

CRITERION 3	COURSE OUTCOMES AND PROGRAM OUTCOMES	Max. Marks: 175 Claimed: 175
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3.1 CORRELATION BETWEEN THE COURSES AND THE PROGRAM OUTCOMES (POs) AND PROGRAM SPECIFIC OUTCOMES (PSOs) (25) Claimed:25

The Program Outcomes (POs) and Program Specific Outcomes (PSOs) are The COs are published on the department website and notice boards. The following are the POs and PSOs:

Program Specific Outcomes (PSOs):

PO1: Engineering Knowledge

To apply the basic knowledge of contemporary science and technology along with civil engineering fundamentals and essential computational techniques/procedures that aid in solving real-life engineering problems.

PO2: Problem Analysis

To identify, formulate and analyze a complex civil engineering problem supported by literature survey leading to substantial conclusions.

PO3: Design/Development of solutions

To obtain solutions for complex civil engineering problems and design system components/processes keeping in view the appropriate considerations for the public health and safety, society, culture and environment.

PO4: Conduct investigations of Complex Problems

To apply systematic approach includes design of experiments, analysis and interpretation of data, and synthesis of the information to investigate a complex civil engineering problem using research-based knowledge to obtain reasonable conclusions.

PO5: Modern tool usage

To develop and use appropriate state-of-the-art software's and modern IT-based engineering tools/resources for modelling of complex civil engineering problems, duly identifying the limitations.

PO6: The Engineer and Society

To utilize the contextual information in order to examine societal, health, safety, legal and cultural issues and identify the consequent responsibilities relevant to the professional engineering practice based on reasoning.

PO7: Environment and Sustainability

To ensure sustainable development by means of professional engineering solutions in context of the impact on the environment and the society.

PO8: Ethics and Professionalism

To adhere to professional ethics and norms, and respect human values while practicing the engineering profession.

PO9: Teamwork and Leadership

To perform efficiently as a member or leader of a team or as an individual in diverse work environments

PO10: Communication Skills

To deliberate effectively and clearly on activities related to engineering profession and to comprehend and communicate ideas, interpretations and outcomes of an engineering analysis efficiently in both verbal and printed form.

PO11: Project Management and Finance

To implement knowledge and understanding of the engineering principles together with efficient management of time and financial resources as a leader or a team member in executing engineering projects.

PO12: Life Long Learning

To have inclination to life-long learning through self-education, interaction with stalwarts in the field of civil engineering, participation in professional societies and constantly updating the knowledge regarding recent developments.

Program Specific Outcomes (PSOs)

The Program Specific Outcomes broadly describe the overall capabilities a student is expected to possess at the end of the undergraduate program. The Program Specific Outcomes of the undergraduate program in Civil Engineering Department are given in Table B.3.1a.

PSOs	Statement
PSO1	Ability to demonstrate professional engineering approach, including application of principles and utilization of technical resources such as software's towards solving technical problems requiring civil engineering interventions.
PSO2	Ability to furnish and/or analyse designs and construct structural systems, produce related documents, drawings and reports, and present objective estimates of the related quantities.
PSO3	Ability to conduct field and laboratory investigations pertaining to civil engineering domain, and utilize modern tools and techniques of surveying.

Table 3.1a.

3.1.1. Evidence of Course Outcomes (COs):

The course outcomes are statements describing the expected depth of understanding of the disciplinary subject and the essential abilities related to the subject upon completion of the course. The courses outcomes for each course are mentioned in the syllabi of the program. Course outcome formed to meet the following guidelines:

- Follows Bloom's taxonomy.
- Reflects the whole syllabus prescribed by Institute for each course.
- A key topic of each unit is taken as the one-course outcome.
- The number of COs for each course should be a maximum of six.

Eight core courses are mentioned below for demonstration, with one course per semester in Table B.3.1b.

S. No.	Courses	Course Outcomes	
1.	CIP100: ENGINEERING DRAWING	CIP-102.1	Comprehend general projection theory, with an emphasis on the use of orthographic projection to represent three-dimensional objects in two-dimensional views.
		CIP-102.2	Apply auxiliary or sectional views to most practically represent engineered parts.
		CIP-102.3	Understand the intersection, development of surface of body and fasteners.
		CIP-102.4	To interpret Orthographic, Isometric and Perspective views of objects.
2.	CIL100: ENGINEERING MECHANICS	CIL-201.1	Determine the resultants in planer force systems. Identify and quantify all forces associated with a static framework
		CIL-201.2	Calculate the center of gravity, center of mass, and centroid for simple and composite volumes. Determine moment of area of plane sections. To determine the forces in members of a plane truss.
		CIL-201.3	Determine the resultants in planer force systems using energy principles.

		CIL-201.4	Understand the fundamental concepts of stress and strain and the relationship between both through the strain-stress equations in order to solve problems for simple tri-dimensional elastic solids. Solve problems in kinematic and dynamic systems.
		CIV-201.5	Solve problems in kinematic and dynamic systems
3.	CIV-301 STRUCTURAL ANALYSIS-I	CIV-301.1	Understand the concepts of stress and strain, principal stresses and principal planes.
		CIV-301.2	Determine Shear force and bending moment in beams and understand concept of theory of simple bending.
		CIV-301.3	Calculate the deflection of beams by different methods and selection of method for determining slope or deflection
		CIV-301.4	Apply basic equation of torsion in design of circular shafts and helical springs
		CIV-301.5	To understand the buckling behavior of columns subjected to axial loads.
4.	CIV-401 STRUCTURAL ANALYSIS-II	CIV-401.1	Identify the degree of indeterminacy of different types of structures
		CIV-401.2	Determine the strain energy and compute the deflection of determinate beams, frames and trusses using energy principles.
		CIV-401.3	Analyze statically indeterminate structures by force methods.
		CIV-401.4	Analyze statically indeterminate structures by force methods.
		CIV-401.5	Analyze building frames by approximate methods for horizontal and vertical loads
5.	CIV-501 DESIGN OF STRUCTURES-I	CIV-501.1	To develop basic understanding of reinforced concrete as a construction material.
		CIV-501.2	To develop understanding of various design philosophies and their differences.
		CIV-501.3	To understand behavior of RCC beams.
		CIV-501.4	To understand behavior of RCC members under flexural shear
		CIV-501.5	To understand behavior of compression members.
6.	CIV-601: DESIGN OF STRUCTURES-II	CIV-601.1	Design of bolted and welded connections; concentric and eccentric
		CIV-601.2	Design of rolled and built-up tension members.
		CIV-601.3	Design of rolled and built-up compression members
		CIV-601.4	Design of laterally supported and unsupported flexural members
		CIV-601.5	Design of plate girders

		CIV-601.6	Understanding failure modes and application of Limit States Design philosophies of Steel Design
7.	CIV -701: ENVIRONMENTAL ENGINEERING- I/WATER SUPPLY AND SANITARY ENGINEERING	CIV -701.1	To develop the concept about various aspects related to drinking water quality and quantity.
		CIV -701.2	To understand the various aspects of storage and distribution of drinking water.
		CIV -701.3	To design water treatment plants.
		CIV -701.4	To have knowledge about various aspects related to sanitation of buildings.
8.	CIV -802: BRIDGE ENGINEERING	CIV -802.1	Classify different types of bridges and demonstrate fundamental knowledge of design of bridges and understand hydrologic and hydraulic aspects of waterway bridges.
		CIV -802.2	Use influence lines to calculate maximum effects (forces) due to standard moving vehicle loads prescribed in IRC Codes. Select an appropriate load system as per IRC-6 and evaluate design forces and moments in bridges.
		CIV-802.3	Design the slab culvert
		CIV-802.4	Design the Truss type bridges including cross beams and stringers.
		CIV-802.5	Design Plate Girder Bridges both composite and non-composite.
		CIV-802.6	Design slabs for all types of bridges.

Table 3.1b

3.1.2. Explanation of Course Articulation Matrix to be ascertained:(10)

(Claimed: 10)

The various levels of correlation used are as follows:

Strong correlation (High)	-	“3”
Moderate correlation (Medium)	-	“2”
Low correlation (Low)	-	“1”
No correlation	-	“- “

3.1.2.1. Demonstration of CO-PO mapping for courses mentioned at 3.1.1

The Course Outcome statements of all the courses are given in Criteria 2. The mapping of the course outcomes of each course with program outcomes and the program-specific outcome has been made. Table 3.1.c. Table 3.1.b with the Program Outcomes and Program Specific Outcomes shows the mapping of Course Outcomes of courses.

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COURSE	CO	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	PS O 1	PS O 2	PS O 3
CIP100	CIP-100.1	3	3	3	3	2	2	2	-	3	3	2	2	3	3	3
	CIP-100.2	3	3	3	3	2	2	2	-	3	3	2	2	3	3	3
	CIP-100.3	3	3	3	3	2	2	2	-	3	3	2	2	3	3	3
	CIP-100.4	3	3	3	3	2	2	2	-	3	3	2	2	3	3	3
	CO	3	3	3	3	2	2	2	-	3	3	2	2	3	3	3
CIL100	CIP-100.1	3	3	1	1	-	2	1	-	-	-	-	-	2	-	1
	CIP-100.2	3	3	2	2	-	2	1	-	-	-	-	-	2	1	2
	CIP-100.3	3	3	2	2	-	2	1	-	-	-	-	-	2	1	2
	CIP-100.4	3	3	2	2	-	2	1	-	-	-	-	-	2	1	2
	CIP-100.5	3	3	2	2	-	2	1	-	-	-	-	-	2	1	2
	CO	3	3	1.8	1.8	-	2	1	-	-	-	-	-	2	1	1.8
CIV-301	CIV-301.1	3	2	2	3	1								3	2	1
	CIV-301.2	3	3	3	2	2	-	-	-	-	-	-	-	3	3	1
	CIV-301.3	3	3	2	3	3	-	-	-	-	-	-	-	2	2	1
	CIV-301.4	3	2	2	2	3	-	-	-	-	-	-	-	3	1	1
	CIV-301.5	3	2	3	2	2	-	-	-	-	-	-	-	1	2	1
	CO	3	2.4	2.4	2.4	2.4	-	-	-	-	-	-	-	2.4	2	1
CIV-401	CIV-401.1	3	2.4	2.4	2	2	-	-	-	-	-	-	-	2.4	2	1
	CIV-401.2	3	2.4	2.4	2	2	-	-	-	-	-	-	-	2.4	2	1
	CIV-401.3	3	2.4	2.4	2	2	-	-	-	-	-	-	-	2.4	2	1
	CIV-401.4	3	2.4	2.4	2	2	-	-	-	-	-	-	-	2.4	2	1
	CIV-401.5	3	2.4	2.4	2	2	-	-	-	-	-	-	-	2.4	2	1
	CO	3	2.4	2.4	2	2	-	-	-	-	-	-	-	2.4	2	1
CIV-501	CIV-501.1	3	2	3	-	-	-	-	-	-	2	-	3	3	2	3
	CIV-501.2	3	2	3	-	-	-	-	-	-	2	-	3	3	2	3
	CIV-501.3	3	2	3	-	-	-	-	-	-	2	-	3	3	2	3
	CIV-501.4	3	2	3	-	-	-	-	-	-	2	-	3	3	2	3
	CIV-501.5	3	2	3	-	-	-	-	-	-	2	-	3	3	2	3
	CO	3	2	3	-	-	-	-	-	-	2	-	3	3	2	3
CIV-601	CIV-601.1	3	3	3	3	2	1	2	2	-	-	3	2	3	2	2
	CIV-601.2	3	3	3	3	2	1	2	2	-	-	3	2	3	2	2
	CIV-601.3	3	3	3	3	2	1	2	2	-	-	3	2	3	2	2
	CIV-601.4	3	3	3	3	-	3	1	2	-	-	3	2	3	2	2
	CIV-601.5	3	3	3	3	-	1	-	-	-	-	3	-	3	2	2
	CIV-601.6	3	3	3	3	-	3	-	-	-	-	3	-	3	2	2
	CO	3	3	3	3	2	1.67	1.8	2	-	-	3	2	3	2	2
CIV-701	CIV-701.1	3	3	-	-	3	2	-	2	2	3	-	2	2	2	1
	CIV-701.2	2	3	-	-	2	3	-	2	2	2	-	1	2	2	2

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	CIV-701.3	3	2	-	-	3	3	-	2	3	3	-	3	3	2	3
	CIV-701.4	1	2	1	1	1	-	-	-	-	1	1	-	2	1	3
	CO	2.3	2.5	1	1	2.3	2.67	-	2	2.33	2.3	1	2	2.25	1.75	2.25
CIV-802	CIV-802.1	3	3	3	3	-	2	2	-	-	-	-	2	3	3	3
	CIV-802.2	3	3	3	3	2	2	2	-	-	-	2	2	3	3	3
	CIV-802.3	3	3	2	2	-	2	2	-	-	-	2	2	3	3	3
	CIV-802.4	3	3	2	2	-	2	2	-	-	-	2	2	3	3	3
	CIV-802.5	3	3	2	2	-	2	2	-	-	-	2	2	3	3	3
	CIV-802.6	3	3	2	2	-	2	2	-	-	-	2	2	3	3	3
	CO	3	3	2.3	2.3	2	2	2	-	-	-	2	2	3	3	3

Table 3.1c Course Articulation Matrix:

3.1.3. Explanation of Program Articulation Matrix to be ascertained (10):

Claimed:10

The various levels of correlation used are as follows:

Strong correlation	-	3
Moderate correlation	-	2
Low correlation	-	1
No correlation	-	“ - “

3.1.3.1. Demonstration of mapping of courses with POs and PSOs

The mapping of the course with the program outcomes and program-specific outcomes has been done for three academic years. Table 3.1d shows the demonstration of mapping of courses shown in Table 3.1b with POs and PSOs.

COURS E CODE	P O 1	P O 2	P O 3	P O 4	P O 5	PO 6	P O 7	P O 8	PO 9	P O 10	P O 11	P O 12	PS O 1	PS O 2	PS O 3
CIP100	3	3	3	3	2	2	2	-	3	3	2	2	3	3	3
CIV-201	3	3	1.8	1.8	-	2	1	-	-	-	-	-	2	1	1.8
CIV-301	3	2.4	2.4	2.4	2.2	-	-	-	-	-	-	-	2.4	2	1
CIV-401	3	2.4	2.4	2	2	-	-	-	-	-	-	-	2.4	2	1
CIV-501	3	2	3	-	-	-	-	-	-	2	-	3	3	2	3
CIV-201	3	3	3	3	2	1.67	1.8	2	-	-	3	2	3	2	2
CIV-701	2.3	2.5	1	1	2.3	2.67	-	2	2.33	2.3	1	2	2.25	1.75	2.25
CIV-801	3	3	2.3	2.3	2	2	2	-	-	-	2	2	3	3	3

Table 3.1d

Table 3.1e provides the details of various courses and their COs mapping with the Program Outcomes and Program Specific outcomes for three academic years (2019-20). The Program Articulation matrix for other two academic years (2018-19, 2017-18) are attached with P 23 file.

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The typical Program Articulation matrix for session 2019-20 is shown below

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
MEL100	Elements of Mechanical Engg.	2.05	1.37	1.37	-	-	-	-	-	-	1.37	-	1.89	1.89	1.26	1.89
PHL100	Engineering Physics	3	3	2.8	2	2	1			1	-	-	-	-	-	-
HUL 100	Basic English and Communication Skills	2	2	2	-	-	2	-	-	2.3	2.6	2	2.5	2	2	1
HUP 100	Language Laboratory	-	-	-	-	-	-	-	-	3	3	3	2	-	-	-
CIL100	Engineering Mechanics	3	3	1.8	1.8		2	1						2	1	1.8
MAL100	Mathematics -I	2.4	1.8	2.6	-	-	-	-	-	-	-	1	3	1.6	2.4	1.2
PHP100	Physics Laboratory-I	3	3	2.8	2	2	1	-	-	1	-	-	-	-	-	-
WSP100	Work shop Practice	3	1	1	-	1	1	2	1	3	1	2	2	-	-	-
EEL-100	Basic Electrical Engineering	2.8	1.8	1.6	2.4	1.8	1.4	-	-	-	-	-	1.4	2	2	2.2
ITL100	Computer Programming	2.75	2.3	2.5	3	1.8	-	-	-	-	-	-	2.5	3	1.5	1
CYL-101	Environmental studies	2.8	2.5	3	-	1.8	2.8	3			2	1.5	2.3	2.3	1.5	2
ELP-100	Basic Electrical Engineering	2.67	1.7	1.5	2.5	1	1.3	-	-	-	-	2.3	1.4	1.5	1.5	2
CYP100	Engineering Chemistry Lab.	2.5	1.5	-	-	2.5	2	2.3			1.3	2	1.3	2	2.25	1
ITP100	Computer Programming Laboratory	2	2.5	2.8	2.5	2	-	-	-	1	2	-	-	-	-	-
CIP100	Engineering Drawing	3	3	3	3	2	2	2		3	3	2	2	3	3	3
HUL 101	Advanced English Communication Skills and Organizational Behaviour	2	2	2	-	-	2.5	-	-	2.3	2.6	2	2	2	2	1
MAL101	Mathematics II	2.4	1.8	2.4						-	-	1	3	1.6	2.4	1.2
CIV-301	Structural Analysis-I	3	2.5	2	1.8	-	2	1	-	-	-	-	1	3	1	2
CIV-301(P)	Structural Engineering Lab I	3	1.8	1.3	1	-	2	1.3	-	-	-	-	-	3	1.75	2
CIV-302	Fluid Mechanics I	2.5	-	-	-	-	2.8	2.5	2	2.5	2.8		2.3	2.5	2.3	2
CIV-302(P)	Fluid Mechanics Lab I	2.3	1	1	1.5	2.5	1.3	1	2.8	1.5	1.5	1.5	2.3	2.3	2.8	2
CIV-303	Surveying I	3	1.5	1.5			2.3	1		1.5	1.8	-	-	3	3	1
CIV-303(P)	Surveying Lab I	2.75	2	2.3	1.75	2.8	1.5	1.5	1.3	2.5	2.3	1.3	1	2.5	2	1
MTH-303	Mathematics III	2.2	2.4	2.4	2.4	-	-	-	-	-	1	-	1	1.8	2.6	-
HSS-301	Humanities and Social Science I	3	2	3	-	-	-	-	-	-	2	-	3	3	2	3

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ELE-304	Electrical Engineering Tech	2.66	1.6	1.5	2.5	1	1.3	-	-	-	-	2.3	1.4	-	-	-	
ELP100	Electrical Engineering Lab	2.5	2.3		1.8	-	2.5	2	-	-	-	2.3	2.5	-	-	-	
CIV-401	Structural Analysis-II	3	2.4	2.4	2.4	2.2	-	-	-	-	-	-	-	2.4	2	1	
CIV-402	Fluid Flow in Pipes and Channels	2.5	2.3	1.8	1.5	-	-	-	-	-	-	-	2	2.5	2.3	2.5	
CIV-402(P)	Fluid Mechanics Lab II	3	3	3	3	-	3	3	-	-	-	-	3	3	2	3	
CIV-403	Surveying II	3	2.8	2.8	1	1.8	1	1	1	2	2	1	1	2	1	2	
CIV-403(P)	Surveying Lab II	3	2.9	2.9	2	1.8	2	2	2	1	2	2	1	2	2.5	1.5	2.5
CIV-404	Engineering Geology and Materials	3	2	2	-	-	-	-	-	-	2	-	3	3	2	3	
CIV-404 (P)	Geology Lab	2.25	2.8	-	-	1.3	1.3	2.8	2	2	-	-	2.3	2	3	2.75	
CIV-405	Building Drawing and Construction	3	-	-	-	-	2.5	3	3	3	2.5	2.5	2.5	3	3	3	
MTH-40	Mathematics II	2	2.4	2.2	-	-	-	-	-	-	1	-	1	1.8	2.6	1	
CIV-400	Professional Development Activities	3	3	3	1	2	3	3	2	2	3	3	3	2	1.5	2.5	
CIV-501	Design of Structures-I	3	2	3	-	-	-	-	-	-	2	-	3	3	2	3	
CIV-501(P)	Concrete Laboratory	3	2	1.8	2		2	1	-	-	-	-	2	3	2	2	
CIV-502	Highway Engineering and PMS	3	2	1.8	2		1.8	1.8	-	-	-	-	2	3	2	1.8	
CIV-502(P)	Highway Lab.	2.5	2.7	2.7	2.3	2	2.5	2.3	-	-	-	-	2.5	2.5	2.7	2.5	
CIV-503	Geotechnical Engineering -I	3	2.2	2	1.8	-	2	1.8	-	-	-	-	2	3	2.2	2.6	
CIV-503(P)	Geotechnical Laboratory I	2.9	2.2	2.1	2.0	-	2.1	1.7	-	-	-	-	2.1	2.9	2.2	2.2	
CIV-504	Water Resources Engineering	3	2.8	3	2.7	2.3	2.7	2.4	-	-	-	-	2.3	2.4	2.8	2.5	
CIV-505	Structural Analysis-III	2.7	2.7	2.7	1.16	2	2	2	-	-	-	-	2.1	2.7	2.7	2.4	
CIV-500	Professional Development Activities	3	3	3	1	2	3	3	2	2	3	3	3	2	1.5	2.5	
CIV-506: E1	Engineering Seismology	2.3	2.3	2.5	2.25	2.8	2.8	2.5	2	2.5	2.8	-	2.3	2.5	2.25	2	
CIV-511: E1	Concrete Technology	3	2.8	3			3	2.5	3	-	2.8	-	2.8	3	2.75	2.5	
CIV-601	Design of Structures-II	3	3	3	3	2	1.67	1.8	2	-	-	-	2	3	2	2	
CIV-601(P)	Structural Engineering Lab. II	3	3	3	3	-	2	2	-	-	-	-	2	3	3	3	
CIV-602	Traffic Engineering and Road Facilities	2.5	2.7	2.7	2.3	-	2.5	2.3	-	-	-	-	2.5	2.5	2.7	2.5	
CIV-602(P)	Traffic Engineering Lab	2.5	2.7	2.7	2.3	2	2.5	2.3	-	-	-	-	2.5	2.5	2.7	2.5	
CIV-603	Geotechnical Engineering -II	3	3	3	3	-	2	2	-	-	-	-	2	3	3	3	

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CIV-603(P)	Geotechnical Laboratory II	3	3	3	3	-	3	1.5	-	-	-	1	2	3	3	3
CIV-604	Irrigation and Hydraulic Structures	3	2.3	2.3	2.3	1	2.5	2.3	-	-	-	-	2.5	3	2.3	2.25
CIV-611: E1	Water-Shed Management	2	2	1.8	1.8	1.5	2	-	-	-	-	-	2	2	2	2
CIV-612: E2	Applied Hydrology	2.8	2.8	2.8	3	2.5	2.3	2.8					2.5	2.75	3	2.75
CIV-612: E2	Advanced Structural Analysis	3	3	3	3	1.3	2	2	-	-	-	-	2	3	3	3
CIV-701	Water supply & Sanitary Engineering	2.3	2.5	1	1	2.3	2.67	-	2	2.33	2.3	1	2	2.25	1.75	2.25
CIV-701(P)	Water Quality lab	2.5	2.7	2.7	2.3	2	2.5	2.3	-	-	-	-	2.5	2.5	2.67	2.5
CIV-702	Structural Dynamics	3	2.3	2.7	1.5	1.5	2	1.5	2	1	1.5	-	2	-	-	-
CIV-703	Construction Technology & Management	3	2	2	-	-	-	-	-	-	2	-	3	3	2	3
CIV-704	Design of Structures-III	3	3	3	3	2	2	2	-	-	-	-	3	3	3	3
CIV-705	Quantity Surveying and Cost Evaluation	3	3	1.8	1.8	-	2	1	-	-	-	-	-	2	1.5	2
CIV-706	Seminar	3	3	3	1	2	3	3	2	2	3	3	3	2	1.5	2.5
CIV-707	Project Pre-Work	3	3	3	3	3	3	2.5	2.5	1.5	1.5	1	2.5	3	2	2
CIV-711: E1	Railway and Airport Engineering	3	3	3	3	2	2	2	-	-	-	-	2	3	3	3
CIV-711: E1	Advanced geotechnical engineering	3	3	3	3	1.3	2	2	-	-	-	-	2	3	3	3
CIV-700	Professional Development Activities	3	3	3	3	3.0	3	2.5	2.5	1.5	1.5	1	2.5	3	2	2
CIV-801	Hydropower Engineering	2.5					2.8	2.5	2	2.5	2.8		2.3	2.5	2.3	2
CIV-802	Bridge Engineering	3	3	2.3	2.3	2	2	2	-	-	-	2	2	3	3	3
CIV-803	Project	3	1	1	3	2	3	2	1	2	2	2	2	3	2	2
CIV-804	Practical Training & Viva-Voce	3	3	3	3	2	2	1	1	2	2	1	2	2	2	2
CIV-811: E1	Rock Mechanics and Tunneling Technology	3	3	1.8	1.8		2	1	-	-	-	-	-	2	1.5	2.2
CIV-812: E2	Ground Improvement Techniques	2	2	2.3	2.3	2.3	1.3	2.3	1	1.7	1.7	1	2.7	2	3	3
		2.76	2.43	2.39	2.21	1.96	2.15	2.02	1.87	2.02	2.12	1.82	2.22	2.54	2.24	2.24

Table 3.1e

3.2. Attainment of Course Outcomes: (75)

Claimed: 75

3.2.1. Describe the assessment tools and processes used to gather the data upon which the evaluation of Course Outcome is based: (10)

Claimed: 10

Assessment of course outcomes is a systematic and continuous method of collecting, analysing and using information about a course from various sources and measuring course outcomes in order to improve student learning. For assessing the course outcomes (CO), both direct and indirect assessments methods are considered. Direct assessment consists of midterm examination/major examination/assignments. Marks obtained by students in these examinations are used to assess the CO attainment. For Indirect assessment, course outcome surveys are carried out at the end of a course and the results are analysed. In these surveys, responses are recorded on a 3-point scale, to get the self-assessment of students w.r.t. COs attainment. The record for all the internal assessments is maintained by the faculty and the department.

1. CO Assessment Rubrics:

COs are evaluated based on the performance of students in a mid-term examination, one major examination and continuous assessment (in the form of assignments and quizzes). The contributions are 30%, 60% and 10% for the mid-term exam, major exam and continuous assessment, respectively.

However, the lockdowns due to abrogation of Article 370 and subsequent COVID-19, the regular pattern examination couldn't be possible and alternative evaluation schemes were adopted. For Autumn 2019, the contributions are 90% and 10% for major exam and continuous assessment respectively. In Spring 2020 the classes were held online and the evaluation was based on Mid Term (30%) as assignments and Major (40%) as Comprehensive Viva-Voce Examination (CVVE), the remaining 30% was based on the Maximum Semester Grade Point Average (SGPA) up to previous semesters. Whereas for the assessment of CO attainment purpose, the Assignments was given weightage of 40% and CVVE has been given 60% weightage.

Assessment of Course Outcomes (Upto Spring 2019)

(a) Theory Courses:

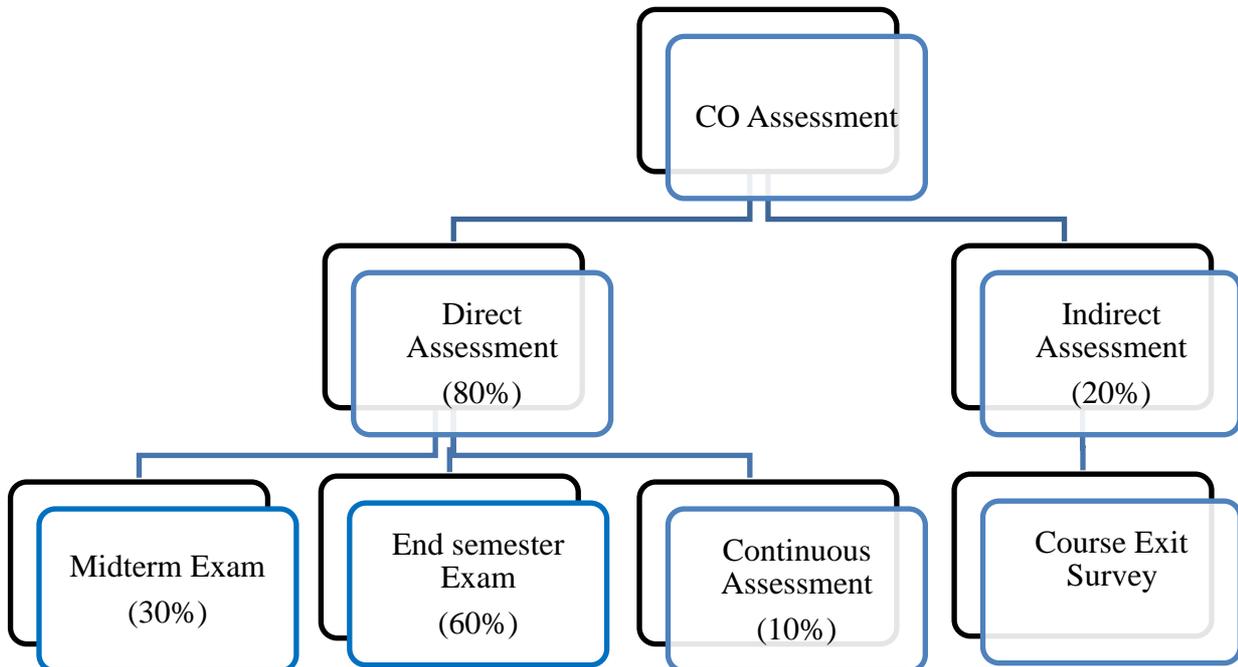


Fig. 3.2a

(b) Laboratory/ Practical Courses:

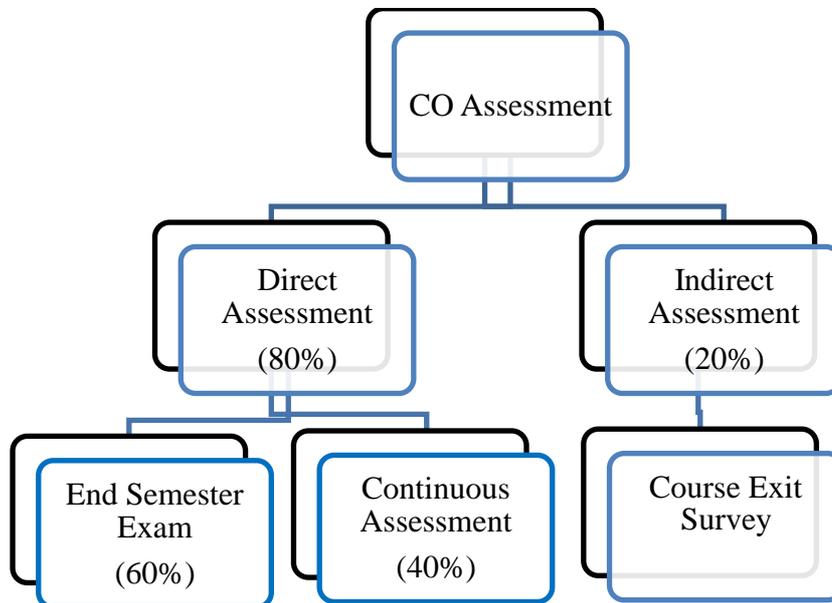


Fig. 3.2b

Assessment of Course Outcomes (Autumn 2019)

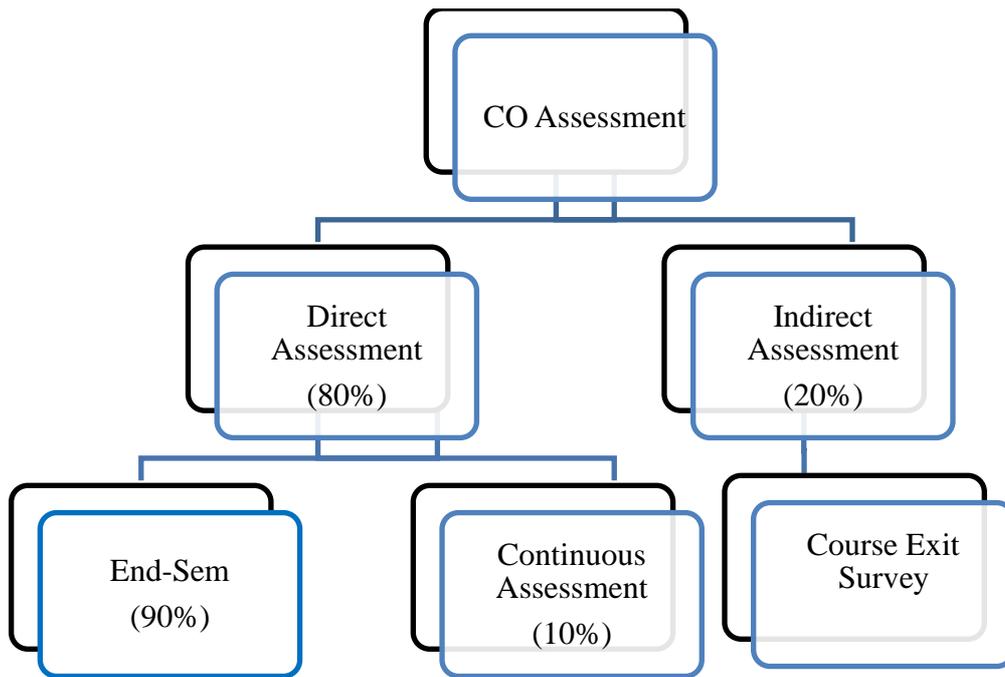


Fig. 3.2a

(b) Laboratory/ Practical Courses:

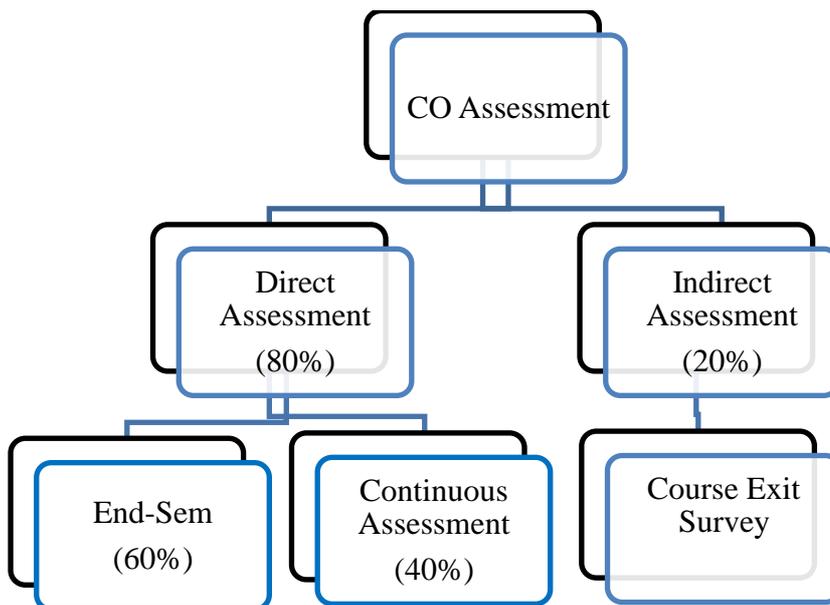


Fig. 3.2b

Assessment of Course Outcomes (Spring 2020)

(a) Theory Courses:

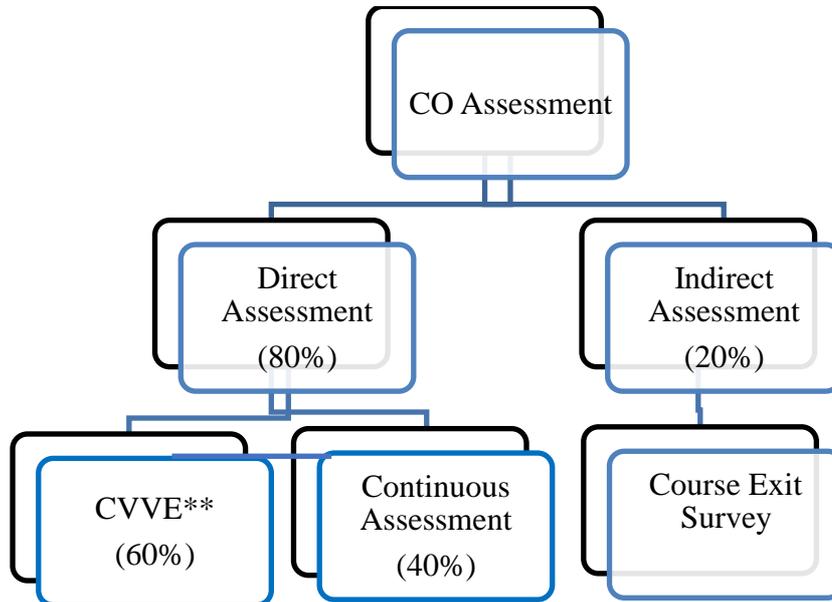


Fig. 3.2a

** Not to be included for 8th semester courses (Spring 2020). Direct Assessment for 8th semester courses to be done with 100% weightage on CVVE / whichever mode of exam equivalent to CVVE was adopted.

(b) Laboratory/ Practical Courses:

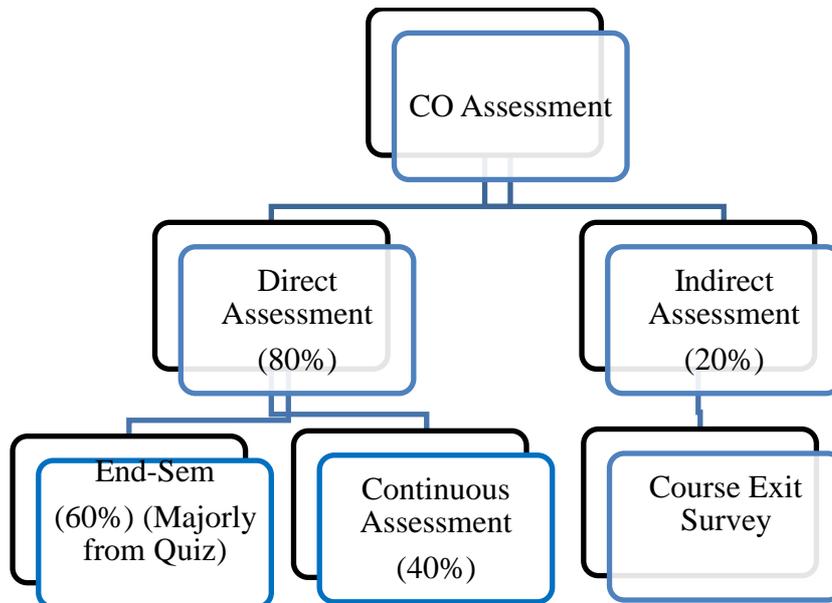


Fig. 3.2b

CO Assessment Tools:

The various assessment tools used to evaluate COs and the frequency with which the assessment processes are carried out are listed in Table 3.2.a

DIRECT ASSESSMENT TOOLS			
Course Type	Assessment Tools	Frequency	
Theory	Mid-Term exam	Once per course	
	Continuous Assessment	Twice/Thrice per course	
	End Semester Exam	Once per course	
Laboratory	Continuous Assessment	Every lab session	
	End Semester Exam	Once per course	
Seminar (7th semester)	Presentation	Once per course	
Project	Phase I (7th semester)	Review	Once per semester
	Phase II (8th semester)	Review	Once/ Twice per semester
		Evaluation by Guide	Continuous evaluation
		Demonstration / Final Evaluation	Once per course
Viva Voce (8th semester)	End Semester Assessment	Once per program	

2. Quality / Relevance of Assessment Process:**Theory:**

Mid-semester Test: The Mid-semester test encourages students to cope up with subject matter covered in class. The questions satisfy Bloom's taxonomy, wherein each question is mapped to the appropriate course outcome of the respective course and assessed based on the set attainment levels.

Major Test: Major test is conducted once at the end of every semester to evaluate the students' performance. The questions are designed to assess students' knowledge of engineering practices, frameworks, and problem-solving skills.

Continuous Assessment: Continuous assessment in the form of assignments, oral quizzes, MCQ are the qualitative performance assessment tools to assess the promptness and understanding of the subject. Student's submissions are evaluated based on work quality, time limit, and originality. The questions in the assignment are mapped to the Course outcomes of the subject.

Laboratory:

Lab courses provide students with the first-hand experience with course concepts and the opportunity to explore experimental methods and their application in the field.

Criterion 3

Continuous assessment: All the students are expected to be regular and learn the application aspects of the various tests and develop the necessary skills to analyse the testing data and application in designing various civil engineering structures and facilities. It also facilitates interaction among the students and develops the team spirit required to cope with advancing worlds. Performance assessment is based on the ability of the student to actively participate in the successful conduct of prescribed practical work and draw appropriate conclusions. The student submits a record of experimental work performed in each class.

Major laboratory exam: A major laboratory exam is conducted to assess the ability of a student to perform a given task by integrating the knowledge gained from related theory courses and regular laboratory sessions. The exam includes viva voce and performing a given experiment.

Seminar:

The seminar is a part of the sixth-semester curriculum. The student makes two seminar presentations (preliminary and a final) on a topic of their choice and is approved by the assigned faculty. A seminar presentation is planned for 30 minutes, including a question-answer session of 5 to 10 minutes. The seminar is evaluated based on flow and the material presented presentation by the students before an evaluation committee consisting of three faculty members, including the Head of the Department. The committee generally evaluates the seminar based on the following parameters.

Relevance: The seminar PowerPoint presentation generally covers the fundamentals and advanced topics in engineering. The importance of the topic is considered to assess the seminar.

Presentation: The flow of presentation and communication skills are essential tools to evaluate.

Viva-voce: At the end of the presentation, the assessment panel and the audience ask their doubts and questions about the seminar topic. The effectiveness of the student's response to these queries is also assessed.

Report and Documentation: A seminar report is submitted at the end of the semester. This report presents the subject matter in a detailed manner. Students' ability to comprehend and effective writing is assessed based on the report.

Project

The Project is intended to test intellectual and innovative abilities and allow students to synthesize and apply the grasped knowledge and analytical skills learned to solve real-life problems. The project work started in the seventh semester and continued in the eighth semester.

Project-7th Semester:

Students are expected to discuss the possible topics of interest with a faculty member and develop the final topic. The students are supposed to finalise the topic and complete the literature review within the first half of the seventh semester. The students are expected to submit the proposed project's relevance, literature survey, scope, objectives, time schedule, and cost estimate during the semester.

Assessment tools used to evaluate project work are:

Mid-term Evaluation: Mid-term evaluation is conducted at the mid of the semester, and a group panel evaluates the work based on various parameters. The feasibility and significance of the work are two major assessment criteria. The basic understanding of the topic and presentation skills are also evaluated by the panel based on their performance.

End-term Evaluation: End-term evaluation is conducted at the end of the semester in the form of a presentation. Detailed report submission is also compulsory. At the end of the presentation, the assessment panel and the audience ask their doubts and questions about the topic. The effectiveness of the student’s response to these queries is also assessed. The submitted project report is assessed.

Project –8th Semester

To assessment tools are almost identical to those of the 7th-semester project work. Like 7th-semester project work, the evaluation is made in the mid-semester (Mid-term Evaluation) and at the end of the semester.

Examiners examines whether the project demonstrates a high level of understanding and originality in the analysis (theoretical and /or empirical). The project topic should make a significant contribution to the knowledge base of the discipline and field of study. The topic should be innovative having the future scope and the results should be appropriate and of high quality.

3.2.2. Record the attainment of Course Outcomes of all courses with respect to set attainment levels (65) Claimed 65

3.2.2.1 Record the attainment of Course Outcomes of all courses with respect to set attainment levels.

Program shall have set Course Outcome attainment levels for all courses.

Table 3.2.a Direct Assessment Tools

Program shall have set Course Outcome attainment levels for all courses.

1)Direct Course Outcome attainment levels (up to Spring semester 2018)

Assessment Method	Level	Attainment Levels
Midterm Exam	1	50% of students scoring more than 40% marks
	2	60% of students scoring more than 40% marks
	3	75% of students scoring more than 40% marks
End Semester Exam	1	50% of students scoring more than 40% marks

Continuous Assessment	2	60% of students scoring more than 40% marks
	3	75% of students scoring more than 40% marks
	1	50% of students scoring more than 50% marks
	2	60% of students scoring more than 50% marks
	3	75% of students scoring more than 50% marks

Table 3.2.b

3.2.2.2 Direct Course Outcome attainment levels (Autumn semester 2018 onwards)

Assessment Method	Level	Attainment Levels
Midterm Exam	1	50% of students scoring more than 50% marks
	2	60% of students scoring more than 50% marks
	3	70% of students scoring more than 50% marks
End Semester Exam	1	50% of students scoring more than 50% marks
	2	60% of students scoring more than 50% marks
	3	70% of students scoring more than 50% marks
Continuous Assessment	1	50% of students scoring more than 50% marks
	2	60% of students scoring more than 50% marks
	3	70% of students scoring more than 50% marks

Table 3.2.c

3.2.2.3 Evaluation of Assessment tools based on the set attainment levels.

The process to evaluate each of the above components is described step by step:

Measuring Course Outcome attained through End Term Examination (weightage 60%)

This part shall be calculated using the marks obtained by students in the end semester examination. The end term examination consists of 5 questions covering all the COs, out of which only 4 questions need to be attempted by the students. The assessment shall be given in terms of marks obtained by the student in each CO.

The method used is as follows:

Step1: Check the answer sheets of all students and enter their marks in the excel format with each sub part of every question in separate column. Ex: 1 a, 1 b, 1 c etc. should all have a separate column.

Criterion 3

Step2: For a CO, identify the questions belonging to it as mentioned against each question in the question paper.

Step3: CO attainment percentage is calculated by counting the number of students who attempted a CO and scored above or equal to benchmark set (50% for Autumn 2018 onwards/ 40%, up to Spring 2018) and dividing by total no. of students taking the course, for each CO.

Step4: For each CO, Attainment level is assigned as explained.

Measuring Course Outcome attained through Midterm Exams (Weightage -30%).

The method used is as follows:

Step1: Check the answer sheets of all students and enter their marks in the excel format with each sub part of every question in separate column. Ex: 1 a, 1 b, 1 c etc. should all have a separate column.

Step2: For a CO, identify the questions belonging to it as mentioned against each question in the question paper.

Step3: Calculate the CO attainment percentage for each student by counting the number of students scoring above or equal to benchmark set (50% for Autumn 2018 onwards/ 40%, up to Spring 2017) and dividing by total no. of students taking the course, for each CO.

Step4: For each CO, Attainment level is assigned as explained.

Measuring CO Attainment through Assignments (Weightage-10%)

The assignment given includes all COs of the course. The assessment shall be given in terms of marks obtained by the student in each CO. The method used is as follows:

Step1: Check the assignment of all students and enter their marks in the excel format with each sub part of every question in separate column. Ex: 1 a, 1 b, 1 c etc. should all have a separate column.

Step2: For a CO, identify the questions belonging to it as mentioned against each question in the assignment.

Step3: Calculate the CO attainment percentage for each student by counting the number of students scoring above or equal to the benchmark set (50%) and dividing by the total no. of students taking the course for each CO.

Step4: For each CO, the Attainment level is assigned according to the method as explained.

Direct CO Attainment

Direct CO Attainment is calculated by giving specific weightage to the individual CO attainments of End Term (60% weightage), Mid Term (30%) and Assignments (10%).

Indirect CO Attainment

Indirect CO Attainment is evaluated based on a course exit survey in which students grade the Attainment COs as 1, 2, or 3. 1 means CO is Mildly Attained, 2 means Moderately Attained, and 3 refers to excellent Attainment. Finally, the Indirect CO Attainment is taken as the average response of all the students

3.2.2.4 Overall CO Attainment

Overall CO Attainment is calculated by giving a weightage of 80% to Direct Attainment and 20%

Example to demonstrate the CO Attainment Evaluation Process:

In order to demonstrate the CO attainment evaluation process, an example of the Geotechnical Engineering II (CIV-603) course file of spring 2020 has been provided below:

CIV-603

SESSION: SPRING-2019

CO-PO/PSO MAPPING MATRIX

Cos	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CIV-603.1	3	3	3	3	-	2	2	-	-	-	-	2	3	3	3
CIV-603.2	3	3	3	3	-	2	2	-	-	-	-	2	3	3	3
CIV-603.3	3	3	3	3	-	2	2	-	-	-	-	2	3	3	3
CIV-603.4	3	3	3	3	-	2	2	-	-	-	-	2	3	3	3
Average	3	3	3	3	-	2	2	-	-	-	-	2	3	3	3

Table 3.2.d

Direct assessment for course outcome

(End semester examination + Mid Semester examination + Assignment)

Calculating the attainment level of Course Outcome (Direct Assessment) by considering the weight age of 60% for End Semester, weight age of 30% for Mid Semester Examinations and weight age of 10% for Assignments

Direct CO Attainment= 60% (End Semester) + 30% (Mid Semester) + 10% (Assignment)

S. No.	Course Outcome	CO attainment (End Sem)	CO attainment (Mid Sem)	CO attainment (Assignment)	60% (End Semester) + 30% (Mid Semester) + 10% (Assignment)
1	CO1	3	3	3	3
2	CO2	3	-	3	2.1
3	CO3	3	-	3	2.1
4	CO4	3	3	3	3

Table 3.2.e

Indirect assessment for course outcome

Course Exit Survey

- If maximum number of students are saying that CO is Weakly attained ----Level-1
- If maximum number of students are saying that CO is Moderately attained ----Level-2
- If maximum number of students are saying that CO is Strongly attained ----Level-3

Given below is result of attainment of COs for Geotechnical Engineering II (CIV-603) based on course exit survey

Course Outcome	CO attainment
CO1	2
CO2	3
CO3	3
CO4	3

Table 3.2.f

CO ATTAINMENT CALCULATION

(Direct Assessment + Indirect Assessment)

Calculating the attainment level of **Overall Course Outcome** (Direct Assessment + Indirect Assessment) by considering the weight age of 80% for direct assessment and weight age of 20% for indirect Assessment.

Overall Course Outcome= 80% Direct + 20% Indirect

S. No.	Course Outcome	CO attainment (Direct assessment)	CO attainment (Indirect Assessment)	Overall CO attainment = 80% Direct + 20% Indirect
1	CO1	3	2	2.8
2	CO2	2.1	3	2.28
3	CO3	2.1	3	2.28
4	CO4	3	3	3

Table 3.2.g

3.2.3. Record the attainment of Course Outcomes of all courses with respect to set attainment levels: (65) Claimed:65

Assessment Year 2019-20

Course Code	Course Name	CO1	CO2	CO3	CO4	CO5	CO6
MEL100	Elements of Mechanical Engg.	1.68	2.24	2.42	1.86		
PHL100	Engineering Physics	3	3	2	3	3	

Criterion 3

CIL100	Engineering Mechanics	2.18	2.28	1.46	1.46	1.46	
HUL100	Basic English and Communication Skills	2.64	2.67	2.8	2.6		
CYL101	Environmental Studies	2.9	2.92	2.91	2.9		
MAL100	Mathematics I	2.55	1.65	1.2	1.2	1.2	
HUP100	Language Laboratory	1.69	1.72	2.88	2.9		
PHP100	Physics Laboratory	3	3	3	3		
HUL101	Advanced English Comm.Skills & Organizational Behavior	2.89	2.91	2.81	1.7		
EEL100	Basic Electrical Engineering	2.8	2.79	2.93	2.01	2.03	1.72
ITL100	Computer Programming	3	3	3	2.3		
CYL100	Engineering Chemistry	2.2	2.3	2.1	2.2		
CIP100	Engineering Drawing	2.24	2.08	2.06	2.08		
MAL101	Mathematics II	3	3	3	3	3	
ELP100	Basic Electrical Engineering Laboratory	3	3	3	3		
CYP100	Chemistry Laboratory	3	3	3	3		
ITP100	Computer Programming Laboratory	2.7	2.5	2.7	2.2		
HUL-201	Humanities & Social Science-I	2.7	2.2	2.4	2.3	2.1	
CIV-301	Structural Analysis I	3	3	3	3	2.76	
CIV-301(P)	Structural Engineering Lab I	3	2.54	2.62	3		
CIV 302	Fluid Mechanics I	2.8	3	2.7	2.5		
CIV 302(P)	Fluid Mechanics Lab I	3	3	3	3	3	
CIV 303	Surveying I	2.22	1.5	1.5	1.22		
CIV 303(P)	Surveying Lab I	2	2	2	2		
MAT201	Mathematics III	2.1	1.65	1.65	1.65	2.1	
ELE-304	Electrical Engineering Tech	2.9	2.6	2.7	2.9	2.9	
ELE-304(P)	Electrical Engineering Lab	3	3	3	3		
HSS-301	Humanities and Social Sciences I	2.9	2.9	2.91	2.92	2.9	2.9
CIV-401	Structural Analysis II	3	3	3	3	2.04	
CIV-402	Fluid Flow in Pipes and Channels	3	2.94	2.96	2.94		
CIV-402(P)	Fluid Mechanics Lab II	3	3	3	3		
CIV-403	Surveying II	2.9	2.6	1.9	2.1		
CIV-403(P)	Surveying Lab II	2	2	2	2		
CIV-404	Engineering Geology and Materials	2.88	2	2.12	2		
CIV-404	Engineering Geology Lab	2.88	2	2.12	2		
CIV-405	Building Drawing and Construction	2.99	2.99	2.04	2.99		
MTH-403	Mathematics IV	3	3	3	3		
CIV-501	Design of Structures-I	2.08	2.28	1.56	1.28	1.56	
CIV-501(P)	Concrete Laboratory	3	3	3	3		
CIV 502	Highway Engineering and PMS	0.84	3	3	2.76	2.04	2.04
CIV-502(P)	Pavement lab	3	3	2.52	2.2		
CIV-503	Geotechnical Engineering I	2.28	1.56	1.56	2.8	2.28	
CIV-503(P)	Geotechnical Lab I	3	3	3	3		
CIV-504	Water Resources Engineering	2.28	2.52	0.64	1.896	1.36	0.2
CIV-505	Structural Analysis III	3	3	2.28			

Criterion 3

CIV-506: E1	Engineering Seismology	3	1.56	2.28	3		
CIV-511: E1	Concrete Technology	2.63	2.46	2	2.21		
CIV-601	Design of Structures-II	2.95	2.62	2.65	2.64	2.93	2.99
CIV-601(P)	Structural Engineering Lab. II	3	3	3	3		
CIV-602	Traffic Engineering and Road Facilities	3	2.28	2.92	2.28		
CIV-602(P)	Traffic Engineering Lab	3	3	3	3		
CIV-603	Geotechnical Engineering -II	3	2.8	3	2.8		
CIV-603 (P)	Geotechnical Laboratory -II	3	3	3	3		
CIV-604	Irrigation and Hydraulic Structures	2.89	2.89	2.88	2.89		
CIV-611: E1	Water-Shed Management	3	1.36	3	2.18	2.08	
CIV-612: E2	Applied Hydrology	3	3	3	3		
CIV-701	Water supply & Sanitary Engineering	3	3	2.52	1.8		
CIV-701(P)	Water Quality lab	3	3	3	3		
CIV-702	Structural Dynamics	3	3	2.8	2.28		
CIV-703	Construction Technology & Management	3	3	3	3		
CIV-704	Design of Structures-III	3	3	3	3	3	
CIV-706	Seminar	3	3	3	3		
CIV-707	Project Pre-Work	2.56	2.45	2.38	2.67	2.32	
CIV-711: E1	Railway and Airport Engineering	2.96	2.94	2.96	2.98		
CIV-711: E1	Advanced Geotechnical Engineering	2.6	2.8	2.28			
CIV-801	Hydropower Engineering	2.8	3	2.8	3		
CIV-802	Bridge Engineering	2	2.96	2.98	2.96	1.98	2.96
CIV-803	Project	2.68	2.66	2.32	2.56	2.62	
CIV-811: E1	Transportation Planning & Economics	3	3	3	2.76		
CIV-811: E1	Rock Mech and Tunnel Engineering	2.28	2.28	2.28	2.28	2.04	
CIV-812: E2	Ground Improvement Techniques	3	2.4	2.5			

Table 3.2.h.2

Assessment Year 2018-19

Course Code	Course Name	CO1	CO2	CO3	CO4	CO5	CO6
CIV-102	Engineering Drawing	0.74	0.65	0.66	0.71		
MTH-101	Mathematics I	2.7	2.7	2.4	1.5	1.5	
IT-101	Computer Fundamentals and Problem-solving Techniques	3	3	2.1	2.1		
PHY-101	Physics I	2.4	1.8	0.9	0.3		
PHY-101(P)	Physics Lab I	3	3	3	3		
CHM-101	Chemistry I	2.4	2.4	2.4	1.8		
CHM-101(P)	Chemistry Lab I	3	3	3	3		
HSS-101	Communication Skills and Oral Presentation	2.7	2.7	2.7	1		
WSP-1	Workshop Lab I	3	3	3	3	3	
CIV-201	Engineering Mechanics	1.82	2.04	1.92	2.66	2.5	
MTH-201	Mathematics II	3	3	3	1.5	2.1	
CSE-201	Computer Programming	3	3	3	2.1		
CSE-202(P)	Computer Programming Lab	2.6	2.6	2.6	2.2		
PHY-201	Physics II	3	2.4	2.1	0.2		
PHY-201(P)	Physics Lab II	2.4	3	2.6	3		
CHM-201	Chemistry II	3	3	2.4	2.1		
CHM-201(P)	Chemistry Lab II	3	3	3	3		
HU-201	Introduction to Social Sciences	2.7	1.8	2.7	2.1	1.8	
MEC-201	Machine Drawing	1.95	1.3	0.9	0.45		
WSP-1	Workshop Lab II	3	3	3	3		
CIV-301	Structural Analysis I	1.92	2.32	1.66	0.42		
CIV-301(P)	Structural Engineering Lab I	3	2.52	2.52	3		
CIV 302	Fluid Mechanics I	3	2.94	2.96	2.94		
CIV 302(P)	Fluid Mechanics Lab I	3	3	3	3	3	
CIV 303	Surveying I	2.93	2.2	2.66	2.6		
CIV 303(P)	Surveying Lab I	2.8	3	3	2.9		
MTH-303	Mathematics III	2.52	2.56	2.56	1.8	1.8	
ELE-304	Electrical Engineering Tech	2.32	2.52	2.44	2.08	2.1	
ELE-304(P)	Electrical Engineering Lab	3	3	3	3		
HSS-301	Humanities and Social Sciences I	2.9	2.9	2.91	2.92	2.9	2.9
CIV-401	Structural Analysis II	2.93	2.89	2.94	2.17	1.7	
CIV-402	Fluid Flow in Pipes and Channels	3	2.94	2.96	2.94		
CIV-402(P)	Fluid Mechanics Lab II	3	3	3	3		
CIV-403	Surveying II	0.96	1.44	1.91	2.63		

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CIV-403(P)	Surveying Lab II	2.94	2.95	2.92	2.84		
CIV-403(SC)	Surveying Camp	3	3	3	2.8		
CIV-404	Engineering Geology and Materials	2.08	1.96	2.01	1.96		
CIV-404 (P)	Engineering Geology Lab	3	3	3	3		
CIV-405	Building Drawing and Construction	2.38	2.96	2.98	2.77		
MTH-403	Mathematics II	2.8	3	2.56	2.28		
CIV-501	Design of Structures-I	2.21	2.23	2.48	2.96	1.7	
CIV-501(P)	Concrete Laboratory	3	3	3	3		
CIV 502	Highway Engineering and PMS	0.84	3	3	2.76	2	2.04
CIV-502(P)	Pavement lab	3	3	3	3		
CIV-503	Geotechnical Engineering I	2.8	2.28	2.28	2.08	2.1	
CIV-503(P)	Geotechnical Lab I	3	3	3	3		
CIV-504	Water Resources Engineering	2.52	2.76	0.44	2.28	1.8	0.2
CIV-505	Structural Analysis III	2.76	3	2.08			
CIV-511:E1	Concrete Technology	2.63	2.46	2	2.21		
CIV-601	Design of Structures-II	2.45	2.94	2.96	2.24	2.2	2.25
CIV-601(P)	Structural Engineering Lab.	3	3	3	3		
CIV-602	Traffic Engineering and Road Facilities	3	2.28	3	2.28		
CIV-602(P)	Traffic Engineering Lab	3	3	3	3		
CIV-603	Geotechnical Engineering -II	2.8	2.28	2.28	3		
CIV-603(P)	Geotechnical Laboratory II	3	3	3	3		
CIV-604	Irrigation and Hydraulic Structures	0.76	2.43	2.19	2.16		
CIV-611:E1	Water-Shed Management	3	2.8	2.8	2.16	2.3	
CIV-612:E2	Applied Hydrology	3	2.32	2.8	2.16		
CIV-612:E2	Advanced Structural Analysis	0.84	2.28	2.28	2.76	2.8	2.04
CIV-701	Water supply & Sanitary Engineering	3	3	2.52	1.8		
CIV-701(P)	Water Quality lab	3	3	3	3		
CIV-702	Structural Dynamics	2.45	1.72	2.02	1.19		
CIV-703	Construction Technology & Management	2.95	2.94	2.96	2.95		
CIV-704	Design of Structures-III	2.97	2.27	2.27	2.75	2.3	
CIV-706	Seminar	3	3	3	3		
CIV-707	Project Pre-Work	2.46	2.33	2.44	2.47	2.4	
CIV-711:E1	Railway and Airport Engineering	2.95	2.95	2.47			

Criterion 3

CIV-711:E1	Advanced Geotechnical Engineering	2.6	2.8	2.28			
CIV-711:E2	Computer Aided Design	3	3	3	2.04		
CIV-801	Hydropower Engineering	2.21	1.47	2.66	1.9		
CIV-802	Bridge Engineering	2.92	2.91	2.17	2.63	2.1	2.2
CIV-803	Project	2.46	2.33	2.44	2.47	2.4	
CIV-811:E1	Transportation Planning and Economics	1.56	3	3	2.04		
CIV-812:E2	Environmental Engineering	2.52	3	3	2.28		
CIV-812:E2	Earthquake Resistant Design	2.93	2.93	2.19	2.16		
CIV-812:E3	Ground Improvement Techniques	0.99	2.4	2.18	2.11		

Table 3.2.h.2

Assessment Year 2017-18

Course Code	Course Name	CO1	CO2	CO3	CO4	CO5	CO6
CIV-102	Engineering Drawing	1.97	2.2	1.23	1.19		
MTH-101	Mathematics I	2.1	1.5	1.5	0.9	0.9	
IT-101	Computer Fundamentals and Problem-solving Techniques	3	3	2.1	2.1		
PHY-101	Physics I	3	1.2	0.9	0.2		
PHY-101(P)	Physics Lab I	3	3	3	3		
CHM-101	Chemistry I	3	3	3	2.1		
CHM-101(P)	Chemistry Lab I	3	3	3	3		
HSS-101	Communication Skills and Oral Presentation	2	2	2	2		
WSP-1	Workshop Lab I	2.4	3	3	2.4	2.4	
CIV-201	Engineering Mechanics	3	2.08	2.28	2.8	2.28	
MTH-201	Mathematics II	3	2.4	2.4	1.5	1.5	
CSE-201	Computer Programming	3	3	3	2.1		
CSE-202(P)	Computer Programming Lab	2.2	2.2	2.2	2.2		
PHY-201	Physics II	3	1.8	1.5	0.3		
PHY-201(P)	Physics Lab II	2.4	3	2.4	3		
CHM-201	Chemistry II	3	2.8	3	2.2		
CHM-201(P)	Chemistry Lab II	3	3	3	3		
HU-201	Introduction to Social Sciences	2.7	2.7	1.8	3	1.8	
MEC-201	Machine Drawing	3	3	2.55	1.2		
WSP-1	Workshop Lab II	3	3	3	3		
CIV-301	Structural Analysis I	1.92	1.76	1.26	0.42		
CIV-301(P)	Structural Engineering Lab I	3	2.04	3	2.52		
CIV 302	Fluid Mechanics I	2.76	3	3	1.8		
CIV 302(P)	Fluid Mechanics Lab I	3	3	3	3	3	

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CIV 303	Surveying I	2.93	2.92	2.66	2.84		
CIV 303(P)	Surveying Lab I	2.496	2.55	2.52	2.09		
MTH-303	Mathematics III	3	2.8	2.08	1.8	1.8	
ELE-304	Electrical Engineering Tech	2.32	2.52	2.44	2.08	2.08	
ELE-304(P)	Electrical Engineering Lab	3	3	3	3		
HSS-301	Humanities and Social Sciences I	2.9	2.91	2.88	2.92	2.91	2.92
CIV-401	Structural Analysis II	2.93	2.89	2.94	2.17	1.68	
CIV-402	Fluid Flow in Pipes and Channels	2.7	2.06	2.9	2.9		
CIV-402(P)	Fluid Mechanics Lab II	3	3	3	3		
CIV-403	Surveying II	2.42	1.95	1.95	2.65		
CIV-403(P)	Surveying Lab II	2.94	2.94	2.92	2.86		
CIV-403(SC)	Surveying Camp	2.94	2.94	2.94	2.86		
CIV-404	Engineering Geology and Materials	2.96	2.92	2.2	2.17		
CIV-404 (P)	Engineering Geology Lab	3	3	3	3		
CIV-405	Building Drawing and Construction	2.95	2.94	2.25	2.71		
MTH-406	Mathematics II	2.8	3	2.8	2.04		
CIV-501	Design of Structures-I	2.42	2.42	2	1.71	1.71	
CIV-501(P)	Concrete Laboratory	2.2	2.04	1.72	2.54		
CIV 502	Highway Engineering and PMS	1.56	2.04	2.28	2.04	2.76	2.04
CIV-502(P)	Pavement lab	3	3	3	3		
CIV-503	Geotechnical Engineering I	2.32	2.56	2.28	2.28	2.28	
CIV-503(P)	Geotechnical Lab I	3	3	3	3		
CIV-504	Water Resources Engineering	2.4	2.84	0.44	1.76	1.12	2.08
CIV-505a	Structural Analysis III	2.32	2.52	2.28			
CIV-505b	QSCE	2.3	2.52	2.52	2.08	1.36	
CIV-601	Design of Structures-II	2.93	2.94	2.32	2.96	2.37	2.96
CIV-601 (P)	Structural Engineering Lab.	3	3	3	3		
CIV-602	Traffic Engineering and Road Facilities	2.99	3	2.83	2.04		
CIV-602 (P)	Traffic Engineering Lab	3	3	3	3		
CIV-603	Geotechnical Laboratory II	2.32	2.28	2.28	2.8		
CIV-603(P)	Irrigation and Hydraulic Structures	1.71	1.71	1.22	1.66		
CIV-604	Water-Shed Management	3	2.8	2.8	2.16	2.28	
CIV-611:E1	Applied Hydrology	0.84	2.28	2.28	2.76	2.76	2.04
CIV-701	Water supply & Sanitary Engineering	3	3	2.92	2.28		
CIV-701(P)	Water Quality lab	3	3	3	3		
CIV-702	Structural Dynamics	2.53	2.28	2.1	2.15		
CIV-703	Construction Technology & Management	2.95	2.94	2.96	2.95		
CIV-704	Design of Structures-III	2.9	2.3	2.3	2.9	2.3	
CIV-706	Seminar	3	3	3	3		
CIV-707	Project Pre-Work	2.48	2.29	2.43	2.48	2.39	
CIV-711E2	Railway and Airport Engineering	2.95	2.94	2.25			

CIV-711:E1	Computer Aided Design	1.2	3	3	1.8		
CIV-711:E2	Hydropower Engineering	3.4	3.4	3.4	3.3		
CIV-801	Bridge Engineering	2.8	2.8	2.8	2.9	2.9	2.8
CIV-802	Project	2.48	2.29	2.43	2.48	2.39	
CIV-803	Transportation Planning and Economics	1.56	2.04	3	2.04		
CIV-811:E1	Rock Mech and Tunnel Engineering	2.904	2.9	2.92	2.9		
CIV-811:E1	Environmental Engineering	3	2.52	3	1.8	2.58	
CIV-812:E3	Earthquake Resistant Design	2.93	2.93	1.71	2.16	2.43	

Table 3.2.h.3

3.3. Attainment of Program Outcomes and Program Specific Outcomes (75)

Claimed 75

3.3.1. Describe the assessment tools and processes used for assessing the attainment of each of the program Outcomes and Program Specific Outcomes: (10)

Claimed:10

A. List of assessment tools and process:

i. PO and PSO Assessment Tool:

The various direct and indirect assessment tools used to evaluate POs & PSOs and the frequency with which the assessment processes are carried out are listed in Table 3.3. a.

		Course	Assessment Tools	Frequency	
Direct (80% weightage)	CO Assessment	Theory	Midterm	once/course	
			Continuous Assessment	Weekly	
			Major	Once/course	
		Laboratory	Continuous Assessment (Report, Experiments)	Daily	
			Major Lab Exam (Viva Voce, perform a given experiment)	Once/lab course	
		Seminar	Presentation	Twice/Course	
			Report	Once/course	
		Project	7 th Semester	Mid-Term Evaluation	Once/course
				End- Term Evaluation	Once/course
			8 th Semester	Mid-Term Evaluation	Once/course
End-Term Evaluation (Demonstration and evaluation by External Examiner)	Once/course				
Indirect (20% weightage)	Surveys	Program Exit Survey		Once in a year	
		Employer Survey		Once in a year	
		Alumni Survey		Once in a year	

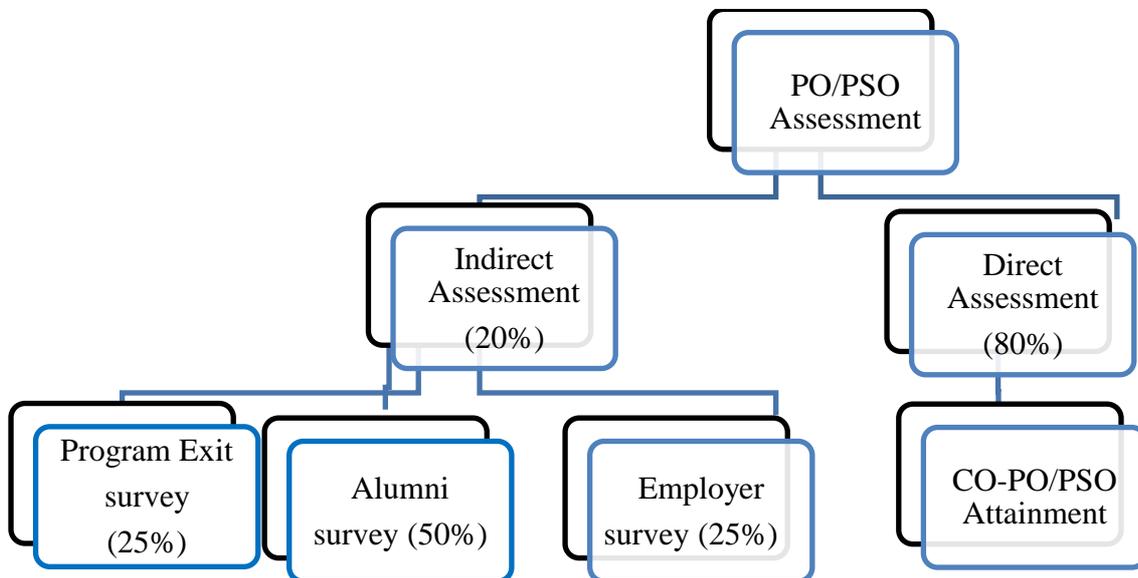
Table 3.3.a Assessment tools used for evaluation of PO and PSO attainment

ii. Assessment Process:

PO/PSO assessment is done by giving 80% weightage to direct assessment and 20% weightage to indirect assessment.

Direct assessment is based on CO attainment, where 60% weightage is given to attainment through the Major exam and 30% weightage is given to attainment through Minor assessments and 10% weightage is given to attainment through assignment/quiz.

Indirect assessment is done through program exit survey, alumni survey and employer survey. Program exit survey and employer survey are given a weightage of 25% each and alumni survey is given a weightage of 50% as has been decided at institute level.



3.3.2 Quality/relevance of assessment tools and processes:

i. Direct Assessment Tools and Process

Direct assessment tools described in section 3.2.1 are used for the direct assessment of POs and PSOs. Initially, the attainment of each course outcome is determined as described in section 3.2.2. The attainment of each PO corresponding to a course is determined from the attainment values obtained for each course outcome related to that PO and the CO-PO mapping values. Similarly, the values of PSO attainment are also determined. By factoring in the attainment of COs,

$\text{PO attainment} = (\text{PO mapping level}/3) * \text{CO attainment}$ $\text{PSO attainment} = (\text{PSO mapping level}/3) * \text{CO attainment}$

Criterion 3

ii. PO/PSO attainment of a course (example)

CIV - 603

SESSION: SPRING-2019

COs	CO Attain.	POs																				PSOs									
		1	Att	2	Att	3	Att	4	Att	5	Att	6	Att	7	Att	8	Att	9	Att	10	Att	11	Att	12	Att	1	Att	2	Att	3	Att
CIV-603.1	2.8	3	2.8	3	2.8	3	2.8	3	2.8	-		2	1.9	2	1.9	-	-	-	-	-	-	-	-	2	1.9	3	2.8	3	2.8	3	2.8
CIV-603.2	2.28	3	2.3	3	2.3	3	2.28	3	2.3	-		2	1.5	2	1.5	-	-	-	-	-	-	-	2	1.5	3	2.28	3	2.28	3	2.28	
CIV-603.3	2.28	3	2.3	3	2.3	3	2.28	3	2.3	-		2	1.5	2	1.5	-	-	-	-	-	-	-	2	1.5	3	2.28	3	2.28	3	2.28	
CIV-603.4	3	3	3	3	3	3	3	3	3	-		2	2	2	2	-	-	-	-	-	-	-	2	2	3	3	3	3	3	3	
Average		3	2.6	3	2.6	3	2.59	3	2.6	-		2	1.7	2	1.7	-	-	-	-	-	-	-	2	1.7	3	2.59	3	2.59	3	2.59	

Table 3.3.b

PO & PSO ATTAINMENT CALCULATION (IN-DIRECT ASSESSMENT)

Employer’s feedback, Alumni Feedback & Student exit survey is considered for this purpose. In Students exit survey, a questionnaire was designed for this purpose and the average responses of the outgoing students for each PO is computed. Program exit survey and alumni survey are given a weightage of 25% and 50%, respectively and Employer survey, 25%. The following is result of survey for Assessment year (2019-20)

S. No.	Survey	PO1	PO 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	PS O 1	PS O 2	PS O 3
1	Program Exit Survey	2.64	2.83	2.8	2.9	3	3	3	3	3	3	3	2.8	2.65	2.3	2.7
2	Alumni Survey	2.84	2.53	2.6	2.8	2.6	2	2	2.6	3	3	3	2.4	2.58	2.8	2.6
3	Employer Survey	2.25	2.75	2.8	2.3	2.3	3	3	2.3	2	2	2	3	2.25	2.8	2.3
	Indirect Attainment	2.643	2.66	2.7	2.7	2.6	3	3	2.6	3	3	2	2.6	2.52	2.7	2.5

Table 3.3.c

OVERALL PO ATTAINMENT CALCULATIONS

Direct Assessment + In Direct Assessment

Finally, overall PO attainment values are computed by adding direct and indirect PO attainment values in the proportion of 80:20 respectively i.e., 80% weightage for direct assessment and 20% for indirect assessment

Overall PO attainment = (80% Direct + 20% Indirect)

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Indirect Attainment	2.64	2.66	2.7	2.7	2.6	2.6	2.7	2.62	2.5	2.55	2.47	2.635	2.52	2.66	2.52
Direct Attainment	2.59	2.59	2.59	2.6	-	1.7	1.7	-	-	-	-	1.727	2.59	2.59	2.59
Overall PO Attainment	2.63	2.65	2.68	2.7	2.1	2.4	2.5	2.09	2	2.04	1.97	2.453	2.53	2.65	2.53

Table 3.3.d

iii. Indirect Assessment Tools and Process

Indirect assessment is done through program exit survey, alumni survey, and employer survey. The program exit survey and employer survey are given a weightage of 25% each, and the alumni survey is given a weightage of 50%. Because of the restrictions due to COVID-19, all the feedback was taken through google forms, whose links were sent to the stakeholders on online platforms.

Program Exit Survey:

An exit survey is conducted for students who have graduated from the department for that year. The questionnaire format in the exit survey form to evaluate the attainment of POs and PSOs is given in section (a), and the relation of POs & PSOs with each question is given in section (b).

Questionnaire Format up to 2018 (Spring)

Civil Engineering Department			
<u>National Institute of Technology, Srinagar</u>			
Exiting Students Survey			
Name:		Enrolment Number	
Phone No.		Email:	
Assessment of Abilities, Skills and Attributes acquired at NIT Srinagar.			
Please rate each of the following items in terms how well your education at NIT Srinagar prepared you for them.			
1	Basic knowledge in mathematics, science, engineering and humanities.		
	Extremely Satisfied	Satisfied	Not Satisfied
2	Ability to identify, design, analyse and solve civil engineering problems		
	Extremely Satisfied	Satisfied	Not Satisfied
3	Ability to identify, design, analyse and solve civil engineering problems		
	Extremely Satisfied	Satisfied	Not Satisfied
4	Design/ development of complex engineering problems and their solutions		
	Extremely Satisfied	Satisfied	Not Satisfied
5	Use of research-based knowledge and research methods		
	Extremely Satisfied	Satisfied	Not Satisfied
6	Demonstrate the ability to apply advanced technologies to solve contemporary and new problems		
	Extremely Satisfied	Satisfied	Not Satisfied

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7	Awareness to apply engineering solutions in global, national and societal contexts		
	Extremely Satisfied	Satisfied	Not Satisfied
8	Understanding professional engineering solutions in societal and environmental contexts		
	Extremely Satisfied	Satisfied	Not Satisfied
9	Understanding of professional and ethical responsibility		
	Extremely Satisfied	Satisfied	Not Satisfied
10	Ability to function as an effective member in multi-disciplinary teams		
	Extremely Satisfied	Satisfied	Not Satisfied
11	Proficient in English language in both communicative and technical forms		
	Extremely Satisfied	Satisfied	Not Satisfied
12	Demonstrate the ability to choose and apply appropriate resource management techniques		
	Extremely Satisfied	Satisfied	Not Satisfied
13	Capable of self-education and clearly understand the value of updating their professional knowledge to engage in life-long learning		
	Extremely Satisfied	Satisfied	Not Satisfied
14	Ability to integrate theory and practice to construct systems of varying complexity		
	Extremely Satisfied	Satisfied	Not Satisfied
15	Ability to apply civil engineering skills, tools and mathematical techniques to analyse, design and model complex systems		
	Extremely Satisfied	Satisfied	Not Satisfied
16	Ability to design and manage small-scale projects to develop a career in civil engineering		
	Extremely Satisfied	Satisfied	Not Satisfied

Table 3.3.h

1. Please list some very important skills that you think you had learned in the engineering program.
2. Please write down any comments or suggestions that you think will improve the engineering programs at NIT Srinagar.
3. Please comment about the department Vision and Mission:

Signature:

Relation of POs and PSOs with questionnaire:

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Questions	Q1	Q2	Q3	Q4	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q6	Q14	Q15

Table 3.3.i

PO/PSO	Question	Justification
PO1	Q1	Both Q1 and PO1 are related to basic knowledge of engineering and mathematics
PO2	Q2	Q2 asks about solution to civil engineering problems which is also the statement of PO2
PO3	Q3	Both represent the same idea
PO4	Q4	Investigation of complex problems is related to PO4
PO5	Q6	Both represent the same idea
PO6	Q7	Q7 deals with engineering solutions to global, national and societal contexts which is the basic idea of PO6
PO7	Q8	Both Q8 and PO7 talk about sustainable development
PO8	Q9	Professionalism and ethics are related to PO8
PO9	Q10	Both talk about teamwork
PO10	Q11	Both are related to communication
PO11	Q12	Resource management is the common theme of PO11 and Q12
PO12	Q13	Both are concerned with lifelong learning
PSO1	Q6	Use of technical resources and advanced technology forms the basis of PSO1 which is asked about in Q6
PSO2	Q14	Both represent the similar idea
PSO3	Q15	PSO3 and Q15 are about Civil Engineering skills and tools

Table 3.3.j

Evaluation Process:

The questionnaire consists of 16 questions that are relevant for assessing each PO and PSO. Each question has 3 options: extremely satisfied, satisfied, and somewhat satisfied, which are given marks 3, 2, and 1, respectively. The survey results are tabulated, and the average values corresponding to each PO and PSO are calculated.

The questionnaire has been modified for 2019 Autumn onwards. The questionnaire format is shown in in Table below:

Civil Engineering Department <u>National Institute of Technology, Srinagar</u> Student Feedback Form	
Name(optional):	Year Passed out/studying:
Email(optional):	Phone(optional):

Assessment of Knowledge, Skills, Abilities and Attributes acquired by Students at NIT Srinagar		
Please rate each of the following in terms how well NIT Srinagar has inculcated them in you so far by writing the appropriate number against each by Using Scale (1 to 3) . 1= Satisfactory; 2=Good; 3=Excellent		
S.No.	Attribute	Rating
1	Ability to acquire and apply knowledge of basic mathematics, science and engineering fundamentals.	
2	Ability to apply analytical skills to engineering problems.	
3	Ability to conduct experiments, analyze data, and present results.	
4	Ability to conduct independent research for information required in engineering problem-Solving.	
5	Ability to use modern technologies and tools necessary for practice.	
6	Ability to understand global issues related to engineering.	
7	Understand the importance of ethical and professional responsibility.	
8	An ability to function on multi-disciplinary teams.	
9	An ability to communicate effectively.	
10	Recognition of the need for, and an ability to engage in life-long learning.	
	Suggestions for improvement:	

Signature:

Relation of POs and PSOs with questionnaire:

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Questions	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q7	Q8	Q9	Q8	Q10	Q1	Q2	Q4

Table

PO/PSO	Question	Justification
PO1	Q1	Both Q1 and PO1 are related to basic knowledge of engineering and mathematics
PO2	Q2	Q2 asks about solution to civil engineering problems which is also the statement of PO2
PO3	Q3	Both represent the same idea
PO4	Q4	Investigation of complex problems and independent research is related to PO4
PO5	Q5	Both represent the same idea
PO6	Q6	Q6 deals with engineering solutions to global, national and societal contexts which is the basic idea of PO6
PO7	Q7	Both Q7 and PO7 talk about professional responsibility

PO8	Q7	Professionalism and ethics are related to PO8
PO9	Q8	Both talk about teamwork
PO10	Q9	Both are related to communication
PO11	Q8	Resource management is the common theme of PO11 and Q12
PO12	Q10	Both are concerned with lifelong learning
PSO1	Q1	Use of technical resources and advanced technology forms the basis of PSO1 which is asked about in Q6
PSO2	Q2	Both represent the similar idea
PSO3	Q4	PSO3 and Q15 are about Civil Engineering skills and tools

Table

Employer Survey:

Feedback is taken at a frequency of once in two years from the employers who had given jobs to our graduates. The questionnaire format in the employer survey form to evaluate attainment of POs and PSOs is given in section (a), and the relation of POs & PSOs with each question is given in section(b)(d)Questionnaire Format:

Rate the NIT Srinagar graduates working in your organization using the following criterion. Put a tick mark (✓)

Questionnaire Format:

Knowledge, Skills, Abilities, Attitude and other Attributes expected out of NIT SRINAGAR graduates

Sl. No	Overall, are you satisfied with:	Extremely Satisfied	Satisfied	Somewhat Satisfied
1	Capacity for development and analysis of engineering problems and formulation of appropriate solutions, retaining professional and ethical responsibilities.			
2	Aptitude for self-education, ability to learn new skills and a clear appreciation for the value of lifelong learning to update professional Knowledge			
3	Understanding professional engineering solutions for sustainable development and their application in global, national and societal contexts.			
4	Competence for acquiring new skills and applying them in research and development			
5	Fundamental knowledge in mathematics and science and professional fluency in English both communicative and technical forms			
6	Dexterity in the differentiation of management techniques and possession of leadership skills that enable the successful function of multi-disciplinary teams			

Table 3.3.k

Relation of POs and PSOs with questionnaire:

Pos/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Questions	Q5	Q1	Q3	Q1	Q1	Q3	Q3	Q1	Q6	Q5	Q6	Q2	Q4	Q3	Q3

Table 3.3l

PO/PSO	Question	Justification
PO1	Q5	Both Q5 and PO1 are related to basic knowledge of engineering and mathematics
PO2	Q1	Q1 asks about the solution to civil engineering problems which is also the statement of PO2
PO3	Q3	Engineering solutions in global, national, and societal contexts are related to PO3, which has been asked in Q3
PO4	Q1	Investigation of complex problems is related to PO4
PO5	Q1	Both represent the same idea
PO6	Q3	Similar statements
PO7	Q3	Both Q3 and PO7 talk about sustainable development
PO8	Q1	Professionalism and ethics are related to PO8
PO9	Q6	Q6 asks about the statement of PO9
PO10	Q5	Q5 enquires about efficient communication techniques same as PO10
PO11	Q6	Resource management is the common theme of PO11 and Q6
PO12	Q2	Both represent the same idea
PSO1	Q4	Use of technical resources and advanced technology forms the basis of PSO1 which is asked about in Q4
PSO2	Q3	Ability to construct structural systems is what Q3 asks about
PSO3	Q3	Q3 and the statement of PSO3 relate to the same idea

*Table 3.3m***Evaluation Process:**

The questionnaire consists of 6 questions. These questions are relevant for assessing each PO and PSO. If multiple questions satisfy a PO, then their average is taken. A similar procedure is followed for PSOs also. Each question has 3 options: extremely satisfied, satisfied, and somewhat satisfied, which are given marks 3, 2, and 1, respectively. These marks are tabulated, and the average values corresponding to each PO and PSO are determined.

Alumni Survey:

Feedback is taken from alumni. The questionnaire format in the alumni survey form to evaluate attainment of POs and PSOs is given in section (a), and the relation of POs & PSOs with each question is given in section (b).

Questionnaire Format:

Assessment of Knowledge, Skills, Abilities, Attitude, and attributes acquired at NIT SRINAGAR.

Civil Engineering Department National Institute of Technology Srinagar Alumni Survey Form		
Thank you for taking the time to fill out this questionnaire. All the information will be kept confidential and will be used only for statistical purposes. As an alumnus, your opinions are valued and are utilized to help us make periodic changes and updates for continuous improvement of our undergraduate program		
Name(optional)		
Year of Graduation		
Mailing address		
Placement	Before/after graduation	Core/Software
Name of the Company		
Please rate each of the following skills, abilities, or attributes regarding their importance to state how well your education at Civil Engineering Department, National Institute of Technology, Srinagar prepared you for these. Write the appropriate number by Using Scale (1 to 3). 1= Satisfactory; 2=Good; 3=Excellent		
Skills, Abilities, and Attributes		Rating
Apply Knowledge of mathematics, Basic Sciences and Engineering		
Problem Identification and Analysis		
Design a system and develop solution to the problem		
Investigate and handle complex problems		
Ability to use techniques and tools in engineering practice		
Understand and appreciate the impact of engineering in the societal and global contexts		
Awareness of existing issues (e.g. Economics of engineering, Environmental issues)		
Understand professional and ethical responsibilities as an engineer (e.g., safety, professional ethics, code of conduct)		
Function effectively in teams		
Proficient in English language in both communicative and technical forms		
Awareness of the need for life-long learning (Seeking further education, self-learning, Membership in professional societies)		
Project Management and Finance		
	Suggestion if any:	

Signature	
-----------	--

Table 3.3n

Relation of POs and PSOs with questionnaire:

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Questions	Q1	Q2	Q3	Q4	Q5	Q7	Q6	Q8	Q9	Q10	Q12	Q11	Q5	Q4	Q5

Table 3.3o

POs	Questions	Justification
PO1	Q1	Related as both are related to basic sciences
PO2	Q2	Related since both are related to identification and analysis processes
PO3	Q3	Related as they are the same
PO4	Q4	Related as both have a common goal
PO5	Q5	Related since both include use of recent techniques
PO6	Q7	Related as both points are related to existing issues
PO7	Q6	Related as both have a mutual goal
PO8	Q8	Related as both include professional ethics
PO9	Q9	Related as both include team work
PO10	Q10	Related as both are based on communication skills
PO11	Q12	Related due to the mention of time and finance in both points
PO12	Q11	Related as both include lifelong learning
PSO1	Q5	Related as both include use of techniques and tools
PSO2	Q4	Related as both include investigations
PSO3	Q5	Related as it includes more than use of techniques and tools

Table 3.3p

a) Evaluation Process:

The questionnaire consists of 12 questions which are relevant for assessing each PO and PSO. Each question is having 3 options, namely, extremely satisfied, satisfied and somewhat satisfied, which is given marks 3, 2, and 1 respectively. These marks are tabulated and the average values is value is shown:

3.3.2. Provide results of evaluation of each PO and PSO: (65) Claimed: 65

3.3.2.1 PO and PSO Attainment

The PO Attainment Direct, Indirect and Final attainment for the four academic years viz. 2019-20, 2018-2019 and 2017-2018 has been provided in the following Tables.

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PO Attainment (Direct): Assessment Years 2019-2020

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
MEL100	Elements of Mechanical Engg.	2.05	1.37	1.37	-	-	-	-	-	-	1.37	-	1.89	1.89	1.30	1.89
PHL100	Engineering Physics	2.80	2.70	2.61	1.20	0.99	0.95	-	-	0.90	-	-	-	-	-	-
CYL 100	Engineering Chemistry	1.90	1.85	1.80	0.75	-	1.15	1.65	0.80	0.70	1.25	1.43	2.00	2.17	1.45	1.93
HUL 100	Basic English and Communication Skills	-	-	-	-	-	0.88	-	-	1.50	2.25	1.25	0.75	-	-	-
HUP 100	Language Laboratory	-	-	-	-	-	-	-	-	1.50	2.25	1.50	1.00	-	-	-
CIL100	Engineering Mechanics	1.77	1.77	1.03	1.03	-	1.18	0.59	-	-	-	-	-	1.18	0.45	1.03
MAL100	Mathematics -I	1.24	1.00	1.34	-	-	-	-	-	-	-	0.33	0.33	0.74	1.27	0.57
PHP100	Physics Laboratory-I	1.82	2.00	0.92	1.00	0.93	1.00	1.00	0.82	1.00	1.00	-	0.91	1.50	-	-
WSP100	Work shop Practice	1.00	-	-	-	-	1.00	-	1.00	1.00	-	-	1.20	-	-	-
EEL-100	Basic Electrical Engineering	2.13	1.37	1.22	1.98	-	0.97	-	-	-	-	1.72	1.15	1.32	1.02	1.51
ITL100	Computer Programming	0.70	2.10	2.20		2.10	-	-	-	-	-	1.30	1.20	-	1.87	2.50
CYL-101	Environmental studies	1.00	2.70	2.82	1.90	-	1.80	2.74	1.78	1.86	-	1.76	0.91	-	-	-
ELP-100	Basic Electrical Engineering	2.10	1.00	-	1.35	-	2.33	1.80	-	-	-	2.08	-	0.92	0.75	1.53
CYP100	Engineering Chemistry Lab.	2.12	2.00	0.91	1.00	0.92	1.00	1.00	0.91	1.22	-	-	0.93	1.50	-	-
ITP100	Computer Programming Laboratory	1.00	0.92	2.30	1.00	3.00	1.00	-	1.00	-	-	-	2.00	-	-	-
CIP100	Engineering Drawing	1.69	1.69	1.69	1.69	1.13	1.13	1.13	-	1.75	1.75	1.41	1.41	1.69	1.69	1.69
HUL 101	Advanced English Communication Skills and Organizational Behaviour	-	-	-	-	-	0.80	-	-	0.92	1.73	0.83	0.64	-	-	-
MAL101	Mathematics II	2.28	1.72	2.32	-	-	-	-	-	-	-	0.56	0.60	1.48	2.32	1.16

Criterion 3

CIV-201	Engineering Mechanics	1.62	1.62	0.99	0.99		1.08	0.54	-	-	-	-	-	1.08	0.45	0.99
CIV-301	Structural Analysis-I	2.81	2.16	1.98	2.24	2.04	-	-	-	-	-	-	-	2.30	1.82	0.86
CIV-301(P)	Structural Engineering Lab I	3.00	2.90	3.00	2.90	-	1.20	1.20	1.00	1.00	1.10	1.00	1.00	2.90	3.00	2.00
CIV-302	Fluid Mechanics I	2.30	-	-	-	-	2.50	2.30	1.90	2.30	2.50	-	2.00	2.30	2.10	1.83
CIV-302(P)	Fluid Mechanics Lab I	2.25	1.00	1.00	1.50	2.50	1.35	1.00	2.75	1.50	1.50	1.50	2.25	2.25	2.75	2.00
CIV-303	Surveying I	1.30	1.41	1.01	-	-	-	-	-	-	1.42	-	1.61	1.10	1.42	0.60
CIV-303(P)	Surveying Lab I	1.65	1.20	1.35	1.05	1.65	0.90	0.75	0.75	1.50	1.35	0.75	0.60	1.50	1.20	0.60
MAT201	Mathematics I	1.66	1.56	1.15	-	-	-	-	-	-	1.56	-	1.77	1.33	1.56	0.67
HSS-301	Humanities and Social Science I	-	1.14	0.57	-	-	0.47	0.58	0.15	0.57	-	1.42	1.84	-	-	-
ELE-304	Electrical Engineering Tech	2.12	1.38	1.23	1.82	1.38	1.06	-	-	-	-	1.66	1.07	1.51	1.56	1.69
ELE-304(P)	Electrical Engineering Lab	2.00	-	-	-	-	1.00	-	-	-	-	-	-	1.00	-	-
CIV-401	Structural Analysis-II	2.48	2.12	2.06	2.05	1.98	-	-	-	-	-	-	-	2.30	1.78	0.74
CIV-402	Fluid Flow in Pipes and Channels	2.50	2.25	1.75	1.50	-	-	-	-	-	-	-	2.00	2.50	2.25	25.00
CIV-402(P)	Fluid Mechanics Lab II	3.00	3.00	3.00	3.00	-	2.00	2.00	-	-	-	-	3.00	3.00	3.00	2.00
CIV-403	Surveying II	2.38	2.22	2.13	0.79	1.37	0.79	0.79	0.79	1.58	1.58	0.79	0.79	1.58	0.79	1.58
CIV-403(P)	Surveying Lab II	1.65	1.20	1.35	1.05	1.65	0.90	0.75	0.75	1.50	1.35	0.75	0.60	1.50	1.20	0.60
CIV-404	Engineering Geology and Materials	3.00	2.00	2.00	-	-	-	-	-	-	2.00	-	3.00	3.00	2.00	3.00
CIV-404 (P)	Geology Lab	1.76	2.19	-	-	0.97	0.97	2.19	1.58	1.58	-	-	1.76	1.58	2.37	2.19
CIV-405	Building Drawing and Construction	2.50	-	-	-	-	2.25	2.25	2.25	2.50	2.50	2.50	2.57	2.50	2.50	2.57
MTH-406	Mathematics II	2.28	1.72	2.32	-	-	-	-	-	-	-	0.56	0.6	1.48	2.32	1.16
CIV-400	Professional Development Activities	3.00	3.00	2.90	2.50	3.00	2.00	2.00	2.00	1.00	1.00	1.00	2.00	2.70	2.00	1.50
CIV-501/	Design of Structures-I	2.06	1.38	2.06	-	-	-	-	-	-	1.38	-	2.06	2.06	1.38	2.06

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CVT 301																
CIV-501(P)	Concrete Laboratory	3.00	2.00	1.75	2.00	-	2.00	1.00	-	-	-	-	2.00	3.00	2.00	2.00
CIV-502	Highway Engineering and PMS	2.76	1.84	1.84	1.84	-	0.92	0.92	-	-	-	-	1.84	2.76	1.84	1.84
CIV-502(P)	Highway Lab.	2.18	1.68	1.68	1.50	1.29	2.18	2.00	-	-	-	-	2.18	2.18	1.68	2.18
CIV-503	Geotechnical Engineering -I	2.10	1.50	1.31	1.25	-	1.40	1.21	-	-	-	-	1.40	2.10	1.50	1.84
CIV-503(P)	Geotechnical Laboratory I	3.00	2.00	1.20	2.00	-	2.00	1.00	-	-	-	-	2.00	3.00	2.00	3.00
CIV-504	Water Resources Engineering	1.10	0.80	0.70	0.70	0.50	0.90	0.70	-	-	-	-	1.10	0.80	0.60	0.70
CIV-505	Structural Analysis-III	2.31	2.31	2.31	2.08	2.00	1.74	1.74	-	-	-	-	1.74	2.31	2.31	2.31
CIV-500	Professional Development Activities	3.00	2.80	3.00	2.75	3.00	2.20	2.00	2.00	1.10	1.20	1.00	2.10	2.90	2.00	1.50
CIV-506: E1	Engineering Seismology	1.89	1.89	2.02	1.77	2.33	2.21	2.08	1.64	2.08	2.33	-	1.95	2.08	1.89	1.58
CIV-511:E1	Concrete Technology	2.25	2.03	2.25	-	-	2.25	2.10	2.25		2.03	-	2.10	2.25	2.03	1.83
CIV-601	Design of Structures-II	2.90	1.93	2.90	-	-	-	-	-	-	1.93	-	2.90	2.90	1.93	2.90
CIV-601(P)	Structural Engineering Lab. II	3.00	3.00	3.00	3.00	-	2.00	2.00	-	-	-	-	2.00	3.00	3.00	3.00
CIV-602	Traffic Engineering and Road Facilities	2.20	1.70	1.70	1.51	1.26	2.20	2.01	-	-	-		2.20	2.20	1.70	2.20
CIV-602(P)	Traffic Engineering Lab	2.50	2.67	2.67	2.33	2.00	2.50	2.25	-	-	-	-	2.50	2.50	2.67	2.50
CIV-603	Geotechnical Engineering -II	2.90	2.90	2.90	2.90	-	1.93	1.93	-	-	-	-	1.93	2.90	2.90	2.90
CIV-603(P)	Geotechnical Laboratory II	3.00	2.00	1.20	2.00	-	2.00	1.00	-	-	-	-	-	-	-	2.00
CIV-604	Irrigation and Hydraulic Structures	2.90	2.15	2.15	2.15	1.00	2.40	2.15	-	-	-	-	2.40	2.90	2.15	2.40
CIV-611: E1	Water-Shed Management	1.73	2.03	1.65	1.55	0.87	1.73	1.73	-	-	-	1.35	1.63	1.93	1.63	1.83
CIV-612: E2	Applied Hydrology	2.75	2.75	2.75	3.00	2.50	2.33	2.75	-	-	-	-	2.50	2.75	3.00	2.75

Criterion 3

CIV-612: E2	Advanced Structural Analysis	2.16	2.16	2.16	2.16	0.89	1.44	1.44	-	-	-	-	1.44	2.16	2.16	2.16
CIV-701(P)	Water supply & Sanitary Engineering	1.15	1.41	1.72	1.31	1.15	1.41	1.15	1.41	-	-	-	1.39	1.39	1.41	1.45
CIV-701(P)	Water Quality lab	2.00	2.50	-	2.50	-	2.80	2.80	-	-	-	-	2.90	2.60	2.70	2.90
CIV-702	Structural Dynamics	1.85	1.40	1.22	0.91	0.94	0.25	0.91	0.45	0.13	0.91	-	1.23	1.59	1.19	1.10
CIV-703	Construction Technology & Management	3.00	2.00	2.00	-	-	-	-	-	-	-	-	2.00	3.00	2.00	3.00
CIV-704	Design of Structures-III	3.00	3.00	3.00	3.00	3.00	2.00	2.00	2.00	-	-	-	-	3.00	3.00	3.00
CIV-705	Quantity Surveying and Cost Evaluation	2.23	2.23	1.35	1.38	-	1.38	1.23	-	-	-	-	-	1.38	1.09	1.62
CIV-706	Seminar	2.40	1.60	2.40	2.40	2.40	1.60	1.60	1.60	2.40	2.40	0.80	2.40	1.60	1.20	2.00
CIV-707	Project Pre-Work	2.50	1.00	1.00	1.00	2.00	1.00	1.00	1.00	0.50	0.50	0.25	2.00	3.00	2.00	2.00
CIV-711: E1	Railway and Airport Engineering	3.00	3.00	3.00	3.00	2.00	2.00	2.00	-	-	-	-	2.00	3.00	3.00	3.00
CIV-711: E1	Advanced geotechnical engineering	1.10	1.33	1.43	1.53	1.03	0.68	0.88	0.98	1.15	1.33	0.73	1.03	0.83	1.03	0.98
CIV-700	Professional Development Activities	3.00	2.80	3.00	2.75	3.00	2.20	2.00	2.00	1.10	1.20	1.00	2.10	2.90	2.00	1.50
CIV-801	Hydropower Engineering	2.50	-	-	-	-	2.75	2.50	2.00	2.50	2.75	-	2.75	2.50	2.25	2.00
CIV-802	Bridge Engineering	2.64	2.64	2.04	2.04	0.33	1.76	1.76	-	-	-	1.54	1.76	2.64	2.64	2.64
CIV-803	Project	3.00	1.00	1.00	3.00	2.00	3.00	2.00	1.00	2.00	2.00	2.00	2.00	3.00	2.00	2.00
CIV-811: E1	Practical Training & Viva-Voce	3.00	3.00	2.90	3.00	2.00	2.00	1.00	1.00	2.00	2.00	1.00	2.00	2.00	1.50	1.50
CIV-811: E1	Rock Mechanics and Tunneling Technology	2.23	2.23	1.38	1.38	-	1.38	1.23	-	-	-	-	-	1.38	1.09	1.62
CIV-812: E2	Ground Improvement Techniques	0.80	0.87	1.00	1.07	0.67	0.53	0.87	0.40	0.73	0.73	0.40	1.07	0.80	1.20	1.20
	Direct Attainment	2.21	1.91	1.87	1.79	1.60	1.60	1.59	1.25	1.35	1.61	1.09	1.69	2.07	1.84	2.18

Table 3.3q1

PO Attainment (Indirect): Assessment Years 2019-2020

S. No.	Survey	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	Program Exit Survey	2.50	2.00	2.00	1.50	2.50	1.50	2.00	2.00	2.00	2.50	2.00	2.50	2.50	2.00	2.00
2	Alumni Survey	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
3	Employer Survey	3.00	2.00	3.00	2.00	2.00	3.00	3.00	2.00	2.00	3.00	2.00	3.00	3.00	3.00	3.00
	Indirect Attainment	2.88	2.50	2.75	2.38	2.63	2.63	2.75	2.50	2.50	2.88	2.50	2.88	2.88	2.75	2.75

Table 3.3q2

Overall Attainment for Assessment Years 2019-2020

Attainment	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Direct Attainment (80%)	2.21	1.91	1.87	1.79	1.6	1.6	1.59	1.25	1.35	1.61	1.09	1.69	2.07	1.84	2.18
Indirect Attainment (20%)	2.88	2.5	2.75	2.38	2.63	2.63	2.75	2.5	2.5	2.88	2.5	2.88	2.88	2.75	2.75
Overall PO/PSO Attainment	2.34	2.03	2.05	1.91	1.81	1.81	1.82	1.50	1.58	1.86	1.37	1.93	2.23	2.02	2.29

Table 3.3q3

PO Attainment (Direct): Assessment Years 2018-2019

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CHM-101	Chemistry-I	2.10	1.70	1.14	-	-	-	-	-	-	1.38	-	1.74	1.14	1.13	1.34
CHM-101P	Chemistry Laboratory-I	2.43	1.46	-	-	2.44	1.94	2.19	-	-	1.30	1.94	1.21	2.43	2.43	1.46
PHY-101	Physics-I	1.35	1.35	1.15	0.60	1.12	0.45	-	-	-	-	-	-	-	-	-
PHY-102P	Physics Laboratory-I	3.00	3.00	2.75	2.00	2.00	1.00	-	-	1.00	-	-	-	-	-	-
HSS-101	Communication Skills and Oral Presentation	-	-	-	-	-	-	-	-	1.85	2.11	1.89	-	-	-	-
IT - 101	Computer Fundamentals & Problem-Solving Techniques	2.23	1.09	0.75	-	0.85	-	-	-	-	-	-	1.73	2.15	1.65	1.21
MTH - 101	Mathematics-I	1.82	1.39	1.98	0.34	-	-	-	-	-	-	0.46	0.55	1.17	1.86	0.88

Criterion 3

CIV-102	Engineering Drawing	0.69	0.69	0.69	0.69	0.46	0.46	0.46	-	0.69	0.69	0.46	0.46	0.69	0.69	0.69
WSP I	Work-Shop Practice I	2.60	1.66	0.64	-	-	-	-	-	-	-	-	1.64	0.78	1.68	0.74
CHM-201	Chemistry-II	1.74	1.76	2.00	0.89	1.44	0.87	2.11	0.89	0.89	1.78	-	1.56	1.74	2.01	1.11
CHM-201P	Chemistry Laboratory-II	2.75	2.55	1.50	-	-	-	-	-	-	1.75	-	2.25	2.12	2.50	1.50
PHY-201	Physics-II	1.92	1.92	1.67	0.84	0.64	-	-	-	0.64	-	-	-	-	-	-
PHY-202P	Physics Laboratory-II	2.70	2.70	2.50	1.80	1.80	0.90	-	-	0.90	-	-	-	-	-	-
CSC-201	Computer Programming	2.48	1.68	2.34	1.50	1.63	-	-	-	-	-	-	2.25	2.72	1.33	0.91
CSE-202P	Computer Programming Lab	1.88	1.86	2.06	1.32	1.86	-	-	-	0.37	-	-	2.24	0.75	1.87	0.75
HU-201	Introduction to Social Sciences	-	-	0.35	-	-	1.07	0.88	0.94	1.02	0.35	0.39	0.35	-	-	-
MTH - 201	Mathematics-II	2.03	1.56	2.00	-	-	-	-	-	-	-	0.53	0.60	1.34	2.06	0.97
CIV-201	Engineering Mechanics	2.19	2.19	1.34	1.34	-	1.46	0.78	-	-	-	-	-	1.46	0.68	1.34
WSP II	Work-Shop Practice II	1.56	1.22	1.52	-	-	-	-	-	-	-	0.40	-	1.05	1.30	0.73
MED-201	Machine Drawing	1.23	0.8	1.30	1.8	-	-	-	0.68	1.53	-	-	0.8	1.33	1.01	0.42
CIV-301	Structural Analysis-I	1.50	1.50	1.50	0.90	-	1.20	0.50	-	-	-	-	0.50	1.50	0.60	1.20
CIV-301(P)	Structural Engineering Lab I	2.76	1.63	1.17	0.92	-	1.84	1.13	-	-	-	-	1.59	2.76	1.63	1.84
CIV-302	Fluid Mechanics I	2.50	-	-	-	-	2.75	2.50	2.00	2.50	2.75	-	2.25	2.50	2.25	2.00
CIV-302(P)	Fluid Mechanics Lab I	2.50	2.67	2.67	2.33	2.00	2.50	2.25	-	-	-	-	2.50	2.50	2.67	-
CIV-303	Surveying I	2.73	2.22	2.20	1.62	2.47	1.69	0.24	1.23	2.42	1.22	0.49	0.95	2.46	1.92	1.18
CIV-303(P)	Surveying Lab I	2.00	1.40	1.00	2.00	-	2.00	-	-	-	-	-	2.00	2.00	1.00	1.60
MTH-303	Mathematics I	1.66	1.56	1.15	-	-	-	-	-	-	1.56	-	1.77	1.33	1.56	0.67
HSS-301	Humanities and Social Science I	-	1.14	0.57	-	-	0.47	0.58	0.45	0.57	-	1.42	1.84	-	-	-
ELE-304	Electrical Engineering Tech	2.12	1.38	1.23	1.82	1.38	1.06	-	-	-	-	1.66	1.07	1.51	1.56	1.69
ELE-304(P)	Electrical Engineering Lab	2.00	-	-	-	-	1.00	-	-	-	-	-	-	1.00	-	-
CIV-401	Structural Analysis-II	2.73	2.20	1.90	2.15	2.02	2.65	0.80	1.16	1.16	-	-	0.80	2.65	1.75	0.67
CIV-402	Fluid Flow in Pipes and Channels	2.50	-	-	-	-	2.75	2.50	2.00	2.50	2.75	-	2.25	2.50	2.25	2.00
CIV-402(P)	Fluid Mechanics Lab II	2.36	2.36	2.36	2.36	-	2.36	2.36	-	-	-	-	2.36	2.36	1.57	2.36
CIV-403	Surveying II	1.74	1.58	1.66	0.58	1.04	0.58	0.58	0.58	1.16	1.16	0.58	0.58	1.16	0.58	1.16
CIV-403(P)	Surveying Lab II	3.00	2.50	2.00	2.00	-	2.00	-	-	-	-	-	2.00	3.00	2.00	3.00
CIV-403(SC)	Surveying Camp	2.73	1.85	2.05	1.92	2.60	1.68	1.16	0.70	2.16	1.67	0.92	0.89	2.85	1.93	1.41
CIV-404	Engineering Geology and Materials	2.03	-	-	-	-	-	2.28	2.03	1.68	2.03	2.28	1.78	2.03	1.93	1.54

Criterion 3

CIV-404 (P)	Geology Lab	2.10	2.65	-	-	1.15	1.15	2.65	1.90	1.90	-	-	2.10	1.90	2.85	2.85
CIV-405	Building Drawing and Construction	2.40	-	-	-	-	2.03	1.78	2.03	2.40	2.03	2.40	2.03	2.10	2.40	2.40
MTH-406	Mathematics II	2.01	2.22	2.26	1.62	-	-	-	-	-	-	-	2.03	2.02	2.47	-
CIV-501	Design of Structures-I	2.20	2.20	2.20	2.20	0.88	1.13	1.08	1.28	-	-	2.20	1.28	2.20	1.46	1.46
CIV-501(P)	Concrete Laboratory	3.00	2.00	1.75	2.00	-	2.00	1.00	-	-	-	-	2.00	3.00	2.00	2.00
CIV-502	Highway Engineering and PMS	2.28	1.52	1.41	1.52	-	1.37	1.37	-	-	-	-	1.52	2.28	1.52	1.41
CIV-502(P)	Highway Lab.	2.50	2.67	2.67	2.33	2.00	2.50	2.25	-	-	-	-	2.50	2.50	2.67	2.50
CIV-503	Geotechnical Engineering -I	2.34	1.71	1.57	1.41	-	1.56	1.42	-	-	-	-	1.56	2.34	1.71	2.01
CIV-503(P)	Geotechnical Laboratory I	3.00	2.00	1.20	2.00	-	2.00	1.00	-	-	-	-	2.00	3.00	2.00	3.00
CIV-504	Water Resources Engineering	1.50	1.20	1.10	1.10	0.80	1.20	1.00	-	-	-	-	1.10	1.10	1.00	1.10
CIV-505	Structural Analysis-III	2.12	2.12	2.12	1.86	-	1.58	1.58	-	-	-	-	1.58	2.12	2.12	2.12
CIV-511:E1	Concrete Technology	2.25	2.03	2.25	-	-	2.25	2.10	2.25	-	2.03	-	2.10	2.25	2.03	1.83
CIV-601	Design of Structures-II	2.45	2.45	2.45	2.45	0.93	1.28	1.05	1.16	-	-	2.45	1.16	2.45	1.63	1.63
CIV-601(P)	Structural Engineering Lab.	3.00	3.00	3.00	3.00	-	2.00	2.00	-	-	-	-	2.00	3.00	3.00	3.00
CIV-602	Traffic Engineering and Road Facilities	2.20	1.70	1.70	1.51	1.26	2.20	2.01	-	-	-	-	2.20	2.20	1.70	2.20
CIV-602(P)	Traffic Engineering Lab	2.50	2.67	2.67	2.33	2.00	2.50	2.25	-	-	-	-	2.50	2.50	2.67	2.50
CIV-603	Geotechnical Engineering -II	2.59	2.59	2.59	2.59	-	1.73	1.73	-	-	-	-	1.73	2.59	2.59	2.59
CIV-603(P)	Geotechnical Laboratory II	3.00	2.00	1.20	2.00	-	2.00	1.00	-	-	-	-	2.00	3.00	2.00	3.00
CIV-604	Irrigation and Hydraulic Structures	1.80	1.40	1.40	1.40	0.80	1.60	1.40	-	-	-	-	1.60	1.80	1.40	1.40
CIV-611:E1	Water-Shed Management	1.73	1.73	1.55	1.55	0.47	1.73	1.73	-	-	-	1.25	1.73	1.73	1.73	1.73
CIV-612:E2	Applied Hydrology	2.11	2.11	2.11	2.11	2.11	1.20	2.12	-	-	-	-	2.14	1.44	1.63	1.69
CIV-612:E2	Advanced Structural Analysis	2.16	2.16	2.16	2.16	0.89	1.44	1.44	-	-	-	-	1.44	2.16	2.16	2.16
CIV-701	Water supply & Sanitary Engineering	1.15	1.41	1.72	1.31	1.15	1.41	1.15	1.41	1.39	1.39	1.41	1.45	1.15	1.41	1.72
CIV-701(P)	Water Quality lab	2.00	1.00	-	2.00	-	1.00	2.00	-	-	-	-	2.00	2.00	1.00	2.00
CIV-702	Structural Dynamics	2.4	1.8	1.8	-	1.7	1.6	1.4	1.6	-	-	2.1	1.6	2.4	1.4	2.4
CIV-703	Construction Technology & Management	2.61	2.61	-	-	2.61	2.61	-	1.96	2.29	2.61	-	1.96	2.29	1.96	1.96
CIV-704	Design of Structures-III	2.50	2.50	2.50	2.50	1.67	1.67	1.67	-	-	-	-	2.50	2.50	2.50	2.50
CIV-705	Seminar	2.40	1.60	2.40	2.40	2.40	1.60	1.60	1.60	2.40	2.40	0.80	2.40	1.60	1.20	2.00
CIV-706	Project Pre-Work	2.50	1.00	1.00	1.00	2.00	1.00	1.00	1.00	0.50	0.50	0.35	2.00	3.00	2.00	2.00

Criterion 3

CIV-711: E1	Railway and Airport Engineering	2.70	2.70	2.70	2.70	1.80	1.80	1.80	-	-	-	-	1.80	2.70	2.70	2.70
CIV-712: E2	Computer Aided Design	1.42	1.34	1.67	1.42	2.17	-	-	-	-	1.17	1.67	-	2.34	1.42	2.26
CIV-801	Hydropower Engineering	1.95	1.95	1.95	1.95	-	1.30	1.70	0.70	-	1.30	-	1.60	1.80	2.00	1.80
CIV-802	Bridge Engineering	2.50	2.50	2.00	2.00	1.70	1.70	1.70	-	-	-	1.60	1.70	2.50	2.50	2.50
CIV-803	Project	2.48	2.48	2.48	2.48	1.64	1.96	2.26	2.42	2.42	2.17	2.46	2.46	2.46	2.46	2.46
CIV-811:E1	Transportation Planning and Economics	2.02	1.60	1.60	1.60	1.34	1.60	1.60	-	-	-	1.60	1.60	2.02	1.60	1.60
CIV-812:E2	Environmental Engineering	2.07	2.26	0.19	0.19	2.07	1.92	-	1.42	1.67	2.07	0.19	1.42	2.05	1.61	2.03
CIV-812:E2	Earthquake Resistant Design	2.52	1.93	1.70	0.95	1.40	1.50	1.18	0.97	-	1.07	-	1.63	2.08	1.90	1.50
CIV-812:E2	Ground Improvement Techniques	2.08	2.09	1.75	2.00	2.28	1.19	2.11	0.90	1.13	2.03	1.18	2.42	1.82	2.37	2.03
	Direct Attainment	2.23	1.88	1.75	1.65	1.63	1.61	1.54	1.26	1.45	1.64	1.23	1.66	2.07	1.84	1.74

Table 3.3r1

PO Attainment (Indirect): Assessment Years 2018-2019

S. No.	Survey	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	Program Exit Survey	2.64	2.83	2.78	2.94	2.98	2.66	2.92	2.95	2.75	2.59	2.80	2.80	2.65	2.31	2.66
2	Alumni Survey	2.84	2.53	2.63	2.79	2.58	2.47	2.47	2.63	2.68	2.68	2.53	2.37	2.58	2.79	2.58
3	Employer Survey	2.25	2.75	2.75	2.25	2.25	2.75	2.75	2.25	2.00	2.25	2.00	3.00	2.25	2.75	2.25
	Indirect Attainment	2.64	2.66	2.70	2.69	2.60	2.59	2.65	2.62	2.53	2.55	2.46	2.63	2.52	2.66	2.52

Table 3.3r2

Overall Attainment for Assessment Years 2018-2019

Attainment	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Direct Attainment (80%)	2.23	1.88	1.75	1.65	1.63	1.61	1.54	1.26	1.45	1.64	1.23	1.66	2.07	1.84	1.74
Indirect Attainment (20%)	2.64	2.66	2.7	2.69	2.6	2.59	2.65	2.62	2.53	2.55	2.46	2.63	2.51	2.66	2.52
Overall Attainment	2.31	2.04	1.94	1.86	1.82	1.81	1.76	1.53	1.67	1.82	1.48	1.86	2.16	2.00	1.90

Table 3.3r3

PO Attainment (Direct): Assessment Years 2017-2018

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CHM-101	Chemistry-I	2.48	1.99	1.33	-	1.69	1.2	1.57	-	0.71	1.63	1.92	2.05	2.12	2.23	1.57
CHM-101P	Chemistry Laboratory-I	2.36	1.41	-	-	2.35	1.88	2.12	-	-	1.26	1.88	1.78	2.35	2.36	1.41
PHY-101	Physics-I	1.32	1.32	1.07	0.54	1.05	0.44	-	-	-	-	-	-	-	-	-
PHY-102P	Physics Laboratory-I	3	3	2.75	2	2	1	-	-	1	-	-	-	-	-	-
HSS-101	Communication Skills and Oral Presentation	-	-	-	-	-	-	-	-	1.57	1.74	1.57	-	-	-	-
IT - 101	Computer Fundamentals & Problem-Solving Techniques	2.23	1.09	0.37		0.85	-	-	-	-	-	-	1.73	2.15	1.65	1.2
MTH - 101	Mathematics-I	1.43	1.12	1.58	0.8	-	-	-	-	-	-	0.8	0.408	0.93	1.5	0.69
CIV-102	Engineering Drawing	1.43	1.43	1.43	1.43	1	1	1	-	1.43	1.43	1	1	1.43	1.43	1.43
WSP I	Work-Shop Practice I	2.28	1.48	0.64	-	-	-	-	-	-	-	-	1.58	0.66	1.66	0.62
CHM-201	Chemistry-II	1.76	1.56	2.1	0.91	1.44	0.88	2.14	0.92	0.92	1.68	-	1.46	1.76	2.21	1.21
CHM-201P	Chemistry Laboratory-II	2.38	1.85	1.58	-	-	1.78	1.85	-	-	1.38	1.21	1.83	2.34	2.38	1.65
PHY-201	Physics-II	1.65	1.65	1.4	0.4	0.55	-	-	-	0.55	-	-	-	-	-	-
PHY-202P	Physics Laboratory-II	3	3	2.75	2	2	1	-	-	1	-	-	-	-	-	-
CSC-201	Computer Programming	2.48	1.68	2.34	1.5	1.63	-	-	-	-	-	-	2.25	2.72	1.33	0.91
CSE-202P	Computer Programming Lab	1.88	1.86	2.06	1.32	1.86	-	-	-	0.37	-	-	2.24	0.75	1.87	0.75
HU-201	Introduction to Social Sciences	-	-	-	-	-	1.21	1.02	0.99	0.93	0.45	0.43	0.47	-	-	-
MTH - 201	MATHEMATICS-II	1.81	1.4	1.77	-	-	-	-	-	-	-	0.46	0.5	1.14	1.84	0.87
CIV-201	Engineering Mechanics	2.49	2.49	1.46	1.46	-	1.66	0.83	-	-	-	-	-	1.66	0.63	1.46
WSP II	Work-Shop Practice II	1.96	1.45	1.88	-	-	-	-	-	-	-	0.44	-	1.04	1.26	0.74
MED-201	Machine Drawing	1.96	0.46	2.11	0.54	-	-	-	1.07	0.82	-	-	0.52	2.08	1.42	0.7
CIV-301	Structural Analysis-I	1.5	1.5	1.3	0.9	-	1.2	0.5	-	-	-	-	0.5	1.5	0.6	1.2
CIV-301(P)	Structural Engineering Lab I	2.55	1.55	1.1	0.85	-	1.7	1	-	-	-	-	1.45	2.55	1.55	1.7
CIV-302	Fluid Mechanics I	2.1	2.2	-	0.8	2.09	2	-	1.5	1.7	2.1	0.5	1.46	2.01	1.61	1.93

Criterion 3

CIV-302(P)	Fluid Mechanics Lab I	1.62	0.37	0.27	1.25	-	0.9	0.9	-	-	-	-	0.9	1.75	0.6	1.92
CIV-303	Surveying I	2.11	2.18	2.2	1.65	2.39	1.68	0.5	1.18	2.44	0.54	0.47	0.95	2.6	1.9	1.23
CIV-303(P)	Surveying Lab I	2	1.4	1	2	-	2	-	-	-	-	-	2	2	1	1.6
MTH-303	Mathematics I	1.66	1.56	1.15	-	-	-	-	-	-	1.56	-	1.77	1.33	1.56	0.67
HSS-301	Humanities and Social Science I	-	1.14	0.57	-	-	0.47	0.58	0.24	0.57	-	1.42	1.84	-	-	-
ELE-304	Electrical Engineering Tech	2.12	1.38	1.23	1.82	1.38	1.06	-	-	-	-	1.66	1.07	1.51	1.56	1.69
ELE-304(P)	Electrical Engineering Lab	2	-	-	-	-	1	-	-	-	-	-	-	1	-	-
CIV-401	Structural Analysis-II	2.73	2.2	1.9	2.15	2.02	2.65	0.8	1.16	1.16	-	-	0.8	2.65	1.75	0.67
CIV-402	Fluid Flow in Pipes and Channels	2.325	-	-	-	-	2.55	2.35	1.85	2.35	2.575	-	2.14	2.35	2.1	1.87
CIV-402(P)	Fluid Mechanics Lab II	2.36	2.36	2.36	2.36	-	2.36	2.36	-	-	-	-	2.36	2.36	1.57	2.36
CIV-403	Surveying II	2.24	2.08	2.04	0.75	1.33	0.75	0.75	0.75	1.5	1.5	0.75	0.75	1.5	0.75	1.5
CIV-403(P)	Surveying Lab II	2.67	1.93	2.03	1.65	2.7	1.38	0.64	0.94	2.33	2.18	0.97	0.43	2.41	1.78	0.96
CIV-403(SC)	Surveying Camp	2.72	1.85	2.05	1.92	2.6	1.68	1.16	0.7	2.16	1.67	0.92	0.89	2.85	1.93	1.41
CIV-404	Engineering Geology and Materials	2.5	-	-	-	-	2.75	2.5	2	2.5	2.75	-	2.25	2.5	2.25	2
CIV-404(P)	Engineering Geology Lab	2.25	2.75	-	-	1.25	1.25	2.75	2	2	-	-	2.25	2	2	2
CIV-405	Building Drawing and Construction	2.3	-	-	-	-	2.05	2.05	2.05	2.3	2.3	2.3	2.37	2.3	2.3	2.55
MTH-406	Mathematics II	2.01	2.22	2.26	1.62	-	-	-	-	-	-	-	2.03	2.02	2.47	-
CIV-501	Design of Structures-I	1.92	1.92	1.92	1.92	0.88	0.84	0.98	1.08	-	-	1.92	1.08	1.92	1.28	1.28
CIV-501(P)	Concrete Laboratory	2.13	1.42	1.23	1.42	-	1.42	0.71	-	-	-	-	1.42	2.13	1.42	1.42
CIV-502	Highway Engineering and PMS	2.12	1.41	1.26	1.41	-	1.3	1.3	-	-	-	-	1.41	2.12	1.41	1.26
CIV-502(P)	Pavement Lab	2.5	2.67	2.67	2.33	2	2.5	2.25	-	-	-	-	2.5	2.5	2.67	2.5
CIV-503	Geotechnical Engineering -I	2.34	1.71	1.56	1.41	-	1.56	1.41	-	-	-	-	1.56	2.34	1.71	2.01
CIV-503(P)	Geotechnical Laboratory I	2.9	1.9	1.2	1.9	-	1.9	1	-	-	-	-	1.9	2.9	1.9	2.9
CIV-504	Water Resources Engineering	1.6	1.3	1.1	1.1	0.9	1.3	1.1	-	-	-	-	1.2	1.2	1.2	1.2
CIV-505a	Structural Analysis III	2.12	2.12	2.12	1.86	-	1.58	1.58	-	-	-	-	1.58	2.12	2.12	2.12
CIV-505b	Quantity Surveying and Cost Evaluation	2.15	2.15	1.27	1.59	-	1.58	1.12	-	-	-	-	-	1.4	1.03	1.51

Criterion 3

CIV-511: E1	Engineering Seismology	2.5	2.8	2.5	2.5	2.8	2.8	2.5	2	2.5	2.8	-	2.3	2.03	1.93	1.54
CIV-601	Design of Structures-II	2.75	2.75	2.75	2.75	0.91	1.58	1.07	1.24	-	-	2.75	1.24	2.75	1.83	1.83
CIV-601(P)	Structural Engineering Lab.	3	3	3	3	-	2	2	-	-	-	-	2	3	3	3
CIV-602	Traffic Engineering and Road Facilities	2.22	1.72	1.72	1.55	1.31	2.22	2.05	-	-	-	-	2.22	2.22	1.72	2.22
CIV-602(P)	Traffic Engineering Lab	2.5	2.67	2.67	2.33	2	2.5	2.25	-	-	-	-	2.5	2.5	2.67	2.5
CIV-603	Geotechnical Engineering - II	2.42	2.42	2.42	2.42	-	1.61	1.61	-	-	-	-	1.61	2.42	2.42	2.42
CIV-603(P)	Geotechnical Laboratory II	3	2	1.2	2	-	2	1	-	-	-	-	2	3	2	3
CIV-604	Irrigation and Hydraulic Structures	1.35	1.03	1.03	1.03	0.4	1.1	0.98	-	-	-	-	1.1	1.35	1.03	1.03
CIV-611:E1	Water-Shed Management	1.73	1.73	1.55	1.55	0.47	1.73	1.73	-	-	-	1.25	1.73	1.73	1.73	1.73
CIV-701	Water supply & Sanitary Engineering	2.17	2.37	0.7	0.39	2.17	1.98	-	1.49	1.73	2.17	0.69	1.48	2.11	1.68	2.05
CIV-701(P)	Water Quality lab	2	1	-	2	-	1	2	-	-	-	-	2	2	1	2
CIV-702	Structural Dynamics	2.2	1.7	1.4	1.1	1.1	1.8	1.1	0.39	0.6	1.1	-	1.5	1.9	1.5	1.3
CIV-703	Construction Tech. & Management	2.66	2.66	-	-	2.66	2.66	-	2	2.33	2.66	-	2	2.33	2	2
CIV-704	Design of Structures-III	2.54	2.54	2.54	2.54	1.69	1.69	1.69	-	-	-	-	2.54	2.54	2.54	2.54
CIV-705	Seminar	2.4	1.6	2.4	2.4	2.4	1.6	1.6	1.6	2.4	2.4	0.8	2.4	1.6	1.2	2
CIV-706	Project Pre-Work	2.5	1	1	1	2	1	1	1	0.5	0.5	0.45	2	3	2	2
CIV-711:E1	Railway and Airport Engineering	2.7	2.7	2.7	2.7	1.8	1.8	1.8	-	-	-	-	1.8	2.7	2.7	2.7
CIV-711: E2	Advanced Structural Analysis	2.16	2.16	2.16	2.16	0.89	1.44	1.44	-	-	-	-	1.44	2.16	2.16	2.16
CIV-712: E2	Computer Aided Design	1.18	1.22	1.55	1.3	1.81	-	-	-	-	1.05	1.55	-	1.98	1.3	1.9
CIV-801	Hydropower Engineering	1.95	1.95	1.95	1.95	-	1.3	1.7	0.7	-	1.3	-	1.6	1.8	2	1.8
CIV-802	Bridge Engineering	2.5	2.6	2	2	1.6	1.7	1.7	-	-	-	1.7	1.7	2.6	2.6	2.6
CIV-803	Project	2.37	2.37	2.37	2.37	1.52	2.02	2.11	2.32	2.32	2.01	2.37	2.37	2.37	2.37	2.37
CIV-811: E1	Rock Mech and Tunnel Engineering	2.32	2.5	2.5	2.32	2.5	2.25	2.25	1.82	2.25	2.25	-	2	2.03	1.93	1.54
CIV-812: E2a	Environmental Engineering	2.07	2.18	0.55	0.35	2.07	1.88	-	1.42	1.67	2.07	0.35	1.46	1.97	1.57	1.87
CIV-812:E2b	Earthquake Resistant Design	2.52	1.93	1.7	0.95	1.4	1.5	1.18	0.97	-	1.07	-	1.63	2.08	1.9	1.5

Criterion 3

	Direct PO/PSO Attainment	2.21	1.85	1.71	1.59	1.65	1.61	1.47	1.31	1.54	1.64	1.14	1.59	2.05	1.76	1.70
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Table 3.3s1

PO Attainment (Indirect): Assessment Years 2017-2018

S. No.	Survey	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	Program Exit Survey	2.68	2.86	2.79	2.95	2.97	2.70	2.98	2.98	2.78	2.62	2.80	2.76	2.64	2.32	2.70
2	Alumni Survey	2.82	2.55	2.55	2.91	2.73	2.46	2.36	2.55	2.73	2.64	2.64	2.46	2.73	2.91	2.73
3	Average Employer Survey	2.25	2.75	2.75	2.25	2.25	2.75	2.75	2.25	2.00	2.25	2.00	3.00	2.25	2.75	2.25
	Indirect PO/PSO Attainment	2.64	2.68	2.66	2.75	2.67	2.59	2.61	2.58	2.56	2.54	2.52	2.67	2.59	2.72	2.60

Table 3.3s2

Overall PO/PSO Attainment for Assessment Year 2017-2018

Attainment	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Direct Attainment (80%)	2.21	1.85	1.71	1.59	1.65	1.61	1.47	1.31	1.54	1.64	1.14	1.59	2.05	1.76	1.70
Indirect Attainment (20%)	2.64	2.68	2.66	2.75	2.67	2.59	2.61	2.58	2.56	2.54	2.52	2.67	2.59	2.72	2.6
Overall PO/PSO Attainment	2.30	2.02	1.90	1.82	1.85	1.81	1.70	1.56	1.74	1.82	1.42	1.81	2.16	1.95	1.88

Table 3.3s3

OVERALL PO/PSO Attainment Levels for Three Assessment Years

Assessment Years	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
2019-20	2.34	2.03	2.05	1.91	1.81	1.81	1.82	1.5	1.58	1.86	1.37	1.93	2.23	2.02	2.29
2018-19	2.31	2.04	1.94	1.86	1.82	1.81	1.76	1.53	1.67	1.82	1.48	1.86	2.16	2	1.9
2017-18	2.3	2.02	1.9	1.82	1.85	1.81	1.7	1.56	1.74	1.82	1.42	1.81	2.16	1.95	1.88

Table 3.3u