Criteria-2: Teaching Learning and Evaluation

2.6.1 Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the institution are stated and displayed on website and attainment of POs and COs are evaluated

INDEX

Department of Civil Engineering

2.6.1.1 PROGRAM OUTCOME STATEMENTS	
PO No.	**Statements**
PO1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**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.
PO4	**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.
PO5	**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.
PO6	**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.
PO7	**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.
PO8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**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.
PO11	**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.
PO12	**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.

2.6.1.1 Course outcomes of all courses (A.Y. 2022-23)			
Second Year-I			
Course no.		**Course code**	**Course name**
301		**BTBS301**	Engineering Mathematics – III
COs	After the successful completion of this course student will be able to:		
1	Find Laplace and Inverse Laplace Transforms of elementary functions by applying suitable property and/or suitable method.		
2	Write the Fourier Integral of elementary functions by applying suitable formula also problems related to Fourier transforms to domain specific problems.		
3	Formulate Partial Differential Equations by eliminating arbitrary constants and functions from system arises in respective domain, also solve them using appropriate technique.		
4	Check the Analyticity of given function and use its other properties as and when required, construct analytic function using suitable technique.		
5	Perform contour integration of complex functions by using suitable technique.		
Course no.		**Course code**	**Course name**
302		**BTCVES302**	**Mechanics of Solids**
COs	After the successful completion of this course student will be able to:		
1	Perform the stress-strain analysis.		
2	Draw force distribution diagrams for members and determinate beams.		
3	Visualize force deformation behavior of bodies.		
4	Perform failure analysis		
Course no.		**Course code**	**Course name**
303		**BTCVC303**	**Building Construction & Drawing**
COs	After the successful completion of this course student will be able to:		
1	Understand types of masonry structures		
2	Comprehend components and building and their purpose		
3	Draw plan , section and elevation of various structures		
4	Apply the principles of planning and byelaws used for building planning		
5	Prepare detailed working drawing for doors and windows		
Course no.		**Course code**	**Course name**
304		**BTCVC304**	**Hydraulics -I**
COs	After the successful completion of this course student will be able to:		
1	Determine the properties of fluids & pressure and their measurements.		
2	Calibrate the various flow measuring devices.		
3	Visualize the fluid flow phenomena, observed in civil engineering system.		

4	Understand, apply & analyse dimensional analysis, dimensionless number & model studies.
5	Understand fundamentals of pipe flow, losses in pipes & analysis of pipe network.

Course no.	**Course code**	**Course name**
305	**BTCVC305**	**Surveying**

COs	After the successful completion of this course student will be able to:
1	Understand the importance of surveying in the field of civil engineering
2	Perform the basics of linear/angular measurement methods like chain surveying, compass surveying
3	Perform plane table surveying
4	Perform the levelling and theodolite survey in elevation and angular measurements.

Course no.	**Course code**	**Course name**
306	**BTHM306**	**Soft Skill Development**

COs	After the successful completion of this course student will be able to:
1	Acquire interpersonal communication skills.
2	Develop the ability to work independently.
3	Develop the qualities like self-discipline, self-criticism and self-management.
4	Have the qualities of time management and discipline.
5	Present themselves as an inspiration for others

Course no.	**Course code**	**Course name**
307	**BTCVL 307**	**Solid Mechanics Laboratory**

COs	After the successful completion of this course student will be able to:
1	Evaluate Young Modulus, torsional strength, hardness and tensile strength of given specimens.
2	Determine the strength of coarse aggregates.
3	Find the compressive strength of concrete cubes and bricks.
4	Determine physical properties of given coarse aggregates, fine aggregates and cement samples.

Course no.	**Course code**	**Course name**
308	**BTCVL 308**	**Hydraulics-I Laboratory**

COs	After the successful completion of this course student will be able to:
1	Analyze the properties of fluids and their verification.
2	Predict empirical behavior of fluids.
3	Apply principles of hydraulics while working in field
4	Understand fundamental of pipe flow and losses in pipe.

Course no.	**Course code**	**Course name**

309	**BTCVL 309**	**Surveying Laboratory**
COs	After the successful completion of this course student will be able to:	
1	Use the theodolite along with chain/tape, compass on the field.	
2	Apply geometric and trigonometric principles of basic surveying calculation	
3	Plan a survey, taking accurate measurements, field booking, and adjustment of errors.	
	Apply field procedures in basic types of surveys, as part of a surveying team.	
	Employ drawing techniques in the development of a topographic map.	
Course no.	**Course code**	**Course name**
310	**BTES210P**	**Internship –I Evaluation**
COs	After the successful completion of this course student will be able to:	
1	Enhance the skills and exposure to field practices.	
2	Write report internship activity.	
3	Enhance presentation skills	
Second Year-II		
Course no.	**Course code**	**Course name**
401	**BTCVC401**	**Building Planning and Drawing**
COs	After the successful completion of this course student will be able to:	
1	Plan buildings considering various principles of planning and bye laws of governing body	
2	Comprehend various utility requirements in buildings	
3	Understand various techniques for good acoustics	
Course no.	**Course code**	**Course name**
402	**BTCVC402**	**Environmental Engineering**
COs	After the successful completion of this course student will be able to:	
1	Apply the water treatment concepts and methods.	
2	Prepare basic process designs of water and wastewater treatment plants.	
3	Apply the wastewater treatment concepts and methods..	
4	Apply the solid waste management concepts.	
5	Analyze the concentration of air pollutants and adopt various measures to control it.	
Course no.	**Course code**	**Course name**
403	**BTCVC401**	**Building Planning and Drawing**
COs	After the successful completion of this course student will be able to:	
1	Plan buildings considering various principles of planning and byelaw of governing body.	

2	Comprehend various utility requirements in buildings	
3	Understand various techniques for good acoustics.	
Course no.	**Course code**	**Course name**
404	**BTCVC404**	**Water Resources Engineering**
COs	After the successful completion of this course student will be able to:	
1	Understand need of Irrigation in India and water requirement as per farming practice in India.	
2	Understand various irrigation structures and schemes.	
3	Develop basis for design of irrigation schemes.	
Course no.	**Course code**	**Course name**
405	**BTCVC405**	**Hydraulics - II**
COs	After the successful completion of this course student will be able to:	
1	Design open channel sections in a most economical way.	
2	Know about the non-uniform flows in open channel and the characteristics of hydraulic jump.	
3	Understand application of momentum principle of impact of jets on plane & curved plates.	
4	Analyse & evaluate the efficiency of various hydraulic machines-Turbines.	
5	Analyse & evaluate the efficiency of various Pumps.	
Course no.	**Course code**	**Course name**
406	**BTCVC406**	**Engineering Geology**
COs	After the successful completion of this course student will be able to:	
1	Recognize the different land forms which are formed by various geological agents.	
2	Identify the origin, texture and structure of various rocks and physical properties of mineral.	
3	Emphasize distinct geological structures which have influence on the civil engineering structure.	
4	Understand how the various geological conditions affect the design parameters of structures.	
Course no.	**Course code**	**Course name**
407	**BTCVL407**	**Building Planning and CAD Lab.**
COs	After the successful completion of this course student will be able to:	
1	Draw plan, elevation and section of load bearing and framed structures.	
2	Draw plan, elevation and section of public structures.	

Course no.	Course code	Course name
408	BTCVL408	Environmental Engg. Lab.
COs	After the successful completion of this course student will be able to:	
1	Quantify the pollutant concentration in water, wastewater and ambient air.	
2	Recommend the degree of treatment required for the water and wastewater.	
3	Analyze the survival conditions for the microorganism and its growth rate.	
4	Analyze water quality result and compare with BIS standards.	
Course no.	**Course code**	**Course name**
409	BTCVL409	HE-II Lab
COs	After the successful completion of this course student will be able to:	
1	Understand various properties of fluids and measurement techniques	
2	Carry out calibrations of various flow measuring devices.	
3	Understand mechanism of hydraulic jump, various jets and pumps.	
4	Analyze efficiency of various hydraulic machines.	
Course no.	**Course code**	**Course name**
410	BTCVP410	Field Training
COs	After the successful completion of this course student will be able to:	
1	Understand on field engineering	
2	Apply theoretical knowledge on filed	
Third Year-I		
Course no.	**Course code**	**Course name**
501	BTCVC 501	Design of Steel Structures
COs	After the successful completion of this course student will be able to:	
1	Identify and compute the design loads and the stresses developed in the steel member.	
2	Analyze and design the various connections & identify the potential failure modes.	
3	Analyze and design various tension, compression and flexural members.	
4	Understand provisions in relevant BIS Codes.	
Course no.	**Course code**	**Course name**
502	BTCVC 502	Geotechnical Engineering
COs	After the successful completion of this course student will be able to:	
1	Understand different soil properties and behavior.	
2	Understand stresses in soil and permeability and seepage aspects.	
3	Develop ability to take up soil design and foundation by using shear parameters of soil.	
4	Improve the soil by compaction and or consolidation.	
5	Compute lateral earth pressure on the retaining structures.	

Course no.	Course code	Course name
503	BTCVC 503	Structural Mechanics –II

COs	After the successful completion of this course student will be able to:
1	Have a basic understanding of matrix method of analysis and will be able to analyze the determinant structure.
2	Have a basic understanding of the principles and concepts related to finite difference and finite element methods
3	Have a basic understanding of concept of influence line
4	Analyze truss using energy method.

Course no.	Course code	Course name
504	BTCVC 504	Concrete Technology

COs	After the successful completion of this course student will be able to:
1	Understand the various types and properties of ingredients of concrete
2	Understand affect of admixtures on the behaviour of the fresh and hardened concrete
3	Formulate concrete design mix for various grades of concrete

Course no.	Course code	Course name
506	BTCVPE506	Material, Testing and Evaluation

COs	After the successful completion of this course student will be able to:
1	Understand various properties of materials
2	Understand various types of materials used in construction along with their properties
3	Know the concept of composite materials and their application in construction industry
4	Know the new techniques used for construction activity

Course no.	Course code	Course name
507	BTCVES507	Software applications in Civil Engineering

COs	After the successful completion of this course student will be able to:
1	Understand the fundamentals of MS excel.
2	Understand civil engineering software's
3	Apply various software's in specialized works of civil engineering
4	Simplify the tedious calculation.

Course no.	Course code	Course name
508	BTCVL508	SDD of Steel Structures Lab.
COs	After the successful completion of this course student will be able to:	
1	Simulate a practical design requirement in to a theoretical statement to solve mathematically to arrive at a safe economical and realistic feasible solution that can be executed.	
2	Apply the theoretical knowledge in practical's	
3	Impart the software knowledge in practical design consideration.	
4	Enhance the skillsets in structural design applorach.	
Course no.	**Course code**	**Course name**
509	BTCVL509	Geotechnical Engineering Lab
COs	After the successful completion of this course student will be able to:	
1	Determine different Engineering properties of soil	
2	Identify and classify the soil based on standard geotechnical Engineering Practice	
3	Perform laboratory compaction and in place density tests	
4	Perform and interpret direct shear test and estimate shear strength parameters	
Course no.	**Course code**	**Course name**
510	BTCVL510	Concrete Technology Lab.
COs	After the successful completion of this course student will be able to:	
1	Find the Properties of material	
2	Understand various test of concrete	
3	Understand various Instruments related to quality control	
4	Prepare Concrete mix Design	
	Learn various NDT methods used for inspection of concrete	
Course no.	**Course code**	**Course name**
511	BTCVP410	Internship
COs	After the successful completion of this course student will be able to:	
1	Summarize the engineering knowledge.	
2	Conduct investigations of the Engineering problem formulated by using Engineering Sciences.	
3	Design and develop solution(s) for Engineering problem with due consideration to public health, safety, culture, society, environment and sustainability.	
4	Create, select and apply modern tools for investigating, designing and developing solution(s) to engineering problem.	
5	Work as individual and in team for communicating and managing the project work	

	and its fiancés.
6	Apply professional ethics while identifying the problem, investigating the problem, designing a solution to the problem, working as a individual or team for communicating and managing work.
7	Develop ability for independent & life long learning.

Third Year-II		
Course no.	**Course code**	**Course name**
601	**BTCVC601**	**Design of RC Structures**
COs	After the successful completion of this course student will be able to:	
1	Comprehend to the various design philosophies used for design of reinforced concrete.	
2	Analyze and design the reinforced concrete slab using limit state and working state method.	
3	Analyze and design the reinforced concrete beam using limit state and working state method.	
4	Analyze and design the reinforced concrete column using limit state and working state method.	
5		
Course no.	**Course code**	**Course name**
602	**BTCVC602**	**Foundation Engineering**
COs	After the successful completion of this course student will be able to:	
1	To predict soil behavior under the application of loads and come up with appropriate solutions to foundation design queries.	
2	Analyze the stability of slope by theoretical and graphical methods.	
3	Analyze the results of in-situ tests and transform measurements and associated uncertainties into relevant design parameters.	
4	Synthesize the concepts of allowable stress design, appropriate factors of safety, margin of safety, and reliability.	
Course no.	**Course code**	**Course name**
604	**BTCVC604**	**Transportation Engineering**
COs	After the successful completion of this course student will be able to:	
1	Discriminate the studies of highway planning, development, surveys and alignment.	
2	Design the geometric elements of highway	
3	Identify the suitability of appropriate highway materials based on their properties	
4	Interpret the elements of traffic management.	

Course no.	Course code	Course name
605	BTCVPE605	Industrial Waste Treatment

COs	After the successful completion of this course student will be able to:
1	Identify and analyze the characteristics of industrial wastewater
2	Describe pollution effects of disposal of industrial effluent.
3	Identify and design treatment options for industrial handling industrial liquid waste
4	Formulate environmental management plan
5	

Course no.	Course code	Course name
606	BTCVOE606	elective 2

COs	After the successful completion of this course student will be able to:
1	Identify and evaluate the deficiencies if any in the deposits of the given project area.
2	Capable of providing alternative methods to improve its quality so that the structures built on it will be stable and serve the intended purpose.

Course no.	Course code	Course name
607	BTHM607	Indian Constitution

COs	After the successful completion of this course student will be able to:
1	Understand Fundamental Rights and Economic Program
2	Understand Workers and Human Rights
3	Understand Human Rights in Indian Constitution and Law

Course no.	Course code	Course name
608	BTCVL608	SDD of RC Structures Lab.

COs	After the successful completion of this course student will be able to:
1	Analysis g+2 building
2	Design G+2 building
3	Summarize the entire work as report.

Course no.	Course code	Course name
609	BTCVL609	Transportation Engineering Lab

COs	After the successful completion of this course student will be able to:
1	Perform tests on various road construction materials.
2	Perform CBR tests on local soils to determine subgrade properties needed for roadways.
3	Know about the pavement materials & design.
4	Understand the importance of aggregate used in highway constructions.

Course no.	**Course code**	**Course name**
610	**BTCVM610**	**Mini Project**
COs	After the successful completion of this course student will be able to:	
1	Summarize the engineering knowledge.	
2	Conduct investigations of the Engineering problem formulated by using Engineering Sciences.	
3	Design and develop solution(s) for Engineering problem with due consideration to public health, safety, culture, society, environment and sustainability.	
4	Create, select and apply modern tools for investigating, designing and developing solution(s) to engineering problem.	
5	Work as individual and in team for communicating and managing the project work and its fiancés.	
6	Apply professional ethics while identifying the problem, investigating the problem, designing a solution to the problem, working as a individual or team for communicating and managing the project work and its finances.	
7	Develop ability for independent & life long learning.	

Course no.	**Course code**	**Course name**
611	**BTCVP611**	**Field Training**
COs	After the successful completion of this course student will be able to:	
1	Summarize the engineering knowledge.	
2	Conduct investigations of the Engineering problem formulated by using Engineering Sciences.	
3	Design and develop solution(s) for Engineering problem with due consideration to public health, safety, culture, society, environment and sustainability.	
4	Create, select and apply modern tools for investigating, designing and developing solution(s) to engineering problem.	
5	Work as individual and in team for communicating and managing the project work and its fiancés.	
6	Apply professional ethics while identifying the problem, investigating the problem, designing a solution to the problem, working as a individual or team for communicating and managing the project work and its finances.	
7	Develop ability for independent & life long learning.	

Final Year-I		
Course no.	**Course code**	**Course name**
701	**BTCVC701**	**Design of Concrete Structures – II**
COs	After the successful completion of this course student will be able to:	
1	Able to identify the behavior, analyze and design of the beam sections subjected to torsion.	
2	Able to analyze and design of axially and eccentrically loaded column and construct the interaction diagram for them.	
3	Understand various concepts, systems and losses in pre-stressing.	
4	Able to analyze and design the rectangular and symmetrical I-section pre-stressed beam/girders.	
Course no.	**Course code**	**Course name**
702	**BTCVC702**	**Infrastructure Engineering**
COs	After the successful completion of this course student will be able to:	
1	Know about the basics and design of various components of railway engineering	
2	Understand the types and functions of tracks, junctions and railway stations.	
3	Know about the aircraft characteristics, planning and components of airport	
4	Understand the types and components of docks and harbors.	
Course no.	**Course code**	**Course name**
703	**BTCVC703**	**Water Resources Engineering**
COs	After the successful completion of this course student will be able to:	
1	Understand need of Irrigation in India and water requirement as per farming practice in India.	
2	Understand various irrigation structures and schemes.	
3	Develop basis for design of irrigation schemes.	
Course no.	**Course code**	**Course name**
704	**BTCVC704**	**Professional Practices**
COs	After the successful completion of this course student will be able to:	
1	Discuss methods of quantity surveying, costing and valuation.	
2	Facilitate students with concepts of costing and valuation.	
3	Make students familier with the process involved during tendering and contracting.	

Course no.	Course code	Course name
705	BTCVE705D	Limit State Design of Steel Structures

COs	After the successful completion of this course student will be able to:
1	Analyze and design the various connections and identify the potential failure modes
2	Analyze and design the tension members for various failure modes
3	Analyze and design the compression members as strut and columns
4	Analyze and design the various flexural members as laterally supported and unsupported members

Course no.	Course code	Course name
706	BTCVOE706D	Introduction to Earthquake Engineering

COs	After the successful completion of this course student will be able to:
1	Understand geological time scale and physiographic division of India and their geological and characteristics different geological formation in India
2	Perform sub surface exploration and interpret core log.
3	Solve numerical problem based on core drilling and seismic data.
4	Familiar with origin of earthquake, seismic wave and landslide in Deccan trap.

Course no.	Course code	Course name
707	BTCVL707	Design & Drawing of RC & Steel Structures

COs	After the successful completion of this course student will be able to:
1	Simulate a practical design requirement in to a theoretical statement
2	Solve mathematically to arrive at a safe economical and realistic feasible solution that can be executed.

Course no.	Course code	Course name
708	BTCVL708	Professional Practices

COs	After the successful completion of this course student will be able to:
1	Understand the professional practices used in engineering
2	Apply the skills to manage the field problem
3	Identify the different skill sets

Course no.	Course code	Course name
709	BTCVT709	Field Training /Internship/Industrial

COs	After the successful completion of this course student will be able to:
1	Summarize the engineering knowledge.
2	Conduct investigations of the Engineering problem formulated by using Engineering Sciences.
3	Design and develop solution(s) for Engineering problem with due consideration to public health, safety, culture, society, environment and sustainability.
4	Create, select and apply modern tools for investigating, designing and developing solution(s) to engineering problem.
5	Work as individual and in team for communicating and managing the project work and its fiancés.
6	Apply professional ethics while identifying the problem, investigating the problem, designing a solution to the problem, working as a individual or team for communicating and managing work.
7	Develop ability for independent & life long learning.

Course no.	Course code	Course name
710	BTCVS710	Seminar

COs	After the successful completion of this course student will be able to:
1	Conduct investigations of the Engineering problem formulated by using Engineering Sciences.
2	Work as individual and in team for communicating and managing the team work.
3	Apply professional ethics while identifying the problem, investigating the problem, designing a solution to the problem, working as a individual or team for communicating and managing the work.
	Develop ability for independent & life long learning.

Course no.	Course code	Course name
711	BTCVP711	Project Stage-I**

COs	After the successful completion of this course student will be able to:
1	Identify and formulate Engineering problem addressing needs of Industry & Society.
2	Conduct investigations of the Engineering problem formulated by using Engineering Sciences.
3	Design and develop solution(s) for Engineering problem with due consideration to public health, safety, culture, society, environment and sustainability.

4	Create, select and apply modern tools for investigating, designing and developing solution(s) to engineering problem.
5	Work as individual and in team for communicating and managing the project work and its fiancés.
6	Apply professional ethics while identifying the problem, investigating the problem, designing a solution to the problem, working as a individual or team for communicating and managing the project work and its finances.
7	Develop ability for independent & life long learning.

Final Year-II		
Course no.	**Course code**	**Course name**
801	**BTCVSS801A**	**(Self-Study Course) #**
COs	After the successful completion of this course student will be able to:	
1	Characterization of Construction Materials	
2	understand construction materials	
3	application of construction material	
Course no.	**Course code**	**Course name**
803	**BTCEP803**	**Project Stage-II**
COs	After the successful completion of this course student will be able to:	
1	Identify and formulate Engineering problem addressing needs of Industry & Society.	
2	Conduct investigations of the Engineering problem formulated by using Engineering Sciences.	
3	Design and develop solution(s) for Engineering problem with due consideration to public health, safety, culture, society, environment and sustainability.	
4	Create, select and apply modern tools for investigating, designing and developing solution(s) to engineering problem.	
5	Work as individual and in team for communicating and managing the project work and its fiancés.	
6	Apply professional ethics while identifying the problem, investigating the problem, designing a solution to the problem, working as a individual or team for communicating and managing the project work and its finances.	
7	Develop ability for independent & life long learning.	

Department of Civil Engineering

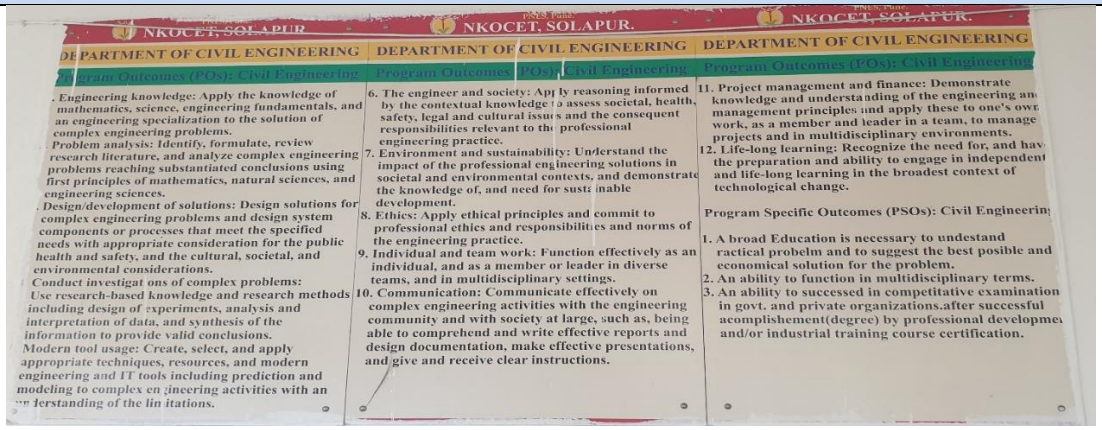
2.6.1.2 Dissemination of POs and Cos

The Program Outcomes & Course Outcomes for the courses offered by the Department is stated and is disseminated through following way:

2.6.1.2.1 Website

Website Link
https://www.orchidengg.ac.in/civil-engineering/#objectives-and-outcomes

2.6.1.2.2 Department Notice Board

Department Notice Board


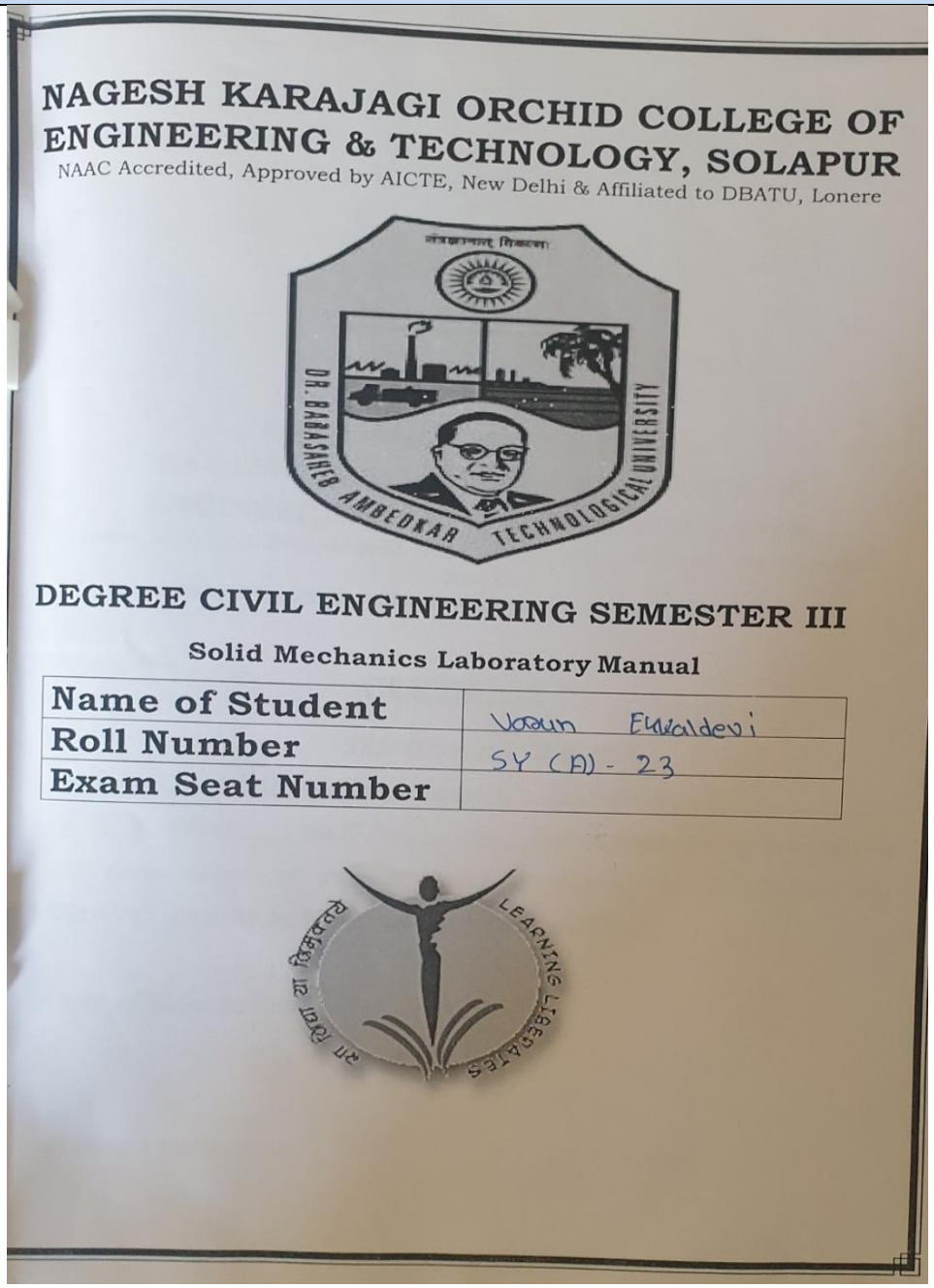
2.6.1.2.2- Photos of notice board showing display of PO & PSOs

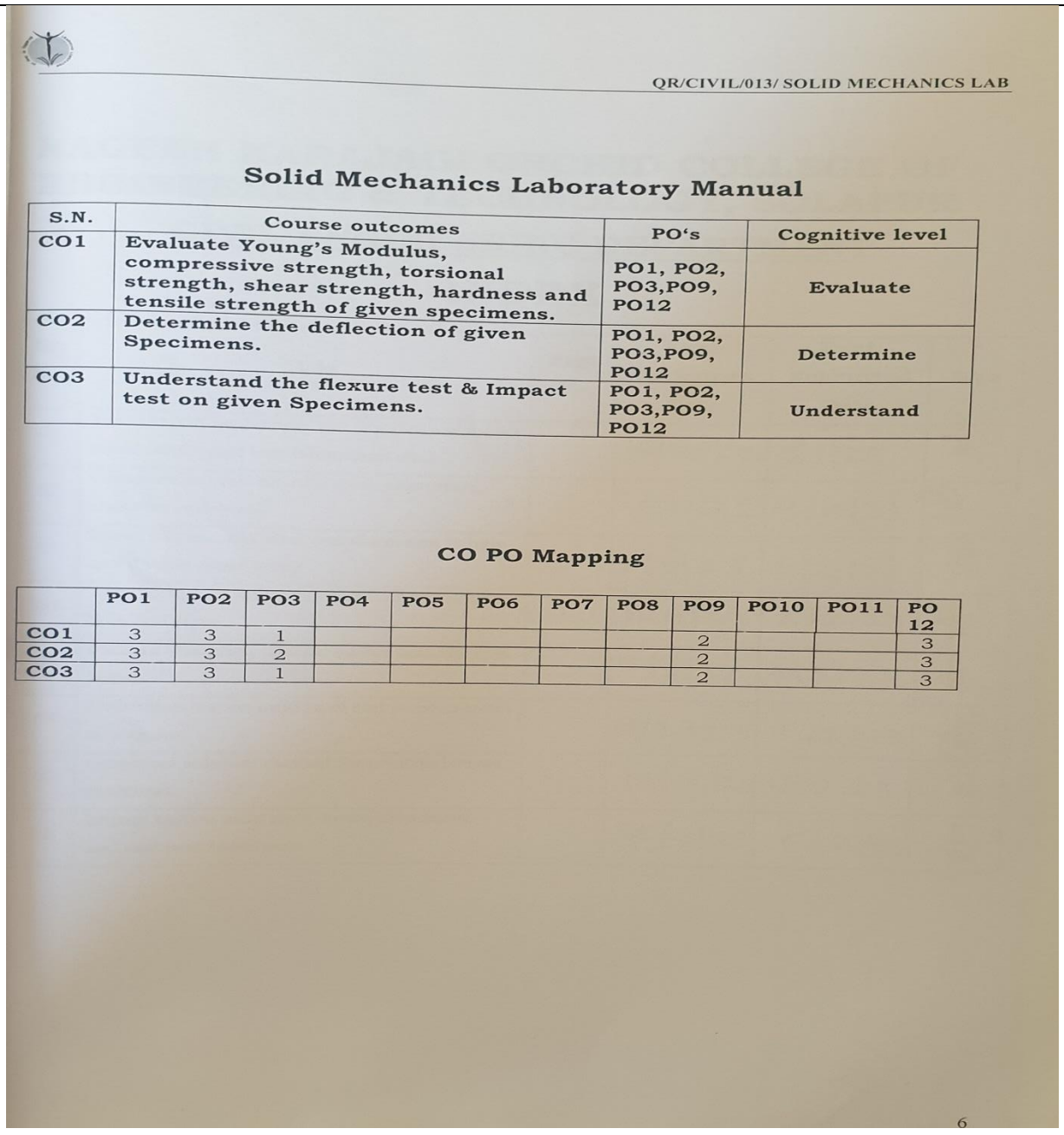
2.6.1.2.3 Orientation Sessions

Orientation Sessions


2.6.a.4- Photos of student Orientation program

2.6.1.2.4 Laboratory Manuals

Laboratory Manuals




QR/CIVIL/013/ SOLID MECHANICS LAB

Solid Mechanics Laboratory Manual

S.N.	Course outcomes	PO's	Cognitive level
CO1	Evaluate Young's Modulus, compressive strength, torsional strength, shear strength, hardness and tensile strength of given specimens.	PO1, PO2, PO3,PO9, PO12	Evaluate
CO2	Determine the deflection of given Specimens.	PO1, PO2, PO3,PO9, PO12	Determine
CO3	Understand the flexure test & Impact test on given Specimens.	PO1, PO2, PO3,PO9, PO12	Understand

CO PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12
CO1	3	3	1						2			3
CO2	3	3	2						2			3
CO3	3	3	1						2			3

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2.6.a.4- Photos of lab manual showing CO-PO

2.6.1.2.5 Question Papers

Question Papers

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE
N.K. ORCHID COLLEGE OF ENGINEERING AND TECHNOLOGY, SOLAPUR

Academic Year 2022-23

Continuous Assessment-1

Course: B. Tech in Civil Engineering — **Sem.: III (Div: A & B)**

Subject Name: Hydraulics-I (BTCVC 304) — **Max. Marks: 20**

Date: 05/01/2023 — **Duration: 1 hr.**

Instructions to the Students:
1) Attempt all questions.
2) Assume suitable data if any.

No.	Questions	Marks	CO	BL
Q.1	Derive expression for Pascal's law. **Or** Derive expression for Hydraulic law.	04	1	Analyze
Q.2	Space between sq. plate parallel to each other is filled with oil. Each size of plate is 48 cm^2, thickness of oil is 15.5 mm, upper plate which moves 6 m/sec requires force of 98 N to maintain speed. Determine dynamic viscosity in poise & kinematic viscosity in stocks. Specific Gravity of oil is 0.8. **Or** Rectangular plane surface 3.2 m wide 4.3 m deep lies in water in such a way that its plane makes an angle 40^0 with free surface. Determine total pressure & height of center of pressure when upper edge is 2.2 m below surface.	06	1	Apply
Q.3	The diameter of pipe at section (1) & (2) are 250 mm & 350 mm respectively. if the velocity of water flowing through pipe at section (1) is 5 m/s. Find discharge through pipe & velocity at section (2). **Or** Determine whether continuity equation is satisfied or not. $u = x^3 - y^3 - z^3$ $v = y^3 - z^3$ $w = -(3x^2z) - (3y^2z) + (\frac{z^3}{3})$	04	2	Apply
Q.4	Derive continuity equation in 3-dimensions. **Or** Determine total acceleration at point (3, 2, 4) for following velocity equation: $V = [(x^2y)\,i + (y^2z)\,j - (2xyz + yz^2)\,k]$	06	2	Analyze Apply

2.6.a.5- Photos of question paper showing CO