Program Outcomes (POs)
Program Specific Outcomes (PSO)Course Outcomes (COs)
&
CO PO-PSO Articulation Matrices

Department of Civil Engineering

BRCM

College of Engineering & Technology

PROGRAME OUTCOMES (PO) as Defined by NBA

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

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

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

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

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

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

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

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

PO-9 : Individual or teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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

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

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

Program Specific Outcomes (PSO)

PSO-1: Capability to manage large infrastructure projects ensuring safe and cost-effective execution of projects having knowledge of fast track construction and project management.

PSO-2: Ability to use building software packages to calculate safe loads and stresses for designing structural members to ensure safety and serviceability.

B-TECH CIVIL ENGG SEMESTER-3ʳᵈ

COURSE:- **INTRODUCTION TO CIVIL ENGINEERING**
COURSE CODE:- **PCC-201-G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomys
CO1	To Remember various terms used in building construction.	L1 (Remember)
CO2	To Understand the importance of Civil Engineering in the infrastructural development of the society.	L2 (Understand)
CO3	To Apply the knowledge about sound acoustic system and various traditional building material.	L3 (Apply)
CO4	To Evaluate the types and properties of various building material and basic requirement of a building construction.	L4 (Evaluate)
CO5	To Analysis the suitable types of flooring , plastering , varnishes with their uses.	L4 (Analysis)

Course Articulation Matrix

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

COURSE:- **SURVEVYING**
COURSE CODE:- **PCC-CE-207-G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomys
CO1	To Recall the various terminology & equipment used in Surveying	L1 (Remember)
CO2	To Understand the working of various Surveying instrument i.e. Compass, Theodolite, Levelling equipment etc & process of setting of different curves for road & railway	L2 (Understand)
CO3	To Apply the Principles of surveying in field.	L3 (Apply)
CO4	To Apply different tape correction on linear measurement & suitable correction on angular measurement.	L3 (Apply)
CO5	To Prepare plan/map & contour map of an area	L4 (Analyse)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO 5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	1	2									1	2
CO2	2	2	2	1	3				2			2	2	1
CO3	2	2	1	2	2								1	2
CO4	2	1	1	1									2	1
CO5	2	1	1		2	2			3	2	2	2	2	3

COURSE:- **ENGINEERING MECHANICS**
COURSE CODE:- **PCC-203-G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom'sTaxonomys
CO1	To Identify the relationship between stress and strain on deformable solids	L1 (Identify)
CO2	To Distinguish various civil engineering structures members through SFD AND BMD under different loading conditions	L2 (Distinguish)
CO3	To Apply the torsion in shaft and Column stability.	L3 (Apply)
CO4	To Analyse the concepts of failure theories for design of structures	L4 (Analyse)
CO5	To Summarize different materials and their behaviour	L5 (Summarize)

Course Articulation Matrix

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

COURSE:- **SURVEVING LAB**
COURSE CODE:- **LC-CE-215-G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomys
CO1	To Recall the various terminology & equipment used in Surveying	L1 (Remember)
CO2	To Understand the working of various Surveying instrument i.e. Compass, Theodolite, Levelling equipment etc & process of setting of different curves for road & railway	L2 (Understand)
CO3	To Apply the Principles of surveying in field.	L3 (Apply)
CO4	To Prepare plan/map & contour map of an area	L4 (Analyse)
CO5	To Estimate quantity of Earthwork by determining RL of ground points With the help of levelling instrument.	L6 (Evaluation)

Course Articulation Matrix

CO/PO	PO1	PO2	P3	PO4	PO 5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	2									1	2	2
CO2	2	2	1	3	2			2			2	2	1	1
CO3	2	1	2	2									2	2
CO4	1	1	1		3							2	1	2
CO5	1	1		2	2			3	2	2	2	2	2	1

COURSE:- **MATHEMATICS III**
COURSE CODE:- **MC-106-G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomys
CO1	Pupil will be able to recall the essential tool of partial differential equation, the essential tool of partial differential equation, numerical methods, integration, laplace transform and discrete mathematics. in a comprehensive manner.	L1 (Remember)
CO2	Students will be able to understand different type polynomial and transcendental equations, interpolation, linear and non linear PDE and basic concept of Laplace transformation.	L2 (Understand)
CO3	Pupil will be able to apply the tools of differentiation and integration and numerical method to solve polynomial and transcendental equations, interpolation, linear and non linear PDE and Laplace transform that are used in various techniques dealing engineering problems.	L3 (Apply)
CO4	Students will be able to analyse how to deal with Laplace, numerical, problems, PDE and Discrete maths problem that are essential in most branches of engineering.	L4 (Analyse)
CO5	Pupil will also be able to evaluate/solve the mathematical problems related to PDE, Numerical Method, Laplace Transform, Discrete Math's	L6 (Evaluation)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO 5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2										1	3	2
CO2	3	2										1	3	1
CO3	2	3										1	3	2
CO4	2	3										1	2	2
CO5	2	3										1	3	1

COURSE:- **ECONOMICS FOR ENGINEERS**
COURSE CODE:- **MC-106-G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomys
CO1	To Describe the Basic of Economics Theories terminology, Cost concepts and Pricing Policies Used in Engineering Economics.	L1 (Remember)
CO2	To Summarize the measures of national income, the function of banks and concepts of globalization.	L2 (Understand)
CO3	To Discuss how supply and demand change when a product price changes.	L3 (Apply)
CO4	To Use the concept of Demand to explain the Outcomes of markets for individuals firms and society.	L4 (Analyse)
CO5	To Analyze how a change in price and income affects the behavior of buyers and sellers	L4 (Analyse)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO 5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1						3					2	1	1	2
CO2						2			3		2	1	1	2
CO3						3					3	1	1	2
CO4						3					2	1	3	2
CO5						3			2		2	1	3	1

B-TECH CIVIL ENGG SEMESTER-4th

COURSE:- **HYDRAULIC ENGINEERING**
COURSE CODE:- **MC-106-G**
Course Outcome

	CO (Course outcome)	RBT*-Revised Bloom Taxonomy
CO1	To describe various types of flow in pipes and open channels.	L1 (Remember)
CO2	To understand the hydraulic jump and its application.	L2 (Understand)
CO3	To Identify the different losses in flow through pipes.	L3 (Apply)
CO4	To design themost economical section in open channel flow.	L4 (Analyse)
CO5	To relate the theory and practice of problems in hydraulic engineering.	L5 (Evaluate)

Course Articulation Matrix

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

COURSE:- **DESIGNOFCONCRETE STRUCTURE**
COURSE CODE:- **PCC-CE-204-G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomy
CO1	To Recall the terms used in RC Structural elements like Beam ,Column and Slabs	L1 (Remember)
CO2	To Illustrate use of various components to understand structure stability .	L2 (Understand)
CO3	To Explain the application of LSM and WSM concept for application In practical life	L2 (Understand)
CO4	To Analysis the cause of failure of RC structure like Beam, Column ,Strut, footing ,Retaining wall .	L4 (Analyse)
CO5	To Evaluate and find and fix the causes of failure of RC structure by suitable methods .	L6 (Evaluate)

Course Articulation Matrix

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

COURSE:- STRUCTURAL ANALYSIS
COURSE CODE:- PCC-CE-206-G
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomy
CO1	To Remember various terminology used in Determinate and indeterminate structure subjected to static or moving loading	L1 (Remember)
CO2	To Understand the concept of deflection, Rotation & ILD	L2 (Understand)
CO3	To Select Suitable method of Analyses and Applying them practically on structure	L3 (Apply)
CO4	Apply concept of ILD and moving Load on Structure	L3 (Apply)
CO5	Analyses Determinate and indeterminate structure (Beam , Arch and Truss) using different Displacement method	L4 (Analyse)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO11	PSO2
CO1	2	1	1		2		1			2		2	2	
CO2	2	1			1	2				3		2		2
CO3	3	2	3	2	2	2		2			2	1	1	2
CO4	3	2		2	2	2					2	1	2	1
CO5	3	3		3	2		2					2		2

COURSE:- GEOMATICS AND AERIAL SURVEYING
COURSE CODE:- PCC-CE-208-G
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomy
CO1	To IDENTIFY the principle of surveying on very large scale by locating precise horizontal controls	L1 (Remember)
CO2	To SUMMARIZE about surveying applications in setting out works.	L2 (Understand)
CO3	To DISCOVER absolute positions of a point using celestial measurements.	L3 (Apply)
CO4	To CALCULATE different types of errors in measurements and their adjustment	L4 (Analyse)
CO5	To PREPARE basic concept of photogrammetry, Remote sensing, and GIS.	L5 (Evaluate)

Course Articulation Matrix

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

COURSE:- **MATERIAL TESTING AN EVALUATION**
COURSE CODE:- **PCC-CE-210-G**
Course outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomy
CO1	To Remembering the various termonology used in material testing and concrete technology.	L1 (Remember)
CO2	To Understand the behaviour of construction material.	L2 (Understand)
CO3	To Applythe mix design concept and explain what will effect on strength of concrete..	L3 (Apply)
CO4	To Analysis the properties of fresh and hardened of concrete.	L4 (Analyse)
CO5	To Avaluate the design of concrete mix using ACI and IS code method..	L6 (Evaluate)

Course Articulation Matrix

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

COURSE:- **HYDRAULIC ENGINEERING LAB.**
COURSE CODE:- **LC-CE-212-G**
Course Outcome

	CO (Course outcome)	RBT*-Revised Bloom Taxonomy
CO1	To list various type of pipe flow.	L1 (Remember)
CO2	To understand the Reynold No. and discharge in pipe flow.	L2 (Understand)
CO3	To compute energy loss in pipe flow.	L3 (Apply)
CO4	To calculate the loss due to pipe fittings.	L4 (Analyse)
CO5	To set upthe discharge in open channel flow.	L5 (Evaluate)

Course Articulation Matrix

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

COURSE:- **STRUCTURAL ANALYSIS LAB**
COURSE CODE:- **LC-CE-214-G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomy
CO1	To **Remember** different things related to Beam , Arches and frames	L1 (Remember)
CO2	To **Understand** the effect of load on Arch, Beam and Frames	L2 (Understand)
CO3	To **Compare** different result Experimental and Theoretical concept	L3 (Apply)
CO4	To Understand the concept of Sway in Portal Frame with the help of **Demonstration**	L3 (Apply)
CO5	To **Calculate** Slope and Deflection of various members subjected to Loading	L4 (Analysis)

Course Articulation Matrix

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

COURSE:- **GEOMATICS AND ARIAL SURVEYING LAB.**
COURSE CODE:- **LC-CE-216-G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomy
CO1	To **IDENTIFY** the use of theodolite for angle measurements.	L1 (Remember)
CO2	To **DESCRIBE** tacheometer for horizontal and vertical distances.	L2 (Understand)
CO3	To **SKETCH** simple circular curves.	L3 (Apply)
CO4	To **CALCULATE** base line measurement.	L4 (Analyse)
CO5	To **PREPARE** total station and its use for measuring distance, elevation and coordinates.	L5 (Evaluate)

Course Articulation Matrix

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

COURSE:- **MATERIAL TESTING & EVALUATION LAB**
COURSE CODE:- **LC-CE-216-G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomy
CO 1	To **Remembering** the various properties of cement, aggregate and concrete for any project work.	L1 (Remember)
CO 2	To **Understand** the importrance of testing of cement,sand,aggregate.	L2 (Understand)
CO 3	To **Apply**the load on concrete sample and find compressive strength and tensile strength.	L3 (Apply)
CO 4	To **Analysis** the strength of concrete after using mix design.	L4 (Analyse)
CO 5	To **Evaluate** the suitability of material for practical application.	L6 (Evaluate)

Course Articulation Matrix

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

B-TECH CIVIL ENGG SEMESTER-5TH

COURSE:- **HYDROLOGY AND WATER RESOURCE ENGINEERING**
COURSE CODE:- **PCC-CE-301-G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomys
CO1	To **Describe** the basic knowledge of Hydrologic Cycle to find out Precipitation Intensity with the Rain Gauge, also for evaporation.	L1
CO2	To **Identify** the hydrological parameters like the Evaporation process to measure with the equation.	L2
CO3	To **Solve** out statistical and probability analysis of runoff relationship with hydrologic data	L3
CO4	To **Distinguish** the concepts of water resource planning,	L4
CO5	To **Categorize** the concepts of hydrograph, unit hydrograph and flood estimation	L5

Course Articulation Matrix

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

COURSE:- **HIGHWAY ENGINEERING-I**
COURSE CODE:- **PCC-CE-303-G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomys
CO1	To Remember various cross section elements of highway.	L1 (Remember)
CO2	To Understand the importance of transportation and characteristics of road transport.	L2 (Understand)
CO3	To apply the knowledge about history of highway development , survey and classification.	L3 (Apply)
CO4	To Evaluate the traffic characteristics and design of intersections.	L4 (Evaluate)
CO5	To analysis the geometric design of highways and pavement material.	L4 (Analysis)

Course Articulation Matrix

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

COURSE:- **DESIGN OF STEEL STRUCTURE**
COURSE CODE:- **PCC-CE-309-G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomys
CO1	To **Recall** the properties of steel & basic terminology used in steel structure	L1 (Remember)
CO2	To **Understand** basic of steel structure with practical application for different loads.	L2 (Understand)
CO3	To **Apply** the IS Code of practice for design of steel structural element and use of stress strain curve of steel.	L3 (Apply)
CO4	To **Evaluate** load carrying capacity (strength) of different structural member & connections	L5 (Evaluate)
CO5	To **Design** different structural member i.e. Tension member, Compression member, Flexural member etc.	L6 (Create)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO 5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	1	3						1	2	3	1
CO2	1	1	1		2						1		3	2
CO3	3	2		2	1	2			1			2	2	
CO4		2	2	2		2					2	2	3	2
CO5	2	3	1	2	1	1			1		2	2	2	2

COURSE:- **DESIGN OF STEEL STRUCTURES DRAWINGS**
COURSE CODE:- **LC-CE-317-G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomys
CO1	To **Remember** the types of member used & types of connection used in steel structure	L1 (Remember)
CO2	To **Understand** the study of drawing for various components like connection, trusses, girders, joints etc.	L2 (Understand)
CO3	To **Apply** the IS Code of practice for design of steel structural element drawing.	L3 (Apply)
CO4	To **Implementation** of design in drawing forms with by laws.	L3 (Apply)
CO5	To **Evaluate** the force in members of truss.	L4 (Evaluate)

Course Articulation Matrix

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

B-TECH CIVIL ENGG SEMESTER-6TH

COURSE: - **IRRIGATION ENGINEERING**
COURSE CODE:- **PCC-CE-302-G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomy
CO1	To **Remember** different terms used in Irrigation and various method of Irrigation	L1 (Remember)
CO2	To **Learn** crop water requirements, effect of water logging and method of land Reclamation	L1 (Remember)
CO3	To **Understand** the concept of water distribution and river training works	L2 (Understand)
CO4	To **Apply** different theory to design Canal, Canal regulatory work, Outlet and Cross drainage works	L3 (Apply)
CO5	To **Create** new method of irrigation and add new concept of energy dissipater	L6 (Create)

Course Articulation Matrix

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

COURSE: - **FOUNDATION ENGINEERING**
COURSE CODE:- **PCC-CE-304-G**
Course Outcome

	CO (Course outcome)	RBT*-Revised Bloom Taxonomy
CO1	To state the investigation of soil by various determination methods.	L1 (Remember)
CO2	To explain soil behavior controlling factors and dewatering method.	L2 (Understand)
CO3	To predict when a deep foundation is needed.	L3 (Apply)
CO4	To point out different parameters which determine the bearing capacity of the soil.	L4 (Analyse)
CO5	To design the layout of caissons and well foundation by dynamic loading on soil foundation.	L5 (Evaluate)

Course Articulation Matrix

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

COURSE:- **HIGHWAYENGINEERING-II**
COURSE CODE:- **PCC-CE-306-G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomy
CO1	To **Remembering** the various termonology used in highway engineering.	L1 (Remember)
CO2	To **Understand** the various types of failures and their causes.	L2 (Understand)
CO3	To **Apply** the constrctiontechnique ,make investigation and develope solution to problem related to highway pavement.	L3 (Apply)
CO4	To **Analysis** the bituminous and non bituminous pavement and rate analysis of MoRTH.	L4 (Analyse)
CO5	To **Avaluate** the design of flexible and rigid pavement.	L6 (Evaluate)

Course Articulation Matrix

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

COURSE: - **AIR AND NOISE POLLUTION CONTROL**
COURSE CODE:- **PEC-CEEL-304-G**
Course Outcome

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
(CO1)	Pupil will be **able to recall** the basic concepts of environment pollution.	L_1 (Remember)
(CO2)	Students will be **able to understand** various air pollutants, various methods of control of air pollution and various methods of control of noise pollution	L_2 (Understand)
(CO3)	Pupil will be **able to apply** various methods of control of noise pollution.	L_3 (Apply)
(CO4)	Students will be **able to analyse** various types of noises.	L_4 (Analyse)
(CO5)	Pupil will be **able to evaluate** adverse impacts of air and noise pollution.	L_5 (Evaluate)

Course Articulation Matrix

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

COURSE:- REPAIR & REHABILITATION OF STRUCTURE
COURSE CODE:- PEC-CEEL-312G
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomy
CO1	To **IDENTIFY** all the terms and concepts associated with the deterioration of concrete structures.	L1 (Remember)
CO2	To **INDICATE** the damage assessment and Rapid Visual inspection of a building showing signs of deterioration and thus should be able to detect the possible cause /source of deterioration.	L2 (Understand)
CO3	To **DISCOVER** knowhow of the Concrete repair industry equipped with a variety of repair materials and techniques.	L3 (Apply)
CO4	To **ILLUSTRATE** the importance of quality control in concrete construction and the significance of protection and maintenance of structures.	L4 (Analyse)
CO5	To **CATEGORIZE** an insight into the subject of concrete repair, its protection, and strengthening.	L5 (Evaluate)

Course Articulation Matrix

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

COURSE:- ENVIRONMENTAL ENGINEERING LAB
COURSE CODE:- LC-CE-308-G
Course Outcome

CO (Course outcome)		RBT*- Revised Bloom's Taxonomys
(CO1)	Pupil will be **able to recall** the concepts of environment.	L1 (Remember)
(CO2)	Students will be **able to understand** about living organisms, and various issues related to environment.	L2 (Understand)
(CO3)	Pupil will be **able to apply** environment friendly techniques for healthy environment	L3 (Apply)
(CO4)	Students will be **able to analyse** problems associated with environmental degradation including pollution related issues.	L4 (Analyse)
(CO5)	Pupil will be **able to evaluate** contribution of human behavior in environmental degradation.	L5 (Evaluate)

Course Articulation Matrix

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

COURSE:- **FOUNDATION ENGINEERING LAB**
COURSE CODE:- **LC-CE-310-G**
Course Outcome

	CO (Course outcome)	RBT*-Revised Bloom Taxonomy
CO1	To recall basic properties of soil.	L1 (Remember)
CO2	To estimate the density of soil and shear strength parameter of soil.	L2 (Understand)
CO3	To operate triaxial test for selection of foundation.	L3 (Apply)
CO4	To examine soil behavior under plate load test.	L4 (Analyse)
CO5	To collect the consolidation parameter of clayey soil.	L5 (Evaluate)

Course Articulation Matrix

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

COURSE:- **HIGHWAYENGINEERING-II LAB**
COURSE CODE:- **LC-CE-312-G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomy
CO1	To **Remembering** the use of modern equipment for traffic studies and pavement evaluation.	L1 (Remember)
CO2	To **Understand** the characterization of highway material..	L2 (Understand)
CO3	To **Apply**the mixdesign of granular, bituminious and composite material.	L3 (Apply)
CO4	To **Analysis** the standard specification for IS/IRC/MoRT for judging suitability of these material.	L4 (Analyse)
CO5	To **Evaluate** the use of modern test tool and developesolution to use highway material for sustainable development..	L6 (Evaluate)

Course Articulation Matrix

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

B-TECH CIVIL ENGG SEMESTER-7TH

COURSE:- **Railway and Airport Engineering**
COURSE CODE:- **PEC-CEEL- 419 G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomys
CO1	To **Remember** various terminology used in railway and airport Engineering.	L1 (Remember)
CO2	To **Understand** the characteristics and function of railway and airport Engineering.	L2 (Understand)
CO3	To **Understand** the various types of function Railway yards and factor effecting railway capacity	L3 (Apply)
CO4	To **Apply** the modern concept or technique in excavation and crossing and signal system	L4 (Apply)
CO5	To **Analysis** the concept of processes involved in railway and tunnel design and maintenance .	L4 (Analysis)

Course Articulation Matrix

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

COURSE:- **Ground Water Engineering**
COURSE CODE:- **PEC-CEEL- 413G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomy's
CO1	To **Remember** various terminology used in Ground water Engineering	L1 (Remember)
CO2	To **Understand** the concept of water Distribution (Water cycle) & Aquifer properties	L2 (Understand)
CO3	To **Apply** various technique for conservation of Ground water	L3 (Apply)
CO4	To conduct recovery test-pumping test and **Calculate** well losses	L4 (Analysis)
CO5	To **Design** of Tube well in different Aquifers	L6 (Create)

Course Articulation Matrix

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

COURSE:- **Construction Planning and Management**
COURSE CODE:- **PCC-CE- 401G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomys
CO1	To **Identify** the concepts of the construction project management withtime and cost estimates.	L1
CO2	To **Summarize** Cost of the Projects with total cost of the Project andselection of construction equipment's	L2
CO3	To **Practice** the Basic knowledge of construction management, bar/milestone chart	L3
CO4	To **Distinguish** knowledge of PERT and CPM, CPM (Cost Model)	L4
CO5	To **Categorize** construction equipment's and selection of construction equipment's.	L5

Course Articulation Matrix

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

COURSE:- **Project Work –I**
COURSE CODE:- **PROJ- CE-427G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomys
CO1	To **Remember** the study of published literature of topics.	L1 (Remember)
CO2	To **Understand** the solving behaviour of assigned topic and Design process.	L3 (Understand)
CO3	To **Apply** the study of presentation on the topic to present a Report for projector.	L4 (Apply)
CO4	To **Prepare** a well defined lecture for departmental seminar representation.	L5 (Prepare)
CO5	To **Summarize** the paper to present in the national conference/ Journals.	L6 (Summarize)

Course Articulation Matrix

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

COURSE:- **DESIGN OF HYDRAULIC STRUCTURES**
COURSE CODE:- **PCC-CE- 405 G**

Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomys
CO1	To **Identify** the design lines of hydraulic structures	L1
CO2	To **Indicate** for read charts for various designing purposes	L2
CO3	To **Discover** develop understanding on cross drainage works and ondesign considerations of Dams	L3
CO4	To **Differentiate** design processes of Spillways.	L4
CO5	To **Create** an understanding on seepage conditions	L5

Course Articulation Matrix

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

B-TECH CIVIL ENGG SEMESTER-8TH

COURSE:- **ESTIMATION, COASTING AND VALUATION**
COURSE CODE:- **PCC-CE-402 G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomy
CO1	To **Remembering** the various terms used in Estimating & Costing.	L1 (Remember)
CO2	To **Understand** the preparation of an approximate estimate for a residential building.	L2 (Understand)
CO3	**Demonstrate** the calculation of earth quantity of roads.	L3 (Apply)
CO4	To **Analysis** the cost and carryout make economic in the design making of project.	L4 (Analyse)
CO5	To **Evaluate** the rates of various types of work.	L6 (Evaluate)

Course Articulation Matrix

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

COURSE:- **Advanced Structure Analysis**
COURSE CODE:- **PEC-CEEL- 410G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomy
CO1	To **Recall** of basic concepts in structural analysis like (structural elements, joints ,support ,stability rigidity and static indeterminacy, kinematic indeterminacy)	L1 (Remember)
CO2	To **understand** the development of flexibility matrices , stiffness matrics for beam,2D structure ,truss etc	L2 (Understand)
CO3	**Apply** the knowledge to the design of various civil engineering structures using software .	L3 (Apply)
CO4	**Analysis** structures using advanced methods of analysis .	L4 (Analyse)
CO5	To **Evaluate** computer programming for matrics structural analysis	L6 (Evaluate)

Course Articulation Matrix

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

COURSE:- QUALITYENGINEERING
COURSE CODE:- OEC-ME-410G
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomy
CO1	To **IDENTIFY** the basic techniques of quality improvement, fundamental knowledge of statistics and probability	L1 (Remember)
CO2	To **INDICATE** charts to analyze for improving the process quality.	L2 (Understand)
CO3	To **DISCOVER** different sampling plans	L3 (Apply)
CO4	To **ILLUSTRATE** basic knowledge of total quality management	L4 (Analyse)
CO5	To **PREPARE** the modern quality management techniques	L5 (Evaluate)

Course Articulation Matrix

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

COURSE:- SEMINAR
COURSE CODE:- **S-CE-418 G**
Course Outcome

	CO (Course outcome)	RBT*- Revised Bloom's Taxonomy
CO1	To **IDENTIFY** important concepts from the readings and provide depth in coverage of the topic.	L1 (Remember)
CO2	To **DESCRIBE** organizational issues including teams, and attitudes, and define work-life balance and its impact on organizations and employees.	L2 (Understand)
CO3	To **DISCOVER** current technologies in the field of civil engineering.	L3 (Apply)
CO4	To **ILLUSTRATE** industrial problems and suggest possible solutions.	L4 (Analyse)
CO5	To **PREPARE** effective group communication, presentation, self-management and report writing skills.	L5 (Evaluate)

Course Articulation Matrix

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