	VSEC	AEC	EEM	IKS	VEC	RM	CEP	Pr	Int	CC	
Credit	-	-	09	03	02	-	-	-	03	-	-	2	-	4	-	-	23
Cumulative	20	15	63	09	14	05	05	06	06	02	02	2	2	4	-	01	156

Program Elective Course-III offered by Civil Engineering Department

PEC-III (SEM-VII)	0CVPEC403	Select from the bucket

Multidisciplinary Minor-V offered by Civil Engineering Department

MDM-V (SEM-VII)	0CVMDM405	Mini Project

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(Academic Year 2028-29 Onwards)

Final Year B.Tech. **Semester VIII** **Civil Engineering**

Course Code	Course Name	Teaching Scheme				Evaluation Scheme					Total
							Theory		Practical		
		L	T	P	Credit	Scheme	Max	Minimum Marks for Passing	Max	Minimum Marks for Passing	
0CVPCC451	MOOC Course-I	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVPEC452	MOOC Course-II	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVPR453	Project Phase- II	0	0	4	2	ISE	-	-	50	20	100
						ESE	-		50	20	
0CVINT454	Internship/OJT	0	0	20	10	ISE	-	-	100	40	200
						ESE			100	40	
TOTAL		**6**	**0**	**24**	**18**	**TOTAL MARKS**					**500**
Total Contact Hours Per Week		**30**									

Course Category	Basic Engineering Science		Program Courses		Multidisciplinary Minor		Skill Courses	Humanities Social Science and Management				Experimental Learning				Liberal Learning	Total
	BSC	ESE	PCC	PEC	MDM	OE	VSEC	AEC	EEM	IKS	VEC	RM	CEP	Pr	INT/ OJT	CC	
Credit	-	-	03	03	-	-	-	-	-	-	-	-	-	2	10	-	18
Cumulative	20	15	66	12	14	05	05	06	06	02	02	2	2	6	10	01	174

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MOOC Courses Bucket (Sem -VIII)

	MOOC Course-I (0CVPCC451)	MOOC Course-II (0CVPEC452)
A	Structural Health Monitoring	3D Printing Technology
B	Intelligent Transportation Systems	Green Technology
C	Smart Cities	Application of AI and ML in Civil Engineering
D	Any other MOOC available in that semester, with the consent of course Coordinator	

Program Elective Courses (PEC) Offered by Civil Engineering Department

PEC	Course code	Semester	1. Structural Engineering	2. Construction Engineering and Management	3. Sustainable Infrastructure Development
I	0CVPEC304	V ↓	0CVPEC304A Advanced Concrete Technology	0CVPEC304B Engineering Management	0CVPEC304C Principles of Sustainable Development
II	0CVPEC355	VI ↓	0CVPEC355A Advanced Structural Analysis	0CVPEC355B Material Management	0CVPEC355C Sustainable Infrastructure Systems and Regulation
III	0CVPEC403	VII ↓	0CVPEC403A Advanced Design of RC Structures	0CVPEC403B Contracts and Accounts	0CVPEC403C Planning and Technology for Sustainable Infrastructure
MOOC Course	0CVPEC452	VIII ↓	As per the MOOC courses available		

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MDM Courses Offered by Civil Engineering Department

MDM	Semester	Course code	Minor in Civil Engineering (Construction Management)	Credits
I	III	0CVMDM204	Engineering Management	3
II	IV	0CVMDM255	Supply Chain Management	3
III	V	0CVMDM305	Engineering, Procurement and Construction Contract	3
IV	VI	0CVMDM356	Project Management	3
V	VII	0CVMDM405	Mini Project	2

Open Electives Offered by Civil Engineering Department

OE	Semester	Course Code	Open Elective Course	Credits
I	IV	0CVOE256	Disaster Management	2
II	V	0CVOE306	Human Resources Development	2

Semester	Credit
I	20
II	20
III	23
IV	24
V	22
VI	24
VII	23
VIII	18
Total	**174**

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Padmabhooshan Vasantraodada Patil Institute of Technology,
Budhgaon, Sangli (MS) – 416304

(An Autonomous Institute)

Affiliated to

Dr. Babasaheb Ambedkar Technological University,
Lonere, Raigad

(Accredited by NAAC)

Department of Civil Engineering

Curriculum for Second Year Undergraduate Degree Programme

B. Tech. in Civil Engineering

In accordance with National Education Policy (NEP – 2020)

w. e. f.
Academic Year: 2026-27

Dr. Vasantraodada Patil Shetkari Shikshan Mandal's

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Department of Civil Engineering

Curriculum Structure and Evaluation Scheme

(Academic Year 2026-27 Onwards)

S.Y. B. Tech **Semester III** **Civil Engineering**

Course Code	Course Name	Teaching Scheme				Evaluation Scheme					Total
							Theory		Practical		
		L	T	P	Credit	Scheme	Max	Minimum Marks for Passing	Max	Minimum Marks for Passing	
0CVPCC201	Mechanics of Solid	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVPCC202	Surveying	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVPCC203	Building Materials and construction	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVMDM204	MDM-I	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVVEC205	Environmental Studies	2	0	0	2	ISE	50	20	-	-	50
0CVES206	Engineering Mathematics-III	3	1	0	4	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVHSSM207	Principles of Management	2	0	0	2	ISE	50	20	-	-	50
0CVPCC208	Strength of Materials Laboratory	0	0	2	1	ISE	-	-	50	20	100
						ESE			50	20	
0CVPCC209	Surveying laboratory	0	0	2	1	ISE	-	-	50	20	100
						ESE			50	20	
0CVPCC210	Building Construction and Drawing Laboratory	0	0	2	1	ISE	-	-	50	20	50
Total		**19**	**1**	**6**	**23**	**TOTAL MARKS**					**850**
Total Contact Hours Per Week		**26**									

Course Category	Basic, Engineering Science		Program Courses		Multidisciplinary Minor		Skill courses	Humanities Social Science and Management				Experimental learning				Liberal learning	Total
	BSC	ESE	PCC	PEC	MDM	OE	VSEC	AEC	EEM	IKS	VEC	RM	CEP	Pr	Int	CC	
Credit	04	-	12	-	03	-	-	-	02	-	02	-	-	-	-	-	23
Cumulative	20	15	12	-	03	-	03	03	02	02	02	-	-	-	-	01	63

Multidisciplinary Minor offered by Civil Engineering

MDM-I (SEM-III)	0CVMDM204	Engineering Management

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Department of Civil Engineering

Curriculum Structure and Evaluation Scheme

(Academic Year 2026-27 Onwards)

S.Y. B.Tech **Semester IV** **Civil Engineering**

Course Code	Course Name	Teaching Scheme				Evaluation Scheme					Total
							Theory		Practical		
		L	T	P	Credit	Scheme	Max	Minimum Marks for Passing	Max	Minimum Marks for Passing	
0CVPCC251	Structural Mechanics-I	3	1	0	4	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVPCC252	Concrete Technology	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVPCC253	Fluid Mechanics	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVPCC254	Building Planning and Drawing	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVMDM255	MDM-II	3	0	0	3	ISE1	10	40*	-	-	100
						MSE	20				
						ISE2	10				
						ESE	60				
0CVOE256	Open Elective-I	2	0	0	2	ISE	50	20	-	-	50
0CVAEC257	Soft Skills	0	0	2	1	ISE	25	10	-	-	25
0CVVEC258	Universal Human Values-II	2	0	0	2	ISE	50	20	-	-	50
0CVVSEC259	Drawing and CAD Lab	0	0	2	1	ISE	-	-	75	30	75
0CVPCC260	Concrete Technology Laboratory	0	0	2	1	ISE	-	-	50	20	75
						ESE			25	10	
0CVPCC261	Fluid Mechanics Laboratory	0	0	2	1	ISE	-	-	50	20	75
						ESE			25	10	
TOTAL		**19**	**1**	**8**	**24**	**TOTAL MARKS**					**850**
Total Contact Hours Per Week		**28**									

Course Category	Basic Engineering Science		Program Courses		Multidisciplinary Minor		Skill Courses	Humanities Social Science and Management				Experimental Learning				Liberal Learning	Total
	BSC	ESE	PCC	PEC	MDM	OE	VSEC	AEC	EEM	IKS	VEC	RM	CEP	Pr	Int	CC	
Credit	-	-	15	-	03	02	01	01	-	-	02	-	-	-	-	-	24
Cumulative	20	15	27	-	06	02	04	06	02	02	02	-	-	-	-	01	87

Multidisciplinary Minor offered by Civil Engineering

MDM-II (SEM-IV)	0CVMDM204	Supply Chain Management

Open Elective-I offered by Civil Engineering

OE-I(SEM-IV)	0CVOE256	Disaster Management

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S.Y. B.Tech **Semester III** **Civil Engineering**

0CVPCC201, MECHANICS OF SOLIDS

Course Details:

Course Code and Course Title	**0CVPCC201 – Mechanics of solids**			
Semester:	III			
Prerequisites	Engineering Mechanics			
Teaching Scheme: -	**Lecture**	**Tutorial**	**Practical**	
Lecture/Tutorial/Practical	3	-	2	
Credit	03			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE 2**	**ESE**
	10 Marks	20 Marks	10 Marks	60 Marks

Course Outcomes (CO) Upon successful completion of this course, the students will be able to:		**BL**
CO1	**Apply** concepts of stress, strain and elastic relationships to calculate deformation in structural members under axial loads and temperature variations.	**3**
CO2	**Interpret** shear force and bending moment diagrams for beams under various loading and support conditions.	**3**
CO3	**Determine** bending and shear stresses in beams of different cross-sections under various loading conditions.	**3**
CO4	**Apply** torsion theory concepts to determine stresses and power transmission in shafts.	**3**
CO5	**Calculate** hoop and longitudinal stresses in thin cylinders under internal pressure.	**3**
CO6	**Draw** influence line diagrams for beams under different loading conditions.	**3**

Course Content		
Unit No.	**Contents**	**Hrs.**
Unit 1	**Simple stresses and strains** Engineering Properties of different materials, Concept of Stress and strain, Generalized Hooke's law, Elastic constants and their relationship for isotropic materials. Stresses, strains and deformation in homogeneous and composite bars under concentrated loads, self-weight and temperature changes.	**07**

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Unit 2	**Shear force Diagram and Bending Moment Diagram** Concept of SF and BM, Relationship between loading, shear force and bending moment, Shear force and bending moment equations, SFD and BMD with salient values for cantilever beams, simply supported beams and overhanging beams considering point loads, UDL, UVL and Couple.	**08**
Unit 3	**Bending Stresses in beams** Bending stresses in simple beam, Assumption and derivation of simple bending, Theory of pure bending, Flexure formula. Bending stress for symmetrical and unsymmetrical sections.	**06**
Unit 4	**Shear Stresses in beams** Shear stress distribution in beams, maximum and average shear stress, shear stress distribution diagram for various beam cross sections, Flitched beams.	**06**
Unit 5	**Torsion and Thin cylinder** Assumptions, derivation of torsion formulae, torsion of circular shafts, Theory of Thin cylinder- Hoop and Longitudinal Stress.	**06**
Unit 6	**Influence Line Diagrams** Introduction to moving loads, Influence Line Diagrams, Muller-Breslau's principle and its application to statically determinate simple and compound beams, Influence line diagrams for support reaction, Shear force and bending moment.	**06**
	Total Hrs.	**39**

Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Strength of Materials	Singer F.L. and Pytel	Harper Collins Publishers	4th	2011
2	Mechanics of Structures	Junnarkar S.B.	Charotar Publishers, Anand	31st	2014
3	Strength of Material	Khurmi R.S.	S. Chand & Co., New Delhi	26th	2018
4	Strength of Materials	Sadhu Singh	Khanna Publishers, New Delhi	11th	2024
5	A Text Book of Strength of Materials	Prasad I.B.	Khanna Publishers, New Delhi	12th	2020
6	Strength of Materials	Ramamrutham S.	Dhanpat Rai & Sons, Delhi	14th	2020

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Reference Book

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Introduction to Mechanics of Solids	Popov E.P.	Prentice Hall	2nd	2005
2	An Introduction to Mechanics of Solids	Crandall S.H., Dahl N.C., Lardner T.J.	Tata McGraw Hill	2nd	1978
3	Mechanics of Materials	Beer F.P., Johnston E.R., DeWolf J.T.	Tata McGraw Hill	7th	2017
4	Mechanics of Materials	Punmia B.C.	Laxmi Publications	2nd	2016
5	Strength of Materials	Subramanian R.	Oxford University Press	2nd	2016

Useful link /Web Resources: -

1. https://nptel.ac.in/courses/105106049

2. https://ocw.mit.edu/courses/2-001-mechanics-materials-i-fall- 2006/

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0CVPCC202, SURVEYING

Course Details

Course Code and Course Title	**0CVPCC202 - Surveying**			
Semester	III			
Prerequisites	Basic Civil Engineering			
Teaching Scheme	**Lecture**	**Tutorial**	**Practical**	
Lecture/Tutorial/Practical	03	-	02	
Credit	03			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE 2**	**ESE**
	10 Marks	20 Marks	10 Marks	60 Marks

Course Outcomes (CO) Upon successful completion of this course, the students will be able to: -		**BL**
CO1	**Apply** levelling techniques to determine elevations and prepare contour maps for field surveying applications.	3
CO2	**Interpret** the various uses of theodolite and apply trigonometric levelling techniques in surveying.	3
CO3	**Perform** curve setting operations for engineering projects such as roads, railways, and canals.	3
CO4	**Differentiate** between aerial, terrestrial, and satellite photogrammetry based on their principles and applications.	3
CO5	**Describe** the concepts of remote sensing, GIS and demonstrate the use of thematic layers and spatial data analysis for engineering applications.	3
CO6	**Identify** the parts, settings, and operational features of Total Station used in modern surveying applications.	3

Course Content

Unit No	**Contents**	**Hrs.**
Unit 1	**Levelling and Contouring** Introduction, types of levelling, temporary and permanent adjustment of dumpy, auto and tilting level, correction of curvature and refraction. Contouring-characteristics, uses, methods and application on field.	**09**
Unit 2	**Theodolite Surveying** Types of theodolite, uses, measurement of horizontal and vertical angle, theodolite traversing, closing error, calculation of latitude and departure, balancing of traverse theodolite, gales traverse table, omitted measurements. Trigonometric levelling.	**06**

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Unit 3	**Curve Setting** Classification, significance of curve setting, elements of horizontal curves, setting out of curves by linear and angular methods. Types of vertical curve, length of vertical curve.	**06**
Unit 4	**Remote Sensing** Remote sensing- Definition, relevance, types, application, electromagnetic radiation and spectrum, energy sources and its characteristics, image acquisition and image interpretation, GIS-Terminology, advantages, basic components of GIS, data types, GIS analysis, application of software's.	**06**
Unit 5	**Photogrammetry** Introduction to Photogrammetry, types application on field, Scale of vertical photographs, flight planning. **Digital Instruments** Classification, measuring principles of EDM, GPS, Digital Theodolite, DGPS, Drone.	**06**
Unit 6	**Total Station** Total station settings, parts of Total station, uses of Total station, Total station set up on station, different adjustment in Total station, Area measurement by Total station, Resection by Total station	**06**
	Total Hrs.	**39**

Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Surveying, Vol-I,II,III	Dr. B. C. Punmia, Ashok K. Jain, Arun K. Jain,	Laxmi Publications.	16th	2005
02	Surveying Vol-I	Duggal S. K.	Tata McGraw Hill	3rd	2009
03	Surveying and Levelling	N.N. Basak.	Tata McGraw Hill	2nd	2017
04	Surveying and Levelling	T. P. Kanetkar and S. V. Kulkarni,	Pune Vidyarthi Griha Prakashan	24th	2010
05	Surveying, Vol I&II	Arora, K.R.,	Standard Book House. New Delhi.	16th	2013

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H.O.D.

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(0th Revision)

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Reference Book

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Higher Surveying	A.M. Chandra	New Age International	3rd	2015
02	Surveying and Levelling	R. Agor	Khanna Publishers	2nd	2015
03	Surveying	N. R. Chandak, Hemraj R. Kumavat	S.K. Kataria & Sons	2nd	2019
04	Elementary Surveying	Charles D. Ghilani, Paul R. Wolf	Pearson	15th	2020
05	Surveying: Theory and Practice	James M. Anderson & Edward M. Mikhail	McGraw-Hill	7th	1998

Useful link /Web Resources

1. https://nptel.ac.in/
2. https://www.vlab.co.in/
3. https://www.nsps.us.com/
4. https://www.coursera.org/
5. https://www.fig.net/

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0CVPCC203, BUILDING MATERIALS AND CONSTRUCTION

Course Details:-

Course Code and Course Title	**0CVPCC203 - Building Materials And Construction**			
Perquisite's	Basic Civil Engineering(0BSES113)			
Teaching Scheme Lecture/ Tutorial/ Practical	**Lecture**	**Tutorial**	**Practical**	
	03	-	02	
Credit	03			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE 2**	**ESE**
	10 Marks	20 Marks	10 Marks	60 Marks

Course Outcomes (CO) Upon successful completion of this course, the students will be able to:-		**BL**
CO1	**Explain** the engineering properties and applications of building materials used for sustainable construction practices.	2
CO2	**Identify** building systems and components as per the suitability in building construction.	2
CO3	**Discuss** the types and requirements of masonry in building construction.	2
CO4	**Apply** the principles of door and window design to prepare scaled drawings with suitable fixtures and fastenings for building applications.	3
CO5	**Design and draw** staircases, ramps, elevators, and escalators for vertical circulation in buildings.	3
CO6	**Select** various floor and roof systems for building construction.	3

Course Content		
Unit No	**Contents**	**Hrs.**
Unit 1	**Building Materials** Engineering properties and applications of major building materials: Stone, Brick, cement, Aggregates, Mortar, Concrete, Steel, Wood, Glass, floor, roofing and miscellaneous-aluminium, composite material, plastic and admixtures, Recent advances in building materials, Sustainable materials.	**06**
Unit 2	**Building Systems** Load bearing and framed structures, Pre-fabricated and Pre-Engineered structures, Energy efficient buildings, building components, Foundations-	**06**

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	Bearing capacity of soils, Types of foundations, Types of RCC column footing and pile foundation, Formwork and scaffolding.	
Unit 3	**Masonry Construction** Stone masonry-General requirements, Types; Brick Masonry-General requirements, Brick bonds; Concrete and reinforced masonry, Composite masonry, Partition walls.	**07**
Unit 4	**Doors and Windows** Doors- Size, Types, Scaled drawings of Panelled and Glazed doors. Windows- Size, Types, Scaled drawings of Panelled and Glazed windows. Fixtures and fastenings.	**07**
Unit 5	**Vertical Circulation** Types, Types of stairs, Design requirements of stairs, Design and drawing of Quarter turn, Dog legged and Open well staircase. Elevators and Escalators, Ramp - Design guidelines.	**07**
Unit 6	**Roofs and Floors** Roof: Types, Components of pitched roof, Timber trusses, Lean-to, Couple and couple-close, King post and Queen post trusses-Detailed drawings, Steel trusses, Roof covering material and selection criteria Floors-Types and selection criteria.	**06**
	Total Hrs.	**39**

Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	The text book of Building Construction	S. P. Arora and Bindra,	Dhanpat Rai	5th	2025
2	Engineering Materials	S. C. Rangawala	Charotar publisher	44th	2024
3	Building Construction	S. C. Rangawala	Charotar Publication	35th	2025
4	Building Construction	Sushil Kumar	Standard Publication	20th	2018
5	Building Construction	Dr. B.C. Punmia	Laxmi publications	10th	2016

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Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	A to Z of Practical Building Construction and its Management-	Sandeep Mantri	Satya Prkashan	18th	2020
2	Construction Technology	R. Chudley	Harlow Longman	2nd	1999
3	Engineering Materials – Handbook of Building Construction.	R.K. Rajput	Chand Publications	3rd	2006
4	IS 3495, IS 1077, IS 383, IS 4031	---	BIS	Part 1 to 5	2021

Useful link /Web Resources

1. https://www.uceb.eu/DATA/CivBook/28.%20Building%20Construction%20Handbook.
2. https://www.bis.gov.in/?lang=hi
3. https://law.resource.org/pub/in/bis/S03/is.sp.62.1997.pdf

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0CVMDM204: ENGINEERING MANAGEMENT

Course Details:

Course Code and Course Title	**0CVMDM204 - Engineering Management**			
Semester:	III			
Prerequisites	-			
Teaching Scheme: - Lecture/Tutorial/Practical	**Lecture**	**Tutorial**	**Practical**	
	3	-	-	
Credit	03			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE 2**	**ESE**
	10 Marks	20 Marks	10 Marks	60 Marks

Course Outcomes (CO) Upon successful completion of this course, the students will be able to:		**BL**
CO1	**Explain** the role and functions of a project manager in construction projects for effective project coordination and stakeholder management.	**2**
CO2	**Classify** organizational structures in engineering projects for effective project coordination and management.	**2**
CO3	**Apply** cost estimation and budgeting techniques for effective resource planning and cost control in engineering projects.	**3**
CO4	**Classify** risks and uncertainties in construction projects for effective risk assessment and mitigation planning.	**2**
CO5	**Implement** quality management tools in engineering projects for quality control and continuous improvement.	**3**
CO6	**Summarize** legal, ethical and sustainability aspects in engineering management for responsible professional practice.	**2**

Course Content		
Unit No.	**Contents**	**Hrs.**
Unit 1	**Project Manager and Project Environment** Role and responsibilities of a project manager, Difference between general management and engineering management, Engineering project lifecycle and stakeholder identification, Types of engineering projects- Civil, Infrastructure, Industrial, Project environment: internal and	**06**

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(0th Revision)

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	external factors, Introduction to NEP competency framework for engineers.	
Unit 2	**Organizational Structures for Engineering Projects** Functional, projectized, and matrix organizations, Advantages and limitations of each structure, Line and staff relationships in construction firms, Delegation, authority, and accountability in engineering context, Case studies of organizational structures in Indian construction companies, Coordination mechanisms across departments.	**07**
Unit 3	**Resource and Financial Management** Types of resources: human, material, equipment, financial, Resource allocation and levelling basics, Cost estimation methods: unit rate, parametric, analogous, Budgeting and cost control in construction, Break-even analysis and simple financial ratios, Introduction to earned value management (EVM).	**06**
Unit 4	**Risk Management in Engineering** Concept of risk and uncertainty in construction projects, Risk identification techniques: brainstorming, checklists, SWOT, Qualitative risk assessment: probability and impact matrix, Risk response strategies: avoid, transfer, mitigate and accept, Introduction to quantitative risk analysis, Risk register preparation.	**07**
Unit 5	**Quality Management for Engineers** Concept and dimensions of quality in construction, Total Quality Management (TQM) – principles and application, Seven basic quality tools: flowchart, Pareto, Ishikawa, control chart, histogram, scatter, check sheet, ISO 9001 quality management system overview, Quality audits and inspections in civil construction, Cost of quality: prevention, appraisal, and failure costs.	**06**
Unit 6	**Legal, Ethical, and Sustainability Aspects** Engineer's responsibilities under Indian Contract Act and labour laws, Professional ethics – codes of conduct (IEI, ASCE guidelines), Intellectual property rights in engineering design, Sustainable engineering: green building concepts and GRIHA/LEED basics, Corporate social responsibility (CSR) in construction, Health, Safety, and Environment (HSE) management overview.	**07**
	Total Hrs	**39**

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Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Engineering Management	Fraidoon Mazda	Pearson Education / Addison-Wesley	1st	1997
2	Construction Project Management	K. K. Chitkara	Tata McGraw Hill / McGraw Hill Education	4th	2019
3	Management of Engineering Projects	N. J. Smith	Thomas Telford / Blackwell Science	2nd	2002

Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Construction Management	Daniel W. Halpin & Bolivar A. Senior	Wiley	5th	2021
2	Project Management for Engineers	Natarajan K. V.	PHI Learning	1st	2015
3	ISO 9001:2015 Quality Management Systems	ISO	ISO Geneva	5th	2015

Useful Links / Web Resources

1. NPTEL: Construction Project Management – https://nptel.ac.in
2. PMI Body of Knowledge (PMBOK) – https://www.pmi.org
3. GRIHA Green Rating – https://www.grihaindia.org
4. Indian Engineering Council – https://www.iei.org.in

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0CVVEC205, ENVIRONMENTAL STUDIES

Course Code and Course Title	**0CVVEC205 -Environmental Studies**			
Semester	IV			
Prerequisites	--			
Teaching Scheme	**Lecture**	**Tutorial**	**Practical**	
	02	-	-	
Credit	02			
Evaluation Scheme	**ISE1**	**MSE**	**ISE2**	**ESE**
	25 Marks	-	25 Marks	-

Course Outcomes (COs): Upon successful completion of this course, Student will be able to:		**BL**
CO1	**Explain** the components and importance of Environment, ecosystems and Bio-diversity	**2**
CO2	**Discuss** the various natural resources and strategies for their management	**3**
CO3	**Explain** the sources of pollution, effects and control measures	**2**
CO4	**Apply** the knowledge of EIA, EMS and Audits for the preparation of reports.	**3**

Course Contents (Topics Covered)

Course Contents		
Unit No.	**Contents**	**Hrs.**
1	**Introduction to Environmental Studies** Definition, scope and importance, Components of environment, Multidisciplinary nature of environmental studies. Ecosystems- Types, Structure and function, energy flow, food chains and food webs. Biodiversity- Types, Importance and conservation	**06**
2	**Natural resources and Management** Natural resources- Forest, Water, Mineral food, Energy and Land. Energy resources- Renewable-Wind, Hydropower, Tidal, Ocean thermal, Solar, Biomass, Biogas, Geothermal and Hydrogen. Non-renewable- Coal	**06**

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	Petroleum, Natural gas, Nuclear energy, Sustainable management of resources	
3	**Environmental pollution and climate change** Types of pollution- Water, Air, Solid waste, Soil and Noise, Sources, effects and control measures, Global effects of pollution	**06**
4	**EIA, EMS, Social issues and legislation** Environmental Impact Assessment (EIA) - Purpose and process. Engineering Management Systems(EMS)-Principles and steps, Introduction to Environmental Audit and Green audit	**06**
	Total Hours	**24**

Text/Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Ecological and Environmental studies	S. K. Garg	Khanna publishers	1st	2006
2	Essentials of Environmental studies	Kurian Joseph and R. Nagendran	Pearson Education, Singapore	2nd	2004
3	Environmental studies	Dr. Suresh K. Dhameja	Katson books	4th	2012
4	Environmental studies	Dr. P. D. Raut	Shivaji University, Kolhapur	4th	2012

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0CVES206, ENGINEERING MATHEMATICS – III

Course Details:

Course Code and Course Title	**0CVES206 – Engineering Mathematics – III**			
Semester :	III			
Prerequisites	Engineering Mathematics – I and II			
Teaching Scheme:-	**Lecture**	**Tutorial**	**Practical**	
Lecture/Tutorial/Practical	3	1	-	
Credit	4			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE 2**	**ESE**
	10 Marks	20 Marks	10 Marks	60 Marks

Course Outcomes (CO) Upon successful completion of this course, the students will be able to:		**BL**
CO1	**Explain** the effect of change of interval and arbitrary period on Fourier expansion.	**2**
CO2	**Apply** Lagrange's linear equation method and Method of separation of variables to solve first-order partial differential equations.	**3**
CO3	**Apply** Gauss Divergence Theorem and Stokes' Theorem to evaluate surface and volume integrals.	**3**
CO4	**Understand** the numerical methods for linear system solution and evaluation of integrals.	**2**
CO5	**Apply** the knowledge of probability distributions and statistical techniques to the given data.	**3**
CO6	**Apply** correlation and regression analysis to fit a suitable mathematical model for the statistical data.	**3**

Course Content		
Unit No.	**Contents**	**Hrs.**
Unit 1	**Fourier Series** Periodic functions, Dirichlet's conditions, Definition, determination of Fourier coefficients (Euler Formulae), Expansion of functions, Even and odd functions, change of interval, Half range Fourier sine and cosine series.	**07**

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Unit 2	**Partial Differential Equations** Formation of Partial differential equations by eliminating arbitrary constants and functions, Solution of Partial Differential Equation by direct integration, Lagrange's linear equations, Method of separation of variables, Wave Equation and its solution, One dimensional heat flow equation.	**07**
Unit 3	**Vector Integral** Line integrals, surface and volume integral, Green's theorem in plane, Gauss divergence theorem, Stoke's Theorem(Without Proof)	**06**
Unit 4	**Numerical Differentiation and Integration** Numerical differentiation-Introduction, Newton's Forward Difference Method, Newton's Backward Difference Method, Newton's Central Difference Method Numerical Integration-Trapezoidal Rule, Simpson's $1/3^{rd}$ rule and Simpson's $3/8^{th}$ rule.	**06**
Unit 5	**Probability Distribution** Mean and Standard Deviation, Random Variable, Probability Mass Function and Probability Density Function, Binomial, Poisson and Normal Distributions.	**06**
Unit 6	**Applied Statistics** Correlation- Introduction, Types of correlation, Methods of studying correlation, Karl Pearson's correlation coefficient and its Properties Applied Statistics-Curve Fitting by the Method of Least Squares - Straight Line, Parabolic curve and Exponential Curve.	**07**
	Total Hours	**39**

List of Tutorials

Tutorial No.	Title of Tutorial
1	Examples on Fourier Series in different intervals.
2	Examples on Half range Fourier sine and cosine series.
3	Examples on Partial Differential Equations.
4	Examples on Application of Partial Differential Equations.
5	Examples on Vector Integrals.

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6	Examples on Numerical Differentiation.
7	Examples on Numerical Integrations.
8	Examples on Probability Distributions.
9	Examples on Correlation.
10	Examples on Curve Fitting.

Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Higher Engineering Mathematics	H. K. Das and Er. Rajnish Verma	S. Chand & Co. Pvt. Ltd., New Delhi	3rd Edition	2011
2	A Course in Engineering Mathematics (Vol III)	Dr. B. B. Singh	Synergy Knowledgeware, Mumbai	2nd Edition	2010
3	Introductory Methods of Numerical Analysis	S. S. Sastry	PHI Learning / Prentice Hall of India, New Delhi	5th Edition	2012
4	Higher Engineering Mathematics	B. V. Ramana	Tata McGraw-Hill Publications, New Delhi	1st Edition	2007

Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Advanced Engineering Mathematics	Erwin Kreyszig	John Wiley & Sons, New York	10th Edition	2011
2	Advanced Engineering Mathematics	C. R. Wylie & L. C. Barrett	Tata McGraw-Hill Publishing Company Ltd., New Delhi	6th Edition	1995
3	Numerical Methods for Scientific and Engineering Computation	M. K. Jain, S. R. K. Iyengar, R. K. Jain	New Age International Publishers, New Delhi	7th Edition	2012
4	A Text Book of Engineering Mathematics	Peter O'Neil	Thomson Asia Pte Ltd., Singapore	7th Edition	2012

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0CVHSSM207, PRINCIPLES OF MANAGEMENT

Courser Details:-

Course Code and Course Title	**0CVHSSM207-Principles of Management**			
Semester	III			
Prerequisites	--			
Teaching Scheme	**Lecture**	**Tutorial**	**Practical**	
	2	-	-	
Credit	2			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE 2**	**ESE**
	25 Marks	-	25 Marks	-

Course Outcomes (COs): Upon successful completion of this course, Student will be able to:		**Blooms Level**
CO1	**Develop** analytical and managerial abilities for solving organizational and workplace problems using management concepts and theories.	3
CO2	**Identify** and classify different types of plans such as policies, procedures, rules, programs, budgets, and strategies used in organizations..	3
CO3	**Describe** different types of organizational structures and evaluate their suitability in various business environments.	3
CO4	**Identify** and compare different leadership styles and major leadership theories used in management practices.	3

Course Contents		
Unit No.	**Contents**	**Hrs**
Unit 1	**Introduction to Management:** Definition, nature, scope, and importance of management, Functions of management, Levels of management, Managerial roles and skills, Evolution of management thought ,Scientific Management – F.W. Taylor, Administrative Theory – Henri Fayol, Bureaucratic Theory – Max Weber, Human Relations Approach – Elton Mayo ,Management as science, art, and profession.	**07**
Unit 2	**Planning and Decision Making :** Nature and importance of planning. Types of plans, Planning process,	**05**

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	Strategic planning, Forecasting techniques, Decision-making process, Types of decisions, Decision-making models, Problem-solving techniques, Management by Objectives (MBO).	
Unit 3	**Organizing and Staffing:** Principles of organization, Organizational structure, Departmentation, Delegation and decentralization, Authority and responsibility, Span of control, Line and staff organization, Staffing process, Recruitment and selection, Training and development, Performance appraisal.	**05**
Unit 4	**Leadership, Motivation, and Communication:** Nature and importance of leadership, Leadership styles and theories, Motivation concepts, Maslow's Need Hierarchy Theory, Herzberg's Two-Factor Theory, McGregor's Theory X and Theory Y, Communication process, Types and barriers of communication, Team dynamics and conflict management, Emotional intelligence.	**07**
	Total Hours	**24**

Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Essentials of Management	Koontz, H. and Weihrich, H	McGraw Hill	12th	2023
2	Management	Robbins, S.P. and Coulter, M.	Pearson	16th	2024
3	Principles of Management	Gupta, C.B.	Sultan Chand & Sons	18th	2023
4	Principles and Practice of Management	Prasad, L.M.	Sultan Chand & Sons	10th	2020
5	Principles of Management	Tripathi, P.C. and Reddy, P.N.	McGraw Hill	6th	2017

Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1.	The Practice of Management	Peter Drucker	Harper Business	Classic/Reissue	2006
2.	Organizational Behaviour	Fred Luthans	McGraw Hill	14th	2021

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3.	Management	Stoner, Freeman & Gilbert	Pearson / Prentice Hall	6th	2018
4.	Organizational Behaviour	Stephen Robbins	Pearson	19th	2023

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0CVPCC208, STRENGTH OF MATERIALS LABORATORY

Course Details:-

Course Code and Course Title	**0CVPCC208 -Strength of Materials Laboratory**			
Semester	III			
Perquisite's	Engineering Mechanics, Engineering Mathematics-I &II			
Teaching Scheme Lecture/ Tutorial/ Practical	**Lecture**	**Tutorial**	**Practical**	
	-	-	02	
Credit	01			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE 2**	**ESE**
	25 Marks	-	25 Marks	50 Marks

Course Outcomes (CO'S):-Upon successful completion of this course , the student will able to:		**BL**
CO1	**Perform** tensile and flexural tests on steel and timber specimens to determine their strength properties for civil engineering applications.	**3**
CO2	**Conduct** compression tests on concrete cubes, bricks, and paving blocks to measure their strength properties for quality control in construction practices.	**3**
CO3	**Determine** internal forces in truss members using analytical methods	**3**
CO4	**Apply** simple computer programs for stress and strain computations in strength of materials problems.	**3**

List of Experiments

Practical work consists of the performance of at least eight experiments from the list given below, with Experiment No. 11 being compulsory.

Expt. No.	**Experiment List**
1	Strain measurement involving strain gauges
2	Tension test on ferrous and non-ferrous alloys (mild steel / cast iron /aluminium etc.)

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3	Compression test on mild steel, aluminium, concrete, wood and brick.
4	Deflection test on mild steel and wooden beam specimens
5	Hardness Test
6	Graphical solution method for principal stress problems.
7	Shear test on mild steel and aluminium (single and double shear tests).
8	Flexure test on timber and cast-iron beams.
9	Impact test on mild steel, brass, aluminium, and cast-iron specimens.
10	Torsion test on mild steel and cast-iron solid bars and pipes.
11	Analysis of Truss by Analytical method.(Compulsory)
12	Computer Programming for Stress and Strain Computations

Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Strength of Materials	Andrew Pytel and Ferdinand L. Singer	Harper & Row Publishers, New York	4th	2011
2	Mechanics of Structures	Dr. H.J. Shah and S.B. Junnarkar	Charotar Publishing House, Anand	31st	2014
3	Strength of Material	Khurmi R.S	S. Chand and Co., New Delhi	34th	2018
4	Strength of Materials	Ramamrutham S	Dhanpat Rai and Sons, Delhi	17th	2011
5	Theory of Structures	Ramamrutham S., and R. Narayanan	Dhanpat Rai and Sons, Delhi	16th	2020
6	Strength of Materials	R. K. Bansal	Laxmi Publications, New Delhi	6th	2018

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H.O.D.

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Reference Book

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Elements of Strength of Materials	Timoshenko, S. and Young, D. H	DVNC, New York, USA.	5th	1968
2	Solid Mechanics	Kazmi, S. M. A	TMH, Delhi, India.	2nd	2017
3	Mechanics of Materials	Hibbeler, R. C.	East Rutherford, NJ: Pearson, Prentice Hall,	6th	2004
4	An Introduction to the Mechanics of Solids	Crandall, S. H., N. C. Dahl, and T. J. Lardner.	New York, NY: McGraw Hill	2nd	1979
5	Mechanics of Materials	Ferdinand P. Beer, E. Russell Johnston Jr., John T.	McGraw-Hill, New York	7th	2014

Useful link /Web Resources/IS codes

1. IS: 1608 (2005); IS: 432 (Part-I)-1982(Reaffirmed 1995) Tensile Testing of Metals.
2. IS: 1598-1977 Methods for Izod Impact Test of Metals.
3. IS: 1499-1977 Method for Charpy Impact Test (U- Notch) for Metals.
4. IS: 1237-2012 Cement Concrete Flooring Tiles.
5. IS: 3495(Part 1to 4) 1992 Methods of Tests of Burnt Clay Building Bricks.
6. IS: 1077-1992 Common Burnt Clay Building Bricks Specification.
7. IS: 1708-1 to 18 (1986), IS: 2408 Methods of Testing of Timber Specimen.
8. Virtual Lab: https://sm-nitk.vlabs.ac.in

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H.O.D.

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P.V.P. Institute of Technology, Budhgaon, An Autonomous Institute, EN06269

0CVPCC209, SURVEYING LABORATORY

Course Details

Course Code and Course Title	**0CVPCC209 - Surveying Laboratory**			
Semester	III			
Prerequisites	Basic Civil Engineering			
Teaching Scheme Lecture/Tutorial/Practical	**Lecture**	**Tutorial**	**Practical**	
	-	-	02	
Credit	01			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE 2**	**ESE**
	25 Marks	-	25 Marks	50 Marks

Course Outcomes (CO) Upon successful completion of this course, the students will be able to: -		**BL**
CO1	**Operate** surveying instruments such as dumpy level, auto level, theodolite, digital planimeter, total station and DGPS for accurate field measurements.	3
CO2	**Perform** levelling operations and compute reduced levels accurately using appropriate methods in surveying practice.	3
CO3	**Measure** horizontal angles, distances, and elevations with precision in field conditions.	3
CO4	**Set out** simple circular curves using linear and angular methods in practical field situations.	3
CO5	**Demonstrate** the use of a total station to measure angles, distances, and elevations.	3
CO6	**Apply** DGPS and Q-GIS tools to conduct land surveying and perform spatial data analysis for real-world engineering problems.	4

Course Contents

Expt. No.	Experiment List
01	To calculate reduced levels by various methods of levelling.
02	To carry out reciprocal levelling by using auto level.
03	Measurement of horizontal angle by various methods using transit theodolite.
04	Setting out of simple circular curve by linear method.
05	Measurement of area by using digital Planimeter.

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(0th Revision)

P.V.P. INSTITUTE OF TECHNOLOGY, BUDHGAON An Autonomous Institute EN06269

06	Study and use of Total Station for measurement of angle, distance and elevation.
07	Area measurement by Total station.
08	Resection and offset setting by Total station.
09	Land Surveying by using DGPS.
10	Introduction to Q-GIS Software and its Applications.
Field Projects (Among following 01 shall be performed)	
01	Profile levelling and Road Project by using Total Station.
02	Block Contouring.

Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Surveying, Vol-I, II, III	Dr. B. C. Punmia, Ashok K. Jain, Arun K. Jain,	Laxmi Publications.	16th	2005
02	Surveying Vol-I	Duggal S. K.	Tata McGraw Hill	3rd	2009
03	Surveying and Levelling	N.N. Basak.	Tata McGraw Hill	2nd	2017
04	Surveying and Levelling	T. P. Kanetkar and S. V. Kulkarni,	Pune Vidyarthi Griha Prakashan	24th	2010
05	Surveying, Vol I&II	Arora, K.R.,	Standard Book House. New Delhi.	16th	2013

Reference Book

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Higher Surveying	A.M. Chandra	New Age International	3rd	2015
02	Surveying and Levelling	R. Agor	Khanna Publishers	2nd	2015
03	Surveying	N. R. Chandak, Hemraj R. Kumavat	S.K. Kataria & Sons	2nd	2019

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H.O.D.

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04	Elementary Surveying	Charles D. Ghilani, Paul R. Wolf	Pearson	15th	2020
05	Surveying: Theory and Practice	James M. Anderson & Edward M. Mikhail	McGraw-Hill	7th	1998

Useful link /Web Resources

1. https://nptel.ac.in
2. https://www.vlab.co.in
3. https://www.nsps.us.com
4. https://www.coursera.org
5. https://www.fig.net

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0CVPCC210, BUILDING CONSTRUCTION AND DRAWING LABORATORY

Course Details:-

Course Code and Course Title	**0CVPCC210 - Building Construction and Drawing Laboratory**			
Semester	III			
Prerequisites	-			
Teaching Scheme	**Lecture**	**Tutorial**	**Practical**	
	-	-	02	
Credit	01			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE 2**	**ESE**
	25 Marks	-	25 Marks	-

Course Outcomes (CO's):-Upon successful completion of this course the student will able to:		**BL**
CO1	**Draw** scaled drawings of building components	**2**
CO2	**Design and draw** scaled drawings of door and windows	**3**
CO3	**Design and draw** scaled drawings of RCC stair	**3**
CO4	**Design and draw** scaled drawings of King post and Queen post roof truss	**3**
CO5	**Describe** on field construction procedures, prevailing labour and material rates	**3**

List of Experiments:

Expt. No.	**Experiment List**
	A. Half imperial drawing sheets consisting of the following
1	Isolated and combined RCC footing, Pile foundation
2	Types of stone masonry
3	Brick bonds(Header, Stretcher, 1 and 1.5 brick thick English and Flemish bonds)
4	TW panelled door and window
5	Design and drawing of Dog-legged or Open well RCC stair by using CAD
6	King post and Queen post timber roof trusses
	B. Sketch book consisting of free hand sketches of following
7	i) Conventional symbols used in building construction, ii) Detailed section of a wall iii) Arches, Lintels iv)Types of Doors and Windows, v)Types of stairs vi)Types of floors, vii) Types of roofs, v) Formwork for RCC components

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C. Field visits	
8	Visit to various construction sites to study building materials and foundation details
9	Visit to various construction sites to study building components of super structure
10	Market survey to learn prevailing labour and material rates

Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	The text book of Building Construction	S. P. Arora and Bindra,	Dhanpat Rai	5th	2025
2	Building Construction	S. C. Rangawala	Charotar Publication	35th	2025
3	Building construction	Dr. B.C. Punmia	Laxmi publications	10th	2016
4	Building Construction	Sushil Kumar	Standard Publication	20th	2018

Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	A to Z of Practical Building Construction and its Management-	Sandeep Mantri	Satya Prkashan	18th	2020
2	IS 3495, IS 1077, IS 383, IS 4031	---	BIS	Part 1 to 5	2021
3	Construction Technology	R. Chudley	Harlow Longman	2nd	1999

Useful link /Web Resources

1. https://www.uceb.eu/DATA/CivBook/28.%20Building%20Construction%20Handbook
2. https://www.bis.gov.in/?lang=hi
3. https://law.resource.org/pub/in/bis/S03/is.sp.62.1997.pdf

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S.Y. B.Tech Semester IV Civil Engineering

0CVPCC251, STRUCTURAL MECHANICS-I

Course Details:

Course Code and Course Title	**0CVPCC251 - Structural Mechanics-I**			
Semester:	IV			
Prerequisites	Engineering Mechanics, Mechanics of Solids			
Teaching Scheme: -	**Lecture**	**Tutorial**	**Practical**	
Lecture/Tutorial/Practical	3	1	-	
Credit	04			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE 2**	**ESE**
	10 Marks	20 Marks	10 Marks	60 Marks

Course Outcomes (CO) Upon successful completion of this course, the students will be able to:		**BL**
CO1	**Determine** the degree of indeterminacy of structures using equilibrium equations to check the structural stability.	2
CO2	**Calculate** slope and deflection of determinate beams by applying various methods.	3
CO3	**Apply** the concept of principal stresses and principal strains for failure analysis of materials.	3
CO4	**Compute** stresses in structural members subjected to combined effect of direct and bending stresses.	3
CO5	Calculate critical buckling loads for columns using appropriate theories to assess their stability.	3
CO6	**Analyse** three-hinged arches and cable suspension bridge under various loading conditions using equilibrium principles.	3

Course Content

Unit No.	**Contents**	**Hrs.**
Unit 1	**Structural Systems and Strain Energy Concept** Types of structures, Equilibrium and compatibility conditions, Determinacy and Stability of structures, Static and kinematic degree of indeterminacy for beams, trusses and frames. Strain energy due to axial force, Shear force, Bending moment and torsion, Castigliano's and strain energy theorems, Application of energy theorem for computing deflections in determinate beams.	07

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Unit 2	**Slope and Deflection of determinate Beams** Calculations of slope and deflection by double integration, Macaulay's method, Moment area method and Conjugate beam method	**07**
Unit 3	**Principal stresses and strains** Concept of principal planes and principal stresses, Normal and shear stresses on an oblique plane, Magnitude and orientation of principal stresses and maximum shear stress. Mohr's circle for plane stresses. Theory of failures: Maximum Principal stress, Maximum Principal strain, Maximum shear stress, Maximum shear strain and Maximum strain energy theory.	**06**
Unit 4	**Combined Direct and Bending Stresses** Combined direct and bending stresses, Eccentric loading on short columns, Kern of section, bi-axial eccentricity, Applications to chimneys, Dams, and retaining walls.	**07**
Unit 5	**Columns and Struts** Concept of short and long columns, formulae by Euler, Euler's Crippling load for different end conditions, limitations of Euler's formula, equivalent length, Rankine's formula and its applications.	**06**
Unit 6	**Three hinged arches** Horizontal thrust, Support reaction, Bending Moment. **Cables & Suspension Bridge** Analysis of forces in cables, Cable suspension bridges with three hinged and two hinged stiffening girders.	**06**
	Total Hrs.	**39**

List of Tutorials

Tutorial No.	Tutorial Topics
1	Static & Kinematic Indeterminacy - Beams, Trusses and Frames.
2	Strain Energy - Axial, Bending, Shear, Torsion & Castigliano's theorem.
3	Slope & Deflection of beam - Double Integration & Macaulay Method.
4	Slope & Deflection of beam - Moment Area & Conjugate Beam Method.
5	Principal Stresses & Strains, Mohr's Circle.
6	Theories of Failure.
7	Combined Direct & Bending Stresses, Eccentric Loading & Kern of Section.
8	Biaxial Eccentricity-Anyone from (Chimneys, Dams & Retaining Walls)
9	Columns: Euler's Theory, Critical Load, Different end conditions, Effective length concept.
10	Columns: Rankine's Formula, Limitations of Euler's Theory & practical applications.

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11	Three Hinged Arches – Horizontal thrust, Support reactions & Bending Moment.
12	Cables & Suspension Bridges – Cable Forces, Cable Profile & stiffening girders analysis.

Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Strength of Materials	R. K. Bansal	Laxmi Publications	4th	2009
2	Mechanics of Structures	S.B. Junnarkar	Charotar Publishers, Anand	31st	2014
3	Strength of Material	R.S. Khurmi	S. Chand & Co., New Delhi	26th	2018
4	Strength of Materials	Sadhu Singh	Khanna Publishers, New Delhi	11th	2024
5	Strength of Materials	S. Ramamrutham	Dhanpat Rai & Sons, Delhi	14th	2020
6	Structural Analysis	L.S. Negi and R.S. Jangid	Tata Mc-Graw Hills	1st	2004

Reference Book

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Engineering Mechanics of Solids	Egor P. Popov	PHI Learning	2nd	2008
2	Mechanics of Materials	Beer F.P., Johnston E.R., DeWolf J.T.	Tata McGraw Hill	7th	2017
4	Strength of Materials	Nash W.	McGraw Hill	4th	2005
4	Mechanics of Materials	Punmia B.C.	Laxmi Publications	2nd	2016
5	Strength of Materials	Subramanian R.	Oxford University Press	2nd	2016
6	Theory of Structures	S. Ramamrutham	Dhanpat Rai & Sons, Delhi	9th	2012

Useful link /Web Resources: -

1. https://nptel.ac.in/courses/105106049
2. https://ocw.mit.edu/courses/2-001-mechanics-materials-i-fall- 2006/
3. https://www.bis.gov.in/

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0CVPCC252, CONCRETE TECHNOLOGY

Course Details:

Course Code and Course Title	**0CVPCC252 – Concrete Technology**			
Semester:	IV			
Prerequisites	Basic knowledge of building materials			
Teaching Scheme: - Lecture/Tutorial/Practical	**Lecture**	**Tutorial**	**Practical**	
	03	-	02	
Credit	03			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE 2**	**ESE**
	10 Marks	20 Marks	10 Marks	60 Marks

Course Outcomes (CO) Upon successful completion of this course, the students will be able to:		**Blooms Level**
CO1	**Explain** the properties of concrete ingredients and their influence on concrete performance.	2
CO2	**Apply** suitable admixtures for specific construction requirements and environmental conditions.	3
CO3	**Determine** the properties of fresh concrete for consistency control.	3
CO4	**Design** concrete mix proportion for various ingredients as per Indian Standard guidelines.	4
CO5	**Analyse** properties of hardened concrete to assess its performance under various environmental conditions for durability enhancement.	4
CO6	**Explain** suitability and applications of different types of special concrete for various construction needs.	2

Course Content		
Unit No.	**Contents**	**Hrs.**
Unit 1	**Ingredients of Concrete** Cement: Manufacturing process of cement, Chemical composition, Hydration of cement, Classification, grades of cement and types of cement, Tests on cement. Aggregate: Classification, Mechanical and Physical properties, Deleterious Materials, Soundness, Alkali aggregate reaction, Grading of Aggregates, Tests on aggregate, Artificial and Recycled aggregate. Water: Mixing Water, Curing water, Tests on water.	**08**

Dr. V. T. Gaikwad
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Unit 2	**Admixtures in Concrete** Chemical Admixtures: Plasticizers, Super plasticizers, Retarders, Accelerator, Air entraining agents Mineral Admixtures: Fly ash, Silica fume, GGBS, Rice husk ash, Surkhi, Metakaolin	**05**
Unit 3	**Fresh Concrete & Concrete Mix Design** Manufacturing process of concrete: Batching, Mixing, Transportation, Placing Including Pumping and Compaction Techniques for Good Quality Concrete, Curing, Methods of curing Properties of fresh concrete: Workability: Factors affecting workability, Methods of Measuring Workability, Segregation and Bleeding, Temperature Effects on Fresh Concrete Grades of Concrete. Concrete Mix Design: Factors to be considered, Statistical quality control, Introduction to different method of mix design, Design of Concrete Mix Using IS 10262: 2019 Guidelines.	**08**
Unit 4	**Hardened Concrete** Strength of concrete: General, Factors affecting strength, Micro cracking and stress strain relation, other strength properties, Relation between tensile and compression strengths, impact strength, Bond strength, torsional behaviour of concrete, Resistance to abrasion. Elasticity, Creep, and Shrinkage	**06**
Unit 5	**Durability of concrete** Significance, Permeability and Durability, Chemical Attack, Sulphate attack, Attack by Seawater, Acid attack, Chloride attack, Concrete Subjected to High Temperature, Carbonation of concrete and its determination, Surface Treatments of Concrete, Non-destructive testing: Schmidt's Rebound hammer, Ultrasonic pulse velocity method.	**06**
Unit 6	**Special Concretes** Introduction to Special Concretes: Fibre reinforced concrete, High performance concrete, Pumped concrete, Ready mixed concrete, High Strength Concrete Self Compacting Concrete, Geopolymer Concrete, Shot Crete, 3D printed Concrete, Self-Healing Concrete, Photo catalytic Concrete, Hydrophobic Concrete.	**06**
	Total Hrs.	**39**

Dr. V. T. Gaikwad
H.O.D.

Dr. K. K. Pandyaji
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Dr. S. S. Mohite
Director

P.V.P. Institute of Technology, Budhgaon, An Autonomous Institute, EN06269

Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Concrete Technology	M. S. Shetty	S. Chand Publications	8th	2018
2	Concrete Technology	M. L. Gambhir	Tata McGraw Hill Publications	6th	2025
3	Concrete Technology	Santkumar A.R	Oxford University Press	-	2009
4	Textbook of Concrete Technology	P.D.Kulkarni R.K.Ghosh	Newage international	3rd	2007

Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Concrete Technology	Neville and Brooks	Pearson Education New Delhi	3rd	2010
2	Concrete Technology	Dr. Aminul Islam Laskar	Laxmi Publication	2nd	2019
3	Properties of Concrete	A. M. Neville	Pearson Education India	5th	2012
4	Concrete Technology	R. S. Varshney	Oxford and IBH	2nd	2005
5	Advanced Concrete Technology	Zongjin Li, Xiangming Zhou, Hongyan Ma, Dongshuai Hou	John Wiley & Sons	2nd	2022

Useful link /Web Resources/IS Codes

1. http://civ02.vlabs.ac.in/exp10/index.html
2. nptel.ac.in/courses/105102012
3. IS 456: 2000, Plain and Reinforced Concrete – Code of Practice, Bureau of Indian Standards, New Delhi.
4. IS 10262: 2019, Concrete Mix Proportioning – Guidelines, Bureau of Indian Standards, New Delhi

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H.O.D.

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0CVPCC253, FLUID MECHANICS

Course Details:

Course Code and Course Title	**0CVPCC253 – Fluid Mechanics**			
Semester:	IV			
Prerequisites	Engineering Mechanics, Engineering Mathematics I and II			
Teaching Scheme: - Lecture/Tutorial/Practical	**Lecture**	**Tutorial**	**Practical**	
	03	-	02	
Credit	03			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE 2**	**ESE**
	10 Marks	20 Marks	10 Marks	60 Marks

Course Outcomes (CO) Upon successful completion of this course, the students will be able to:		**BL**
CO1	**Explain** fluid properties and hydrostatic principles related to pressure, buoyancy and stability of submerged and floating bodies.	2
CO2	**Apply** dimensional analysis using Rayleigh's method and Buckingham π theorem for similarity and non-dimensional numbers.	3
CO3	**Apply** fluid kinematics and dynamics principles to determine flow characteristics using continuity, Euler's and Bernoulli's equations.	3
CO4	**Determine** flow parameters in laminar, turbulent and boundary layer flows using basic formulas.	3
CO5	**Compute** head losses and flow in pipe systems including series, parallel, and network pipes.	3
CO6	**Explain** fundamentals of open channel flow and its hydraulic characteristics.	2

Course Content		
Unit No.	**Contents**	**Hrs.**
Unit 1	**Properties of Fluid and Fluid statics:** Properties of Fluid: Density, specific weight, specific volume, relative density, Newton's Law of Viscosity, Dynamic and kinematic viscosity, Classification of fluids, compressibility, surface tension, capillarity, vapour pressure. Fluid Statics: Pascal's law and Hydrostatic Law, Total pressure, Centre of pressure for plane surfaces.	**07**

Dr. V. T. Gaikwad
H.O.D.

Dr. K. K. Pandyaji
Dean Academics

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Director

(0th Revision)

	Buoyancy- Centre of buoyancy, stability of submerged and floating bodies, metacentre, metacentric height.	
Unit 2	**Dimensional Analysis:** Dimensions of various physical quantities, Rayleigh's method, Buckingham π method, Types of similarity, Non-dimensional numbers and their significance.	**06**
Unit 3	**Fluid Kinematics and Dynamics:** Fluid Kinematics: Types of fluid flows, Rate of Flow, Continuity equation in Cartesian coordinate flows, Velocity and Acceleration. Fluid Dynamics: Equation of motion, Euler's equation, Bernoulli's equation and practical applications of Bernoulli's equation: Venturi meter, Orifice Plate, Orifice meter.	**08**
Unit 4	**Laminar flow and Turbulent Flow:** Laminar Flow: Laminar flow in Circular pipe, Laminar flow between two parallel plates, Flow through tube. Turbulent Flow: Shear stress in turbulent flow and turbulent velocity profiles in fully developed pipe flow, Reynolds Experiment. Boundary Layer Theory – Concept of boundary layer theory, Thickness of boundary layer, Separation of boundary	**06**
Unit 5	**Flow through Pipes:** Major Losses –Darcy-Weisbach equation, Chezy's Equation, Minor losses, H.G.L. and T.E.L., Loss of energy in pipes, Pipe discharging for a reservoir, Pipes in series and parallel, Equivalent Pipe, Compound Pipe, Power transmission.	**06**
Unit 6	**Fundamentals of Open Channel Flow:** Fundamentals of Open Channel Flow, Difference between pipe flow and open channel flow, Types of open channel flow, Classification of notches and weirs, Discharges Equations.	**06**
	Total Hrs.	**39**

Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Hydraulics and Fluid Mechanics including Hydraulic Machines	Dr. P.N. Modi and Dr. S.M. Seth	Standard Book House	20th	2015

Dr. V. T. Gaikwad
H.O.D.

Dr. K. K. Pandyaji
Dean Academics

Dr. S. S. Mohite
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2	A Textbook of Fluid Mechanics and Hydraulic Machines	Dr. R.K. Bansal	Laxmi Publications	10th	2018
3	Hydraulics Fluid Mechanics and Fluid Machines	S Ramamrutham	Dhanpat Rai Publications	09th	2012
4	Fluid Mechanics and Hydraulic Machines	R. K. Rajput	S. Chand & Company Ltd	2nd	2019
5	Fluid Mechanics including Hydraulic Machines	A.K. Jain	Khanna Publishers	12th	2016

Reference Book

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Introduction to Fluid Mechanics & Fluid Machines	S.K. Som and G. Biswas	Tata McGraw-Hill	3rd	2011
2	Fluid Dynamics	V.L. Streeter, K.W. Bedford and E.B. Wylie	McGraw-Hill, New York	10th	2017
3	Fluid Mechanics	Frank M. white	McGraw-Hill, Education.	9th	2021

Useful link /Web Resources

1. https://nptel.ac.in/courses/112105171
2. https://www.engineersedge.com/fluid_flow/
3. https://www.coursera.org/courseraplus?query=fluid+mechanics

Dr. V. T. Gaikwad
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0CVPCC254, BUILDING PLANNING AND DRAWING

Course Details:-

Course Code and Course Title	**0CVPCC254 - Building Planning and Drawing**			
Perquisite's	Building materials and construction (0CVPCC203), Building construction and drawing laboratory (0CVPCC210)			
Teaching Scheme Lecture/ Tutorial/ Practical	**Lecture**	**Tutorial**	**Practical**	
	03	0	02	
Credit	03			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE 2**	**ESE**
	10Marks	20Marks	10Marks	60 Marks

Course Outcomes (CO'S):-Upon successful completion of this course , the student will able to:		**BL**
CO1	**Apply** planning principles and building bye-laws for designing climate-responsive residential buildings	3
CO2	**Apply** planning principles and building bye-laws for designing climate-responsive public buildings	3
CO3	**Develop** plumbing and electrical layouts using appropriate standards	3
CO4	**Analyse** ventilation and thermal performance for building comfort	4
CO5	**Integrate** fire safety and acoustic elements in building design	3
CO6	**Apply** green building concepts for planning and construction of energy efficient, eco-friendly structures	3

Course Content		
Unit No.	**Contents**	**Hrs.**
Unit 1	**Planning and design** Principles of building planning, significance of sun diagram, wind diagram, orientation. Local self-government bodies and classification. Land use classification and Land development requirements. Bye laws-FSI, Setback, marginal distances, open space, height of building. Requirements of parts of building- size of rooms, parking, garden, toilet etc., Residential buildings- Design considerations for apartment, bungalow, row house & twin bungalow. Procedure and documents required for building permission and occupancy certificate.	**08**

Dr. V. T. Gaikwad
H.O.D.

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(0th Revision)

Unit 2	**Planning and design of public buildings** Design considerations for public buildings- Schools, Colleges, Hospitals, Hotel, Theatre, Market, and Shopping Mall etc. Industrial requirements, RERA guidelines, Anthropometry: Study of Human dimensions, space required for various simple activities, Circulation spaces	**07**
Unit 3	**Plumbing, Sanitation and Electrification-** Plumbing and Sanitation- Concept of plumbing & drainage plan, Plumbing systems, understanding details of drainage layout various types of SWR pipes, traps, fittings, chambers, design of septic tank and secondary treatment, Electrification - Lighting design with Lumen method, Lighting layout with furniture arrangement, Wires and wiring methods, Circuit breakers.	**05**
Unit 4	**Ventilation and Thermal insulation** Definition, necessity of ventilation, functional requirements, various systems and selection criteria. Artificial ventilation - Air conditioning: Purpose, classification, principles, working. Thermal Insulation: General concept, Principles, Materials, Methods Computation of Heat loss and heat gain in Buildings	**07**
Unit5	**Fire resistant and Acoustics** Causes of fire, Rules and regulations for means of access, height, open space etc. Fire zones, Fire loads, Fire resistance of various building materials. Firefighting equipment's – extinguishers, hydrants, sprinklers, wet riser, down comer etc. Fire detection system, fire alarm system, Fire staircase, fire lift, fire door, Acoustics - Definition, Understanding concept of reverberation, Sabine's formula, absorption coefficient, Acoustical treatment for walls, roofs, floors etc., acoustical materials, Noise control.	**07**
Unit 6	**Green Building**. Green Building: Green building rating systems, green building criteria, components, Green Building: passive solar design, site selection and planning, Rain water harvesting, Energy audit	**05**
	Total Hrs.	39

Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Building Design and Drawing	Sane Y. S.	Allied Book Stall	2nd	1964

Dr. V. T. Gaikwad
H.O.D.

Dr. K. K. Pandyaji
Dean Academics

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(0th Revision)

2	Building Drawing	M.G.Shah, C.M.Kale, S.Y.Patki	Tata McGraw-Hill	5th	2019
3	Handbook of Designing and Installation of Services in High Rise Building Complexes,	Jain V.K	Khanna Publishers	3rd	2000
4	Civil Engineering Drawing	V. B. Sikka, S. K. Kataria and Sons	S.K.Kataria and sons	7th	2015
5	Building Planning and Drawing	Dr. N. Kumarswamy and Kameshwara Rao	Charotar Publications	9th	2023

Reference Book

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	SP 7- National Building Code Group 1 to 5	-	B.I.S.	3rd	2016
2	Code of practice for Architectural and Building Drawings	-	I.S. 962 – 1989	2nd	1989
3	Building bye-laws	-	SMKC	-	-
4	The Idea of Green Building,	Jain A.K	Khanna Publishers	1st	2014
5	Unified development control and promotion regulations for Maharashtra state	CREDAI	Maharashtra state Gazette	1st	2020

Useful link /Web Resources

1. http://103.203.175.90:81/fdScript/RootOfEBooks/E%20Book%20collection%20-%202024%20-%20A/CED/Building%20Planning%20and%20Drawing.
2. https://www.sapnaonline.com/books/building-planning-drawing-n-kumara-938035858x-9789380358581

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0CVOE255, SUPPLY CHAIN MANAGEMENT

Courser Details:-

Course Code and Course Title	**0CVOE255 Supply Chain Management**			
Semester:	IV			
Prerequisites	Principles of Management, Engineering Management			
Teaching Scheme: - Lecture/Tutorial/Practical	**Lecture**	**Tutorial**	**Practical**	
	3	-	-	
Credit	03			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE 2**	**ESE**
	10 Marks	20 Marks	10 Marks	60 Marks

Course Outcomes (CO's): -Upon successful completion of this course, the student will able to:		**BL**
CO1	**Explain** the concepts, components, and importance of supply chain management in construction projects.	**2**
CO2	**Describe** procurement planning methods, vendor evaluation techniques, and sourcing approaches used in construction works.	**2**
CO3	**Apply various** inventory management techniques for effective construction material management.	**3**
CO4	**Analyse** logistics and warehouse management practices in construction supply chains for operational cost optimization.	**3**
CO5	**Illustrate** the application of different digital technologies in construction supply chain operations for effective resource management.	**2**
CO6	**Implement** a sustainable procurement and supply chain plan incorporating green building material strategies for construction projects.	**3**

Course Content		
Unit No.	**Contents**	**Hrs**
Unit 1	**Introduction to Supply Chain Management** Definition, scope and evolution of SCM; Supply chain components supplier, manufacturer, distributor, retailer, customer; Construction and manufacturing SCM; Key drivers facilities, inventory, transportation, information, sourcing, pricing; Challenges in Indian construction supply chain; SCM performance metrics.	**06**

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Unit 2	**Procurement and Sourcing Management** Procurement planning and procurement cycle; Types: centralized, decentralized, global sourcing; Vendor registration and pre-qualification; Request for Quotation (RFQ), Request for Proposal (RFP); Bid evaluation and vendor selection criteria; E-procurement and reverse auctions; Supplier Relationship Management (SRM).	**07**
Unit 3	**Inventory & Material Management** Types of inventory raw material, WIP, finished goods; ABC and VED analysis; Economic Order Quantity (EOQ) model; Just-in-Time (JIT) principles; Material Requirement Planning (MRP); Stores management and material reconciliation; Wastage control and lean construction materials management.	**06**
Unit 4	**Logistics and Warehouse Management** Construction logistics planning and site logistics; Modes of transportation road, rail, water; Route optimization and transportation cost minimization; Site layout planning for material storage; Warehouse design and operations; Material handling equipment; Last-mile delivery challenges in urban and remote construction projects.	**07**
Unit 5	**Technology in Supply Chain** Enterprise Resource Planning (ERP) in construction SAP, Oracle; Building Information Modelling (BIM) for supply chain 4D and 5D BIM; RFID and IoT for material tracking; Supply chain analytics and dashboards; Block chain applications in construction procurement; Digital twin concepts in construction logistics.	**07**
Unit 6	**Sustainable & Green Supply Chain** Principles of sustainable supply chain management; Green procurement environmental criteria in vendor selection; Green building material standards LEED, GRIHA, IS standards; Circular economy in construction recycling, reuse, reduce; Carbon footprint measurement in supply chain; Case studies sustainable supply chains in Indian infrastructure projects.	**06**
	Total Hrs.	**39**

Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Supply Chain Management:	Sunil Chopra & Peter Meindl	Pearson	7th	2021

Dr. V. T. Gaikwad
H.O.D.

Dr. K. K. Pandyaji
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(0th Revision)

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	Strategy, Planning, and Operation				
2	Designing and Managing the Supply Chain	David Simchi-Levi, Philip Kaminsky & Edith Simchi-Levi	McGraw-Hill	3rd	2008
3	Essentials of Supply Chain Management	Michael Hugos	Wiley	4th	2018
4	Introduction to Materials Management	Tony Arnold, Stephen Chapman & Lloyd Clive	Pearson	7th	2011

Reference Book

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Construction Supply Chain Management Handbook	William J. O'Brien, Carlos T. Formoso, Ruben Vrijhoef & Kerry London	CRC Press / Routledge	1st	2009
2	Supply Chain Engineering and Logistics Handbook	Erick C. Jones	CRC Press	1st	2020
3	Purchasing and Supply Chain Management	Monczka, Handfield, Giunipero & Patterson	Cengage	6th	2015
4	Logistics Management and Strategy	Alan Harrison & Remko Van Hoek	Pearson	5th	2017
5	Supply Chain Integration in the Building Industry	Ruben Vrijhoef	IOS Press	1st	2011

Useful link /Web Resources

1. https://nptel.ac.in/courses/110106045
2. https://nptel.ac.in/courses/110107074
3. https://www.coursera.org/specializations/supply-chain-management
4. https://www.ascm.org
5. https://www.bis.gov.in

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0CVOE256, DISASTER MANAGEMENT

Course Details:-

Course Code and Course Title	**0CVOE256 - Disaster Management**			
Perquisite's	-			
Teaching Scheme Lecture/ Tutorial/ Practical	**Lecture**	**Tutorial**	**Practical**	
	02	00	00	
Credit	02			
Evaluation Scheme	**ISE1**	**MSE**	**ISE2**	**ESE**
	25 marks	-	25 marks	-

Course Outcomes (CO's): -Upon successful completion of this course, the student will able to:		**BL**
CO1	**Explain** fundamental disaster management concepts for analysing disaster situations through case studies.	2
CO2	**Discuss** the impacts of natural and man-made disasters through case studies.	2
CO3	**Describe** basic risk assessment and mitigation strategies in disaster-prone situations.	2
CO4	**Summarize** response, recovery, and institutional mechanisms in disaster management using case studies and drills.	2

Course Content		**Hrs**
Unit No.	**Contents**	
Unit 1	**Fundamentals of Disaster Management** Disaster, Hazard, Risk, Vulnerability, Classification: Natural & Man-made disasters, Disaster management cycle, Case studies: 2004 Indian Ocean Tsunami, Bhopal Gas Tragedy.	**06**
Unit 2	**Types of Disasters and Management** Earthquake, flood, cyclone, landslide, drought, Industrial and fire hazard, Causes, impacts, and basic mitigation strategies, Case study: 2013 Uttarakhand flood.	**07**
Unit 3	**Risk Reduction and Preparedness** Risk assessment basics, Vulnerability and capacity concepts, Structural and non-structural mitigation, Early warning systems, Role of Institution: National Disaster Management Authority.	**07**

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(0th Revision)

Unit 4	**Response, Recovery and Climate Linkages** Emergency response (search, rescue, relief), First aid basics, Rehabilitation and reconstruction, Climate change and disaster link, Role of Agency: National Disaster Response Force.	**06**
	Total Hrs.	**26**

Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Introduction to Disaster Management	Satish Modh	Macmillan Publishers	1st	2010
2	Disaster Management	G.K. Ghosh	APH Publishing Corporation	2nd	2011
3	Natural Hazards and Disaster Management	R.B. Singh	Rawat Publications	1st	2006
4	Disaster Management and Preparedness	Nidhi Bansal	CBS Publishers	1st	2018

Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Handbook of Disaster Management	Jack Pinkowski	CRC Press	1st	2008
2	Disaster Management: Principles and Practice	Rajib Shaw	Universities Press	2nd	2012
3	The Environment and Disaster Management	Keith Smith	Routledge	5th	2013
4	Disaster Risk Reduction: Cases from Urban Africa	Mark Pelling	Earthscan	1st	2003

Useful link /Web Resources

1. https://nidm.gov.in
2. https://ndmindia.mha.gov.in/ndmi
3. https://www.undrr.org/our-work/training
4. https://training.fema.gov

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0CVAEC257, SOFT SKILLS

Course Details:

Course Code and Course Title	**0CVAEC257 – Soft Skills**			
Semester :	IV			
Prerequisites	-			
Teaching Scheme:-	**Lecture**	**Tutorial**	**Practical**	
Lecture/Tutorial/Practical	-	-	2	
Credit	01			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE 2**	**ESE**
	25 Marks	-	-	-

Course Outcomes (COs): Upon successful completion of this course, Student will be able to:		**BL**
CO1	**Develop** professional self-presentation and non-verbal communication skills.	**3**
CO2	**Demonstrate** effective collaborative problem-solving and leadership in team settings.	**3**
CO3	**Construct** professional documents including resumes and formal emails.	**3**
CO4	Critically **evaluate** personal career goals and execute mock professional interactions.	**4**

Unit No.	**Contents**
Unit 1	**Communication Skills & Confidence Building** Topics: Verbal communication (clarity, tone, articulation), Non-verbal communication (body language, gestures, eye contact), Active listening, Overcoming stage fear, Basic presentation skills Practical / Group Activities: Self-Introduction Round (Recorded), Pair Activity: Active Listening Drill, Role Play: Good vs. Poor Communication, 1-Minute Video Speaking Task, Impromptu Speaking (Extempore), Mirror Practice (confidence building)
Unit 2	**Teamwork, Leadership & Interpersonal Skills** Team dynamics, Conflict resolution, Leadership styles, Emotional intelligence (EI basics), Collaboration & trust building, Marshmallow Tower Challenge (Team Building), Blindfold Navigation Activity (Trust exercise), Group Puzzle Solving Task, Conflict Role Play (Student vs Team disagreement), Rotate Leader Activity (each student leads once), Group Discussion (GD) Sessions
Unit 3	**Critical Thinking & Problem Solving**

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	Logical reasoning, Decision-making frameworks, Creative thinking, Problem-solving techniques, Case study analysis, Case Study Discussion (Real-world engineering problem), Mystery Problem Challenge (group deduction task), Brainstorming Sessions (idea generation), Lateral Thinking Puzzles Competition, Decision-Making Simulation (choose best solution scenario), Mini Innovation Task (build simple solution prototype)
Unit 4	**Employability Skills & Professional Development** Resume writing, Interview skills, Group discussion techniques, Workplace etiquette, Time management, Goal setting, Resume Building Workshop, Mock Interviews (Panel + Recording), Group Discussion (HR-style topics), Time Management Game (task prioritization), Goal Setting Exercise (SMART goals), Professional Etiquette Role Play

Activities Planned

Activities conducted in following areas

1. SWOT Analysis
2. Self-Development Plans
3. Demonstration of reading skills
4. Role playing
5. Group activity on poster/model presentation
6. Group Discussion/ Debate on Current issues.
7. Identifying Role Models / motivational posters/audio/video
8. Writing of reports / resume or a mini presentation.
9. Visit to library to explore technical resources /mini projects.
10. Invited expert lectures by a doctor/industrialist/ professional counsellors.
11. Stress management activities/ visit to Gymnasium.
12. Mock Interview.

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H.O.D.

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Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Soft Skills: Enhancing Employability	M. S. Rao	I. K. International Publishing House	1st	2010
2	Personality Development and Soft Skills	Barun K. Mitra	Oxford University Press	3rd	2024
3	Soft Skills for Managers	Dr. Kalyana Chakravarthi, Dr. Latha Chakravarthi	Bizantra Publications	1st	2015

Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	The 7 Habits of Highly Effective People	Stephen R. Covey	Simon & Schuster	30th	2019
2	How to Win Friends and Influence People	Dale Carnegie	Simon & Schuster	-	2009
3	Emotional Intelligence: Why It Can Matter More Than IQ	Daniel Goleman	Bantam Books	-	2005
4	Adam's Time Management	Marshall Cook	Viva Books	1	2001
5	Presentation Skills	Michael Hutton	ISTE Publications	1	2004

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(0th Revision)

0CVVEC258, UNIVERSAL HUMAN VALUES

Course Code and Course Title	**0CVVEC258- Universal Human Values**			
Semester	IV			
Prerequisites	Student Induction Program (SIP)			
Teaching Scheme	**Lecture**	**Tutorial**	**Practical**	
	02	-	-	
Credit	02			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE 2**	**ESE**
	25 Marks	-	25 Marks	-

Course Outcomes (COs): Upon successful completion of this course, Student will be able to:		**BL**
CO1	**Develop** the ability to self-explore and verify value-based living through natural acceptance having right understanding and harmonious relationships as foundational to resolving personal, familial, and societal problems sustainably.	**2**
CO2	**Apply** the understanding of respect as right evaluation to address societal conflicts and contribute to value-based education.	**3**
CO3	**Recognize** the interconnectedness of natural orders and propose responsible human participation to ensure mutual fulfilment in existence.	**3**
CO4	**Apply** value-based understanding to their domain expertise to propose sustainable solutions for societal and ecological mutual fulfilment.	**3**

Course Contents		
Unit No.	**Contents**	**Hrs.**
Unit 1	**Introduction to Value Education** Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education), Understanding Value Education, Self-exploration as the Process for Value Education, Continuous Happiness and Prosperity – the Basic Human Aspirations, Happiness and Prosperity – Current Scenario, Method to Fulfil the Basic Human Aspirations,	**06**
Unit 2	**Understanding Human being as the Co-existence of the Self and the Body** Distinguishing between the Needs of the Self and the Body, The Body as an Instrument of the Self Lecture, Understanding Harmony in the	**06**

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(0th Revision)

	Self, Harmony of the Self with the Body Lecture, Programme to ensure self-regulation and Health	
Unit 3	**Harmony in the Family-the Basic Unit of Human Interaction** 'Trust'-the Foundational Value in Relationship, 'Respect'-as the Right Evaluation, Other Feelings, Justice in Human-to-Human Relationship, Understanding Harmony in Society, Vision for the Universal Human Order	**06**
Unit 4	**Understanding Harmony in the Nature** Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature, Realizing Existence as Co-existence at All Levels, The Holistic Perception of Harmony in Existence.	**06**
	Total Hrs.	**24**

Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	A Foundation Course in Human Values and Professional Ethics	R. R. Gaur, R. Asthana, G. P. Bagaria	Excel Books	2	2019
2	Teachers' Manual for A Foundation Course in Human Values and Professional Ethics	R. R. Gaur, R. Asthana, G. P. Bagaria	Excel Books	2	2019
3	Human Values	A. N. Tripathi	New Age International Publishers, New Delhi	--	2004

Reference Book

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Jeevan Vidya: Ek Parichaya	A. Nagaraj	Jeevan Vidya Prakashan, Amarkantak	-	1999
2	The Story of Stuff	Annie Leonard	Free Press Publishers	-	2010
3	The Story of My Experiments with Truth	Mohandas Karamchand Gandhi	Navjivan Publishing House		1948

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H.O.D.

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(0th Revision)

P.V.P. INSTITUTE OF TECHNOLOGY, BUDHGAON An Autonomous Institute EN06269

4	Small is Beautiful	E. F. Schumacher	Harper Collins / Penguin Publishers	-	1993
5	Slow is Beautiful	Cecile Andrews	Penguin Random House Publishers	-	2023

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0CVVSEC259, DRAWING AND CAD LAB

Course Details:-

Course Code and Course Title	**0CVVSEC259, Drawing and CAD Lab**			
Semester	IV			
Prerequisites	Student Induction Program (SIP)			
Teaching Scheme	**Lecture**	**Tutorial**	**Practical**	
	-	-	02	
Credit	02			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE2**	**ESE**
	25 Marks	-	50 Marks	

Course Outcomes (CO'S):-Upon successful completion of this course, the student will able to:		**BL**
CO1	**Draw** a scaled drawing with measured dimensions of a building	**2**
CO2	**Design and draw** architectural plan of a typical residential building using principles of planning and byelaws	**3**
CO3	**Draw and integrate** various building services viz. plumbing, sanitary, furniture and electrification for a typical residential building	**3**
CO4	**Apply** knowledge of modern tools for drawing a Municipal submission plan of a building	**3**
CO5	**Design and achieve** energy efficiency in a typical building	**3**

List of Experiments:

Expt. No.	**Experiment List**
A. Full imperial drawing sheets for following	
1	Measured drawing based on field measurement exercise
2	Architectural planning and drawing of a residential building
3	Planning and drawing plumbing and sanitary layout for the above building
4	Planning and drawing furniture arrangement for the above building
5	Planning and drawing of electrification layout for above building
B. Application of CAD software	
6	Municipal drawing of above residential building using CAD software
7	Energy efficiency plan for above building
C. Field visits	
8	Visit to various residential and public buildings

Dr. V. T. Gaikwad
H.O.D.

Dr. K. K. Pandyaji
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(0th Revision)

Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Building Design and Drawing	Sane Y. S.	Allied Book Stall	2nd	1964
2	Building Drawing	M.G.Shah, C.M.Kale, S.Y.Patki	Tata McGraw- Hill	5th	2019
3	Handbook of Designing and Installation of Services in High Rise Building Complexes,	Jain V.K	Khanna Publishers	3rd	2000
4	Civil Engineering Drawing	V. B. Sikka, S. K. Kataria and Sons	S.K.Kataria and sons	7th Edition	2015
5	Building Planning and Design,	Kumarswamy and Kameshwar Rao	Charotar Publications	8th Edition	2010

Reference Book

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	SP 7- National Building Code Group 1 to 5	--	B.I.S.	3rd	2016
2	Code of practice for Architectural and Building Drawings	--	I.S. 962 – 1989	2nd	1989
3	Building bye-laws		SMKC		
4	The Idea of Green Building,	Jain A.K	Khanna Publishers	1st	2014
5	Unified development control and promotion regulations for Maharashtra state	CREDAI, Sangli	Maharashtra state Gazette	First	2020

Useful link /Web Resources

1. http://103.203.175.90:81/fdScript/RootOfEBooks/E%20Book%20collection%20-%202024%20-%20A/CED/Building%20Planning%20and%20Drawing.pdf
2. https://www.sapnaonline.com/books/building-planning-drawing-n-kumara-938035858x-9789380358581

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H.O.D.

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0CVPCC260, CONCRETE TECHNOLOGY LAB

Course Details:

Course Code and Course Title	**0CVPCC260 - Concrete Technology Laboratory**			
Semester:	IV			
Prerequisites	Basic knowledge of concrete ingredients			
Teaching Scheme: - Lecture/Tutorial/Practical	**Lecture**	**Tutorial**	**Practical**	
	-	-	02	
Credit	**01**			
Evaluation Scheme	**ISE 1**	**MSE**	**ISE 2**	**ESE**
	25Marks	--	25 Marks	25 Marks

Course Outcomes (COs): Upon successful completion of this course, Student will be able to:		**BL**
CO1	**Perform** laboratory tests on ingredients of concrete to determine their physical and mechanical properties.	3
CO2	**Determine** the properties of fresh and hardened concrete using laboratory testing methods.	3
CO3	**Design** concrete mix proportion for various ingredients as per Indian Standard guidelines.	4
CO4	**Analyse** the performance of concrete using non-destructive testing techniques.	4

Course Contents

Practical Work consists of performance of at least 10 experiments from the list below, including Experiment No. 10 & 11 which are compulsory

Expt. No.	**List of Experiment**
1.	Determination of fineness of cement by Sieve analysis.
2.	Determination of the standard consistency of cement.
3.	Determination of soundness of cement by Le-Chatelier's apparatus/Auto Clave
4.	Determination of initial and final setting time of cement.
5.	Determination of compressive strength of cement.
6.	Determination of particle size distribution of fine, coarse, and all in aggregate by a sieve analysis (grading of aggregate and FM).
7.	Shape test on Coarse aggregate
8.	Determination of specific gravity, water absorption of fine and coarse aggregates.

Dr. V. T. Gaikwad
H.O.D.

Dr. K. K. Pandyaji
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(0^{th} Revision)

9.	Perform Strength Tests on Concrete: Compressive, Flexural and Split Tensile Strength Tests
10.	Design of Concrete Mix Using IS 10262: 2019 Guidelines
11.	Non-destructive test on concrete.
12.	Determination of workability of Fresh concrete by Slump Cone Test.
13.	Determination of Workability of Fresh Concrete by Compaction Factor Test

Text Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Concrete Technology	M. S. Shetty	S. Chand Publications	8th	2018
2	Concrete Technology	M. L. Gambhir	Tata McGraw Hill Publications	6th	2025
3	Concrete Technology	Santkumar A.R	Oxford University Press	-	2009
4	Textbook of Concrete Technology	P.D.Kulkarni R.K.Ghosh	Newage international	3rd	2007

Reference Books

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
1	Concrete Technology	Neville and Brooks	Pearson Education New Delhi	3rd	2010
2	Concrete Technology	Dr. Aminul Islam Laskar	Laxmi Publication	2nd	2019
3	Properties of Concrete	A. M. Neville	Pearson Education India	5th	2012
4	Concrete Technology	R. S. Varshney	Oxford and IBH	2nd	2005
5	Advanced Concrete Technology	Zongjin Li, Xiangming Zhou, Hongyan Ma, Dongshuai Hou	John Wiley & Sons	2nd	2022

Useful link /Web Resources/IS Codes

1. http://civ02.vlabs.ac.in/exp10/index.html
2. nptel.ac.in/courses/105102012
3. IS 456: 2000, Plain and Reinforced Concrete – Code of Practice, Bureau of Indian Standards, New Delhi.
4. IS 10262: 2019, Concrete Mix Proportioning – Guidelines, Bureau of Indian Standards, New Delhi

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H.O.D.

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(0th Revision)

CVPCC261, FLUID MECHANICS LAB

Course Code and Course Title	**0CVPCC261, FLUID MECHANICS LAB**			
Prerequisites	Engineering Mechanics			
Teaching Scheme	**Lecture**	**Tutorial**	**Practical**	
	--	--	02	
Credit	01			
Evaluation Scheme	ISE 1	MSE	ISE 2	ESE
	25 Marks	--	25 Marks	25 Marks

Course Outcomes (COs): Upon successful completion of this course, Student will be able to:		**BL**
CO1	Demonstrate the use of fluid mechanics laboratory equipment to perform experiments for the study of fluid flow behaviour.	**2**
CO2	Measure discharge, viscosity, pressure and flow characteristics using hydraulic laboratory equipment.	**3**
CO3	Determine hydraulic parameters such as coefficient of discharge, metacentric height, head loss and pipe friction through experiments.	**3**
CO4	Analyse losses and flow characteristics in pipes and hydraulic devices to evaluate the performance of fluid systems.	**4**

Course Contents

Expt. No.	List of Experiment
1.	Measurement of discharge using volumetric method.
2.	Study of pressure measuring devices such as piezometer, manometers, and pressure gauges.
3.	Measurement of Viscosity.
4.	Determination of metacentric height for floating body.
5.	Verification of Bernoulli's theorem.
6.	Calibration of flow measuring devices such as orifice, mouthpiece, venturi meter and orifice meter.
7.	Determination of head loss due to pipe fittings.
8.	Study of factors affecting coefficient of friction in pipe flow.

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H.O.D.

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9.	Determination of coefficient of discharge of an ogee weir.
10.	Determination of the coefficient of discharge for a notch.
11.	Study of Pumps and Turbines.
12.	Hydrostatic Pressure Testing of Pipes.

***Note Conduct 10 experiments**

Useful link /Web Resources/IS codes

1. https://nptel.ac.in/courses/112104118
2. https://vlab.co.in/ba-nptel-fluid-mechanics-lab
3. https://www.youtube.com/playlist?list=PLG2CbtyyaXjZJx6K0w5hLqQk3mXq8L0fH
4. IS 2950 (Part 1) – 1965: Indian Standard for code of practice for hydraulic design of weirs

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