DAYANANDA SAGAR ACADEMY OF TECHNOLOGY & MANAGEMENT

CURRICULUM

Scheme and Syllabus III to IV Semester

Outcome Based Education

(Academic Year 2024-2025)

DEPARTMENT OF CIVIL ENGINEERING

3rd & 4th Semester B.E

ABOUT THE INSTITUTE

Dayananda Sagar Academy of Technology and Management- DSATM was established in 2011 with 5 UG Programs and 1 PG Program, the programs are approved by All India Council for Technical Education (AICTE) New Delhi, Affiliated to Visvesvaraya Technological University (VTU), Belagavi and DSATM is an autonomous institute from 2023-2024.

The Dayananda Sagar Institutions is one of pioneer institutions in India and abroad with six decades of excellence in Academic and Research. The newer campuses were necessary to accommodate the growing need of the technology and innovation.

DSATM nurtures the students in academic, research, sports, cultural and extracurricular activities.

- Creating an academic environment to nurture and develop competent entrepreneurs, leaders and professionals who are socially sensitive and environmentally conscious.
- Integration of Outcome Based Education and cognitive teaching and learning strategies to enhance learning effectiveness.
- Developing necessary infrastructure to cater to the changing needs of Business and Society.
- Optimum utilization of the infrastructure and resources to achieve excellence in all areas of relevance.
- Adopting learning beyond curriculum through outbound activities and creative assignments.
- Imparting contemporary and emerging techno-managerial skills to keep pace with the changing global trends.
- Facilitating greater Industry-Institute Interaction for skill development and employability enhancement.
- Establishing systems and processes to facilitate research, innovation and entrepreneurship for holistic development of students.
- Implementation of Quality Assurance System in all Institutional processes.

VISION OF THE INSTITUTE

To strive at creating the institution a center of highest caliber of learning, so as to create an overall intellectual atmosphere with each deriving strength from the other to be the best of engineers, scientists with management & design skills.

MISSION OF THE INSTITUTE

- To serve its region, state, the nation and globally by preparing students to make meaningful contributions in an increasing complex global society challenges.
- To encourage, reflection on and evaluation of emerging needs and priorities with state-of-the-art infrastructure at institution.
- To support research and services establishing enhancements in technical, economic, human and cultural development.
- To establish interdisciplinary centre of excellence, supporting/ promoting student's implementation.
- To increase the number of Doctorate holders to promote research culture on campus.
- To establish IIPC, IPR, EDC, innovation cells with functional MOU's supporting student's quality growth.

QUALITY POLICY

Dayananda Sagar Academy of Technology and Management aims at achieving academic excellence through continuous improvement in all spheres of Technical and Management education. In pursuit of excellence cutting – edge and contemporary skills are imparted to the utmost satisfaction of the students and the concerned stakeholders.

ABOUT THE DEPARTMENT

Department of Civil Engineering Started in 2012 - 2013 with an intake of 60, which is enhanced to 120 from 2014 -2015 session as a result of Progress made in the department & the subsequent results

- Department has grown from strength to strength since inception.
- The final year results at 98.5% an average, since 2016 till the present class of 2023 the out going batch, reflects the holistic education provided & stands testimony for the well maintained standards in delivery of curricular & Co-curricular aspects to students, making them the best of Engineers & good human beings at the service of society at large.
- Every year since the first out going batch in 2016, minimum of three Final year students projects are being recognized by Govt. of Karnataka through KSCST for financial assistance. At least one project is being selected every year for the state level competitions. One project each in 2018 & 2020 & 2023 was selected to the state level competitions from zone level. In 2018 & 2020 we bagged **Best Civil Engineering project of the year**. This reflects the quality of academics delivered at the department & students commitment.
- Best Project award with cash prize of Rs5,000/- at REVA university State level project presentations in May 2024.

- Department is been recognized as the Consultants by Govt. of Karnataka for all civil Engineering works of *KARNATAKA STATE SILK RESEARCH & DEVELOPMENT INSTITUTE*. Department is carrying out consultancy work worth **3.20 crores at present**. This speaks of the quality of faculty & encouragement given by the management.
- Department has students chapter of very prominent & premier Civil Engineering Professional body **'INDIAN CONCRETE INSTITUTE [ICI]**' since 2015. Under which technical trainings / workshops / Site visits and Seminars are being conducted an regular basis This provides students an knowledge latest developments & happenings in the field. **In the year 2022** the student chapter was recognized as the **Best STUDENT CHAPTER of ICI**. This demonstrates active participation of students & staff in technical activities in & out of the college.
- ***'AAKRUTHI'*** a cultural Club at the department is been active in conducting Sports, Cultural & Co-curricular activities in every semester. Cultural team has bagged prizes at several inter college festivals, prominent being UTSAV of BMSCE, at SJBIT, at Saptagiri College of Engineering… etc
- ***'INDUS'*** an annual Magazine & ***'OZONE'*** a biannual News letter are being brought by the department. These are creating a platform for students to bring out their hidden talent in art, literature, Scientific temperament.
- The curriculum includes Internships, Projects, Mini-projects, Soft Skills, Industry visits, Add on courses on Emerging technologies like Drone survey, RS & GIS based projects, REVIT & BIM in projects And in construction management, open day to showcase final year student projects to inter departments.
- All these milestones & achievements are the result of unconditional support, guidance by the management -DSI, through Well qualified & dedicated staff under the dynamic & able leadership of Dr. K N Vishwanath, with 26 years of teaching & industry experience, a member of Board of Examination, Inspection Committee, Faculty selection committee at VTU, VTU representative at NHCE [Autonomous Instn]

VISION OF THE DEPARTMENT

To be an excellent center for learning technology for knowledge with a focus on research and development imparting professional education in Civil Engineering for ever changing societal needs with Credibility, Integrity and Ethical Standards

MISSION OF THE DEPARTMENT

M1: To achieve academic excellence in Curriculum, imbibing Co-curricular and Extra-curricular activities.

M2: To resolve the challenges of construction industry using inclusive technologies towards sustainable growth

M3: To strive for quality in infrastructural development through checks in accordance with codal provisions and by-laws to meet Environmental & Socio-Economic policy.

M4: To enable the graduates to use the modern tool and technologies to configure, Analyse and Design Civil Engineering Structures

PROGRAM EDUCATION OBJECTIVES (PEO'S):

PEO 1: To equip graduates with holistic knowledge necessary for a successful career in diverse field of Civil Engineering.

PEO 2: To empower graduates in Problem Solving, Innovative and Multiple Thinking in multidisciplinary domains of Civil Engineering.

PEO 3: Enable graduates to pursue research & higher education in applied Civil Engineering and engage in the process of life-long learning through entrepreneurship.

PEO 4: To enact Social and Professional responsibilities in Ethical manner to serve the society

PROGRAM OUTCOMES (PO's)

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSO's)

PSO1: Identify and resolve problems in providing basic needs of the society through sustainable infrastructural development by proper planning and execution.

PSO2: Perform analysis and design using advanced techniques in creating various civil engineering structures to meet global standards.

PSO3: Assess the properties of engineering materials and to explore the field conditions to provide useful data for analysis-design and recommendations for revision of codes

PROPOSED UG CREDIT STRUCTURE IN ALIGNMENT WITH VTU

Sl.No	Semester	No. of Credits
1	1st Semester	20
2	2nd Semester	20
3	3rd Semester	21
4	4th Semester	21
5	5th Semester	22
6	6th Semester	22
7	7th Semester	20
8	8th Semester	14
	Total	**160**

PROPOSED UG SCHEME

Sl. No	Course Category	BOS	TD	Teaching Hours/Week					Credits
				Lecture	Tutorial	Practical	Project	Total (Hrs/week)	
				L	T	P	S		
1	IPCC-1	CSE	CSE	3	0	2	0	5	4
2	IPCC-2	CSE	CSE	3	0	2	0	5	4
3	PCC-1	CSE	CSE	3	0	0	0	3	3
4	PCC-2	CSE	CSE	3	0	0	0	3	3
5	BSC	MAT	MAT	3	0	0	0	3	3
6	PBL	CSE	CSE	0	0	2	2	4	2
7	AEC	CSE	CSE	0	0	2	0	2	1
8	SCR	CSE	CSE	0	0	2	0	2	1
9	NCMC	NSS / YOGA / PED							
10	AICTE Activity Points								
								Total	**21**

Percentage of Mapping– Theory & Practical - Scheme & Syllabus- 3rd & 4th Sem

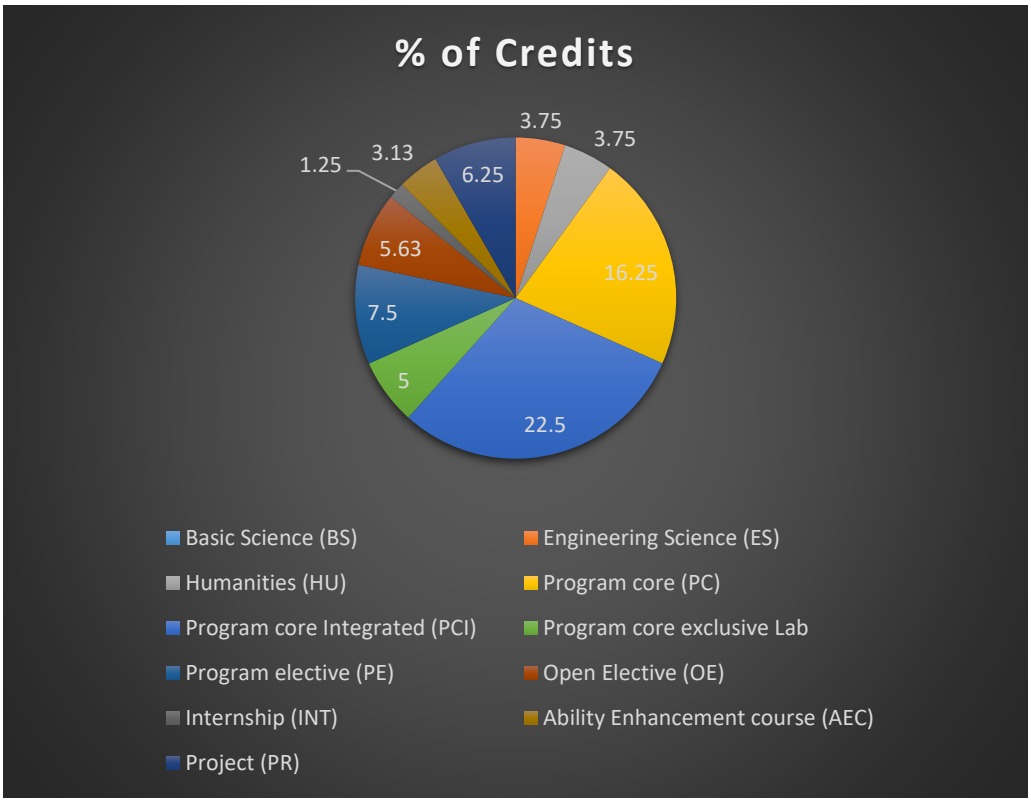
3rd Sem & 4th Sem

Sl. No	Course Category	Component			
		Theory	Practical	Outreach	YOGA/SPORTS
1	PCC-1	100%	--	--	--
2	PCC-2	100%	--	--	--
3	IPCC-1	60%	40%	--	--
4	IPCC-2	60%	40%	--	--
5	PCCL		--	--	--
6	PBL	--	100%	--	--
7	AEC	--	100%	--	--
8	SCR	--	--	100%	--
9	NCMC	--	--	--	100%
	Total Percentage	**53%**	**47%**	**13%**	**13%**

Scheme Distribution

Department of Civil Engineering

Course Component	Credits	% of Credits
Basic Science (BS)	6	3.75
Engineering Science (ES)	6	3.75
Humanities (HU)	26	16.25
Program core (PC)	36	22.50
Program core Integrated (PCI)	8	5.00
Program core exclusive Lab	12	7.50
Program elective (PE)	9	5.63
Open Elective (OE)	2	1.25
Internship (INT)	5	3.13
Ability Enhancement course (AEC)	10	6.25
Project (PR)		
Total	**160**	**100**



SEMESTER WISE CREDIT BREAKDOWN FOR B.E. DEGREE CURRICULUM

BATCH 2023-2027

Course Category	Semester								Total Credits
	1st	2nd	3rd	4th	5th	6th	7th	8th	
Basic Sciences (BSC)									
Engineering Sciences (ESC)			3	3					6
Humanities, Social Sciences and Management (HSMC)					3				3
Ability Enhancement Course (AEC)			1		2	2			5
Universal Human Values (UHV)			1	1	1				3
Professional Core Courses (PCC)			6	6	3	6	3	2	26
Integrated Professional core Course (IPCC)			8	8	8	4	8		36
Professional Elective Course (PEC)			2	2	2	2			8
Institutional Open Elective Courses (IOE)					3	3	3	3	12
Internship (INT)						3	3	3	9
Mini Project / Project Work (PW)								2	2
Non-credit Mandatory Courses (NCMC)				1		2	3	4	10
Total Credits			1	1	1	1			----
			21	21	22	22	20	14	**120**

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Affiliated to VTU
Approved by AICTE
Accredited by NAAC with A+ Grade
6 Programs Accredited by NBA
(CSE, ISE, ECE, EEE, MECH, CIVIL)

Scheme of Teaching and Examinations – 2024
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from 2024-25)

3rd SEMESTER: CIVIL ENGINEERNG [CE]

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture L	Tutorial T	Practical P	Project S	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
1	BCV301	Fluid mechanics	IPCC	Civil	Civil	3	0	2		4	4	3	50	50	100
2	BCV302	Building planning & drawing	IPCC	Civil	Civil	3	0	2		4	4	3	50	50	100
3	BCV303	Strength of materials	PCC	Civil	Civil	2	2	0		3	3	3	50	50	100
4	BCV304	Engineering survey	PCC	Civil	Civil	3	0	0		3	3	3	50	50	100
5	BCV305	Building materials And Structural elements	ESC	Civil	Civil	3	0	0		3	3	3	50	50	100
6	BCV306	Digital surveying	PCCL	Civil	Civil	1	0	2		3	2	3	50	50	100
7	BSCK308	Social connect and responsibility	SCR	Civil	Civil	0	0	2		1	1	---	100	--	100
8	BCV307	Personality development & soft skills for civil engineers	AEC	Civil	Civil	If the course is a Theory: 1	0	0		1	1	2	50	50	100
						If the course is a Lab: 0	0	1							
9	BNSK309	NSS	NSS coordinator			0	0	2			0		100	---	100
		PHYSICAL EDUCATION	Physical Education Director												
		YOGA	Yoga Teacher												
					Total	16		11			21		550	350	900

Scheme of Teaching and Examinations – 2024
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from 2024-25)

4th SEMESTER: CIVIL ENGINEERNG [CE]

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture L	Tutorial T	Practical P	Project S	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
1	BCV401	Transportation engineering-I	IPCC	Civil	Civil	3	0	2		4	4	3	50	50	100
2	BCV402	Water supply & conservation	IPCC	Civil	Civil	3	0	2		4	4	3	50	50	100
3	BCV403	Analysis of structures	PCC	Civil	Civil	3	0	0		3	3	3	50	50	100
4	BCV404	Geo technical engineering -I	PCC	Civil	Civil	3	0	0		3	3	3	50	50	100
5	BCV405	Concrete material science	ESC	Civil	Civil	3	0	0		3	3	3	50	50	100
6	BCV406	Construction materials testing Laboratory	PCCL	Civil	Civil	1	0	2		3	2	3	50	50	100
7	BSCK408	Universal human values -2	UHV	Civil	Civil	0	0	2		1	1	1	100	--	100
8	BCV407	Mini project – civil engineering fundamentals	PBL	Civil	Civil	If the course is a Theory				0	1		50	50	100
						If the course is a Lab				2					
						0	0	2							
9	BNSK409	NSS	NSS coordinator			0	0	2			0		100	---	100
		Physical education	Physical Education Director												
		Yoga	Yoga Teacher												
					Total	16		12			21		550	350	900

IPCC: Integrated Professional Core Course,

PCC: Professional Core Course

PBL: Project Based Learning

AEC: Ability Enhancement Course,

NCMC: Non-Credit Mandatory Course

L: Lecture,

T: Tutorial,

P: Practical

S= SDA: Skill Development Activity,

CIE: Continuous Internal Evaluation,

SEE: Semester End Evaluation.

Integrated Professional Core Course (IPCC): Refers to Integrated Professional Core Course Theory Integrated with practical's of the same course. Credit for IPCC can be 04 and its Teaching Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by only CIE (no SEE). However, questions from the practical part of IPCC shall be included in the SEE question paper.

Non Credit Mandatory Course (NCMC) - National Service Scheme /Physical Education/Yoga: All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education (PE)(Sports and Athletics), and Yoga(YOG) with the concerned coordinator of the course during the first week of III semesters. Activities shall be carried out between III semester to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the degree. The events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and Yoga activities. These courses shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the course is mandatory for the award of degree.

Newly introduced subjects in the syllabus

Sl.No		3rd Semester	4th Semester
1.	List of Existing Elective Courses	No Electives have been offered at this stage	No Electives have been offered at this stage
2.	List of New Existing Elective Courses	No Electives have been offered at this stage	No Electives have been offered at this stage
3.	List of New Industry Aligned Courses	**[1]** DIGITAL SURVEYING **[2]**BUILDING MATERIAL SCIENCE FOR SUSTAINABILITY	**[1]** WATER SUPPLY & CONSERVATION

Percentage of Change in the Syllabus:

3rd Semester						
Sl.No	Course Code	Course Name	Topics Added	Topics removed	Revised in %	Justification
1	23CVES32	Engineering survey	Modern surveying; Photogrammetry: REMOTE SENSING AND GIS	Chain, Compass & Plan table surveying	35	**In modern surveying Total station & Dron is included; In RS & GIS image processing is understood**
2	23CVFM33	Fluid mechanics	Efficiency in pipe flow; Energy equations	Turbines	20	**In any flow network efficiency is prime factor deciding the optimum operation: Turbines are to be learnt if required as an elective.**
3	23CVBD34	Building planning & drawing	Manual Drawing – Building components,	NIL	6	**Want students to have feel of physical measurements**
4	23CVEC36	Building material science for sustainability	Sustainable natural materials for building construction.	Tests on conventional building materials	10	**Students to have knowledge on such materials- they use them in their professional work**
5	23CVSL35	Digital surveying	Total Station & GPS survey- Data collection, Retrieval, preparing drawings	Exercise on Chain, Compass & PT surveying	22	**To be in line with process adopted in market / field work by the companies**

Percentage of deviation:- 35+20+6+10+22 =93/8= 11.0%

4th Semester						
Sl.No	**Course Code**	**Course Name**	**Topics Added**	**Topics removed**	**Revised in %**	**Justification**
1	23CVAS41	Analysis of structures	**Indeterminate structures**	**NIL**	**20**	**To balance the credits & to have equitable distribution of all subjects at UG level**
2	23CVGT42	Geo technical engineering -I	**NIL**	**Phreatic line & Concept:** **Secondary compression**	**10**	**Not much in use at basic design level, WHICH ug STUDENTS**
3	23CVTE43	Transportation engineering-I	**NIL**	**Traffic Engineering**	**20**	**Would be studied as a Professional / Open elective at higher semester- The subject is worth 3 credits & 100 marks**
4	23CVWS44	Water supply & conservation	**Making water a Renewable / Recyclable one at source- Different types, Methods: concept of RWH- in Buildings, at open places, Irrigation fields. Distribution system**	**NIL**	**15**	**Need of the hour is water conservation. Knowledge of distribution completes the cycle of water supply engg**
5	23CVES46	Concrete material science	**Mix design as per IS code for filed applications**	**NIL**	**10**	

Percentage of deviation:- 20+10+20+15+10= 75/8 = 9.35%

3rd SEMESTER

INTEGRATED PROFESSIONAL CORE COURSE (IPCC)

IPCC Course – Integrated Professional Core Course

Teaching Hours/Week (L: T:P: S)	3:0:2:0
Total Hours of Pedagogy	40 hours Theory + 20 Hours of Practical Classes
Credits:	04
Theory - Each Module	8 Hrs
Practical's	8-10 Programs / Experiments
CIE Marks	50
SEE Marks	50
Total Marks	100
Exam Hours	3
Examination nature (SEE)	Theory

- The theory part of the IPCC shall be evaluated both by CIE and SEE.
- The practical part shall be evaluated by only CIE (no SEE).
- However, questions from the practical part of IPCC shall be included in the SEE question paper.

Integrated Professional Core Course (IPCC) - 4 Credit Course

Assessment Details (both CIE and SEE)

- The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%.
- The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks).
- A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation (CIE) for the Theory component of the IPCC (Maximum marks 50)

Internal Assessment Test (IAT):

- IPCC means practical portion integrated with the theory of the course.
- CIE marks for the theory component are 25 marks and that for the practical component is 25 marks.
- 25 marks for the theory component are split into 15 marks for two Internal Assessment Tests (Two Tests, each of 50 Marks with 01-hour 30 minutes' duration, are to be conducted and average of two tests to be reduced to 15 marks) and 10 marks for Two Continuous Comprehensive Assessment (CCA) methods.

- The first Internal test at the end of 40-50% coverage of the syllabus
- The second Internal test after covering 85-90% of the syllabus.
- Scaled-down marks of the sum of two tests and other assessment methods will be CIE marks for the theory component of IPCC (that is for 25 marks).
- The student has to secure 40% of 25 marks to qualify in the CIE of the theory component of IPCC.

The IA test questions are to be framed to map the Course Outcomes (COs), Program Outcomes (POs) and the Revised Blooms Taxonomy (RBT) Levels. Emphasis to be given for Higher order Thinking Skills (HOTS).

Continuous Internal Evaluation (CIE) for the practical component of the IPCC

- On completion of every experiment/program in the laboratory, the students shall be evaluated and Marks shall be awarded on the same day.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report, **05 Marks** are for conducting the experiment, **05 Marks for** preparation of the laboratory record, **5 Marks** for conducting Open Ended Experiments Each experiment. Marks of all experiments' write-ups are added to 15 marks.
- The Practical laboratory test **(duration 03 hours)** at the end of the 15th week of the semester/after completion of all the experiments (whichever is early) shall be conducted for **50 Marks** and scaled down to **5 Marks.**
- The open-ended experiment after completion of all the experiments shall be conducted for 20 marks with a split-up for 5 Marks for writeup, 10 Marks for Execution, and 5 Marks for Viva-Voce.
  Marks for writeup, Execution and Viva-Voce is added and scaled down to 05 marks.
- Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IPCC for 25 marks.
- The student has to secure 40% of 25 marks to qualify in the CIE of the practical component of the IPCC.

Semester End Examination (SEE) for IPCC Theory

SEE will be conducted as per the scheduled timetable, with common question papers for the course (duration 03 hours)

- The question paper will have ten questions. Each question is set for 20 marks.

- The question paper shall be set for 100 Marks. The medium of the question paper shall be English. **The duration of SEE is 03 hours.**
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module. The two questions shall be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels.
- The students have to answer 5 full questions, selecting one full question from each module.
- Marks scored by the student shall be proportionally scaled down to 50 Marks.
- The theory portion of the IPCC shall be for both CIE and SEE, whereas the practical portion will have a CIE component only.
- Questions mentioned in the SEE paper may include questions from the practical component.

Continuous and Comprehensive Assessment (CCA):

Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be (CCA1+CCA2)/2 and scaled down to **10 Marks**.

- CCA1 after 4th week and CCA2 after 9th week. The Assessment will be through rubrics.
- CCA as project-based learning,
    - CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission.
    - The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report

Total score for CCA is **10 Marks**

Total Marks scored for theory component of CIE (IAT+ CCA) is **25 Marks**

Possible Continuous and Comprehensive Assessment (CCA):

- Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom,
- The assessment of these techniques shall be in rubrics.
- The faculty can adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

4 Credits Courses – Integrated Professional Core Course (IPCC)

Assessment Method	Component	Type of Assessments	Syllabus Coverage	Maximum Marks	Average	Reduced Marks	Minimum Passing Marks	Evaluation Details
Total CIE Theory + Practical				**50**	----	----	**20**	
CIE	**Theory**	Internal Assessment Test (IAT) - I	Module – 1 to 2.5	50	(50+50) / 2	**15**	6	Average of Two Internal test each of 50 Marks scale down the marks to 15 Marks
		Internal Assessment Test (IAT) - II	Module – 2.5 to 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives / Activity based learning	Considering all the Modules	50	(50+50) / 2	**10**	4	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives/ Activity based learning		50				
	Total CIE Theory					**25**	10	Scale down Marks of IAT and CCA to 25

CIE	**Practical**	Conduction of Experiments	Performance-Continuous Evaluation of each experiment	05	15	Average of all Experiments	15	4	Performance of the Experiment (On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. 20 marks are for conducting the experiment and calculations/observations/output)
			Record	05					
			Observation book	05					
		Practical Test	Write up	15	50	----	05	4	One Internal Practical Test after conduction of all Experiments for 50 Marks
			Execution	25					
			Viva-voce	10					
		Open Ended Experiment	Write up	05	20	----	05	2	One experiment for 20 marks. 20 marks reduced to 05 marks
			Execution	10					
			Viva-voce	05					
						Total CIE Practical	**25**	**10**	Scale down Marks of Experiments, Record, Observation, Practical Test and Open-Ended Experiment

SEE		Theory exam	Entire theory syllabus including questions from lab Component in respective Modules	100	----	50	20	SEE Exam is theory Exam conducted for 100 Marks, scored Marks are scaled down to 50 Marks
			CIE + SEE	100	----	----	40	

- The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks – 25) in the Practical component.
- The Laboratory Component for the IPCC shall be for CIE only.
- However, in SEE, the Questions from the Laboratory Component shall be included in the respective Modules only.

Note: If few of the 3 Credit Courses are Integrated course type, for such courses the method suggested for 4 Credit IPCC Course shall be followed

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**3rd Semester**				
Course Title	:	**Fluid Mechanics and Hydraulic Machines**				
Course Code	:	**BCV301**				
Course Type (Theory/ Practical/ Integrated)	:	**Theory**				
Category	:	**IPCC**				
Stream	:	**Civil Engineering**		**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**2+2+2**		**SEE**	:	**100**
Total Hours	:	**40 hrs + 20 hrs practical**		**SEE Duration**	:	**100 3 hrs**
Credits	:	**4**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	To understand the properties of fluids and fluid statics
2	To derive the equation of conservation of mass and its application
3	To solve kinematic problems such as finding particle paths and stream lines
4	To use important concepts of continuity equation, Bernoulli's equation and turbulence, and apply the same to problems
5	To analyze laminar and turbulent flows and various flow measuring devices.
6	To study in detail about boundary layers theory

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.

- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

Scheme of Teaching and Examinations for BE Programme -2024-25

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2024-25)

DSATM

COURSE CURRICULUM

Module No.	Topics	Hours
1	Fluids and their properties like density, specific weight, viscosity, surface tension, capillarity Numerical on properties Fluid pressure Pascal's law, Measurement of pressure using simple and differential manometers, Numerical on manometers.	8
Pedagogy	**Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily	
2	Total Pressure, center of pressure: definitions and derivations for total pressure and centre of pressure on vertical and inclined submerged surfaces. Continuity equation and Numerical Kinematics- Types of fluid flow, continuity equation in Cartesian coordinates, flow nets and applications Fluid Dynamics- Euler's equation of motion, Bernoulli's equation and assumptions Applications-Venturimeter, Orificemeter, Pitot tube	8
Pedagogy	**Demonstration:** exhibits the implementation process,	
3	Hydraulic coefficients definitions and numerical on rations, Classification of orifice and mouth piece. Classification of Notches ,Discharge over Rectangular, Triangular and Cipoletti notches Flow through pipes :Major and minor losses, pipes in series and parallel, Numerical on pipe networks , hardy cross method concepts of water hammer and surge tanks	8
Pedagogy	**Animated Video presentation showing C/S & L/S of fluid flow in a pipe**	
4	Flow through Open channels: Classification of Flow through channels, Most economical channel sections and derivations, design problems: Rectangular, Triangular, Circular channel sections. Energy equations: Uniform flow, Specific energy graph and analysis of critical flow, critical depth and critical velocity Non-Uniform flow- Definition of Hydraulic jump and Derivation, Gradually varied flow and equation of GVF through non uniform flow	8
Pedagogy	• **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving	

5	Impulse Momentum Equation, Impact of jet on stationary and moving vanes, curved vanes, Hydro Electric power plant, pelton wheel and Kaplan turbines Design numerical.	**8**
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process	

List of Programs:

Sl. No.	Experiments/Programs	COs
1	Determination of Cd for Venturimeter or Orificemeter	**CO4**
2	Determination of Hydraulic coefficients of small vertical orifice	**CO4**
3	Calibration of Triangular notch	**CO4**
4	Determination of Major losses in pipes	**CO4**
5	Determination of force exerted by a jet on flat and curved vanes	**CO5**
6	Determination of efficiency of Kaplan turbine	**CO3**
7	Determination of efficiency of Pelton wheel turbine	
Open ended Programs		
1	Study Water hammer & its effect on flow in Pipes	

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	R.K. Bansal- A text book of Fluid Mechanics and Hydraulic Machines- Laxmi Publications ,New Delhi
2	P.N.Modi and S.M.Seth-Hydraulics and Fluid Mechanics, including Hydraulic machines, standard Book House, New Delhi
3	S K SOM and G Biswas, "Introduction to Fluid Mechanics and Fluid Machines", Tata McGraw Hill, New Delhi
4	Mohd. Kaleem Khan, "Fluid Mechanics and Machinery", Oxford University Press.
Reference Books	
1	Victor L. Streeter, Benjamin Wyile E and Keith W. Bedford- Fluid Mechanics ,Tata McGraw Hill publishing Co Ltd,New Delhi
2	F.Douglas,J .M .Gasoreik, John Warfield ,Lynne Jack – Fluid Mechanics ,Pearson ,Fifth edition.

3	K.Subramanya- Fluid Mechanics and Hydraulic Machines, Problems and Solutions, Tata McGrawhill, New Delhi
4	S.K SOM and G.Biswas – " introduction to Fluid Mechanics and Fluid Machines, Tata Mcg raw Hill, New Delhi

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	Understand the various properties of fluids and their influence on fluid motion and analyse a variety of problems in fluid statics and dynamics.	U/R	L1/L2
CO2	Apply the various laws of energy, and newton's law of motion in deriving the governing equations for determining the fluid force.	A	L3
CO3	Analyse the forces that act on fluids and bodies submerged in fluids according to the circumstances in order to optimize the water resources.	An	L4
CO4	Classify the discharges and channel flows by applying the geometrical properties.	D	L4
CO5	Evaluate the forces with the help of momentum forces in hydraulic power extraction and structures.	C	L5

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1				1									1	
CO2				1									1		
CO3		1				1						1			1
CO4				1			1							1	
CO5	1								1					1	

Weblinks and Video Lectures (e-Resources)	
1	https://www.youtube.com/watch?v=DW4rItB20h4 (bernoulli's equation and understanding)
2	https://www.youtube.com/shorts/phzl5ZDuCL0(pressure measurement)

3	https://www.youtube.com/shorts/phzl5ZDuCL0 (hydro electric power plant)
4	https://www.youtube.com/watch?v=k0BLOKEZ3KU (turbines Kaplan, francis and pelton)
5	https://web.mit.edu/hml/ncfmf.html (MIT fluid mechanics films for better visual understanding)

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory				Practical
	Continuous Assessment Tests (IAT)		Continuous Comprehensive Assessment (CCA)		Practical Test
	IAT-1	IAT-2	CCA-1	CCA-2	
	50 Marks	50 Marks	50 Marks	50 Marks	
Remember	10	10	0	0	
Understand	15	15	0	0	
Apply	25	25	0	0	
Analyse	25	25			10
Evaluate	15	15	10	10	10
Create	10	10	10	10	5

CIE Course Assessment Plan

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	10				10		20	20
CO2		10		10			20	20
CO3	10		10		10		30	30
CO4					10	10	20	20
CO5						10	10	10
Total	20	10	10	10	30	20	100	100

SEE- Semester End Examination (50 Marks):

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	10
Understand	15
Apply	25
Analyse	25
Evaluate	15
Create	10

SEE Course Plan

CO's	Marks Distribution						Total Marks	Weightage
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	10				10		20	20
CO2		10		10	10		30	30
CO3			10	10		10	30	30
CO4			10		10		20	20
CO5								
Total	10	10	20	20	40	10	100	100

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**III**				
Course Title	:	**Building Planning and Drawing**				
Course Code		**BCV302**				
Course Type (Theory/ Practical/ Integrated)	:	**Integrated**				
Category	:	**IPCC**				
Stream	:	**CIVIL**		**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**2:0:2:0**		**SEE**	:	**50**
Total Hours	:	**40 + 20**		**SEE Duration**	:	**3 hrs**
Credits	:	**4**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	Understand the different types of scales and their conversion.
2	Clear knowledge about the building bylaws – NBC
3	Understand the details of construction of different building components
4	Achieve skill sets to read and interpret the given drawing.
5	Achieve skill sets to prepare computer aided engineering drawings
6	Visualize the completed form of the building and the intricacies of construction based on the engineering drawings

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.
- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.

- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

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Scheme of Teaching and Examinations for BE Program -2024-25

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2024-25)

COURSE CURRICULUM

Module No.	Topics	Hours
1	Introduction to selection of scale, Urban and Municipal by-laws as per National Building Codes, FAR. Introduction to AutoCAD- Components, Screen Layout, workspace, Ribbons, Toolbars etc. Setting units, limits. Draw and modify commands- both commands and graphical approach. Working with drawing aids such as layers, line weight and blocks, object snap etc. Editing sketches and dimensioning of elements. Introduction of text and tables in AutoCAD. Hatching, modelling of layout and plotting of drawings. Identification of Symbols, signs, and lines for different materials used in Civil Engineering. Construction of detailed drawing of the building components using AutoCAD Software: foundation for masonry walls (load bearing and partition walls), Staircase (doglegged and open well) and Roof truss	**20**
Pedagogy	**PPT, Chalk and Talk, Video, Hands on session in AutoCAD**	
2	Introduction to plan, elevation and sectional elevation. Development of Sanctioned plan and working plan, elevation and sectional elevation of the given line diagram in AutoCAD . • Residential building (single and double storey) • Skecthing of near to scale single line diagram for Commercial building – School, office, hospital, hostel	**20**
Pedagogy	**Chalk and Talk, Video, Hands on session in AutoCAD**	
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process	

List of Programs:

Sl. No.	Experiments/Programs	Cos
1	Using AutoCAD draw and modify commands draw and detail the basic two dimensional geometrical shapes for the given specification.	**CO1**

2	Construct a detailed drawing of load bearing masonry wall foundation as per standard dimensions	**CO6**
3	Construct a detailed drawing of partition wall footing as per requirements	**CO6**
4	Draw a detailed drawing of doglegged staircase for a residential building	**CO6**
5	Draw a detailed drawing of open well staircase for a residential building	**CO6**
6	Prepare a detailed drawing of roof truss	**CO6**
7	Develop the plan, section and elevation of a residential building incorporating building bylaws	**CO6**
8	Develop the plan, section and elevation of a two story residential building incorporating building bylaws	**CO6**
Open ended Programs		
1	Building service drawings -electrical and plumbing drawings: [Independent drawings]	**CO6**

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	Gurucharan Singh and Subash Chander, "Civil Engineering Drawing" (2014), English Standard Publishers and Dist., Delhi.
2	Sikka V B Kataria S K & Sons. "A Course in Civil Engineering Drawing".
3	Building Bye Law: Present BBMP Bye Law.
Reference Books	
1	Shah M H and Kale C M, "Building drawing", Tata Mc-Graw Hill Publishing Co. Ltd., New Delhi.
2	Gurucharan Singh, "Building Construction", Standard publishers and distributors, New Delhi.
3	National Building Code, BIS,4 New Delhi. 47
4	Sham Tickoo, "Understanding AUTOCAD 2004 A beginner's Guide", Wiley Dreamtech India Pvt Ltd.
5	Jayaram M A., Rajendra Prasad D S., "A referral on CAD Laboratory", Sapna Publications.

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	Understand and select a suitable scale for the given drawing based on the type of drawing.	Understand	L1/L2
CO2	Apply urban and municipal bylaws as per National building code for the given building based on location and type of structure.	Apply	L3
CO3	Analyse the given drawing for building bylaw compliance	Analyse	L4
CO4	Evaluate any existing structure for building bylaw compliance	Evaluate	L5
CO5	Design the layout and plan a simple residential building as per standards	Create	L6
CO6	Develop detailed drawing for the given line diagram based on the given requirements	Create	L6

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2	3							3							
CO3		3						3						2	
CO4				3				3							
CO5			3					3						2	
CO6					3									2	

Weblinks and Video Lectures (e-Resources)	
1	Link for working with AutoCad: https://www.youtube.com/watch?v=cmR9cfWJRUU&list=PLcH1MIEuSvoGaHGEI_BnQ5In4R_NNOghG
2	Link for Building Components: https://www.youtube.com/playlist?list=PLHTVTvUaTtbBLCiVX4_PZWTpUvwc2RieO
3	Link for Building Planning: https://www.youtube.com/playlist?list=PLcH1MIEuSvoHRuFu9XTT0_dbrvM3sEqLB

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory				Practical
	Continuous Assessment Tests (IAT)		Continuous Comprehensive Assessment (CCA)		Practical Test
	IAT-1	IAT-2	CCA-1	CCA-2	
	50 Marks	50 Marks	50 Marks	50 Marks	
Remember	5	5			5
Understand	5	5			
Apply	5	5			
Analyse	5	5			
Evaluate			20	20	
Create	30	30	30	30	45

CIE Course Assessment Plan

CO's	Marks Distribution			Total Marks	Weightage
	Test-1		Test-2		
	Module-1	Module-2	Module-3		
CO1	5	5		10	10
CO2	5	5	5	15	15
CO3		10		10	10
CO4					
CO5		10		10	10
CO6		10	45	55	55
Total	10	40	50	100	100

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	5
Understand	5
Apply	10
Analyse	10
Evaluate	
Create	70

SEE Course Plan

CO's	Marks Distribution						Total Marks	Weightage
	Module-1	Module-2	Module 3					
CO1	5	5					10	10
CO2	5	5					10	10
CO3		10					10	10
CO4								
CO5			10				10	10
CO6			60				60	60
Total	10	20	70				100	100

PROFESSIONAL CORE COURSE (PCC)

PCC Course - Professional Core Course

Teaching Hours/Week (L: T:P: S)	3:0:0:0
Total Hours of Pedagogy	40 hours
Credits:	03
Each Module	8 Hrs
CIE Marks	50
SEE Marks	50
Total Marks	100
Exam Hours	3
Examination nature (SEE)	Theory

3 Credit Course – Professional Core Course (PCC)

Assessment Details (both CIE and SEE)

- The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%.
- The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks).
- A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

Internal Assessment Test (IAT):

- For the Internal Assessment Test component of CIE, there are 25 marks and for Assignment component of the CIE, there are 25 marks. Two Tests, each of 50 Marks with 01-hour 30 minutes' duration, are to be conducted and average of two tests to be reduced to 25 marks
  - The first test will be administered after 40-50% of the syllabus has been covered, and
  - The second test will be administered after 85-90% of the syllabus has been covered
- Any two assignment methods, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned.
- For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment.

- Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

The IA test questions are to be framed to map the Course Outcomes (COs), Program Outcomes (POs) and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels

Semester-End Examination:

Theory SEE will be conducted as per the scheduled timetable (duration 03 hours).

- The question paper will have ten questions. Each question is set for 20 marks.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.
- The students have to answer 5 full questions, selecting one full question from each module.
- Marks scored shall be proportionally reduced to 50 marks.

Continuous and Comprehensive Assessment (CCA):

Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **10 Marks**.

- CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics
- CCA as project-based learning,
    - CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission.
    - The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report

Total score for CCA is **10 Marks**

Total Marks scored for theory component of CIE (IAT+ CCA) is **25 Marks**

Possible Continuous and Comprehensive Assessment (CCA):

- Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom,
- The assessment of these techniques shall be in rubrics.
- The faculty can adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

Professional Core Course (PCC) – 3 Credit course – Theory

Assessment Method	Component	Type of Assessments	Syllabus Coverage	Maximum Marks	Average	Reduced Marks	Minimum Passing Marks	Evaluation Details
Total CIE Theory + Practical				**50**	----	----	**20**	
	Theory	Internal Assessment Test (IAT) - II	Module – 1 to 2.5	50	(50+50) / 2	**25**	10	Average of Two Internal test each of 50 Marks scale down the marks to 25
		Internal Assessment Test (IAT) - II	Module – 2.5 to 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives / Activity Based learning	Considering all the Modules	50	(50+50) / 2	**25**	10	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives / Activity Based learning		50				
	Total CIE Theory					**50**	20	Total Marks of IAT and CCA is 50
SEE		Theory exam	Entire theory syllabus including questions from lab Component in respective Modules	100	----	50	20	SEE Exam is theory Exam conducted for 100 Marks, scored Marks are scaled down to 50 Marks
CIE + SEE				100	----	----	40	

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**3RD SEM**				
Course Title	:	**STRENGTH OF MATERIALS**				
Course Code	:	**BCV302**				
Course Type (Theory/ Practical/ Integrated)	:	**THEORY**				
Category	:	**PCC**				
Stream	:	**STRUCTURAL ENGINEERING**		**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**2:2:0:0**		**SEE**	:	**50**
Total Hours	:	**40**		**SEE Duration**	:	**3hrs**
Credits	:	**3**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	**Determine** simple stresses and strains and distinguish between different materials with stress strain diagram used in constructions. (Compound stresses and Mohr's circle of stress as an activity for CCA)
2	**Draw** bending moment diagram and shear force diagram along the length of beams.
3	**Examine** Axial stresses, bending stresses and shear stresses across the depth of cross section.
4	**Simplify** to distinguish different structural components in a building
5	**Combine** different structural elements to form skeleton of structure.

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.

- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.
- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

DSATM

Scheme of Teaching and Examinations for BE Program -2024-25

Outcome Based Education and Choice Based Credit System (CBCS)

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COURSE CURRICULUM

Module No.	Topics	Hours
1	**Simple Stresses and Strains:** Introduction, Properties of Materials, Stress, Strain, Hook's law, Poisson's Ratio, Stress – Strain Diagram for structural steel, Elastic constants E, G and K, relationship among elastic constants, problems. **Composite sections and Thermal stresses:** Principles of superposition, Total elongation of tapering bars of circular and rectangular cross sections. Composite section, Thermal stress and strains	8
Pedagogy	**Chalk and talk with demonstration using models, site visits and software to validate results**	
2	**Bending moment and shear force diagrams in beams**: Definition of shear force and bending moment, Sign convention, Relationship between loading, shear force and bending moment, **Development of BMD and SFD expressions and profiles:** For cantilever beams, simply supported beams and over hanging beams subjected to concentrated loads, UDL, UVL and concentrated moments. **BMD and SFD for given loads:** Development of SFD and BMD for cantilever beams, simply supported beams and over hanging beams for concentrated loads, UDL,UVL and concentrated moments.	8
Pedagogy	**Chalk and talk with demonstration using models, site visits and software to validate results**	
3	**Bending stress in beams:** Introduction – Bending stress in beam, Pure bending, Assumptions in simple bending theory, derivation of Simple bending equation (Euler-Bernoulli's equation), modulus of rupture, section modulus, Flexural rigidity, Problems	

	Shear stress in beams: Derivation of Shear stress intensity equations, Derivation of Expressions of the shear stress intensity for rectangular, triangular and circular cross sections of the beams. Problems on calculation of the shear stress intensities at various critical levels of T, I and Hollow rectangular cross sections of the beam	**8**
Pedagogy	**Chalk and talk with demonstration using models, site visits and software to validate results**	
4	**Elastic stability of columns:** Introduction – Short and long columns, Euler's theory on columns, Effective length, slenderness ratio, radii of gyration, buckling load, Assumptions, derivations of Euler's Buckling load for different boundary conditions, Limitations of Euler's theory, Rankine's formula and related problems. **Torsion of circular shafts** **Derivation of expressions:** Twisting moment in shafts, simple torsion theory, derivation of torsion equation, torsional rigidity, polar modulus, shear stress variation across solid circular and hollow circular sections, **Torsional stresses in shafts**: Numerical problems to find diameter of the shafts comparing strength and stiffness of shafts subjected to pure torsion..	**8**
Pedagogy	**Chalk and talk with demonstration using models, site visits and software to validate results**	
5	**Compound stresses**: Introduction, Stress components on inclined planes, General two- dimensional stress system, Principal stresses and principal planes, maximum shear stresses and their planes (shear planes). Compound stress using Mohr's circle of stress method. **Thin and thick cylinders:** Introduction: Longitudinal, circumferential (hoop) stress in thin cylinders. Expressions for longitudinal and circumferential stresses. Problems on estimation of change in length, diameter and volume when the thin cylinder subjected to internal fluid pressure. Problems on thick cylinders.	**8**
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications	

	• **Demonstration:** exhibits the implementation process

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	S.S Bhavikatti 'strength of materials'Vikas publidhing house Technology and Engineering 4th edition
2	B.S. Basavarajaiah, P. Mahadevappa "Strength of Materials" in SI Units, University Press (India) Pvt. Ltd., 3rd Edition,2010
3	H.S Vishwanath and Dharmesh'strength of materials'New age internation 3rd edition
4	Vazirani, V N, Ratwani M M. and S K Duggal "Analysis of Structures Vol. I", 17th Edition, Khanna Publishers, New Delhi.
Reference Books	
1	D.H. Young, S.P. Timoshenko "Elements of Strength of Materials" East West Press Pvt. Ltd., 5th Edition (Reprint2014).
2	Ferdinand P. Beer, E. Russell Johnston and Jr. John T. De Wolf "Mechanics of Materials", Tata McGraw-Hill, Third Edition, SI Units
3	Vazirani, V N, Ratwani M M. and S K Duggal "Analysis of Structures Vol. I", 17th Edition, Khanna Publishers, New Delhi.

Course Outcomes: At the end of the course, the student will be able to:

CO	**Course Outcomes**	**RBT Level**	**RBT Level Indicator**
CO1	**Remember** and **Understand** generalization of material properties and geometric properties to develop concepts of solid mechanics	**Remembering Understanding**	**L1,L2**
CO2	**Apply** concepts to derive expressions and determine various elastic properties of strength and stiffness of structural materials	**Applying**	**L3**

CO3	**Analyze** strength and stiffness of structural components acted upon by loads to find stress and strain resultants, axial force, bending moment, bending shear, twisting moment, deformations and displacements	**Analyzing**	**L4**
CO4	**Evaluate** the strength and stiffness of existing structural components to find load carrying capacity using software.	**Evaluating**	**L5**
CO5	**Create** a structural form with various structural components bars, beams, columns and slabs to withstand self-weight and external loads to create a skeleton of structure.	**Creating**	**L6**

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2	3														
CO3		3												3	
CO4				3	3									3	
CO5			3									3	3		

Program Specific Outcomes:

The Civil Engineering Graduate will be able to:

PSO1: Identify and resolve problems in providing basic needs of the society through sustainable infrastructural development by proper planning and execution.

PSO2: Perform analysis and design using advanced techniques in creating various civil engineering structures to meet global standards.

PSO3: Assess the properties of engineering materials and to explore the field conditions to provide useful data for analysis-design and recommendations for revision of codes.

Weblinks and Video Lectures (e-Resources)	
1	IITRoorkeehttps://npte1.ac.in/courses/112107146/
2	IITKharagpurhttps://npte1.ac.in/courses/105105108/
3	IITRoorkeehttps://nqtel.ac.in/courses/112107147/18
4	http://www.npte1videos.in/20l2/11/strenethof-materia1s-prof.html

CIE- Continuous Internal Evaluation (50 Marks):

Bloom's Category	Theory			
	Continuous Assessment Tests (IAT)		Continuous Comprehensive Assessment (CCA)	
	IAT-1	IAT-2	CCA-1	CCA-2
	50 Marks	50 Marks	50 Marks	50 Marks
Remember	-	-		
Understand	10	10		
Apply	20	20		
Analyse	20	20		
Evaluate			50	
Create				50

CIE Course Assessment Plan:

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	5		5				10	10%
CO2	10	10		10	10	10	50	50%
CO3	10	10		10	10		40	40%
CO4								
Total	25	20	5	20	20	10	100	100%

SEE- Semester End Examination (50 Marks):

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	-
Understand	20
Apply	30
Analyse	30
Evaluate	10
Create	10

SEE Course Plan:

CO's	Marks Distribution						Total Marks	Weightage
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	5	5	5		5	5	25	25%
CO2	10	10	5	5	10	10	50	50%
CO3	5	5		5	5	5	25	25%
CO4								
CO5								
Total	20	20	10	10	20	20	100	100%

Semester	**:**	**III**				
Course Title	**:**	**ENGINEERING SURVEY**				
Course Code	**:**	**BCV304**				
Course Type (Theory/ Practical/ Integrated)	**:**	**THEORY**				
Category	**:**	**PCC**				
Stream	**:**	**CIVIL**		**CIE**	**:**	**50**
Teaching hours/ week (L:T:P:S)	**:**	**3:0:0:0**		**SEE**	**:**	**50**
Total Hours	**:**	**50**		**SEE Duration**	**:**	**3 Hrs**
Credits	**:**	**3**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	**Understand** the basics, evolution, classification and know the present scenario in the field of surveying
2	**Know** the tools, procedure, methods of data collection & application to get the required information of the land surveyed by adopting midsegment surveying
3	**Gather Information** of digital surveying, tools, using data acquired for preparing land characteristics
4	**Be aware of** tools & techniques used for Advanced digital surveying methods & related equipment
5	**Gain Knowledge** on various process & methods involved in data acquisition, retrieval and application of the same.

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.
- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

DSATM

Scheme of Teaching and Examinations for BE Program -2024-25

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2024-25)

On COURSE CURRICULUM

Module No.	Topics	Hours
1	**GEO-INFORMATICS**: Definition, concepts and applications. Maps – types & numbering; scales-types; Toposheets - Uses: Use of symbols, Analysis of landforms using maps; Methods of linear measurements: **HISTORY OF SURVEYING**: Surveying: Definition, Necessity,uses/ Applications, Basic Principles, Primary divisions and classifications of surveying [listing alone]. Introduction to Chain surveying, Compass surveying, Plane table surveying. Booking of chain survey work - Field book entries. Calculation of land area using data collected through chain survey.	**10**
Pedagogy	Chalk and Talk, Power point presentations, Videos, Display Models	
2	**LEVELING:** Introduction, Terminology, Objectives, Classifications of levelling, Profile survey and cross-sections and its uses, Numerical problems on calculation of reduced levels using plane of collimation method & Rise and Fall Method. Calculation of soil / land volume. **& THEODOLITE:** Introduction, Terminology, computation of heights and reduced levels using Single & Double Plane Method **CONTOUR SURVEY**: Contours and their characteristics, Methods of contouring – direct and indirect methods (Grid and Cross section method), Uses and characteristics of contours	**10**
Pedagogy	Chalk and Talk, Power point presentations, Videos, Hands on Experience at Labs, Display Models	
3	**Curves:** Introduction and types of curves, Simple Circular Curve: Elements, Curve settingby Rankine's method of deflection angles, Numerical problems. Compound Curves: Elements of compound curve, Numerical problems. Introduction to Reverse curve and Transition curves (Theory Only)	**10**
Pedagogy	Chalk and Talk, Power point presentations, Videos, Hands on Experience at Labs,	
4	**Total Station**: Introduction - Parts of a Total Station – Accessories – Advantages - Limitations and Applications, Complete procedure for total station survey, data transfer and post processing **Modern surveying:** GPS, DGPS, Drone surveying and LiDAR (Concepts only – Principle, Applications, Advantages and Disadvantages).	**10**
Pedagogy	Chalk and Talk, Videos, Hands on Experience at Labs,	
5	**REMOTE SENSING AND GIS:** Introduction, Principles, Types and Applications of Remote Sensing. Introduction to GIS, Key Components, functions and advantages, sources of data for GIS Data Management and Transformation. Data input methods, data analysis. Overlay operations, Network analysis and Spatial analysis.	**10**
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving	

	• **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	**G S Srivastava** – Introduction to Geoinformatics, McGraw Hill Education, 2014
2	**S K Roy** – Fundamental of Surveying, Prentice Hall of India, New Delhi, 2008
3	**S K Duggal** – Surveying – Vol I, Tata McGraw Hill publishing company Ltd, New Delhi, 4th edition, 2013
4	**Arora K.R**, "Surveying", Vol.I & II, Standard Book House, 2009. ISBN 81-89401-23-8
5.	**Punmia B.C,** "Surveying" Vol.I and Vol.II, Laxmi Publications, (P) Ltd, New Delhi 2010. ISBN 81-7008-853-4
Reference Books	
1	**Davis Clark-** "Surveying-Principles & practice": McGraw Hill Education, 18th edition, 2019
2	**Chandra A.M**, "Plane surveying", New age International (P) Ltd., 2009. ISBN 81-224-1902-X
3	**S K Roy** – Fundamental of Surveying, Prentice Hall of India, New Delhi, 2008
4	**Nagaraj & Hussian**- Surveying & leveling Standard Book publishing
5	**Lillesand and Kiefer,** "Principles of Remote sensing and Image Interpretation", (5th Edition) John Wiley Publishers, New Delhi, 2007
6	**Charles D. Ghilani -** Elementary Surveying: an introduction to geomatics, Prentice Hall, 13th edition, 2012
7	**J R Jensen** –Introductory digital image processing: a remote sensing perspective, Prentice Hall, 2nd edition, 1996
8	**B Bhatia** Remote Sensing and GIS, Oxford University Press, New Delhi

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	**Remember and Understand** the principles and art of surveying using modern tools and techniques to provide a comprehensive plan and development for any Civil Engineering Work	Remember & Understand	L1/L2
CO2	**Apply** the principles of surveying in establishing levels, control points, contours, volumes and other surveying activities.	Apply	L3
CO3	**Analyze** the various data sheets, toposheets, photogrammetry and Satellite data to process the information and transform into reliable data sets for further applications	Analyze	L4
CO4	**Design/ Create** drawings, maps and plans for various construction activities with the data/ information from the field survey carried out using various instruments and techniques.	Design	L6

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1					1										
CO2	3														
CO3		3			2										
CO4			3		2										

Weblinks and Video Lectures (e-Resources)	
1	[A] https://youtu.be/chhuq_t40rY: [B] https://a.impartus.com/ilc/#/video/id/590602
2	[A] Higher Surveying: https://nptel.ac.in: [B] https://a.impartus.com/ilc/#/video/id/2027011
3	[A] Quantity survey:https://youtu.be/TnaAQ4-a7JI: [B] https://a.impartus.com/ilc/#/video/id/2066396
4	Drones:https://https://www.equinoxsdrones.com/blog/10-major-pros-cons-of-unmanned-aerial-vehicle-uav-drone
5	GIS: https://youtu.be/vJAQHA5XQWI: Applications of RS& GIS: https://youtu.be/SVa66vO08So

CIE- Continuous Internal Evaluation (50 Marks):

Bloom's Category	Theory			
	Continuous Assessment Tests (IAT)		Continuous Comprehensive Assessment (CCA)	
	IAT-1	IAT-2	CCA-1	CCA-2
	50 Marks	50 Marks	50 Marks	50 Marks
Remember	-	-		
Understand	10	10		
Apply	20	20		
Analyse	20	20		
Evaluate			50	
Create				50

CIE Course Assessment Plan:

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	5		5				10	10%
CO2	10	10		10	10	10	50	50%
CO3	10	10		10	10		40	40%
CO4								
CO5								
Total	25	20	5	20	20	10	100	100%

SEE- Semester End Examination (50 Marks):

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	-
Understand	20
Apply	30
Analyse	30
Evaluate	10
Create	10

SEE Course Plan:

CO's	Marks Distribution						Total Marks	Weightage
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	8	6	4	4	0	0	22	22%
CO2	6	8	3	3	2	0	22	22%
CO3	0	2	4	4	6	6	22	22%
CO4	0	0	2	2	6	8	18	18%
CO5	0	0	0	2	6	8	16	16%
Total	14	16	13	15	20	22	100	

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**03**				
Course Title	:	**Building Materials & Elements of structure**				
Course Code	:	**BCV305**				
Course Type (Theory/ Practical/ Integrated)	:	**Theory**				
Category	:	**ESC**				
Stream	:	**CV**		**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**3:0:0:0**		**SEE**	:	**50**
Total Hours	:	**40**		**SEE Duration**	:	**180 Minutes**
Credits	:	**03**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	Gain knowledge of construction techniques, processes, and methods for different types of structures.
2	Develop skills in evaluating material performance and ensuring quality control in construction projects.
3	Expertize about the selection criteria and sustainability aspects of building materials

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.
- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve

DSATM

Teaching-Learning Process (TLP).

Scheme of Teaching and Examinations for BE Programme -2024-25

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2024-25)

COURSE CURRICULUM

Module No.	Building Materials for Sustainable Design	Hours
1	**Building Materials: Stone as building material; Requirement of good building stones; Bricks; Classification, Requirement of good bricks. Field and laboratory tests on bricks; compressive strength, water absorption, efflorescence, dimension and war-page. Cement:** Definition & Types**; Timber : Qualities and Types. Glass : Types and Properties. Steel: Types and Properties.** **Fine aggregate:** Natural and manufactured: Sieve analysis, zoning, specific gravity, bulking and moisture content, deleterious materials. **Coarse aggregate:** Natural and manufactured: Importance of size, shape and texture. Grading of aggregates, Sieve analysis, specific gravity, Flakiness and elongation index, crushing, impact and abrasion tests.	8
Pedagogy		
2	. **Foundation: Preliminary investigation of soil, safe bearing capacity of soil, Function and requirements of good foundation , types of foundation , introduction to spread, combined , strap, mat and pile foundation** **Masonry: Definition and terms used in masonry. Brick masonry, characteristics and requirements of good brick masonry, Bonds in brick work, Header, Stretcher, English, Flemish bond, Stone masonry, Requirements of good stone masonry, Classification, characteristics of different stone masonry, Joints in stone masonry. Types of walls; load bearing, partition walls, cavity walls.**	8
Pedagogy		
3	**Lintels and Arches:** Definition, function and classification of lintels, Balconies, chejja and canopy. Arches; Elements and Stability of an Arch. **Floors and roofs: Floors**; Requirement of good floor, Components of ground floor, Selection of flooring material Procedure for laying of Concrete (VDF), Mosaic, Kota, Slate, Marble, Granite, Tile flooring, Cladding of tiles. **Roof**: Requirement of good roof, Types of roof, Elements of a pitched roof, Trussed roof, King post Truss, Queen Post Truss, Steel Truss	8
Pedagogy		
	Doors, Windows and Ventilators: Location of doors and windows, technical terms, Materials for doors and windows: PVC, CPVC and Aluminum. Types of Doors and Windows: Paneled, Flush, Collapsible, Rolling shutter, Paneled and	8

4	glazed Window, Bay Window, French window. Steel windows, Ventilators. Sizes as per IS recommendations **Stairs:** Definitions, technical terms and types of stairs: Wood, RCC, Metal. Requirements of good stairs. Geometrical design of RCC doglegged and open-well stairs. **Formwork:** Introduction to form work, scaffolding, shoring, under pinning.	
Pedagogy		
5	**Plastering and Pointing:** Mortar and its types. Purpose, materials and methods of plastering and pointing: Sand faced plastering, Stucco plastering, lathe plastering, defects in plastering. Water proofing with various thicknesses. **Damp proofing**- causes, effects and methods. **Paints**- Purpose, types, technical terms, ingredients and defects, Preparation and applications of paints to new and old plastered surfaces, wooden and steel surfaces.	**8**
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process	

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	Dr. B. C. Punmia, Ashok kumar Jain, Arun Kumar Jain, "Building Construction, Laxmi Publications (P) ltd., New Delhi.
2	Rangawala S. C. "Engineering Materials", Charter Publishing House, Anand, India.
3	Sushil Kumar "Building Materials and construction", 20th edition, reprint 2015,StandardPublishers
Reference Books	
1	P C Vergese, "Building Materials", PHI Learning Pvt.Ltd
2	S. K. Duggal, "Building Materials", (Fourth Edition)New Age International (P) Limited, 2016 National Building Code(NBC) of India
3	Jagadish. K.S, "Alternative Building Materials Technology", New Age International,2007

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	Recall the fundamental properties and characteristics of various building materials used in construction.	L1	R
CO2	Explain the principles behind the selection of appropriate building materials based on their mechanical, thermal, and durability properties.	L2	U
CO3	Demonstrate the application of building materials and construction technologies in real-world scenarios through case studies and practical examples.	L3	Apply
CO4	Analyze the performance characteristics and limitations of different building materials under varying environmental conditions and loads.	L4	Analyze
CO5	Evaluate comprehensive construction plans integrating advanced materials and technologies to meet specific project objectives.	L5	Create

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2													1		
CO3	3					2						1			
CO4		3										1		2	
CO5			3									1			

Weblinks and Video Lectures (e-Resources)	
1	https://archive.nptel.ac.in/courses/124/105/124105013/
2	https://youtu.be/XsFeVuVQE-E?si=R-0boIWuGkP_WI70
3	https://www.udemy.com/course/interior-construction/?couponCode=ST16MT70224
4	https://www.coursera.org/learn/building-materials-and-human-health

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory			
	Continuous Assessment Tests (IAT)		Continuous Comprehensive Assessment (CCA)	
	IAT-1	IAT-2	CCA-1	CCA-2
	50 Marks	50 Marks	50 Marks	50 Marks
Remember	10	10		
Understand	10	10		
Apply	10	10		
Analyse	20	20		
Evaluate	-	-		
Create	-	-		

CIE Course Assessment Plan

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	10		10	10		10	20 per Test	20
CO2		10	10		10	10	20 per Test	20
CO3	10	10	10	10	10	10	30 per Test	30
CO4	10	10	10	10	10	10	30 per Test	30
CO5								
Total							100 per Test	100

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	20
Understand	20
Apply	30
Analyse	30
Evaluate	
Create	

SEE Course Plan

CO's	Marks Distribution						Total Marks	Weightage
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	10					10	20	20
CO2		10			10		20	20
CO3	10		10		10		30	30
CO4		10		10		10	30	30
CO5								
Total	20	20	10	10	20	20	100	100

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**3rd Semester**				
Course Title	:	**Digital Surveying**				
Course Code	:	**BCV306**				
Course Type (Theory/ Practical/ Integrated)	:	**Practical**				
Category	:	**PCCL**				
Stream	:	**Civil Engineering**		**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**1: 2**		**SEE**	:	**50**
Total Hours	:	**3 Hours Per Week**		**SEE Duration**	:	**180 Minutes**
Credits	:	**2**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	Illustrate the use of various surveying equipment's used in the field
2	Plot contours, longitudinal and cross sections for construction projects.
3	Demonstrate the necessary skills to carry out surveying using Total Station & GPS

List of Programs:

Sl. No.	Experiments/Programs	COs
1	Demonstration of Use of Conventional Instruments such as Chain, Tape for Linear Measurements.	CO 1
2	Demonstration of Use of Compass, Dumpy Level and Theodolite for Surveying Activities.	CO 1
3	Use of Dumpy Level/ Auto Level to carry out Leveling of a given Plot.	CO 1
4	Use of Total Station to Setup, Calibrate, Orient and Create a file.	CO 1

5	Use of Total Station to Map a given area through measurement of Horizontal and Vertical Angles and Distances.	**CO 1**
6	Use of Total Station to Plot the Profile of the Ground Given	**CO 2**
7	Use of Total Station to Plot the Contour Profiles in the Given Area	**CO 2**
8	Use of Total Station to carry out Survey Project of a Closed Traverse and Plot the same on A2 Drawing Sheet	**CO 2**
9	Use of GPS to locate the coordinates of a given point/ Station	**CO 1**
10	Use of GPS to Capture a Profile and Post Process the same for determination of Profile of the Ground.	**CO 2**
Open Ended Experiments		
1	Collection of Field Data from an On-Going Project to provide Project Deliverables	
2	Creating a Map of the Institute from Using Total Station and GPS for comparison of Accuracy and Reliability.	

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	Punmia BC, & Jain Ashok Kumar. (2016). Surveying (17th ed., Vol. 1). Laxmi Publications.
2	Dr. K.R. Arora. (2019). Surveying (17th ed., Vol. 1). Standard Book House.
Reference Books	
1	Charles D. Ghilani. (2012) (13 th ed.). Prentice Hall

Course Outcomes: At the end of the course, the student will be able to:

CO	**Course Outcomes**	**RBT Level**	**RBT Level Indicator**
CO1	**Use Modern Surveying Instruments to Collect, Record and Analyze Real Time Data of Construction Projects.**	**ANALYZE**	**L 5**
CO2	**Create Maps and Plans for the given field Conditions using data obtained from Modern Surveying Instruments**	**CREATE**	**L 6**

Mapping of Course Outcomes to Program Outcomes:

CO/PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1				**3**	**3**									**1**	
CO2	**1**		**3**		**3**										**2**

Weblinks and Video Lectures (e-Resources)	
1	https://www.youtube.com/watch?v=KHI4TEeexuM&list=PLLy_2iUCG87DwNVc3Mz1yYlRA42jSQ1tB&index=28
2	https://www.gps.gov/applications/survey/
3	https://www.youtube.com/watch?v=SVa66vO08So
4	https://archive.nptel.ac.in/courses/105/107/105107158/

ABILITY ENHANCEMENT COURSE
[WITH -PBL]

PBL- Project Based Learning

Teaching Hours/Week (L: T:P: S)	0:0:2:2
Total Hours of Pedagogy	25 hours – Theory + Project
Credits:	02
Modules	5
CIE Marks	50
SEE Marks	50
Total Marks	100
Exam Hours	3
Examination nature (SEE)	Project Evaluation

	CIE		**SEE**	
	Project Weekly Assessment		**Final Project Evaluation**	
Project	**Project Understanding**	05 Marks	**Write up**	10 Marks
	Technical Competence	10 Marks	**Presentation & Demonstration**	50 Marks
	Innovation	10 Marks	**Project report**	25 Marks
	Problem Solving	15 Marks	**Viva-Voce**	15 Marks
	Project Demonstration	10 Marks	**Total**	**100 Marks**
Total		**50 Marks**	**100 Marks Reduced to 50 Marks**	

1. Introduction

Project Based Learning is a model for classroom activity that shifts away from the classroom practices of short, isolated, teacher-centered lessons and instead emphasizes learning activities that are long-term, interdisciplinary, and student-centered.

A systematic teaching method that engages students in learning essential knowledge and life-enhancing skills through an extended, student-influenced inquiry process structured around complex, authentic questions and carefully designed products and tasks.

Project learning, also known as project-based learning, is a dynamic approach to teaching, in which students explore real-world problems and challenges, simultaneously developing cross-curriculum skills while working in small collaborative groups.

2. Characteristics of Project-Based Learning:

- Students making decisions within a framework
- A problem or challenge to be solved;
- Students designing the process for reaching a solution
- Students gathering and managing information
- Continuous Evaluation
- Students regularly reflecting on the process
- A final product to be evaluated for quality
- An atmosphere that tolerates error and change

3. Purpose

- Introducing project-based learning on the curriculum.
- To help students to gain in-depth knowledge of the subject via project.
- During this process, students will be able to learn and understand the various stages of project development.

4. Objectives

- Introducing mini project based on the curriculum.
- Develop in depth knowledge of the topic and technology.
- Use critical thinking skills and make real world connections
- Demonstrate and understand through products.
- Industry and concept-oriented learning.

5. Why Incorporate PBL?

- Promotes collaboration and interaction
- Learners communicate meaningfully and for authentic purposes
- Allows students with a variety of learning styles to demonstrate their acquired knowledge
- Students learn language, content, and skills simultaneously
- Increases learner autonomy
- Provides opportunities for students to pursue their own interests and questions and make decisions about how they will find answers and solve problems.
- Improves education for all students Facilitates student integration of the content of different subjects
- Teaches children to use their own minds well and applies what they learn in school to life-long endeavors.
- Helps students to become technologically literate
- Establishes connections to life outside the classroom, addressing real-world concerns, and developing real-world skills
- Skills learned through PBL are those desired by today's employers.

6. Benefits of PBL

- Offers multiple ways for students to participate and to demonstrate their knowledge.
- Accommodates different kinds of intelligences.
- Shifts students away from doing only what they typically do in a classroom Environment.
- Encourages the mastery of technological tools, thus preparing them for the workforce.
- Serves as a medium for students who don't usually participate.
- Prompts students to collaborate while at the same time support self-directed learning.
- Offers a learning experience that draws on the thinking and shared efforts of several individuals.
- Helps students develop a variety of social skills relating to group work and negotiation.
- Promotes the internalization of concepts, values, and modes of thought, especially those related to cooperation and conflict resolution.
- Establishes a supportive and non-competitive climate for students.
- Provides a means for transferring the responsibility for learning from teachers to students.
- Calls upon students to explain or defend their position to others in their project groups, so that learning is more apt to be personalized and valued.

7. Process

- Project batches will be formed after the commencement of 3rd semester.
- The Students Batch Comprising of 4 members in a batch should be formed by the Project Based Learning co-ordinator.
- Each Semester consists of 16 Weeks of Project based Learning.
- The Level of the Projects to be identified.

  Level 1- 2nd Year – 3rd Semester & 4th Semester

  Level 2- 3rd year – 5th Semester & 6th Semester

  Level 3 – Final Year Project
- The Faculty handling the respective Theory Subject will be the PBL Coordinator and all the three Batches to be handled by the PBL Coordinator with additional faculty.
- The List of Project Batches to be identified by the faculty assigned in consultation with HOD.
- The batch can select any topic from the list circulated by the PBL Coordinator
- The details of students Interaction with the guide shall be maintained by the guide in the prescribed format.

- The Students Project should be continuously evaluated and PBL Coordinator should submit weekly report to the HOD.
- The Rubrics for the PBL should be followed.
- The Students batches shall give the presentation on understanding of the topic and plan for implementation.
- The Evaluation of the Projects is done in Two Phases

7.1 Two phases for Assessment

Phase 1:

1. Phase 1 is for 4 weeks

2**.** During this phase, the students shall discuss about the Objectives, Literature Survey and plan for project execution.

Phase 2:

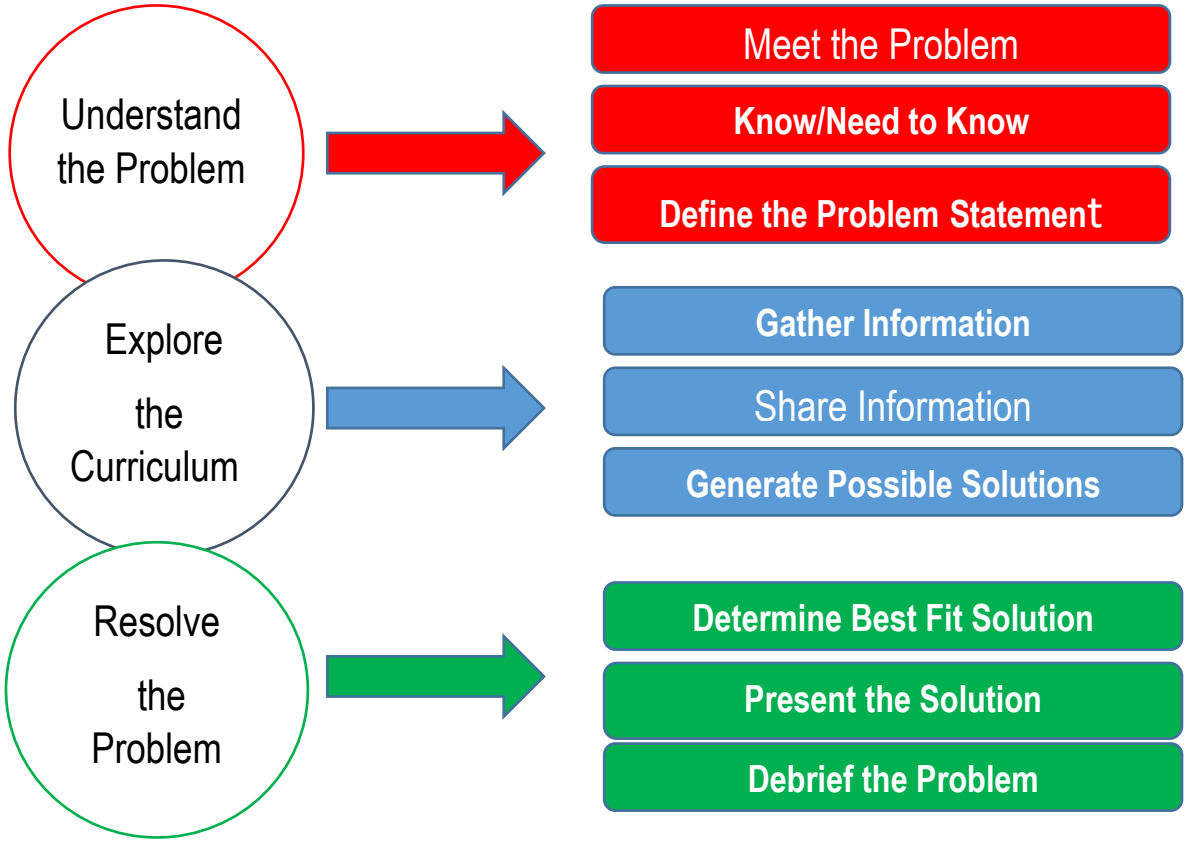
1. Phase 2 is for 11 Weeks

2**.** During this phase, the students shall carry out the project under regular supervision of the guide/subject expert, Implementation and give final presentation/demonstration with project documents.

The marks distribution for PBL Work:

1. Phase 1 – 25 Marks
2. Phase 2 – 25 Marks

8. PBL Teaching and Learning Template



9. Practice

- Every week 3 hour is exclusively dedicated to Project Based Learning.
- Assess their progress until they resolve the problem and summarise their learning.
- Provide opportunities for in-depth investigations of worthy topics.
- Allow learners to become more autonomous as they construct personally-meaningful artefacts that are representations of their learning.
- Motivate students by engaging them in their own learning. PBL affords students opportunities for development.
- Building communication, technical and management skills.

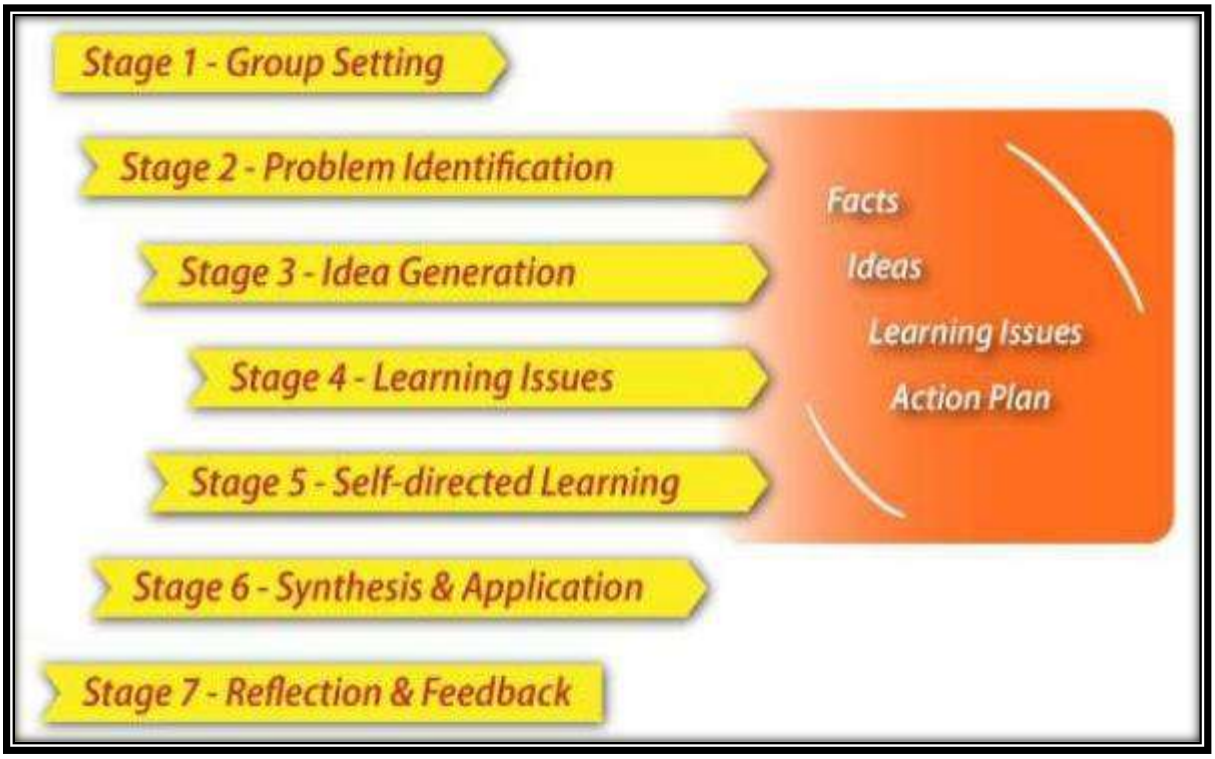
10. Obstacles/Gaps

- Lack of student's interest
- Lack of assessment
- Lack of Basic knowledge
- Lack of consistence attendance and monitoring.
- Lack of abundant time allotment and time management

11. How to Overcome?

- Periodic process – stage wise assessment has to be done.
- Basic Knowledge- A complete guidelines and videos will be provided by the faculty who is handling the respective subject and allotted guide.
- Regular evaluation and periodic monitoring is done by 2 stages.
- For Successful execution and demonstration of end-to-end system, exclusive 3hr/week project time is allotted.

12. Block diagram of PBL



13. Impact Analysis

- It encourages students to draw on their own creativity on problem solving and they learn the bridge gap between theory and practice.
- Final products resulting from project-based learning can be shared with the department at large, thus fostering ownership and technically strong with the subject scenario.

14. PBL – Guidelines

The guidelines are for successful completion of the project and to facilitate effective and uniform conduction of projects by the students. It is expected that these guidelines will help in overall improvement in the quality of the project.

14.1 Main phases of the project

Sl.No	Topics	Duration
Phase-1		
1.	Understanding of the project and preparing a project plan	**3 Weeks**
2.	Literature review	**1 Week**
3.	Planning	**1 Week**
Phase-2		
4.	Analysis and Design	**3 Weeks**
5.	Implementation	**6 Weeks**
6.	Testing	**1 Week**
7.	Writing the project report	**1 Week**
	Total	**16 Weeks**

14.2 Final Presentation Structure

1. Title of the project & Batch Information
2. Agenda / Topics
3. Problem Statement / Project Definition
4. Background / Literature Review
5. Methodology
6. Analysis and Design
7. Implementation
8. Testing
9. Conclusion and Scope for Future Works

14.3 Project Based Learning Report Structure

1. Cover Page
2. Certificate
3. Declaration
4. Acknowledgement
5. Table of Contents
6. List of Tables
7. List of Figures
8. Introduction
9. Background / Literature Review
10. Methodology / Solution
11. Analysis and Design
12. Implementation
13. Results
14. Conclusion and Future Works
15. Bibliography / References
16. Appendices

15. Guidelines to prepare the Project report

- Project reports should be typed neatly only on one side of the paper with 1.5 or double line spacing on a A4 size bond paper (210 x 297 mm).
- The margins should be: Left – 1.25", Right – 1", Top and Bottom – 0.75".
- The total number of reports to be prepared are
    - One copy to the department.
    - One copy to the concerned guide
    - One copy to the candidate.
- Before taking the final printout, the approval of the concerned guide is mandatory and suggested corrections, if any, must be incorporated in the Final Report.
- For making copies dry tone Xerox is suggested.
- An abstract (synopsis) not exceeding 100 words, indicating salient features of the work.

16. Outcome of the project

- Students will gain the knowledge and understand
- To think creatively, work collaboratively.
- Solve complex problems using digital technology.
- Students learn and desire to engage continuous gain about knowledge such as design, analysis, development, implementation and testing.
- Strong written communication skills and the ability to write technical documents that include specification, design, and implementation of a mini project.

Project - Based Learning Rubric

Score Levels	Content	Conventions	Organization	Presentation
5	▪ Is well thought out and supports the solution to the challenge or question ▪ Reflects application of critical thinking ▪ Has clear goal that is related to the topic ▪ Is pulled from a variety of sources ▪ Is accurate	▪ No spelling, grammatical, or punctuation errors ▪ High-level use of vocabulary and word choice	▪ Information is clearly focused in an organized and thoughtful manner. ▪ Information is constructed in a logical pattern to support the solution.	▪ Multimedia is used to clarify and illustrate the main points. ▪ Format enhances the content. ▪ Presentation captures audience attention. ▪ Presentation is organized and well laid out.
4	▪ Is well thought out and supports the solution ▪ Has application of critical thinking that is apparent ▪ Has clear goal that is related to the topic ▪ Is pulled from several sources ▪ Is accurate	▪ Few (1 to 3) spelling, grammatical, or punctuation errors ▪ Good use of vocabulary and word choice	▪ Information supports the solution to the challenge or question.	▪ Multimedia is used to illustrate the main points. ▪ Format is appropriate for the content. ▪ Presentation captures audience attention. ▪ Presentation is well organized.
3	▪ Supports the solution ▪ Has application of critical thinking that is apparent ▪ Has no clear goal ▪ Is pulled from a limited number of sources	▪ Minimal (3 to 5) spelling, grammatical, or punctuation errors ▪ Low-level use of vocabulary and word choice	▪ Project has a focus but might stray from it at times. ▪ Information appears to have a pattern, but the pattern is not consistently	▪ Multimedia loosely illustrates the main points. ▪ Format does not suit the content. ▪ Presentation does not capture audience attention.

2	▪ Provides inconsistent information for solution ▪ Has no apparent application of critical thinking ▪ Has no clear goal ▪ Is pulled from few sources ▪ Has significant factual errors, misconceptions, or misinterpretations	▪ More than 5 spelling, grammatical, or punctuation errors ▪ Poor use of vocabulary and word choice	▪ Content is unfocused and haphazard. ▪ Information does not support the solution to the challenge or question. ▪ Information has no apparent pattern.	▪ Presentation appears sloppy and/or unfinished. ▪ Multimedia is overused or underused. ▪ Format does not enhance content. ▪ Presentation has no clear organization.

Subject Identified for Project Based Learning

Semester	
Subject Identified for PBL	
Prerequisite	
Justification for the selected subject	
List of possible projects	

Signature of the Guide **Signature of HOD**

Project Based Learning - Batch

From **Date:**

Name: & USN:

Name: & USN:

Name: & USN:

Name: & USN:

Semester:

Respected Sir/Madam,

Sub: Regarding PBL Batch

With respect to the above subject, we are the students mentioned above would like to form the batch for carrying out the mini project on……

Thanking you, Yours faithfully

Sl. No.	Name of the student	Signature
1.		
2.		
3.		
4.		

Signature of the Guide

Name of the Guide Designation

Department of ……. Engineering

Dayananda Sagar Academy of Technology & Management
(Autonomous Institute under VTU)

Affiliated to VTU
Approved by AICTE
Accredited by NAAC with A+ Grade
6 Programs Accredited by NBA
(CSE, ISE, ECE, EEE, MECH, CV)

Project Based Learning – Student(s) – Guide – Interaction

Date		
PBL Batch No.		
Title of the project		
Week No.		
Content of the Discussion		
Suggestion by the guide		
Name of Signature of students		

Signature of the Guide **Signature of PBL Coordinator** **Signature of HOD**

Project Based Learning – Continuous Evaluation

Batch No.	Name	USN	Marks assigned	Remarks by the guide on the progress of the project

Signature of the Guide Signature of PBL Coordinator

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OD

Project Based Learning – Review

CONTINIOUS INTERNAL ASSESSMNET							
Batch No.	Name of the Student	USN	**Phase I (25 Marks)**		**Phase II (25 Marks)**		**Final CIE Marks (Phase I & Phase II) (50 Marks)**
			Abstract / Understanding of the Project (5 Marks)	Analysis & Design (20 Marks)	Implementation (20 Marks)	Demonstration (5 Marks)	

Project Based Learning Outcomes

Sl.No	Batch No.	Name of Students	USN	Domain	Outcomes

AEC Course – Ability Enhancement Course

Teaching Hours/Week (L: T:P: S)	0:0:2:0
Total Hours of Pedagogy	8 hours Practical
Credits:	01
Programs / Experiments	
CIE Marks	50
SEE Marks	50
Total Marks	100
Exam Hours	1
Examination nature (SEE)	Theory (MCQ)

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Semester	**:**	**III**				
Course Title	**:**	**Personality Development & Soft skills for Civil Engineers**				
Course Code	**:**	**BCV307**				
Course Type (Theory/ Practical/ Integrated)	**:**	**Theory**				
Category	**:**	**AEC**				
Stream	**:**	**Civil Engineering**		**CIE**	**:**	**50**
Teaching hours/ week (L:T:P:S)	**:**	**1:0:0:0**		**SEE**	**:**	**50**
Total Hours	**:**	**15**		**SEE Duration**	**:**	**1 hr**
Credits	**:**	**1**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	To learn self-fulfilment and overall development of one's own personality by developing personal skills in civil stream.
2	To improve the soft skills like effective communication, business correspondence, leadership leading to successful performance in interviews and group discussions.
3	To provide guidance on career planning, resume building, job interview skills, and industry-specific knowledge to enhance employability in civil engineering.

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.
- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

DSATM

Scheme of Teaching and Examinations for BE Programme -2024-25

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2024-25)

COURSE CURRICULUM

Module No.	Topics	Hours
1	**LSRW, Personality Development and Teamwork:** **Importance of LSRW Skills**: Art of listening & Listening comprehension – Art of Speaking – Art of Reading – Reading comprehension – Art of Writing – email writing. **Personality Development:** Emotional Intelligence – Self Awareness – Self Management – Personal SWOT – Positive Attitude – Patience – Dependability. **Teamwork Construction Site:** What is a Team - Stages of a Team – Benefits of Team work & Collaboration – Group vs Team – Types of Teams – Roles of the Team.	2
Pedagogy	Chalk and talk, PowerPoint Presentation, YouTube videos	
2	**NVC, Excel and Presentation:** **Non – Verbal Communication**: Body language – Gestures – Postures – Eye contact – Hand Shake – First impression– Facial expression. **Presentation Skills**: 4P's of Presentation – Communicating with Credibility – Audience analysis and Building Rapport – Usage of Figures, diagrams & Charts – Presenting with Confidence – Body Language in Presentation – Civil Domain. **Data Analysis from Excel:** Introduction to Microsoft Excel, Workbooks, Worksheets, Basic operations, Built-in formulae, Plotting charts of different types, bar and pie charts, scatter plots, legend - Civil Domain.	4
Pedagogy	Demonstration, Power Point Presentation ,Excel Spreadsheets	
3	**Etiquette and Management**: **Critical Thinking & Problem Solving**: Core Skills – Uses & Importance of Critical Thinking – Principles of Critical Thinking – Facts about Problem Solving at construction site – Skills to use in Problem Solving - Problem Solving Process – Barriers to Problem Solving. **Time Management:** Managing your time – Time wasters – Analyzing your Strengths and weakness – Goal Setting – Why Goal Setting is important - SMART Goals – Types of Goals **Business Etiquette & Poster :** Types of Etiquette – Importance of Etiquette – Meeting Etiquette – Office Etiquette – Phone and email Etiquette – Work Place Etiquette-Online poster creation for business – Canva	3
Pedagogy	Chalk and talk, Enacting, Poster Presentation.	
	Leadership	3

4	**Leadership Skills:** What makes an effective Leader – Relationship Building – Leader vs Boss – Decision Making Skills – Innovation & Motivation – Dependability. **Website Creation & Business Writing** – Google sites tools and steps to create website – How to improve your Business writing skills – Importance of Business writing – how to write effectively – 5C's of Business writing – 4 types of Business writing – Civil Domain. **Conflict Management:** Strategies of Conflict Management – Best practices for Conflict Resolution – Stress Management – Learn to say No – Importance of Conflict Management at Work Place.	
Pedagogy	Chalk and talk, Enacting, Demonstration, Activity	
5	**GD, Creativity and Psychometry:** **Group Discussion:** Types of GD – Attitude & being Proactive – Time management & how to stick to it –Do's & Don'ts. **Creativity & Innovation:** What is Creativity – What is Innovation – Difference between Creativity & Innovation – Categories and misconception of Creativity **Psychometric Analysis:** What is Psychometric Analysis – Cognitive Skills – Importance of Personality Tests – Personality Profiling- Resume portfolio creation.	**3**
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process	

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	Personality Development And Soft Skills, Barun K Mitra, 2nd edition, Oxford University Press, 2016
2	Power of Positive thinking, Norman Vincent Peale, ISBN-13 978-0091906382, RHUK, 2016
3	Meena K and V. Ayothi (2013) A Book on Development of Soft Skills (Soft Skills: A Road Map to Success), P. R. Publishers & Distributors, No. B-20 & 21, V. M. M Complex, Chatiram Bus Stand, Tiruchirappalli-620002
Reference Books	
1	Magic of thinking Big, David J Schwartz, ISBN-13 978-1785040474, Vermilion, 2016
2	Alex K. (2012) Soft Skills-Know Yourself & Know the World, S. Chand & Company LTD, Ram Nagar, New Delhi-110055

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	To understand the concepts of personality development and skills for adapting changes in life and civil engineering field.	L1&2	R,U
CO2	To evaluate emotional intelligence to navigate interpersonal relationships, manage stress and analyzing civil engineering problems.	L5	Evaluate
CO3	To Create networking skills and proposals to connect with industry professionals, peers, and mentors	L6	Create

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1													2		
CO2									2	2				2	1
CO3								3		3					

Weblinks and Video Lectures (e-Resources)	
1	https://onlinecourses.nptel.ac.in/noc22_hs08/preview
2	https://archive.nptel.ac.in/courses/109/104/109104107/
3	https://www.coursera.org/learn/excel-basics-data-analysis-ibm
4	https://freepdf-books.com/excel/
5	https://jobscaptain.com/ms-excel-book-pdf/

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory			
	Continuous Assessment Tests (IAT)		Continuous Comprehensive Assessment (CCA)	
	IAT-1	IAT-2	CCA-1	CCA-2
	50 Marks	50 Marks	50 Marks	50 Marks
Remember	25	25		
Understand				

Apply				
Analyse				
Evaluate			25	
Create				25

CIE Course Assessment Plan:

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	15	5	5	15	5	5	25	100%
CO2								
CO3								
CO4								
CO5								
Total								

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks
Remember	50 MCQ's -50 Marks
Understand	
Apply	
Analyse	
Evaluate	
Create	

SEE Course Plan

CO's	Marks Distribution						Total Marks	Weightage
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	10	10	5	5	10	10	50	100%
CO2								
CO3								
CO4								
CO5								
Total								

1 Credit Course – Practical

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%.
The minimum passing mark for the CIE is 40% of the maximum Marks (20 Marks out of 50).
The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50).
A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the Semester-End Examination (SEE), and a minimum of 40% (40 Marks out of 100) in the total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation (CIE):

CIE marks for the practical course are 50 Marks. The split-up of CIE marks for record/ journal and test are in the ratio 60:40.

- Each experiment is to be evaluated for conduction with an observation sheet and record write-up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments are designed by the faculty who is handling the laboratory session and are made known to students at the beginning of the practical session.
- Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10 marks.
- Total marks scored by the students are scaled down to 30 marks (60% of maximum marks).
- Weightage to be given for neatness and submission of record/write-up on time.
- Department shall conduct a test of 100 marks after the completion of all the experiments listed in the syllabus.
- In a test, test write-up, conduction of experiment, acceptable result, and procedural knowledge will carry a weightage of 60% and the rest 40% for viva-voce.
- The suitable rubrics can be designed to evaluate each student's performance and learning ability.
- The marks scored shall be scaled down to 20 marks (40% of the maximum marks). The Sum of scaled-down marks scored in the report write-up/journal and marks of a test is the total CIE marks scored by the student.

Semester End Evaluation (SEE):

SEE marks for the practical course are 50 Marks.

	• SEE shall be conducted jointly by the two examiners of the same institute; examiners are appointed by the Head of the Institute.
	• The examination schedule and names of examiners are informed to the university before the conduction of the examination. These practical examinations are to be conducted between the schedule mentioned in the academic calendar of the University. All laboratory experiments are to be included for practical examination.
	• (Rubrics) Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered by the examiners or based on the course requirement evaluation rubrics shall be decided jointly by examiners.
	• Students can pick one question (experiment) from the questions lot prepared by the examiners jointly.
	• Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners.
	• General rubrics suggested for SEE are mentioned here,
	  • Writeup-20%,
	  • Conduction procedure and result in -60%,
	  • Viva-voce 20% of maximum marks.
	SEE for practical shall be evaluated for 100 marks and scored marks shall be scaled down to 50 marks (however, based on course type, rubrics shall be decided by the examiners)
	• Change of experiment is allowed only once and 15% of Marks allotted to the procedure part are to be made zero.
	• The minimum duration of SEE is 02 hours.

SOCIAL CONNECT
&
RESPONSIBILITY (SCR)

SCR- Social Connect & Responsibility

Teaching Hours/Week (L: T: P: S)	0:0:0:2
Total Hours of Pedagogy	40 hour Practical Session +15 hour Planning
Credits:	01
Programs / Experiments	12
CIE Marks	100
SEE Marks	------
Total Marks	100
Exam Hours	3
Examination nature (SEE)	No SEE only CIE For CIE Assessment - Activities Report Evaluation by College NSS Officer / HOD / Sports Dept / Any Dept.

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Semester	:	**III**				
Course Title	:	**Social Connect & Responsibility**				
Course Code	:	**BSCK308**				
Course Type (Theory/ Practical/ Integrated)	:	**Integrated**				
Category	:	**SCR**				
Stream	:			**CIE**	:	**100**
Teaching hours/ week (L:T:P:S)	:	**0-0-2-0**		**SEE**	:	**---**
Total Hours	:	**1**		**SEE Duration**	:	—
Credits	:	**1**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	Provide a formal platform for students to communicate and connect to the surrounding.
2	create a responsible connection with the society.
3	Understand the community in general in which they work.
4	Identify the needs and problems of the community and involve them in problem –solving.
5	Develop among themselves a sense of social & civic responsibility & utilize their knowledge in finding practical solutions to individual and community problems.
6	Develop competence required for group-living and sharing of responsibilities & gain skills in mobilizing community participation to acquire leadership qualities and democratic attitudes

Teaching-Learning Process

General Instructions - Pedagogy :

These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.

- In addition to the traditional lecture method, different types of innovative teaching methods may be adopted so that the activities will develop students' theoretical and applied social and cultural skills.
- State the need for activities and its present relevance in the society and Provide real-life examples.
- Support and guide the students for self-planned activities.
- You will also be responsible for assigning homework, grading assignments and quizzes, and documenting students' progress in real activities in the field.
- Encourage the students for group work to improve their creative and analytical skills

DSATM

Scheme of Teaching and Examinations for BE Programme -2024-25

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2024-25)

COURSE CURRICULUM

Contents :

The course is mainly activity-based that will offer a set of activities for the student that enables them to connect with fellow human beings, nature, society, and the world at large.

The course will engage students for interactive sessions, open mic, reading group, storytelling sessions, and semester-long activities conducted by faculty mentors.

In the following a set of activities planned for the course have been listed:

Module No.	Topics	Hours
1	**Part I:** **Plantation and adoption of a tree:** Plantation of a tree that will be adopted for four years by a group of BE / B.Tech students. (ONE STUDENT ONE TREE) They will also make an excerpt either as a documentary or a photo blog describing the plant's origin, its usage in daily life, its appearance in folklore and literature - – Objectives, Visit, case study, report, outcomes.	4
Pedagogy		
2	**Part II :** **Heritage walk and crafts corner:** Heritage tour, knowing the history and culture of the city, connecting to people around through their history, knowing the city and its craftsman, photo blog and documentary on evolution and practice of various craft forms - – Objectives,Visit, case study, report, outcomes.	2
Pedagogy		
3	**Part III :** **Organic farming and waste management:** Usefulness of organic farming, wet waste management in neighboring villages, and implementation in the campus –Objectives,Visit, case study, report, outcomes.	3
Pedagogy		
4	**Part IV:** **Water conservation:** Knowing the present practices in the surrounding villages and implementation in the campus, documentary or photoblog presenting the current practices – Objectives, Visit, case study, report, outcomes.	3
Pedagogy		

5	**Part V :** **Food walk:** City's culinary practices, food lore, and indigenous materials of the region used in cooking – Objectives, Visit, case study,report, outcomes.	**3**
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process	

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	
2	
Reference Books	
1	
2	

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	Communicate and connect to the surrounding.		
CO2	Create a responsible connection with the society.		
CO3	Involve in the community in general in which they work.		
CO4	Notice the needs and problems of the community and involve them in problem –solving.		
CO5	Develop among themselves a sense of social & civic responsibility & utilize their knowledge		

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															

Activities:

Jamming session, open mic, and poetry: Platform to connect to others. Share the stories with others. Share the experience of Social Connect. Exhibit the talent like playing instruments, singing, one-act play, art-painting, and fine art.

PEDAGOGY:

The pedagogy will include interactive lectures, inspiring guest talks, field visits, social immersion, and a course project. Applying and synthesizing information from these sources to define the social problem to address and take up the solution as the course project, with your group. Social immersionwith NGOs/social sections will be a key part of the course. Will all lead to the course project that will address the needs of the social sector?

COURSE TOPICS:

The course will introduce social context and various players in the social space, and present approaches to discovering and understanding social needs. Social immersion and inspiring conversional will culminate in developing an actual, idea for problem-based intervention, based on an in-depth understanding of a key social problem.

Duration :

A total of 40 - 50 hrs engagement per semester is required for the 3rd semester of the B.E. /B.Tech. program. The students will be divided into groups. Each group will be handled by faculty mentor. Faculty mentor will design the activities (particularly Jamming sessions open mic ,and poetry) Faculty mentors has to design the evaluation system as per guidelines of scheme & syllabus.

Continuous Internal Evaluation (CIE):

- After completion of the course, the student shall prepare, with daily diary as reference, a comprehensive report in consultation with the mentor/s to indicate what he has observed and learned in the social connect period.
- The report should be signed by the mentor.
- The report shall be evaluated on the basis of the following criteria and/or other relevant criteria pertaining to the activity completed. Marks allotted for the diary are out of 50.
- Planning and scheduling the social connect Information/Data collected during the social connect Analysis of the information/data and report writing
- Considering all above points allotting the marks as mentioned below

Excellent	: 80 to 100
Good	: 60 to 79
Satisfactory	: 40 to 59
Unsatisfactory and fail: <39	

Pedagogy – Guidelines:

It may differ depending on local resources available for the study as well as environment and climatic differences, location and time of execution.

Sl.No	Topic	Group size	Location	Activity execution	Reporting	Evaluation Of the Topic
1.	Plantation and adoption of a tree:	May be individual or team	Farmers land/ parks / Villages / roadside/ community area / College campus etc….	Site selection /proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics of scheme and syllabus by Faculty
2.	Heritage walk and crafts corner:	May be individual or team	Temples / monumental places / Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	Site selection /proper consultation/Contin uous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics of scheme and syllabus by Faculty
3.	Organic farming and waste management:	May be individual or team	Farmers land / parks / Villages visits / roadside/ community area / College campus etc….	Group selection / proper consultation / Continuous monitoring / Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics of scheme and syllabus by Faculty
4.	Water conservation: & conservation techniques	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers / campus etc…..	Site selection / proper consultation/Contin uous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics of scheme and syllabus by Faculty
5.	Food walk: Practices in societ	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/ Governme nt Schemes officers/ campus etc…	Group selection / proper consultation / Continuous monitoring / Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics of scheme and syllabus by Faculty

1 Credit Course – Practical + Planning

Assessment Details (both CIE and SEE)

NO SEE – Semester End Exam – Completely Practical and activities based evaluation

Plan of Action (Execution of Activities)	
Sl.No	**Practice Session Description**
1.	Lecture session in field to start activities
2.	Students Presentation on Ideas
3.	Commencement of activity and its progress
4.	Execution of Activity
5.	Execution of Activity
6.	Execution of Activity
7.	Execution of Activity
8.	Case study-based Assessment, Individual performance
9.	Sector/ Team wise study and its consolidation
10.	Video based seminar for 10 minutes by each student At the end of semester with Report.

- Each student should do activities according to the scheme and syllabus.
- At the end of semester student performance has to be evaluated by the faculty for the assigned activity progress and its completion.
- At last consolidated report of all activities from 1st to 5th, compiled report should be submitted as per the instructions and scheme.

Assessment Details for CIE (both CIE and SEE)

Weightage	**CIE – 100%**	• Implementation strategies of the project (NSS work). • The last report should be signed by NSS Officer, the HOD and principal. • At last report should be evaluated by the NSS officer of the institute.
Field Visit, Plan, Discussion	10 Marks	
Commencement of activities and its progress	20 Marks	
Case study-based Assessment Individual performance with report	20 Marks	
Sector wise study & its consolidation 5*5 = 25	25 Marks	
Video based seminar for 10 minutes by each student At the end of semester with Report. Activities 1 to 5, 5*5 = 25	25 Marks	
Total marks for the course in each semester	100 Marks	
For each activity, 20 marks CIE will be evaluated for IA marks at the end of semester, Report and assessment copy should be made available in the department.		
Students should present the progress of the activities as per the schedule in the prescribed practical session in the field. There should be positive progress in the vertical order for the benefit of society in general through activities.		

4th SEMESTER

INTEGRATED PROFESSIONAL CORE COURSE (IPCC)

IPCC Course – Integrated Professional Core Course

Teaching Hours/Week (L: T:P: S)	3:0:2:0
Total Hours of Pedagogy	40 hours Theory + 20 Hours of Practical Classes
Credits:	04
Theory - Each Module	8 Hrs
Practical's	8-10 Programs / Experiments
CIE Marks	50
SEE Marks	50
Total Marks	100
Exam Hours	3
Examination nature (SEE)	Theory

- The theory part of the IPCC shall be evaluated both by CIE and SEE.
- The practical part shall be evaluated by only CIE (no SEE).
- However, questions from the practical part of IPCC shall be included in the SEE question paper.

Integrated Professional Core Course (IPCC) - 4 Credit Course

Assessment Details (both CIE and SEE)

- The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%.
- The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks).
- A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation (CIE) for the Theory component of the IPCC (Maximum marks 50)

Internal Assessment Test (IAT):

- IPCC means practical portion integrated with the theory of the course.
- CIE marks for the theory component are 25 marks and that for the practical component is 25 marks.
- 25 marks for the theory component are split into 15 marks for two Internal Assessment Tests (Two Tests, each of 50 Marks with 01-hour 30 minutes' duration, are to be conducted and average of two tests to be reduced to 15 marks) and 10 marks for Two Continuous Comprehensive Assessment(CCA) methods.

- The first Internal test at the end of 40-50% coverage of the syllabus
- The second Internal test after covering 85-90% of the syllabus.
- Scaled-down marks of the sum of two tests and other assessment methods will be CIE marks for the theory component of IPCC (that is for 25 marks).
- The student has to secure 40% of 25 marks to qualify in the CIE of the theory component of IPCC.

The IA test questions are to be framed to map the Course Outcomes (COs), Program Outcomes (POs) and the Revised Blooms Taxonomy (RBT) Levels. Emphasis to be given for Higher order Thinking Skills(HOTS).

Continuous Internal Evaluation (CIE) for the practical component of the IPCC

- On completion of every experiment/program in the laboratory, the students shall be evaluated and Marks shall be awarded on the same day.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report, **05 Marks** are for conducting the experiment, **05 Marks for** preparation of the laboratory record, **5 Marks** for conducting Open Ended Experiments Each experiment. Marks of all experiments' write-ups are added to 15 marks.
- The Practical laboratory test **(duration 03 hours)** at the end of the 15th week of the semester/after completion of all the experiments (whichever is early) shall be conducted for **50 Marks** and scaled down to **5 Marks.**
- The open-ended experiment after completion of all the experiments shall be conducted for 20 marks with a split-up for 5 Marks for writeup, 10 Marks for Execution, and 5 Marks for Viva-Voce.
  Marks for writeup, Execution and Viva-Voce is added and scaled down to 05 marks.
- Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IPCC for 25 marks.
- The student has to secure 40% of 25 marks to qualify in the CIE of the practical component of the IPCC.

Semester End Examination (SEE) for IPCC Theory

SEE will be conducted as per the scheduled timetable, with common question papers for the course (duration 03 hours)

- The question paper will have ten questions. Each question is set for 20 marks.

- The question paper shall be set for 100 Marks. The medium of the question paper shall be English. **The duration of SEE is 03 hours.**
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module. The two questions shall be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels.
- The students have to answer 5 full questions, selecting one full question from each module.
- Marks scored by the student shall be proportionally scaled down to 50 Marks.
- The theory portion of the IPCC shall be for both CIE and SEE, whereas the practical portion will have a CIE component only.
- Questions mentioned in the SEE paper may include questions from the practical component.

Continuous and Comprehensive Assessment (CCA):

Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be (CCA1+CCA2)/2 and scaled down to **10 Marks**.

- CCA1 after 4th week and CCA2 after 9th week. The Assessment will be through rubrics.
- CCA as project-based learning,
    - CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission.
    - The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report

Total score for CCA is **10 Marks**

Total Marks scored for theory component of CIE (IAT+ CCA) is **25 Marks**

Possible Continuous and Comprehensive Assessment (CCA):

- Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom,
- The assessment of these techniques shall be in rubrics.
- The faculty can adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

4 Credits Courses – Integrated Professional Core Course (IPCC)

Assessment Method	Component	Type of Assessments	Syllabus Coverage	Maximum Marks	Average	Reduced Marks	Minimum Passing Marks	Evaluation Details
Total CIE Theory + Practical				**50**	----	----	**20**	
CIE	**Theory**	Internal Assessment Test (IAT) - I	Module – 1 to 2.5	50	(50+50) / 2	**15**	6	Average of Two Internal test each of 50 Marks scale down the marks to 15 Marks
		Internal Assessment Test (IAT) - II	Module – 2.5 to 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives / Activity based learning	Considering all the Modules	50	(50+50) / 2	**10**	4	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives/ Activity based learning		50				
	Total CIE Theory					**25**	10	Scale down Marks of IAT and CCA to 25

CIE	**Practical**	Conduction of Experiments	Performance-Continuous Evaluation of each experiment	05	15	Average of all Experiments	15	4	Performance of the Experiment (On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. 20 marks are for conducting the experiment and calculations/observations/output)
			Record	05					
			Observation book	05					
		Practical Test	Write up	15	50	----	05	4	One Internal Practical Test after conduction of all Experiments for 50 Marks
			Execution	25					
			Viva-voce	10					
		Open Ended Experiment	Write up	05	20	----	05	2	One experiment for 20 marks. 20 marks reduced to 05 marks
			Execution	10					
			Viva-voce	05					
						Total CIE Practical	**25**	**10**	Scale down Marks of Experiments, Record, Observation, Practical Test and Open-Ended Experiment

SEE		Theory exam	Entire theory syllabus including questions from lab Component in respective Modules	100	----	50	20	SEE Exam is theory Exam conducted for 100 Marks, scored Marks are scaled down to 50 Marks
			CIE + SEE	100	----	----	40	

- The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks – 25) in the Practical component.
- The Laboratory Component for the IPCC shall be for CIE only.
- However, in SEE, the Questions from the Laboratory Component shall be included in the respective Modules only.

Note: If few of the 3 Credit Courses are Integrated course type, for such courses the method suggested for 4 Credit IPCC Course shall be followed

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**4th**				
Course Title	:	**Transportation Engineering - I**				
Course Code	:	**23CVTE41**				
Course Type (Theory/ Practical/ Integrated)	:	**Integrated**				
Category	:	**IPCC**				
Stream	:			**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**3:0:2:0**		**SEE**	:	**100**
Total Hours	:	**40+20**		**SEE Duration**	:	**3 Hours**
Credits	:	**4**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	Recognize basic concepts, characteristics of traffic & pavement materials and various modes of transportation.
2	Recognize the importance of alignment to acquire the data required for highways, railway formation level and Airport.
3	Interpret the behavior of pavement materials, concepts of economics, drainage system and orienting the airport runway.
4	Identify the Railway track components and calculation of quantity of track materials.
5	Formulate various types of surveys and approaches used for travel forecasting and prediction of future travel patterns.
6	Assess various pavement materials, mixes and Design both Flexible and Rigid pavement as per IRC guidelines

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.

- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.
- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

Scheme of Teaching and Examinations for BE Program -2024-25

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2024-25)

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COURSE CURRICULUM

Module No.	Topics	Hours
1	**Transportation Engineering:** Introduction, Different Modes of Transportation, M R Jayakar Committee recommendations, Road Classifications and Road Patterns. Highway Alignment: Factors affecting highway alignment, Engineering surveys for alignment conventional and modern methods.	8
Pedagogy	**Chalk and Talk & Video Presentations & PPT**	
2	**Highway Geometric Design:** Factors affecting geometric design of roads, Cross Sectional Elements, Sight distances, Horizontal alignment- Transition curve, superelevation, Extra-widening, Vertical alignment gradients, summit and valley curves***. (No derivations) Problems on Sight distance, Super elevation, extra widening of curves, Length of transition curve, Length of summit and valley curve.***	8
Pedagogy	**Chalk and Talk & Video Presentations & PPT**	
3	.**Materials** And **Highway Construction**: Materials requirement, Properties and Characterisation of sourced material, Material quantity estimation; Procuring, Maintenance of damaged roards	8
Pedagogy	**Chalk and Talk & Video Presentations & PPT**	
4	**Pavement Design and Materials:** Desirable properties of aggregates, soil subgrade & Bitumen, Application of bituminous emulsion, Desirable properties of Bituminous Mixes, Pavement Design: Factors Controlling design of highway pavements, Pavement types, component parts of pavements and their functions; types of joints used in rigid pavement. Critical stresses in flexible and rigid pavement	8
Pedagogy	**Chalk and Talk & Video Presentations & PPT**	
5	**Express ways**: Concept, Necessary, Basic requirement; Standard dimensions, Land acquisition, Alignment, Construction Techniques; Types **Flyovers, Grade separators:** Concept, Necessary, Basic requirement; Standard dimensions, Geometric design, Location;	8

	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process

List of Programs:

Sl. No.	Experiments/Programs	COs
1	Tests on Aggregates a. Crushing Strength Test b. Los Angeles abrasion test c. Impact test d. Shape tests (combined index and angularity number) **(L1, L2)**	CO6
2	Tests on Bituminous Materials a. Penetration test b. Ductility test c. Softening point test d. Specific gravity test e. Viscosity test f. Flash and fire point test **(L1, L2)**	CO6
3	Tests on Soil a. Wet sieve analysis b. CBR Test on soil **(L1, L2)**	CO6
4	Design of flexible pavement as per IRC 37-2018 **(L2, L4)**	CO3
5	Design of Rigid pavement as per IRC 58-2015 **(L3, L4)**	CO3
6	Bituminous Mix Design by Marshall Method (Demonstration only) **(L1, L2)**	
	Open ended Programs	
1	Traffic Engineering Studies	CO4

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	S K Khanna and C E G Justo, "Highway Engineering#, Nem Chand Bros, Roorkee.
2	L R Kadiyali, "Highway Engineering#, Khanna Publishers, New Delhi.

3	"A Text Book of Railway Engineering" by S C Saxena and S P Arora
4	"Airport Engineering# by S C Rangwala
Reference Books	
1	"Airport Planning and Design# by Khanna Arora and Jain, Nem Chand Bros, Roorke.
2	"Roads, Railways, Bridges, Tunnels and Harbour Dock Engineering by B L Gupta, Amit Gupta
3	S K Khanna, C E G Justo and A Veeraragavan, "Highway Materials Testing Laboratory Manual#, Nem Chand Bros, Roorkee

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	Understand the different modes of transportation, Traffic characteristics, highway Planning & characteristics of pavement materials.	Understand / Remember	L1
CO2	Apply the concepts of Sight distances, horizontal and vertical alignments of Highways & Railway formation level.	Apply	L2
CO3	Analyse the behaviour of pavement materials, & Design of Flexible and Rigid Pavement and also to align Runway/taxiway Orientation, length and Railway track quantity.	Analyse	L3
CO4	Evaluate the present system of traffic condition, deficiencies by field surveys and recommend solutions.	Design	L4
CO5	Create an ideal travel plan for daily commute to the preferred destination.	Evaluate	L5
CO6	Investigate various properties of Aggregates, Soil, Bitumen & its Mixes and Pavement Design as per IRC.	Evaluate	L6

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2	*													*	
	*		*												*

CO3														
CO4			*										*	
CO5			*											*
CO6											*			*

Weblinks and Video Lectures (e-Resources)	
1	https://www.youtube.com/watch?v=5zKC_aq4ypM&list=PLE88643285BC70E0F **NPTEL Resources**
2	https://www.youtube.com/watch?v=37WMS483T7Y&list=PL05C6EFB31D920568 **NPTEL Resources**

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory				Practical
	Continuous Assessment Tests (IAT)		Continuous Comprehensive Assessment (CCA)		Practical Test
	IAT-1	IAT-2	CCA-1	CCA-2	
	50 Marks	50 Marks	50 Marks	50 Marks	
Remember	10	10	***	***	***
Understand	10	10	***	***	***
Apply	20	20	***	***	***
Analyse	10	10	***	***	***
Evaluate	***	***	25	25	
Create	***	***	25	25	

CIE Course Assessment Plan

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	20	10	10	10	20	10	80/40	40%
CO2	10	20	10	10	10	20	80/40	40%

CO3	10	10			10	10	40/20	20%
CO4	*	*	*	*	*	*	*	*
CO5	*	*	*	*	*	*	*	*
CO6	*	*	*	*	*	*	*	*
Total	40	40	20	20	40	40	100	100

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	
Understand	35
Apply	35
Analyse	30
Evaluate	***
Create	***

SEE Course Plan

CO's	Marks Distribution						Total Marks	Weightage
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	14	14	7	7	14	14	70 /35	35%
CO2	14	14	7	7	14	14	70 /35	35%
CO3	12	12	6	6	12	12	60 / 30	30%
CO4								
CO5	***	***	***	***	***	***	***	***
CO6	***	***	***	***	***	***	***	***
Total	40	40	20	20	40	40	100	100

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**IV**				
Course Title	:	**Water Supply and Conservation**				
Course Code	:	23CVWS42				
Course Type (Theory/ Practical/ Integrated)	:	**Integrated**				
Category	:	**IPCC**				
Stream	:			**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**3:0:2:0**		**SEE**	:	**100**
Total Hours	:	**40+20**		**SEE Duration**	:	**3hours**
Credits	:	**4**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	To understand the various source and demand of the water
2	To know the quality of the water as per BIS standards
3	To identify the operational treatment units to treat the water
4	To recognize the type of distribution system
5	To propose the need and methods of water conservation for rural and urban areas
6	To interpret the quality of water practically for various water samples (surface and ground water)

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.

- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.
- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

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Scheme of Teaching and Examinations for BE Programme -2024-25

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2024-25)

COURSE CURRICULUM

Module No.	Topics	Hours
1	. **Module-1** **Introduction**: Need for protected water supply, Demand of Water: Types of water demands - domestic demand, industrial, institutional and commercial demand, public use and fire demand, estimation, factors affecting per capita demand, Variations in demand of water, Peak factor. **Design period** and factors governing design period. Methods of population forecasting and numerical problems.	**8hrs**
Pedagogy	Chalk and talk, videos, PowerPoint Presentation, animations	
2	**Module-2** **Sources and Conveyance of Water** **Surface sources** - lakes, streams, rivers. Impounded Reservoirs. Underground sources- Infiltration Galleries, Infiltration Wells and Springs. Intake and conveyance of water- types of intakes i) Reservoir intake ii) River intake iii) Canal intake, conveyance of water -open channels and pipes. **Pipe materials** - HDPE pipes, steel pipes, concrete pipes, pre-stressed concrete pipes, merits and demerits. Pipe Joints -Spigot and Socket joint, Flange joint, Universal pipe joint, Expansion joint, Flexible joint, various stages of pipe laying and its testing. Pipe corrosion and remedial measures. Pipe fittings, types of valves, testing of pipelines.	**8hrs**
Pedagogy	Chalk and talk, videos, PowerPoint Presentation, animations	
3	**Module -3** **Quality and Quantity of Water** **Sampling**- objectives, methods and preservation techniques. Impurities of water - organic and inorganic classification and examination of water. Physical - temperature, colour, turbidity, taste and odour. Chemical - pH value, Total Solids, Hardness, Chlorides, dissolved oxygen, Iron and Manganese, Fluoride, Nitrates and Heavy metals like Mercury, Cadmium and Arsenic. Bacteriological - E-coli, Most Probable Number (MPN), Drinking water standards as per BIS, WHO and CPHEEO.	**6hrs**

	Physico- chemical characteristics of water Sampling (Analysis to be conducted in laboratory session).	
Pedagogy	Chalk and talk, videos, PowerPoint Presentation, animations	
4	**Module -4** **Treatment of Water** Flow diagram of different units of treatment. **Screening**- Types and design of bar screen. **Aeration**- objective, types of aerators, design of cascade aerator **Sedimentation**- plain sedimentation, sedimentation with coagulation, flocculation, design of circular Sedimentation tank **Filtration**- mechanism -theory of filtration, types of filters, slow sand, rapid sand and pressure filters including construction, operation, cleaning. Design of slow and rapid sand filter without under drainage system. **Disinfection** of water, chlorination- chlorine demand, residual chlorine, break point chlorination **Water softening**- description of lime soda, zeolite process, RO membranes **Miscellaneous Treatment**- Fluoridation and De-fluoridation, ozonation and UV treatment of water.	**10hrs**
Pedagogy	Chalk and talk, videos, PowerPoint Presentation, animations, and visit to BWSSB water treatment plant	
5	**Module - 5** **Distribution System and Water Conservation** **Distribution system**: Methods- Gravity, Pumping, Combined gravity and pumping system. Layouts: Dead end, Radial, Grid iron, Circular system. Water supply arrangements in buildings: pipe materials - plastic pipes, High Density Polythene Pipes, merits and demerits. Connections from water main to buildings, supply system with in the building (overhead tanks and Hydro pneumatic systems). **Water conservation**: conservation of rain water, roof water harvesting, recharging of ground water, Star rating for water conveyance components.	**8hrs**
Pedagogy	Chalk and talk, videos, PowerPoint Presentation, animations	
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications	

	• **Demonstration:** exhibits the implementation process

List of Programs:

Sl. No.	Experiments/Programs	COs
1	Sampling and its preservation, preparation of reagents	CO2
2	Determination of pH, Conductivity	CO6
3	Determination of TDS and Turbidity.	CO6
4	Determination of Acidity	CO6
5	Determination of Alkalinity	CO6
6	Determination of Calcium, Magnesium and Total Hardness.	CO6
7	Determination of percentage of % of available chlorine in bleaching powder sample,	CO6
8	Determination of Residual Chlorine.	CO6
Open ended Programs		
1	In-situ preliminary water quality analysis using water kit.	CO6
2	Performance analysis of filter media	CO6

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	Garg, S.K., "Environmental Engineering Vols. I and II", Khanna Publishers, New Delhi, New Delhi 2010
2	Punmia B C, "Environmental Engineering Vol. I", Laxmi Publication (P) Ltd., Delhi. 2011
3	Mark.J Hammer, Water and Waste Technology, John Wiley and Sons Inc., New York, 2008
Reference Books	
1	CPHEEO Manual on water supply and treatment engineering, Ministry of Urban Development, Government of India, New Delhi, 3rd Edition, 2018, Akalank Publications; ISBN-10: 8176393819
2	Environmental Engineering, Howard S. Peavy, Donald R. Rowe, George T, 2017, McGraw Hill International Edition, New York, ISBN-10: 9351340260
3	SP 35 (1987): Handbook on Water Supply and Drainage (with Special Emphasis on Plumbing) [CED 24: Public Health Engineering].

4	Panchdhari. A.C., "Water Supply and Sanitary Installations", New Age International Publishers, New Delhi.

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	Understand the concepts of water supply and conservation methods	Understand / Remember	L1/L2
CO2	Apply the concepts of water supply in sampling, drinking water standards, distribution system and conservation for water supply	Apply	L3
CO3	Analyse water quality and type of treatment techniques to improve the water quality and for water conservation.	Analyse	L4
CO4	Design the water supply Connections from water main to buildings and supply system with in the building	Design	L5
CO5	Investigate the water quality index for a surface water source.	Evaluate	L5
CO6	Interpretation of water quality for various sources of water with respect to BIS for drinking water	Evaluate	L5

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2	3											
CO3		3										
CO4				3					2	2		
CO5						3				3		

Weblinks and Video Lectures (e-Resources)	
1	https://youtu.be/K4Vty0cmybI
2	https://youtu.be/bCKm9KkcQtw https://youtu.be/s0hy0ZlM1bA
3	https://youtu.be/iQwEoEhujTc
4	https://youtu.be/fZPry6BENPI
5	https://youtu.be/6I-eBqE7Hew

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory				Practical
	Continuous Assessment Tests (IAT)		Continuous Comprehensive Assessment (CCA)		Practical Test
	IAT-1	IAT-2	CCA-1	CCA-2	
	50 Marks	50 Marks	50 Marks	50 Marks	
Remember	10	-			
Understand	10	10			
Apply	20	20			
Analyse	10	20			50
Evaluate	-	-	50	50	
Create	-	-			

CIE Course Assessment Plan

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		

CO1	10	10					**20**	**20%**
CO2		**10**	**10**		**10**	**10**	**40**	**40%**
CO3		**10**		**10**	**10**	**10**	**40**	**40%**
CO4								
CO5								
Total	**10**	**20**	**10**	**10**	**20**	**20**		**100%**

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	**20**
Understand	**20**
Apply	**40**
Analyse	**20**
Evaluate	
Create	

SEE Course Plan

CO's	Marks Distribution						Total Marks	Weightage
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	10	10					**20**	**20%**
CO2			**10**		**10**	**10**	**30**	**30%**
CO3				**10**	**10**	**10**	**30**	**30%**
CO4					**10**	**10**	**20**	**20%**
CO5								
Total							**100**	**100%**

PROFESSIONAL CORE COURSE (PCC)

PCC Course - Professional Core Course

Teaching Hours/Week (L: T:P: S)	3:0:0:0
Total Hours of Pedagogy	40 hours
Credits:	03
Each Module	8 Hrs
CIE Marks	50
SEE Marks	50
Total Marks	100
Exam Hours	3
Examination nature (SEE)	Theory

3 Credit Course – Professional Core Course (PCC)

Assessment Details (both CIE and SEE)

- The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%.
- The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks).
- A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

Internal Assessment Test (IAT):

- For the Internal Assessment Test component of CIE, there are 25 marks and for Assignment component of the CIE, there are 25 marks. Two Tests, each of 50 Marks with 01-hour 30 minutes' duration, are to be conducted and average of two tests to be reduced to 25 marks
  - The first test will be administered after 40-50% of the syllabus has been covered, and
  - The second test will be administered after 85-90% of the syllabus has been covered
- Any two assignment methods, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned.
- For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment.

- Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

The IA test questions are to be framed to map the Course Outcomes (COs), Program Outcomes (POs) and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels

Semester-End Examination:

Theory SEE will be conducted as per the scheduled timetable (duration 03 hours).

- The question paper will have ten questions. Each question is set for 20 marks.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.
- The students have to answer 5 full questions, selecting one full question from each module.
- Marks scored shall be proportionally reduced to 50 marks.

Continuous and Comprehensive Assessment (CCA):

Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **10 Marks**.

- CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics
- CCA as project-based learning,
    - CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission.
    - The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report

Total score for CCA is **10 Marks**

Total Marks scored for theory component of CIE (IAT+ CCA) is **25 Marks**

Possible Continuous and Comprehensive Assessment (CCA):

- Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom,
- The assessment of these techniques shall be in rubrics.
- The faculty can adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

Professional Core Course (PCC) – 3 Credit course – Theory

Assessment Method	Component	Type of Assessments	Syllabus Coverage	Maximum Marks	Average	Reduced Marks	Minimum Passing Marks	Evaluation Details
Total CIE Theory + Practical				**50**	----	----	**20**	
	Theory	Internal Assessment Test (IAT) - II	Module – 1 to 2.5	50	(50+50) / 2	**25**	10	Average of Two Internal test each of 50 Marks scale down the marks to 25
		Internal Assessment Test (IAT) - II	Module – 2.5 to 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives / Activity Based learning	Considering all the Modules	50	(50+50) / 2	**25**	10	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives / Activity Based learning		50				
	Total CIE Theory					**50**	20	Total Marks of IAT and CCA is 50

SEE		Theory exam	Entire theory syllabus including questions from lab Component in respective Modules	100	----	50	20	SEE Exam is theory Exam conducted for 100 Marks, scored Marks are scaled down to 50 Marks
			CIE + SEE	100	----	----	40	

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**4TH SEM**				
Course Title	:	**ANALYSIS OF STRUCTURES**				
Course Code	:	**23CVAS43**				
Course Type (Theory/ Practical/ Integrated)	:	**THEORY**				
Category	:	**PCC**				
Stream	:	**STRUCTURAL ENGINEERING**		**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**2:2:0:0**		**SEE**	:	**50**
Total Hours	:	**40**		**SEE Duration**	:	**3hrs**
Credits	:	**3**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	**Classify** different structural forms, static and kinematic indeterminacy of structures
2	**Solve** for forces in truss members, arches, cables and find joint displacements in trusses, deflections in beams and frames
3	**Examine** deflection of determinate beams by moment-area method beam method ,Castigliano's energy methods and analyze indeterminate beams and frames to draw BMD and SFD
4	**Investigate** loads and forces inside structural elements of existing building using software.
5	**Develop** different structural configuration for a proposed building and make a model of the best form.

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.

- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

Scheme of Teaching and Examinations for BE Programme -2024-25

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2024-25)

DSATM

COURSE CURRICULUM

Module No.	Topics	Hours
1	**Introduction:** Structural forms, Conditions of equilibrium, Compatibility conditions, Degree of freedom, Linear and non-linear analysis, Static and kinematic indeterminacies of structural systems. **Analysis of Plane Trusses:** Method of joints and method of sections, problems	8
Pedagogy	**Chalk and talk with demonstration using models, site visits and software to validate results**	
2	**Deflection of beams-Determinate beams** **Moment area method:** Derivation, Mohr's theorem, Sign conventions, application of moment area method to prismatic determinate beams, beams of varying cross sections, use of moment diagram by parts. **Strain energy method:** Principle of virtual displacements, principal of virtual forces, strain energy and complementary energy, strain energy due to axial force, bending, shear and torsion. Castigliano's theorems to calculate deflection of beams,trusses and frames	8
Pedagogy	**Chalk and talk with demonstration using models, site visits and software to validate results**	
3	**Arches and Cable structures** **Arches:** Three hinged parabolic arches with supports at same and different levels subjected to concentrated loads and uniformly distributed loads. Normal thrust, radial shear and bending moment. **Cables:** Analysis of cables under point loads and UDL, length of cables for supports at same level and different levels.	8
Pedagogy	**Chalk and talk with demonstration using models, site visits and software to validate results**	
4	**Deflection of indeterminate beams** **Slope deflection method:** Introduction, sign conventions, development of slope deflection equations, Analysis of continuous beams including settlement of supports, analysis of orthogonal rigid plane frames including sway frames with kinematic indeterminacy upto three.	8
Pedagogy	**Chalk and talk with demonstration using models, site visits and software to validate results**	

5	**Deflection of indeterminate beams** **Moment distribution method:** Introduction, Definition of terms, Development of method, Analysis of continuous beams with support yielding, Analysis of orthogonal rigid plane frames including sway frames with kinematic indeterminacy upto three.	**8**
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process	

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	S S Bhavikatti, structural analysis, vikas publishing house pvt.ltd., new Delhi
2	K.U. Muthu and H. Narendra, "Indeterminate Structural Analysis", IK International Publishing Pvt. Ltd
3	H.S Vishwanath.Analysis of structures.Vikas publications 4th edition
Reference Books	
1	Hibbeler, R.C., Structural Analysis, 9 th edition., Pearson publications., New Delhi, 2012
2	Reddy, C.S., Basic Structural Analysis, 3 rd. ed., Tata McGraw-Hill Education Pvt. Ltd., New Delhi, 2011.
3	Wang C K, "Intermediate Structural Analysis", McGraw Hill, International Students Edition. S. Rajashekhara and G. Sankarasubramanian, "Computational Structural Mechanics", PHI Learning Pvt. Ltd.,

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	**Remember** and **Understand** different structural forms and distinguish between static and kinematic indeterminacy of trusses, beams and frames.	Remembering Understanding	L1, L2
CO2	**Apply** basic concepts of strength of materials to derive expressions to determine resultants of stresses and strains.	Applying	L3
CO3	**Analyze** different structural forms subjected to combination of concentrated loads and moments, UDL, UVL,to find slope, deflection and to draw BMB and SFD in case of indeterminate beams and frames.	Analyzing	L4
CO4	**Evaluate** demand and capacity of existing structures using structural software.	Evaluating	L5
CO5	**Create** different structural forms for a proposed building to model best configuration to withstand loads.	Creating	L6

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2	3														
CO3		3												3	
CO4				3	3									3	
CO5			3									3	3		

Program Specific Outcomes

The Civil Engineering Graduate will be able to:

PSO1: Identify and resolve problems in providing basic needs of the society through sustainable infrastructural development by proper planning and execution.

PSO2: Perform analysis and design using advanced techniques in creating various civil engineering structures to meet global standards.

PSO3: Assess the properties of engineering materials and to explore the field conditions to provide useful data for analysis-design and recommendations for revision of codes.

Weblinks and Video Lectures (e-Resources)	
1	https://nptel.ac.in/courses/105105166
2	https://nptel.ac.in/courses/105105109
3	https://nptel.ac.in/courses/105105166
4	https://nptel.ac.in/courses/105105109

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory			
	Continuous Assessment Tests (IAT)		Continuous Comprehensive Assessment (CCA)	
	IAT-1	IAT-2	CCA-1	CCA-2
	50 Marks	50 Marks	50 Marks	50 Marks
Remember	-	-		
Understand	10	10		
Apply	20	20		
Analyse	20	20		
Evaluate			50	
Create				50

CIE Course Assessment Plan

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	5		5				10	10%
CO2	10	10		10	10	10	50	50%
CO3	10	10		10	10		40	40%
CO4								
CO5								
Total	25	20	5	20	20	10	100	100%

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	-
Understand	20
Apply	30
Analyse	30
Evaluate	10
Create	10

SEE Course Plan

CO's	Marks Distribution						Total Marks	Weightage
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	5	5	5		5	5	25	25%
CO2	10	10	5	5	10	10	50	50%
CO3	5	5		5	5	5	25	25%
CO4								
CO5								
Total	20	20	10	10	20	20	100	100%

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**IV**				
Course Title	:	**Geo-Technical Engineering - 1**				
Course Code	:	**23CVGT44**				
Course Type (Theory/ Practical/ Integrated)	:	**Theory**				
Category	:	**PCC**				
Stream	:	**Civil Engineering**		**CIE**	:	**50 Marks**
Teaching hours/ week (L:T:P:S)	:	**3:0:0:0**		**SEE**	:	**50 Marks**
Total Hours	:	**40**		**SEE Duration**	:	**3 Hours**
Credits	:	**3**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	Basic concepts, terminologies and inter relationships present in soil mechanics to plan and execute geotechnical site investigation program
2	To examine index and engineering properties using laboratory and in situ tests as per IS code.
3	To classify soil based on index and engineering properties of soil.
4	To assess the soil condition and its suitability for proposed civil works by using index and engineering properties.
5	To use engineering and index properties of soil in designing soil structures and check their working conditions.

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.
- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

DSATM

Scheme of Teaching and Examinations for BE Programme -2024-25

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2024-25)

COURSE CURRICULUM

Module No.	Topics	Hours
1	**Introduction:** Types of Rocks and Minerals, Origin and formation of soil Phase Diagram, phase relationships, definitions and their interrelationships. **Determination of Index properties:** Specific gravity, water content, in-situ density, relative density, particle size analysis(sieve and Hydrometer analysis) Atterberg's Limits, consistency indices. Plasticity chart, BIS soil classification (IS: 1498-1970).	8
Pedagogy	**Seminar, Group Discussion, Poster presentation, Problem Solving**	
2	.**Soil Structure and Clay Mineralogy**: Single grained, honey combed, flocculent and dispersed structures, Soil-Water system, Electrical diffuse double layer, adsorbed water, base-exchange capacity, Isomorphous substitution. **Structures & Engineering application of Compaction of Soils** - Kaolinite, Illite and Montmorillonite **:** Definition, Principle of compaction, Standard and Modified proctor's compaction tests, factors affecting compaction, effect of compaction on soil properties, Numerical	8
Pedagogy	**Poster presentation, Think Pair and Share, Case Studies**	
3	**Flow through Soils:** Darcy's law-assumption and validity, coefficient of permeability and its determination (laboratory), factors affecting permeability, permeability of stratified soils, Numerical on permeability. **Seepage Analysis:** Laplace equation, assumptions, limitations (No derivation). Flow nets-characteristics and applications. Flow nets for sheet piles and below the earthen dam section. **Effective Stress Analysis:** Geostatic stresses, Effective stress concept-total stress, effective stress and Neutral stress, Numericals	8
Pedagogy	**Problem Solving, Demonstration**	
4	**Consolidation of Soil:** Definition, Mass-spring analogy, Terzaghi's one dimensional consolidationtheory-assumptions and limitations. Governing differential Equation and solution (No derivation). Consolidation characteristics of soil (Cc, av, mv and Cv). Laboratory one dimensional consolidation test, characteristics of e-log (σ') curve, Pre-consolidation pressure and its determination by Casagrande's method. Over consolidation ratio, normally consolidated, under consolidated and over consolidated soils. Determination of compression index and coefficient of consolidation (square root of time fitting method, logarithmic time fitting method).	8
Pedagogy	**Seminar, Poster presentation, Problem solving**	

5	**Shear Strength of Soil:** Concept of shear strength, Mohr–Coulomb Failure Criterion, Total and effective shear strength parameters, factors affecting shear strength of soils. **Measurement of shear strength parameters** - Direct shear test, unconfined compression test, triaxial compression test and field Vane shear test, Test under different drainage conditions. **Thixotrophy and sensitivity of soils,**	**8**
Pedagogy	**Seminar, Poster presentation, Group discussion**	
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process	

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	Soil Mechanics and Foundations, Punmia B.C,17th Edition,2017, Laxmi Publishing Co. New Delhi, ISBN-10: 8170087910.
2	Soil Engineering in Theory and Practice, Alam Singh and Chowdhary G.R, 2001, CBS Publishers and Distributiors ltd., New Delhi, ISBN 9788123900391
3	Basic and Applied Soil Mechanics, Gopal Ranjan and Rao ASR, 2016, New Age International (P) ltd, New Delhi, ISBN-10: 8122440398
4	Geotechnical Engineering, Braja, M. Das, Thomson Business Information India (P) Ltd., India.
5	Soil Mechanics and Foundation Engineering, VNS Murthy, 1 st Edition, 2015, UBS Publishers and Distributors, New Delhi, ISBN-10: 8123913621
6	Geotechnical Engineering, Narasimha Rao AV and Venkatramaiah C, 2015, University press, India ltd, Hyderabad, ISBN-10: 8173711453
Reference Books	
1	Soil Mechanics, T.W. Lambe and R.V. Whitman, John Wiley & Sons.
2	Geotechnical Engineering, Donald P Coduto, Phi Learning Private Limited, New Delhi
3	Geotechnical Engineering, Shashi K. Gulathi & Manoj Datta, Tata McGraw Hill Publications
4	Geotechnical Engineering, Debashis Moitra, Universities Press.,

5	Foundation analysis and design, Bowles J E , McGraw- Hill Publications.
6	A Guide to soil mechanics, Malcolm D Bolton, Universities Press.,

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	**Understand** definitions, basic concepts and inter relationships of soil mechanics to plan site investigation and sampling techniques	L1/L2	Remember/Understand(R/U)
CO2	**Apply** IS codal provisions and inter relationships to find index and engineering properties of soil.	L3	Apply (A)
CO3	**Analyze** the properties of soil which is used for various civil construction activities.	L4	Analyze (AN)
CO4	**Evaluate** the soil suitability for proposed civil engineering constructions.	L5	Evaluate (E)
CO5	**Create** graphical constructions to check stability and performance of civil engineering structures.	L6	Create (C)

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															2
CO2	3														3
CO3		3												2	
CO4				3				2	2	2				2	
CO5			3							2				1	

Weblinks and Video Lectures (e-Resources)	
1	https://www.azdocuments.in/2020/09/basic-geotechnical-engineering18cv54.html

2	https://vtupulse.com/cbcs-cv-notes/2018-scheme-6-sem-civil-vtu-cbcs-notes/
3	https://archive.nptel.ac.in/courses/105/101/105101201/
4	https://archive.nptel.ac.in/courses/105/105/105105168/

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory			
	Continuous Assessment Tests (IAT)		Continuous Comprehensive Assessment (CCA)	
	IAT-1	IAT-2	CCA-1	CCA-2
	50 Marks	50 Marks	50 Marks	50 Marks
Remember	10	10		
Understand	10	10		
Apply	20	20		
Analyse	10	10		
Evaluate			25	25
Create			25	25

CIE Course Assessment Plan

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	20	10	10	10	20	10	40	40
CO2	10	20	10	10	10	20	40	40
CO3	10	10			10	10	20	20
CO4								
CO5								
Total	40	40	20	20	40	40	100	100

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	
Understand	35

Apply	**35**
Analyse	**30**
Evaluate	
Create	

SEE Course Plan

CO's	Marks Distribution						Total Marks	Weightage
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	14	14	7	7	14	14	70	35
CO2	14	14	7	7	14	14	70	35
CO3	12	12	6	6	12	12	60	30
CO4								
CO5								
Total	40	40	20	20	40	40	200	100

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**IV**				
Course Title	:	CONCRETE MATERIAL SCIENCE				
Course Code	:	**23CVEC45**				
Course Type (Theory/ Practical/ Integrated)	:	**THEORY**				
Category	:	ESC				
Stream	:	**CIVIL**		**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**3:1:0:0**		**SEE**	:	**50**
Total Hours	:	**40+10**		**SEE Duration**	:	**3 HOURS**
Credits	:	**03**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	Understand the theoretical concept of Concrete material which includes Cement, Admixtures and Aggregates,
2	Comprehend the properties of Fresh Concrete, Hardened Concrete & manufacturing process of concrete.
3	Learn the concept of mix design of concrete& its importance in estimation of composition of materials.
4	Know various types of special concretes & its application

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.
- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

DSATM

Scheme of Teaching and Examinations for BE Programme -2024-25

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2024-25)

COURSE CURRICULUM

Module No.	Topics	Hours
1	**Introduction**: Basic Concrete Ingredients: Hydraulic Cements: Physical Properties, Manufacturing process, Chemical composition, hydration of cement, interfacial transition zone. w/c ratio, micro structural development of Portland cement, testing of cement. Aggregates: Properties, types of aggregates, classification of aggregates, importance of grading, testing of aggregates (IS:383:2019), deleterious materials, Water: qualities of water, use of sea water, Admixtures (Mineral and Chemical Admixtures).	8
Pedagogy	1.Blackboard teaching/PowerPoint presentations 2.Regular review of students by asking questions based on topics covered in the class. 3. Video lectures on manufacture of cement.	
2	**Fresh Concrete**: Properties of fresh concrete; Workability, Factor affecting workability, measurement of workability, slump, compacting factor, Vee-Bee consistometer and flow tests, SCC tests, Segregation and bleeding, Plastic shrinkage, Process of manufacture of concrete: Batching, mixing, transportation, placing and compaction and curing by different methods, Ready Mix Concrete.	8
Pedagogy	1.Blackboard teaching/PowerPoint presentations 2.Regular review of students by asking questions based on topics covered in the class. 3 Video lectures on concrete tests in fresh state.	
3	**ADMIXTURES:** Classification, effect on fresh and hardened concrete, retention time, Dosage and their effects, Influence on properties of paste, mortar, and concrete. **Mix Proportioning of Concrete**: Concrete mix design: Concept of mix design, role of water to cement ratio, water content, other variables and exposure conditions, mix proportioning using IS-10262-2019 guidelines .Solving Numerical, to get mix design, for the given material & filed condition	8
Pedagogy	1.Blackboard teaching/PowerPoint presentations 2.Regular review of students by asking questions based on topics covered in the class. 3 Hands on training on concrete mix design.	
4	**Hardened Properties**: Engineering properties of concrete; Compressive strength and the factors affecting the strength, tensile strength, Flexural strength, bond strength, modulus of Elasticity, factors affecting modulus of elasticity, poissons ratio, creep, Drying and Autogenous shrinkage, non–destructive testing; rebound hammer, ultrasonic pulse velocity, Intro to other test methods of NDT, Insitu testing of concrete as per IS- Provisions	8
Pedagogy	1.Blackboard teaching/PowerPoint presentations 2.Regular review of students by asking questions based on topics covered in the class. 3 Hands on training on NDT Tests and other tests.	

5	**Durability:** Significance of durability, Factors affecting durability, carbonation, Aggressive environments - Chloride ions and Sulphate ions, Acid, Corrosion, Freezing and thawing, Alkali Silica reaction, Testing methods for durability. **Special Concretes**: Introduction to light weight concrete – Cellular concrete – No-fines concrete – High density concrete – Fibre reinforced concrete – Polymer concrete – High performance concrete – Self compacting concrete.	**8**
Pedagogy	1.Blackboard teaching/PowerPoint presentations 2.Regular review of students by asking questions based on topics covered in the class.	
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process	

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	Text book/Codes: 1. MS Shetty, "Concrete Technology Theory and practice", S Chand and Company...
2	A M Neville, "Properties of Concrete", Fifth Edition, Pearson Education Asia Pvt ltd, 2014
3	IS: 383-2016. "Indian standard specification for coarse and fine aggregates from natural sources for concrete (Third revision)". Bureau of Indian Standards, New Delhi, India
4	IS: 456-2000, Reaffirmed 2005. "Plain and Reinforced Concrete - Code of Practice". Bureau of Indian Standards, New Delhi, India.
5	5. IS: 10262-2019. "Indian standard concrete mix proportioning (Second revision)". Bureau of Indian Standards, New Delhi, India
Reference Books	
1	1. PK Mehta and Paulo JM Monteiro, "Concrete – microstructure, properties and materials".
2	A R Santhakumar, "Concrete Technology", Oxford – New Delhi.
3	Gambhir ML, "Concrete Technology", Tata McGraw-Hill Publishing Company, New Delhi.
4	Current literatures.

Weblinks and Video Lectures (e-Resources)	
1	https://nptel.ac.in/courses/105102012/
2	http://elearning.vtu.ac.in/

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	2
CO2	2	-	3	-	-	-	-	-	-	-	-	-	-	3	-
CO3	-	-	-	2	-	-	-	-	3	3	-	-	2	-	-
CO4	2	-	-	2	--	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	2	3	-	-	-	-	-

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	Comprehend the influence of ingredient properties on cement and concrete.	Remember	L1/L2
CO2	Explain the requirement of engineering properties of concrete for structural and non-structural uses.	Understand	L1/L2
CO3	Apply fundamental principles, procedures and various specifications for proportioning of concrete mixes.	Apply	L3
CO4	Estimate the strength of concrete and to identify causes of deterioration of concrete.	Analyse	L4
CO5	**Create** Mix design for different Environment conditions as per IS 10262-2019.	Create	L5

Mapping of Course Outcomes to Program Outcomes:

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory			
	Continuous Assessment Tests (IAT)		Continuous Comprehensive Assessment (CCA)	
	IAT-1	IAT-2	CCA-1	CCA-2
	50 Marks	50 Marks	50 Marks	50 Marks
Remember	15			
Understand	15	15		
Apply	20	15		
Analyse		20	20	20
Evaluate			15	15
Create			15	15

CIE Course Assessment Plan

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	10	10	5				25	25
CO2	10	10	5	5	5	5	40	40
CO3				10	10	5	25	25
CO4					10		10	10
CO5								
Total	20	20	10	15	25	10	100	100

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	12.5
Understand	12.5
Apply	17.5
Analyse	7.5
Evaluate	
Create	

SEE Course Plan

CO's	Marks Distribution						Total Marks	Weightage (%)
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	5	5	3	2	5	5	25	25

CO2	**5**	**5**	**3**	**2**	**5**	**5**	**25**	**25**
CO3				**15**	**10**	**10**	**35**	**35**
CO4				**5**	**10**		**15**	**15**
CO5								
Total							**100**	**100**

Dayananda Sagar Academy of Technology & Management
(Autonomous Institute under VTU)

Semester	:	**IV**				
Course Title	:	**Construction Materials Testing Laboratory**				
Course Code	:	**BETCS406**				
Course Type (Practical)	:	**Practical**				
Category	:	**PCCL**				
Stream	:	**Civil**		**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**0:0:2:0**		**SEE**	:	**50**
Total Hours	:	**20**		**SEE Duration**	:	**3 hours**
Credits	:	**02**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	Ability to apply knowledge of mathematics and engineering in calculating the properties of construction materials.
2	Ability to evaluate the physical properties of the non-ferrous materials.
3	Ability to use the techniques, skills and modern engineering tools necessary for engineering confirming the IS codes.
4	Understanding of professional and ethical responsibility in the areas of material testing.
5	Ability to evaluate the mechanical properties of ferrous materials.

Teaching-Learning Process
Pedagogical Initiatives:
Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.

- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

DSATM

Scheme of Teaching and Examinations for BE Program -2024-25
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2024-25)

COURSE CURRICULUM

List of Programs:

Sl. No.	Experiments/Programs
1	**Tests on Ferrous materials**
	1. Tension test on mild steel and HYSD bars.
	2. Compression test on mild steel, cast iron.
	3. Torsion test on mild steel circular sections
	4. Bending Test on mild steel Under two point loading
	5. Shear Test on Mild steel- single and double shear
	6. Impact test on Mild Steel (Charpy & Izod)
	7. Hardness tests on ferrous metals (Brass, aluminum, copper, cast iron, mild steel)- Brinell's, Rockwell and Vicker's
2	**Tests on Non-Ferrous materials**
	1. Bending Test on Wood Under two point loading
	2. Compressive strength and water absorption tests on Bricks and Tiles
	3. Tests on Fine aggregates-Moisture content, Specific gravity, Bulk density, Sieve analysis and Bulking
	4. Tests on Coarse aggregates-Absorption, Moisture content, specific gravity, Bulk density and Sieve analysis
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	Davis, Troxell and Hawk, "Testing of Engineering Materials", International Student Edition – McGraw Hill Book Co. New Delhi.
2	M L Gambhir and Neha Jamwal, "Building and construction materials-Testing and quality control", McGraw Hill education(India)Pvt. Ltd., 2014
3	Fenner, "Mechanical Testing of Materials", George Newnes Ltd. London.
4	Holes K A, "Experimental Strength of Materials", English Universities Press Ltd. London.
5	Kukreja C B, Kishore K. and Ravi Chawla "Material Testing Laboratory Manual", Standard Publishers & Distributors 1996.
Reference Books:	
1	Timoshenko and Young, "Strength of Materials – Vol II", Von Nastrand Company, New York.
2	Laboratory Manual prepared by the Department of Civil Engineering, DSATM.
3	IS Codes: IS 5652 (Part 1): 1993, IS 1500: 2005, IS 1598: 1977, IS 1757: 1988, IS 1608:2005, IS 1708 part (8-9):1986, IS 5242:1979, IS 2408:1963, IS 1786:2008, IS 1717:2012, IS 1717:2012, IS 3495 part (1-4):1992, IS 654:1992

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2	√								√						√
CO3		√			√				√					√	√
CO4		√			√				√					√	√
CO5				√		√		√	√						√

SEE pattern:

· Two questions are to be set - One from group experiments and the other as individual experiment.
· All exercises are to be included for practical examination.
· Group experiments - Tension test, compression test, torsion test and bending test.
· Individual Experiments - Remaining tests.

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	Understand the Classification of type of engineering material based on the energy absorption capacity.	Understand/ Remember	L1
CO2	Apply the knowledge of mathematics and engineering in calculating the properties of construction materials.	Apply	L2
CO3	Analyze the mechanical strength of various ferrous materials by experimentation.	Analyze	L3
CO4	Analyze the physical properties of various Non-ferrous materials by experimentation.	Analyze	L3
CO5	Evaluate the various properties of the materials and compile their suitability as per the provisions given in I.S code.	Evaluate	L4

Weblinks and Video Lectures (e-Resources)	
1	**Link for Impact test:** **https://www.youtube.com/watch?v=T3tc33pd3hQ&ab_channel=Engineer%27sA cademy**
2	**Link for tension and Compression test:** **https://www.youtube.com/watch?v=b5W8qgo7NNQ&ab_channel=CorecivilShubhamAgarwal**
3	**Link for shear test:** **https://www.youtube.com/watch?v=9Xnm6l8rpoQ&ab_channel=JSPMNTCAcademics**
4	**Virtual lab for SOM:** **https://sm-nitk.vlabs.ac.in/exp/tensile-test-mild-steel/videos.html**

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory			
	Continuous Assessment Tests (IAT)		Continuous Comprehensive Assessment (CCA)	
	IAT-1	IAT-2	CCA-1	CCA-2
	50 Marks	50 Marks	50 Marks	50 Marks
Remember				
Understand				
Apply				
Analyse				
Evaluate				
Create				

CIE Course Assessment Plan

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1								
CO2								
CO3								
CO4								
CO5								
Total								

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	
Understand	
Apply	
Analyse	
Evaluate	
Create	

SEE Course Plan

CO's	Marks Distribution						Total Marks	Weightage
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1								
CO2								
CO3								
CO4								
CO5								
Total								

ABILITY ENHANCEMENT COURSE (AEC)

PBL- Project Based Learning

Teaching Hours/Week (L: T:P: S)	0:0:2:2
Total Hours of Pedagogy	25 hours – Theory + Project
Credits:	02
Modules	5
CIE Marks	50
SEE Marks	50
Total Marks	100
Exam Hours	3
Examination nature (SEE)	**Project Evaluation**

	CIE		**SEE**	
	Project Weekly Assessment			
Project	**Project Understanding**	05 Marks	**Write up**	10 Marks
	Technical Competence	10 Marks	**Presentation & Demonstration**	50 Marks
	Innovation	10 Marks	**Project report**	25 Marks
	Problem Solving	15 Marks	**Viva-Voce**	15 Marks
	Project Demonstration	10 Marks	**Total**	**100 Marks**
Total		**50 Marks**	**100 Marks Reduced to 50 Marks**	

17. Introduction

Project Based Learning is a model for classroom activity that shifts away from the classroom practices of short, isolated, teacher-centered lessons and instead emphasizes learning activities that are long-term, interdisciplinary, and student-centered.

A systematic teaching method that engages students in learning essential knowledge and life-enhancing skills through an extended, student-influenced inquiry process structured around complex, authentic questions and carefully designed products and tasks.

Project learning, also known as project-based learning, is a dynamic approach to teaching, in which students explore real-world problems and challenges, simultaneously developing cross-curriculum skills while working in small collaborative groups.

18. Characteristics of Project-Based Learning:

- Students making decisions within a framework
- A problem or challenge to be solved;
- Students designing the process for reaching a solution
- Students gathering and managing information
- Continuous Evaluation
- Students regularly reflecting on the process
- A final product to be evaluated for quality
- An atmosphere that tolerates error and change

19. Purpose

- Introducing project-based learning on the curriculum.
- To help students to gain in-depth knowledge of the subject via project.
- During this process, students will be able to learn and understand the various stages of project development.

20. Objectives

- Introducing mini project based on the curriculum.
- Develop in depth knowledge of the topic and technology.
- Use critical thinking skills and make real world connections
- Demonstrate and understand through products.
- Industry and concept-oriented learning.

21. Why Incorporate PBL?

- Promotes collaboration and interaction
- Learners communicate meaningfully and for authentic purposes
- Allows students with a variety of learning styles to demonstrate their acquired knowledge
- Students learn language, content, and skills simultaneously
- Increases learner autonomy
- Provides opportunities for students to pursue their own interests and questions and make decisions about how they will find answers and solve problems.
- Improves education for all students Facilitates student integration of the content of different subjects
- Teaches children to use their own minds well and applies what they learn in school to life-long endeavors.
- Helps students to become technologically literate
- Establishes connections to life outside the classroom, addressing real-world concerns, and developing real-world skills
- Skills learned through PBL are those desired by today's employers.

22. Benefits of PBL

- Offers multiple ways for students to participate and to demonstrate their knowledge.
- Accommodates different kinds of intelligences.
- Shifts students away from doing only what they typically do in a classroom Environment.
- Encourages the mastery of technological tools, thus preparing them for the workforce.
- Serves as a medium for students who don't usually participate.
- Prompts students to collaborate while at the same time support self-directed learning.
- Offers a learning experience that draws on the thinking and shared efforts of several individuals.
- Helps students develop a variety of social skills relating to group work and negotiation.
- Promotes the internalization of concepts, values, and modes of thought, especially those related to cooperation and conflict resolution.
- Establishes a supportive and non-competitive climate for students.
- Provides a means for transferring the responsibility for learning from teachers to students.
- Calls upon students to explain or defend their position to others in their project groups, so that learning is more apt to be personalized and valued.

23. Process

- Project batches will be formed after the commencement of 3rd semester.
- The Students Batch Comprising of 4 members in a batch should be formed by the Project Based Learning co-ordinator.
- Each Semester consists of 16 Weeks of Project based Learning.
- The Level of the Projects to be identified.

  Level 1- 2nd Year – 3rd Semester & 4th Semester

  Level 2- 3rd year – 5th Semester & 6th Semester

  Level 3 – Final Year Project
- The Faculty handling the respective Theory Subject will be the PBL Coordinator and all the three Batches to be handled by the PBL Coordinator with additional faculty.
- The List of Project Batches to be identified by the faculty assigned in consultation with HOD.
- The batch can select any topic from the list circulated by the PBL Coordinator
- The details of students Interaction with the guide shall be maintained by the guide in the prescribed format.

- The Students Project should be continuously evaluated and PBL Coordinator should submit weekly report to the HOD.
- The Rubrics for the PBL should be followed.
- The Students batches shall give the presentation on understanding of the topic and plan for implementation.
- The Evaluation of the Projects is done in Two Phases

7.1 Two phases for Assessment

Phase 1:

1. Phase 1 is for 4 weeks

2**.** During this phase, the students shall discuss about the Objectives, Literature Survey and plan for project execution.

Phase 2:

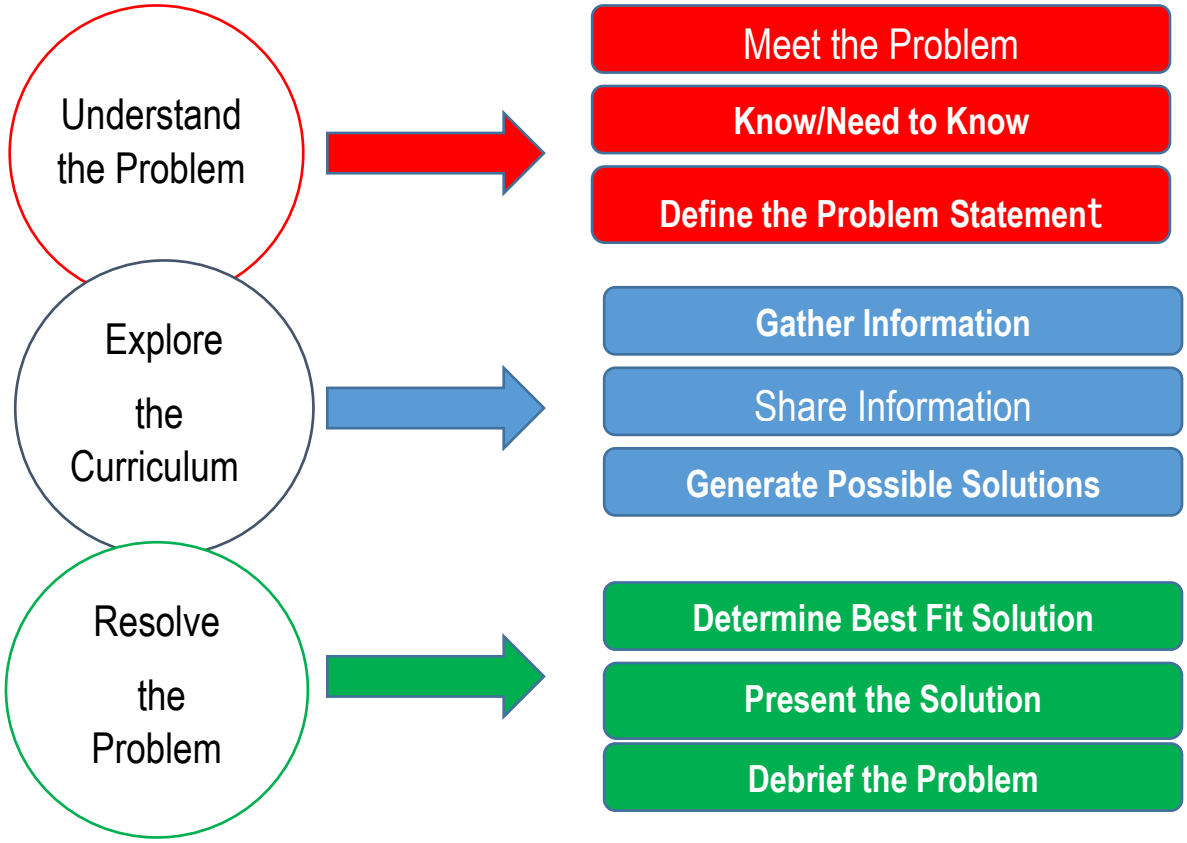
1. Phase 2 is for 11 Weeks

2**.** During this phase, the students shall carry out the project under regular supervision of the guide/subject expert, Implementation and give final presentation/demonstration with project documents.

The marks distribution for PBL Work:

4. Phase 1 – 25 Marks
5. Phase 2 – 25 Marks

24. PBL Teaching and Learning Template



25. Practice

- Every week 3 hour is exclusively dedicated to Project Based Learning.
- Assess their progress until they resolve the problem and summarise their learning.
- Provide opportunities for in-depth investigations of worthy topics.
- Allow learners to become more autonomous as they construct personally-meaningful artefacts that are representations of their learning.
- Motivate students by engaging them in their own learning. PBL affords students opportunities for development.
- Building communication, technical and management skills.

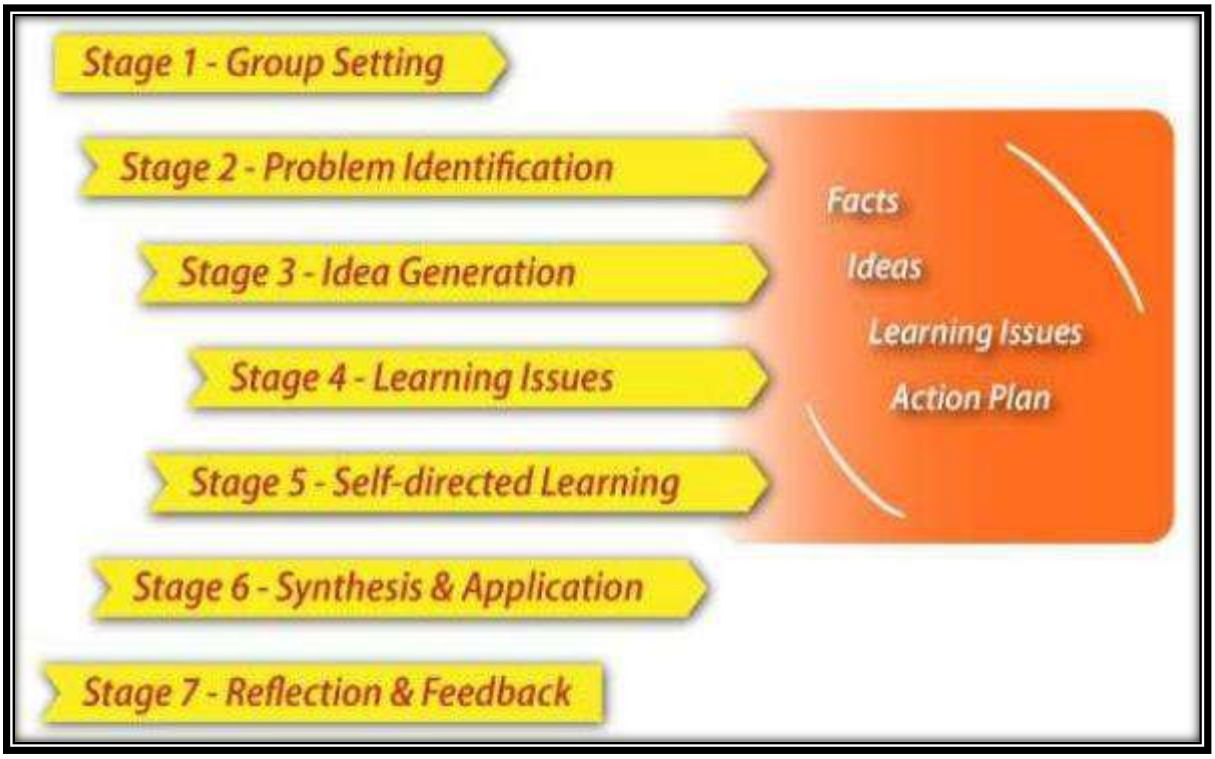
26. Obstacles/Gaps

- Lack of student's interest
- Lack of assessment
- Lack of Basic knowledge
- Lack of consistence attendance and monitoring.
- Lack of abundant time allotment and time management

27. How to Overcome?

- Periodic process – stage wise assessment has to be done.
- Basic Knowledge- A complete guidelines and videos will be provided by the faculty who is handling the respective subject and allotted guide.
- Regular evaluation and periodic monitoring is done by 2 stages.
- For Successful execution and demonstration of end-to-end system, exclusive 3hr/week project time is allotted.

28. Block diagram of PBL



29. Impact Analysis

- It encourages students to draw on their own creativity on problem solving and they learn the bridge gap between theory and practice.
- Final products resulting from project-based learning can be shared with the department at large, thus fostering ownership and technically strong with the subject scenario.

30. PBL – Guidelines

The guidelines are for successful completion of the project and to facilitate effective and uniform conduction of projects by the students. It is expected that these guidelines will help in overall improvement in the quality of the project.

14.1 Main phases of the project

Sl.No	Topics	Duration
Phase-1		
1.	Understanding of the project and preparing a project plan	**3 Weeks**
2.	Literature review	**1 Week**
6.	Planning	**1 Week**
Phase-2		
4.	Analysis and Design	**3 Weeks**
5.	Implementation	**6 Weeks**
6.	Testing	**1 Week**
7.	Writing the project report	**1 Week**
	Total	**16 Weeks**

14.2 Final Presentation Structure

10. Title of the project & Batch Information
11. Agenda / Topics
12. Problem Statement / Project Definition
13. Background / Literature Review
14. Methodology
15. Analysis and Design
16. Implementation
17. Testing
18. Conclusion and Scope for Future Works

14.3 Project Based Learning Report Structure

17. Cover Page
18. Certificate
19. Declaration
20. Acknowledgement
21. Table of Contents
22. List of Tables
23. List of Figures
24. Introduction
25. Background / Literature Review
26. Methodology / Solution
27. Analysis and Design
28. Implementation
29. Results
30. Conclusion and Future Works
31. Bibliography / References
32. Appendices

31. Guidelines to prepare the Project report

- Project reports should be typed neatly only on one side of the paper with 1.5 or double line spacing on a A4 size bond paper (210 x 297 mm).
- The margins should be: Left – 1.25", Right – 1", Top and Bottom – 0.75".
- The total number of reports to be prepared are
    - One copy to the department.
    - One copy to the concerned guide
    - One copy to the candidate.
- Before taking the final printout, the approval of the concerned guide is mandatory and suggested corrections, if any, must be incorporated in the Final Report.
- For making copies dry tone Xerox is suggested.
- An abstract (synopsis) not exceeding 100 words, indicating salient features of the work.

32. Outcome of the project

- Students will gain the knowledge and understand
- To think creatively, work collaboratively.
- Solve complex problems using digital technology.
- Students learn and desire to engage continuous gain about knowledge such as design, analysis, development, implementation and testing.
- Strong written communication skills and the ability to write technical documents that include specification, design, and implementation of a mini project.

Project - Based Learning Rubric

Score Levels	Content	Conventions	Organization	Presentation
5	▪ Is well thought out and supports the solution to the challenge or question ▪ Reflects application of critical thinking ▪ Has clear goal that is related to the topic ▪ Is pulled from a variety of sources ▪ Is accurate	▪ No spelling, grammatical, or punctuation errors ▪ High-level use of vocabulary and word choice	▪ Information is clearly focused in an organized and thoughtful manner. ▪ Information is constructed in a logical pattern to support the solution.	▪ Multimedia is used to clarify and illustrate the main points. ▪ Format enhances the content. ▪ Presentation captures audience attention. ▪ Presentation is organized and well laid out.
4	▪ Is well thought out and supports the solution ▪ Has application of critical thinking that is apparent ▪ Has clear goal that is related to the topic ▪ Is pulled from several sources ▪ Is accurate	▪ Few (1 to 3) spelling, grammatical, or punctuation errors ▪ Good use of vocabulary and word choice	▪ Information supports the solution to the challenge or question.	▪ Multimedia is used to illustrate the main points. ▪ Format is appropriate for the content. ▪ Presentation captures audience attention. ▪ Presentation is well organized.
3	▪ Supports the solution ▪ Has application of critical thinking that is apparent ▪ Has no clear goal ▪ Is pulled from a limited number of sources	▪ Minimal (3 to 5) spelling, grammatical, or punctuation errors ▪ Low-level use of vocabulary and word choice	▪ Project has a focus but might stray from it at times. ▪ Information appears to have a pattern, but the pattern is not consistently	▪ Multimedia loosely illustrates the main points. ▪ Format does not suit the content. ▪ Presentation does not capture audience attention.

2	▪ Provides inconsistent information for solution ▪ Has no apparent application of critical thinking ▪ Has no clear goal ▪ Is pulled from few sources ▪ Has significant factual errors, misconceptions, or misinterpretations	▪ More than 5 spelling, grammatical, or punctuation errors ▪ Poor use of vocabulary and word choice	▪ Content is unfocused and haphazard. ▪ Information does not support the solution to the challenge or question. ▪ Information has no apparent pattern.	▪ Presentation appears sloppy and/or unfinished. ▪ Multimedia is overused or underused. ▪ Format does not enhance content. ▪ Presentation has no clear organization.

Subject Identified for Project Based Learning

Semester	
Subject Identified for PBL	
Prerequisite	
Justification for the selected subject	
List of possible projects	

Signature of the Guide **Signature of HOD**

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**IV**				
Course Title	:	**Project Based Learning**				
Course Code	:	**23CEAE48**				
Course Type (Theory/ Practical/ Integrated)	:	**Integrated**				
Category	:	**PBL**				
Stream	:	**CIVIL**		**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**0-0-1-0**		**SEE**	:	**50**
Total Hours	:	**15**		**SEE Duration**	:	**1 1/2**
Credits	:	**01**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	Understand the importance of project to enhance team building & combining varied skills into one work
2	Knowing concept of basic problem solving skills
3	Developing ability to assess given problem in relevance to existing process and available tools for evolving a solution
4	Mentoring student to provide a feasible solution to societal problem in an amicable method / process

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
- Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.
- Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

DSATM

Scheme of Teaching and Examinations for BE Programme -2024-25

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2024-25)

COURSE CURRICULUM

Module No.	Topics	Hours
1	Excel based: **Entering level readings; Arrive at the amount of earth Work involved for an embankment / cutting: Segregating the Quantity of particular work:**	4
Pedagogy	**Hands on training: Video presentation of a completed project**	
2	Excel based: **calculation of soil properties based on experimental values obtained; Liquid limit, Plastic limit, OMC, Shear strength,**	3
Pedagogy	**Demonstration by a student on thumb rules to be adopted for easier approach while entry / grouping & extracting data for**	
3	Total Station based: **[1] Calculating area of land bound by irregular shaped boundary [2] knowing contours of the land area [3] Determining the extent of land fill or cut for a given Reference RL [4] contour map preparations [5] Determining the extent of land mass submerged, Route deviation**	4
Pedagogy	**Making students to use field data collected during Extensive survey for the validation work & cross check work**	
4	**Manual Drawing:** commercial building development and plan, using sketch book & then bringing out CAD drawing, Elevation, Cross section	2
Pedagogy	**Case study with inputs from an industry person**	
5	ETAB Based: **[1] Getting the SFD & BMD for a given load [2] Validating manual design with S/W based design for the given in put.** [3] **Designing a structure for the given loading & field constraints through E-tabs**	4
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process	

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	Understand the importance of project to enhance team building & combining varied skills into one work	Understand	L1/L2
CO2	Apply the concept of basic problem solving skills	Apply	L3
CO3	Analyse / Assess the problem in relevance to existing process and available tools for evolving a solution	Analyse	L4
CO4	Design and Create a feasible solution to societal problem in an amicable method / process	Create	L5

Assessment Details (both CIE and SEE)

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	
2	
Reference Books	
1	
2	

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation(CIE):

Two Unit Tests each of 15 Marks (duration 1.5 hour) from module 1. First test after the completion of 30-40 % of the syllabus and Second test after completion of 80-90% of the module 1 syllabus One improvement test before the closing of the academic term may be conducted if necessary. However best two tests out of three shall be taken into consideration Students has to submit two assignments of 10 marks each.

One Unit Test will be conducted for the laboratory component at the end of semester. Fourty percentage weightage is given for the test and 60 percentage weightage is given for record.

The teacher has to plan the assignments and get them completed by the students well before the closing of the term so that marks entry in the examination portal shall be done in time. Formative (Successive) Assessments include

Assignments/Quizzes/Seminars/ Course projects/Field surveys/ Case studies/ Hands-on practice (experiments)/Group Discussions/ others. The Teachers shall choose the types of assignments depending on the requirement of the course and plan to attain the Cos and POs. (to have a less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course). CIE methods /test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

The sum of two tests, two assignments, laboratory internals , laboratory record will be out of 100 marks and will be scaled down to 50 marks

Semester End Examination(SEE):

SEE will be conducted by University as per the scheduled timetable as laboratory component in batches, with common question papers for each batch. The question paper shall be set for 100 marks. The medium of the question paper shall be English. The duration of SEE is 03 hours. The question paper will have two parts of equal weightage. The students have to answer one full question out of two full question from each part. Questions may have sub questions.

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	*													*	
CO2	*		*												*
CO3			*				*							*	
CO4			*		*			*							*
CO5															

Weblinks and Video Lectures (e-Resources)	
1	
2	
3	
4	

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory			
	Continuous Assessment Tests (IAT)		Continuous Comprehensive Assessment (CCA)	
	IAT-1	IAT-2	CCA-1	CCA-2
	50 Marks	50 Marks	50 Marks	50 Marks
Remember	5	5		
Understand	5	5		
Apply	5	5		
Analyse	5	5		
Evaluate			20	20
Create	30	30	30	30

CIE Course Assessment Plan:

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module 2 to 2.5	Module-2.5 to 3	Module-4	Module-5		
CO1	10	10					20	20%
CO2		10	10		10	10	40	40%
CO3		10		10	10	10	40	40%
CO4								
CO5								
Total	10	20	10	10	20	20		100%

Project Based Learning - Batch

From, **Date:**

Name: & USN:

Name: & USN:

Name: & USN:

Name: & USN:

Semester:

Respected Sir/Madam,

Sub: Regarding PBL Batch

With respect to the above subject, we are the students mentioned above would like to form the batch for carrying out the mini project on……

Thanking you, Yours faithfully

Sl. No.	Name of the student	Signature
1.		
2.		
3.		
4.		

Signature of the Guide

Name of the Guide Designation

Department of ……. Engineering

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Project Based Learning – Student(s) – Guide – Interaction

Date		
PBL Batch No.		
Title of the project		
Week No.		
Content of the Discussion		
Suggestion by the guide		
Name of Signature of students		

Signature of the Guide **Signature of PBL Coordinator** **Signature of HOD**

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Project Based Learning – Continuous Evaluation

Batch No.	Name	USN	Marks assigned	Remarks by the guide on the progress of the project

Signature of the Guide Signature of PBL Coordinator

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OD

Project Based Learning – Review

CONTINIOUS INTERNAL ASSESSMNET							
Batch No.	Name of the Student	USN	**Phase I (25 Marks)**		**Phase II (25 Marks)**		**Final CIE Marks (Phase I & Phase II) (50 Marks)**
			Abstract / Understanding of the Project (5 Marks)	Analysis & Design (20 Marks)	Implementation (20 Marks)	Demonstration (5 Marks)	

Project Based Learning Outcomes

Sl.No	Batch No.	Name of Students	USN	Domain	Outcomes

SOCIAL CONNECT
&
RESPONSIBILITY (SCR)

SCR- Social Connect & Responsibility

Teaching Hours/Week (L: T: P: S)	0:0:0:2
Total Hours of Pedagogy	40 hour Practical Session +15 hour Planning
Credits:	01
Programs / Experiments	12
CIE Marks	100
SEE Marks	------
Total Marks	100
Exam Hours	3
Examination nature (SEE)	No SEE only CIE For CIE Assessment - Activities Report Evaluation by College NSS Officer / HOD / Sports Dept / Any Dept.

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Semester	:	**IV**				
Course Title	:	**Universal Human Values**				
Course Code	:	**23CCNC39**				
Course Type (Theory/ Practical/ Integrated)	:	**Integrated**				
Category	:	**SCR**				
Stream	:			**CIE**	:	**50**
Teaching hours/ week (L:T:P:S)	:	**1-0-0-0**		**SEE**	:	**50**
Total Hours	:	**15**		**SEE Duration**	:	**1 1/2**
Credits	:	**1**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	Provide a formal platform for students to communicate and connect to the surrounding.
2	create a responsible connection with the society.
3	Understand the community in general in which they work.
4	Identify the needs and problems of the community and involve them in problem –solving.
5	Develop among themselves a sense of social & civic responsibility & utilize their knowledge in finding practical solutions to individual and community problems.
6	Develop competence required for group-living and sharing of responsibilities & gain skills in mobilizing community participation to acquire leadership qualities and democratic attitudes

Teaching-Learning Process

General Instructions - Pedagogy :

These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.

- In addition to the traditional lecture method, different types of innovative teaching methods may be adopted so that the activities will develop students' theoretical and applied social and cultural skills.
- State the need for activities and its present relevance in the society and Provide real-life examples.
- Support and guide the students for self-planned activities.
- You will also be responsible for assigning homework, grading assignments and quizzes, and documenting students' progress in real activities in the field.
- Encourage the students for group work to improve their creative and analytical skills

DSATM

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COURSE CURRICULUM

Contents :

The course is mainly activity-based that will offer a set of activities for the student that enables them to connect with fellow human beings, nature, society, and the world at large.

The course will engage students for interactive sessions, open mic, reading group, storytelling sessions, and semester-long activities conducted by faculty mentors.

In the following a set of activities planned for the course have been listed:

Module No.	Topics	Hours
1	**Part I:** **Plantation and adoption of a tree:** Plantation of a tree that will be adopted for four years by a group of BE / B.Tech students. (ONE STUDENT ONE TREE) They will also make an excerpt either as a documentary or a photo blog describing the plant's origin, its usage in daily life, its appearance in folklore and literature - – Objectives, Visit, case study, report, outcomes.	4
Pedagogy		
2	**Part II :** **Heritage walk and crafts corner:** Heritage tour, knowing the history and culture of the city, connecting to people around through their history, knowing the city and its craftsman, photo blog and documentary on evolution and practice of various craft forms - – Objectives,Visit, case study, report, outcomes.	2
Pedagogy		
3	**Part III :** **Organic farming and waste management:** Usefulness of organic farming, wet waste management in neighboring villages, and implementation in the campus –Objectives,Visit, case study, report, outcomes.	3
Pedagogy		
4	**Part IV:** **Water conservation:** Knowing the present practices in the surrounding villages and implementation in the campus, documentary or photoblog presenting the current practices – Objectives, Visit, case study, report, outcomes.	3
Pedagogy		

5	**Part V :** **Food walk:** City's culinary practices, food lore, and indigenous materials of the region used in cooking – Objectives, Visit, case study,report, outcomes.	**3**
	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process	

Text Books	
Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	
2	
Reference Books	
1	
2	

Course Outcomes: At the end of the course, the student will be able to:

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	Communicate and connect to the surrounding.		
CO2	Create a responsible connection with the society.		
CO3	Involve in the community in general in which they work.		
CO4	Notice the needs and problems of the community and involve them in problem –solving.		
CO5	Develop among themselves a sense of social & civic responsibility & utilize their knowledge		

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															

Activities:

Jamming session, open mic, and poetry: Platform to connect to others. Share the stories with others. Share the experience of Social Connect. Exhibit the talent like playing instruments, singing, one-act play, art-painting, and fine art.

PEDAGOGY:

The pedagogy will include interactive lectures, inspiring guest talks, field visits, social immersion, and a course project. Applying and synthesizing information from these sources to define the social problem to address and take up the solution as the course project, with your group. Social immersionwith NGOs/social sections will be a key part of the course. Will all lead to the course project that will address the needs of the social sector?

COURSE TOPICS:

The course will introduce social context and various players in the social space, and present approaches to discovering and understanding social needs. Social immersion and inspiring conversional will culminate in developing an actual, idea for problem-based intervention, based on an in-depth understanding of a key social problem.

Duration :

A total of 40 - 50 hrs engagement per semester is required for the 3rd semester of the B.E. /B.Tech. program. The students will be divided into groups. Each group will be handled by faculty mentor. Faculty mentor will design the activities (particularly Jamming sessions open mic ,and poetry) Faculty mentors has to design the evaluation system as per guidelines of scheme & syllabus.

Continuous Internal Evaluation (CIE):

- After completion of the course, the student shall prepare, with daily diary as reference, a comprehensive report in consultation with the mentor/s to indicate what he has observed and learned in the social connect period.
- The report should be signed by the mentor.
- The report shall be evaluated on the basis of the following criteria and/or other relevant criteria pertaining to the activity completed. Marks allotted for the diary are out of 50.
- Planning and scheduling the social connect Information/Data collected during the social connect Analysis of the information/data and report writing
- Considering all above points allotting the marks as mentioned below

Excellent	: 80 to 100
Good	: 60 to 79
Satisfactory	: 40 to 59
Unsatisfactory and fail: <39	

Pedagogy – Guidelines:

It may differ depending on local resources available for the study as well as environment and climatic differences, location and time of execution.

Sl.No	Topic	Group size	Location	Activity execution	Reporting	Evaluation Of the Topic
1.	Plantation and adoption of a tree:	May be individual or team	Farmers land/ parks / Villages / roadside/ community area / College campus etc….	Site selection /proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics of scheme and syllabus by Faculty
2.	Heritage walk and crafts corner:	May be individual or team	Temples / monumental places / Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	Site selection /proper consultation/Contin uous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics of scheme and syllabus by Faculty
3.	Organic farming and waste management:	May be individual or team	Farmers land / parks / Villages visits / roadside/ community area / College campus etc….	Group selection / proper consultation / Continuous monitoring / Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics of scheme and syllabus by Faculty
4.	Water conservation: & conservation techniques	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers / campus etc…..	Site selection / proper consultation/Contin uous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics of scheme and syllabus by Faculty
5.	Food walk: Practices in societ	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/ Governme nt Schemes officers/ campus etc…	Group selection / proper consultation / Continuous monitoring / Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics of scheme and syllabus by Faculty

1 Credit Course – Practical + Planning

Assessment Details (both CIE and SEE)

NO SEE – Semester End Exam – Completely Practical and activities based evaluation

Plan of Action (Execution of Activities)	
Sl.No	**Practice Session Description**
1.	Lecture session in field to start activities
2.	Students Presentation on Ideas
3.	Commencement of activity and its progress
4.	Execution of Activity
5.	Execution of Activity
6.	Execution of Activity
7.	Execution of Activity
8.	Case study-based Assessment, Individual performance
9.	Sector/ Team wise study and its consolidation
10.	Video based seminar for 10 minutes by each student At the end of semester with Report.

- Each student should do activities according to the scheme and syllabus.
- At the end of semester student performance has to be evaluated by the faculty for the assigned activity progress and its completion.
- At last consolidated report of all activities from 1st to 5th, compiled report should be submitted as per the instructions and scheme.

Assessment Details for CIE (both CIE and SEE)

Weightage	**CIE – 100%**	• Implementation strategies of the project (NSS work). • The last report should be signed by NSS Officer, the HOD and principal. • At last report should be evaluated by the NSS officer of the institute.
Field Visit, Plan, Discussion	10 Marks	
Commencement of activities and its progress	20 Marks	
Case study-based Assessment Individual performance with report	20 Marks	
Sector wise study & its consolidation 5*5 = 25	25 Marks	
Video based seminar for 10 minutes by each student At the end of semester with Report. Activities 1 to 5, 5*5 = 25	25 Marks	
Total marks for the course in each semester	100 Marks	
For each activity, 20 marks CIE will be evaluated for IA marks at the end of semester, Report and assessment copy should be made available in the department.		
Students should present the progress of the activities as per the schedule in the prescribed practical session in the field. There should be positive progress in the vertical order for the benefit of society in general through activities.		

Course - Skills Mapping Table

3rd Semester					
Sl.No	**Name of the Course**	**Course Code**	**Course Type**	**Course Category**	**Skills attained by the students**
1	Strength of materials	23CVSM31	**Integrated**	**IPCC**	**Analysis & Design for Axial, bending & torsion. Material identification related to stiffness & strength. E-Tabs software, psycho-motor skills to validate knowledge based cognitive skills.**
2	Engineering survey	23CVES32	**Integrated**	**IPCC**	**Gain total knowledge on modern tools for data collection; Application of each tool based on field / type of data required**
3	Fluid mechanics	23CVFM33	**Theory**	**PCC**	**Assessing fluid properties at varied pressure / field condition; Device process to manage water power**
4	Building planning & drawing	23CVBD34	**Theory**	**PCC**	**Skill of viewing building in totality; Developing aesthetic elevation; managing available space for optimum utility:**
5	Digital surveying	23CVSL35	**Laboratory**	**IPCCL**	**Handle advanced data collection equipment, knowledge of data collection in precise manner through digital platform**
6	Building materials & Elements of structure	23CVEC36	**Theory**	**ESC**	**Knowing different materials required for a building & their alternates for sustainability; Concept / function of each element in a structure**
7	Social connect and responsibility	23CCSR37	**Practical**	**SCR**	**Skills of getting connected to society knowing roles & responsibility as citizen to give back for its over all development through individual participation**
8	Personality development & soft skills for civil engineers	23CVAE38	**Project based**	**AEC-PBL**	**Team work required for construction works; Data storing, Consolidating for presentation & billing:Problem anticipating & solving skills;Psychometric Analysis for cognitive skills**

4th Semester					
Sl.No	**Name of the Course**	**Course Code**	**Course Type**	**Course Category**	**Skills attained by the students**
1	Analysis of structures	23CVAS41	Integrated	IPCC	Assess deflection of a given structure for field loading conditions
2	Geo technical engineering -I	23CVGT42	Integrated	IPCC	Capable of analysing given soil sample for its suitability to take on a proposed building load; Develop & site specific solutions to problematic soil
3	Transportation engineering-I	23CVTE43	Theory	PCC	Knowledge of Different types of Highways; Can design geometric element; Pavement Identification; Runway orientation design
4	Water supply & conservation	23CVWS44	Theory	PCC	Skill-4(mention the Skills attained)
5	Construction materials testing Laboratory	23CVML45	Laboratory	IPCCL	Ability to evaluate quality of materials supplied to site & mapping the site requirement ; Design a mix for expected strength for the available materials
6	Concrete material science	23CVES46	Theory	ESC	Knowledge of essential properties of a construction material;Quality check process.
7	Universal human values -2	23CCHV47	Practical	SCR	Skills for dealing with people having different approach; convincing techniques essential while dealing with clients
8	Mini project – civil engineering fundamentals	23CEAE48	Project based	AEC-PBL	Attributing concepts learnt in 3rd & 4th semester for an application / product / process / method orinted towards making construction simple / easy / feasible / customer friendly

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Student - Skills Mapping Table

Sl.No	Name of the Student	USN	3rd Semester				4th Semester			
			Skill-1	Skill-2	Skill-3	Skill-4	Skill-1	Skill-2	Skill-3	Skill-4
			Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
			Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
			Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
			Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
			Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
			Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
			Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
			Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
			Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
			Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
			Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
			Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
			Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
			Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
			Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No