



ANNEXURE – VIII

**(CO-PO mapping matrix and PO ATTAINMENT
for 2020-2024 Batch)**



ANNEXURE – VIII

CO-PO mapping matrix and PO Attainment

Subjects & Course Code	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
100015: Energy, Environment, Ecology & Society	CO1 Describe various energy resources, their conversion to electrical power and role in technological & economic development		3	3	3					2					
	CO2 Update with national/international power status and renewable power development targets & missions						3	3							
	CO3 Recognize the impact of pollution on the ecosystem and control policies adopted at national/international levels								3			3	2		
	CO4 Illustrate the concepts of ecosystems and their conservation								3	3	2		2		
	CO5 Solve practical problems of society in a sustainable and ethical manner								3	3	3			2	
	CO6 Fulfill professional duties keeping in mind the environmental safety, health, and welfare of public													2	
110211: Building Planning & Design	CO1 Explain basics of building planning & design.	2		1		1	1	2	2				1	2	2
	CO2 Illustrate sustainability principle, by laws & characteristics of thermal and sound insulation in building planning & design.	2		1	1	1	3	3	2			2	3	3	2



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(Deemed to be University)
NAAC Accredited with A++ Grade
Department of Civil Engineering



	CO3	Apply sustainability concepts & principles in planning & design of buildings.	2	1	2	1	2	2	2	2	1	2	2	3	2	2
	CO4	Evaluate environmental, sustainable & safety aspects of a building.	2	2	1	2	1	3	3		2	2	2	3	2	2
	CO5	Plan different types of buildings as per by laws & codal provisions.	2	1	1	1	1	2	2	3	2	2	2	3	3	2
100020: Basic Civil Engineering & Mechanics	CO1	Explain concepts and terminologies of building materials, surveying and mechanics	2	2				1	1	1				2		1
	CO2	Illustrate various methods for surveying and mechanics	2	2		2	1			1	1	1		2		1
	CO3	Determine the location, area and volume of objects on ground surface	3	3		3	2							2		
	CO4	Solve the problems of surveying and mechanics by using various methods	3	3	1	2	2	1		1		1		2		1
	CO5	Analyse the effects of system of forces on rigid bodies in static conditions	3	3	1	2	2	1		1		1		3		2
100026: Basic Civil Engineering Lab	CO1	Follow the guidelines for field surveying.	2	1		2	1			3	3	2	1	2		2
	CO2	Follow the working principles of survey instruments for measurements.	3	1		2	1			3	3	2	1	2		2
	CO3	Measure the horizontal distances, difference in elevation and angles of various points	3	3		3	2				2	3		2		2
	CO4	Detect measurement errors and accordingly suggest corrections	3	3		3	2	1			2	2		2		2
	CO5	Interpret survey data and compute areas	3	3	1	3	3				2	3		2		2
110311: Building Material & Construction	CO1	Explain the basic elements of buildings, engg. materials & construction.	2	1		1			1					1		
	CO2	Evaluate the properties of various materials like cement, aggregate, concrete, admixture, brick, stone etc.	2	1		3	2	2	2	2				2	2	1



	CO3	Distinguish the suitability of building materials in the construction of elements of buildings.	2	2	1	2	1	2	2				2		1	
	CO4	Evaluate various types of concrete in building construction accordingly.	2	2	1	2	1		1				2	2	1	
	CO5	Apply various techniques for finishing & protection works of various elements of building.	2		1	1		2	1	1			2			
110311: Building Material & Construction (Lab)	CO1	Determine the properties of cement, sand & aggregate as per IS code	2	1	1	3	2	2	2	2	2	3		2	2	1
	CO2	Determine the workability of concrete for suitability of concrete mix in different construction works	2	1	1	3	2	2	2	2	2	3		2	3	2
	CO3	Evaluate compressive strength of various concrete mixes	3	2	2	3	2	2	2	2	2	3		2	3	2
	CO4	Determine physical properties of brick by experiment and practice accordingly	1			3	2	2	1	2	2	3		2	1	1
	CO5	Examine the properties of the cement mortar for various elements of the buildings	1	1		3	2	2	1	2	2	3		2	1	1
110312: Fluid Mechanics-I	CO1	Define various fluid properties & states of fluid	1					1						1		
	CO2	Apply principles of fluid flow & dimensional analysis	2	1	1	2	1	1	1					2		1
	CO3	Solve fluid flow problems	2	2	1	2	2	2	2					2		2
	CO4	Analyze characteristics of fluid at rest, fluid at motion & dimensionless numbers	2	3	1	2	1	2	2					2		2
	CO5	Discriminate different types of fluid flow, measurement techniques & principles	2	2		2	2	2	2					2		



	CO6	Apply the concepts of laminar flow in solving various fluid flow problems	2	2	1	2	1	1	1					2		2
110312: Fluid Mechanics-I (Lab)	CO1	Differentiate between different flow measurement devices	2	2		3	2	2		2	2	2		2		1
	CO2	Notice flow through pipes & fall velocity of particle	2		1	3	2	2			2	2		2		2
	CO3	Correct the instrumental errors	2	2		2	2				2	2		2		
	CO4	Apply Stoke's law to calculate terminal velocity	2	2	1	3	2			2	2	2		2		2
110313: Surveying	CO1	Explain the techniques used for linear & angular measurements in surveying.	2	2		2	1							2		1
	CO2	Analyse different geodetic methods of survey such as triangulation, trigonometric levelling, tachometry, photographic & GIS.	2	3		2	2			2	2	2		2		1
	CO3	Apply methods in control surveys.	2	3		3	2				1	1		2		2
	CO4	Apply tachometry in traverse computations.	3	3		3	2				1	1		2		2
	CO5	Apply various methods for setting curves, area & volume computations.	2	3		3	2				1	1		2		2
110314: Strength of Material	CO1	Explain the concepts of stress, strains, bending, deflection, buckling & torsion.	2	1		2	1	1						1		1
	CO2	Explain various theories for determining stress, buckling of columns & deflections of structures.	2	1		2	1	1		2				2		1
	CO3	Apply various theories for determining stress, buckling of columns & deflections of structures.	3	3	2	3	2	2	1					2		2
	CO4	Evaluate the stresses in bending, shear and torsion.	3	3	2	3	2	2						2		2



	CO5	Analyze various sections for stresses, strain, bending, torsion, buckling & deflections.	3	3	2	3	2	2					2		2	
110314: Strength of Material (Lab)	CO1	Evaluate properties of material by impact test	2	2		3	2	2	2	2	2	3		2	2	2
	CO2	Evaluate properties of material by hardness test	2	2		3	2	2	2	2	2	3		2	2	2
	CO3	Evaluate properties of material by tensile test	2	2		3	2	2	2	2	2	3		2	2	2
	CO4	Determine compressive & flexural strength of materials	2	2	2	3	2	2	2	2	2	3		2	2	2
110315: Survey Practice Lab	CO1	Observe topographical characteristics	2		1	1	1	1			2	2		2		1
	CO2	Differentiate methods to perform ground survey	2	1		2	1			1	2	2		2		1
	CO3	Prepare longitudinal & cross section profiles	2	2	1	3	2	1		2	2	3		3		2
	CO4	Develop contour map by using tachometer & total station	2	2	1	3	3			2	3	3		3		2
	CO5	Prepare the details of features using Plane table surveying	2	2	1	3	2			2	2	3		2		2
	CO6	Produce a simple circular curve by using Rankine's method for alignment	2	2	1	3	2	1		2	2	3		2		2
110316: Self-Learning/ Presentation	CO1	Analyze contemporary issues in civil engineering & its allied areas through literature survey	1	1		2	1	2	2	1	2	2	1	2	1	2
	CO2	Distinguish state of art & relevance of the topic in national & international arena	1			2	1	2	2	1	2	2	1	2		1
	CO3	Demonstrate good oral & written communication skills									3	3		2		



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(Deemed to be University)
 NAAC Accredited with A++ Grade
 Department of Civil Engineering



	CO4	Develop poster and power point presentations for effective communication									3	3		2		
	CO5	Display lifelong learning	2	2	2	2	2	2	2	2	2	2	1	3	2	2
110411: Geotechnical Engineering-I	CO1	Evaluate different properties of soil, types of foundations and its classifications	2	2		2		2	2					2	1	2
	CO2	Examine flow and shear parameters & their effects on various types of soil	2	2		2	1	2	2					2		2
	CO3	Determine the stress distribution & shear strength parameter of soil by various methods	2	3	1	2	2	2	2	1				2	1	2
	CO4	Analyse the stability of slopes, earth pressures & retaining walls using analytical methods	2	3	1	3	2	2	2	1				2	1	2
	CO5	Evaluate suitable foundation system for various site conditions.	2	2	1	3	2	2	1					2		2
110411: Geotechnical Engineering-I (Lab)	CO1	Check physical properties of soil	2	1		3	2	2	2	2	2	3		2		1
	CO2	Check strength properties of soil	2	2		3	2	2	2	2	2	3		2		2
	CO3	Differentiate the flow properties and stresses of soil	2	2		3	2	2		2	2	3		2		1
	CO4	Check shear strength of soil	2	2		3	2	2		2	2	3		2		2
110412: Theory of Structures-I	CO1	Classify different type of structures based on support conditions	2	1		2		1						2		2
	CO2	Explain various methods & principles for analysis of structures.	1			2		1		1				1		1
	CO3	Apply various methods & principles for structural analysis	2	2		2	2			1				2		2
	CO4	Analyse various structures using various methods, principle & theorems	2	3	1	3	1	2	1	1				2		2



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(Deemed to be University)
NAAC Accredited with A++ Grade
Department of Civil Engineering



110413: Transportation Engineering	CO5	Evaluate different methods of structural analysis.	2	2	1	3	1	2					2		2	
	CO1	Explain the principles of highway planning & their geometrical design.	2		1			1	1					1		1
	CO2	Evaluate physical properties of suitable highway engineering materials with drainage provisions	2			1		1	1					2		1
	CO3	Apply the concepts of traffic engineering in transportation planning.	2	2	1	2		2	2	2				2	3	2
	CO4	Design pavements as per regulations.	2			2	2	2	2					2		2
	CO5	Formulate the layers of pavement along with provisions of its drainage & maintenance.	2	1		2	2	2	2	2	2	2	2	2		2
110413: Transportation Engineering (Lab)	CO1	Select suitable aggregate material by testing the physical properties	2	1		3	2	2	2	2	2	3		2		1
	CO2	Determine properties of bitumen and its grade	2	2		3	2	2	2	2	2	3		2		2
	CO3	Determine CBR value of material for subgrade and subsequent layers of pavement.	2	2		3	2	2		2	2	3		2		1
	CO4	Design job mix formula for bituminous surface using Marshal Stability test.	2	2		3	2	2		2	2	3		2		2
110414: Water Resource Engineering	CO1	Analyse various requirements for an efficient irrigation project	1			1		1	1					1		2
	CO2	Design different components of irrigation system using different theories	1			2		1	1	1				1		2
	CO3	Plan an efficient, economical & safe irrigation system	2	2		2	1	1	1	2				2		3



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(Deemed to be University)
NAAC Accredited with A++ Grade
Department of Civil Engineering



	CO4	Explain the concept of hydrology and hydrograph	2	3	1	3	1	2	2					2		2
	CO5	Apply basic principles for measurement & forecasting of rainfall & runoff	2	3	1	3	2	2	2					2		2
	CO6	Analyse runoff hydrograph by various methods	2	3	2	3	2	2	2		1	1		3	1	3
110415: Civil Drawing Lab	CO1	Attempt to draw different components of a building	2			1	1	1	1	2	2	3		2		
	CO2	Produce plan, elevation & section of various components of a residential and institutional building	2	1	2	2	1	1	1	2	2	3		2		
	CO3	Use AutoCAD software in civil engineering drawing	2	2	2	2	3			1	3	3		3	1	
	CO4	Prepare drawing sheets of various types of buildings like residential, institutional, Commercial etc.	2	1	2			1	1	2	2	3		2		
110520: Data Science	CO1	Define different Data Science techniques	2	2		1	1	1						2		
	CO2	Illustrate various tools used for Data Science technique	2	2		1	1	1						2		
	CO3	Apply data visualization techniques to solve real world problems	2	2		2	2	1						2		
	CO4	Build exploratory data analysis for Data Science methods	2	2		2	2	1						2		
	CO5	Apply Data Science techniques for solving real world problems	2	2	1	2	2	1						2		
	CO6	Evaluate the performance of algorithms in Data Science	2	2		2	2	1						2		
110511: Water Supply Engineering	CO1	Explain the concepts of water supply engineering.	2			2		2	2	2				2	2	1



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(Deemed to be University)
NAAC Accredited with A++ Grade
Department of Civil Engineering



	CO2	Determine the requirements for safe supply of water.	2	2		2		3	3	2				2	3	2
	CO3	Apply suitable water treatment technique based upon the available data.	2	2		3	1	3	3					2	2	2
	CO4	Analyse a given water supply scheme.	3	3	2	3	2	3	3		1	2		3	3	2
	CO5	Design a water supply system based upon the needs of society.	3	3	3	2	2	3	3	2	1	2	1	3	3	2
110511: Water Supply Engineering (Lab)	CO1	Follow sampling procedure & other guidelines for sampling & analysis of water samples.	2	1		3	2	2	2	2	2	3		2		1
	CO2	Check various water quality parameters.	2	2		3	2	2	2	2	2	3		2		2
	CO3	Improve the water quality by suggesting suitable corrective measures.	2	2		3	2	2		2	2	3		2		1
	CO4	Train others on various ways of improving the quality of water.	2	2		3	2	2		2	2	3		2		2
110512: Theory of Structures-II	CO1	Explain various methods for analysis of structures and frames	3	3		3		2						2		1
	CO2	Analyse various loads on framed structures using codal provisions.	3	3		3		2						2		1
	CO3	Analyse different type of structures for various load conditions by different methods.	3	3		3		2						2		1
	CO4	Draw influence line diagrams for statically determinate & indeterminate structure.	3	3		3		2						2		1
	CO5	Analyse beams & frames using plastic analysis.	3	3		3		2						2		1



110513: S. D. D. (RCC)	CO1	Apply the concepts of different design philosophies for deriving basic expressions used in RC design	3	3	2	2	1	2		2			2	3	1	
	CO2	Determine the capacity of RC elements using IS456 guidelines.	3	3	2	2	1	2		2			2	3	1	
	CO3	Analyze the RC elements for determining design variables as per IS456 & IS 875	3	3	2	2	2	2		2	1	2		3	3	2
	CO4	Design the RC elements as per IS 456 provisions.	3	3	3	2	2	2		3	1	2		3	3	2
	CO5	Develop the design sketches for RC elements as per IS456; IS13920 and SP34 provisions.	3	3	3	2	2	2	2	3	1	2		3	3	2
110514: Fluid Mechanics-II	CO1	Differentiate different types of fluid flow & fluid machinery.	2	1		2		1					2		1	
	CO2	Describe principles of analysis of fluid flow problem.	2	2		2		1	1	2			2		1	
	CO3	Explain basic principles for measurement of different forces acting on fluid body.	2	2		2		1	1	2			2		1	
	CO4	Analyse pipe flow, open channel flow problems & various characteristics of hydraulic machines.	3	3	2	3	2	2	2				2		2	
	CO5	Design open & closed conduit systems.	3	3	3	3	2	2	2				2		2	
110515: Minor Project-I	CO1	Recognize various engineering problems and techniques to solve them.	2	2	2	3	2	2	2	2	3	3	1	3	2	
	CO2	Reproduce the solution of the problems upon the need of society.	3	3	3	3	3	3	3		3	3	3	3	3	2
	CO3	Cooperate to work within group.				2	2				3	2		2		
	CO4	Develop the writing and communication skills for various engineering problems.									3	3		2		
	CO5	Display lifelong learning.	2	2	2	2	2	2	2	2	2	2	1	3	2	2



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(Deemed to be University)
NAAC Accredited with A++ Grade
Department of Civil Engineering



110516: Self Learning/ Presentation	CO1	Analyze contemporary issues in civil engineering & its allied areas through literature survey	1	1	2	1	2	2	1	2	2	1	2	1	2	
	CO2	Distinguish state of art & relevance of the topic in national & international arena	1		2	1	2	2	1	2	2	1	2		1	
	CO3	Demonstrate good oral & written communication skills								3	3		2			
	CO4	Develop poster and power point presentations for effective communication								3	3		2			
	CO5	Display lifelong learning	2	2	2	2	2	2	2	2	2	2	1	3	2	2
100005: Project Management & Financing	CO1	Know the attributes of project and its different phases.	2	2	1	1	2	1					2		1	
	CO2	Develop the project network based on work breakdown structure and estimation of activity durations.	3	3	2	2	2	2	1				1	2		1
	CO3	Analyze the project network and make decide the various alternates	3	3		3	3	2					1	2		1
	CO4	Evaluate the optimum cost of project for assigned deadlines.	3	3		2	2	2					1	2		1
	CO5	Understand the different options to arrange the finances to complete it within stipulated time.	2	1		1	1	1					1	2		1
110620: Artificial Intelligence & Machine Learning	CO1	Define basic concepts of Artificial Intelligence & Machine Learning.	3	2		3	2	2					2			
	CO2	Illustrate various techniques for search and processing.	3	2		3	2	2					2			
	CO3	Identify various types of machine learning problems and techniques.	3	2		3	2	2					2			



	CO4	Analyse various techniques in Artificial Intelligence, ANN & Machine Learning.	3	2		3	2	2					2			
	CO5	Apply AI and ML techniques to solve real world problems.	3	2		3	2	2					2			
	CO6	Build AI enabled intelligent systems for solving real world problems.	3	2		3	2	2					2			
110621: Waste Water Engineering	CO1	Explain the concepts of waste water engineering	2			2		2	2	2			2	2	1	
	CO2	Determine the requirements for safe disposal of sewage	2	2		2		3	3	2			2	3	2	
	CO3	Apply suitable technique for sewage treatment & disposal based upon the available data.	2	2		3	1	3	3				2	2	2	
	CO4	Analyse a given sewerage system.	3	3	2	3	2	3	3		1	2		3	3	2
	CO5	Design sewage system for safe disposal of sewage.	3	3	3	2	2	3	3	2	1	2	1	3	3	2
110622: S.D.D (Steel)	CO1	Explain the principles of steel structural design using relevant IS Codes	3	3	3	2	1	2	2	3	1	2		3	3	2
	CO2	Evaluate structural behaviour of different steel structural elements	3	3	3	2	1	2	2	3	1	2		3	3	2
	CO3	Analyse a given section of steel structural element using IS codes	3	3	3	2	2	2	2	3	1	2		3	3	2
	CO4	Design different elements of steel structure under various loading conditions using relevant IS codes	3	3	3	2	2	2	2	3	1	2		3	3	2
	CO5	Design a structure/ component to meet desired needs within realistic constraints such as economy, safety, viable construction & its sustainability as per codal provisions	3	3	3	2	2	2	2	2	2	1	2		3	3



110623: Estimating Costing & Contracting	CO1	Explain the fundamentals of quantity estimation, costing & contracting.	2			1		2	1	2			3	1		2
	CO2	Apply methods to estimate area, volume & cost.	2			1	1	2	1	2			3	2		2
	CO3	Evaluate mathematical & numerical models for rate & quantity estimation	2	2		2	2	2	2	2	2	2	3	3		3
	CO4	Determine rates & value	2	3		2	1	2	2		2	2	3	3		3
	CO5	Classify different rates of items, contracts & measurement techniques	2	3	1	2	2	2	2	2	2	2	3	3		3
110624: Minor Project-II	CO1	Recognize various engineering problems and techniques to solve them	2	2	2	3	2	2	2	2	3	3	1	3		2
	CO2	Reproduce the solution of the problems upon the need of society	3	3	3	3	3	3	3		3	3	3	3	3	2
	CO3	Cooperate to work within group				2	2				3	2		2		
	CO4	Develop the writing and communication skills for various engineering problems									3	3		2		
	CO5	Display lifelong learning	2	2	2	2	2	2	2	2	2	2	1	3	2	2
110731: Hydraulic Structure	CO1	Identify different components of hydro project	2	1		2		2	3	2				2	2	2
	CO2	Explain basic principles of designing hydropower plant & cross drainage works.	2	2		2		3	3	2				2	3	2
	CO3	Solve problems of dam analysis, energy dissipators & cross drainage works.	2	2		3	1	3	3					2	2	2
	CO4	Evaluate suitability of types of hydraulic structures	2	2		3	1	3	3					2	2	2
	CO5	Design various elements of hydraulic structures.	2			1		2	2	2			1	2		1
110732: Advanced Structure Design (RCC)	CO1	Explain behaviour of RCC and Prestressed concrete structures under loads.	2	1	1	2		1	1	2				2	2	2



	CO2	Determine forces developed in RCC and Prestressed concrete structures under loads.	3	3	2	2	1	2		2				2	3	1
	CO3	Compare designs of RCC and Prestressed concrete structures for given loadings.	3	3	2	2	1	2		2				2	3	1
	CO4	Develop economic and safe designs of RCC and Prestressed concrete structures.	3	3	2	2	2	2		2	1	2		3	3	2
110733: Railway, Airport & Tunnel Engineering	CO1	Explain the elements of airport planning, bridges & tunnels.	2		1			1	1					1		1
	CO2	Design runway & taxiway system as per regulations.	2			1		1	1					2		1
	CO3	Explain various elements of railway tracks, signalling, yards, bridges & tunnels.	2	2	1	2		2	2	2				2	3	2
	CO4	Illustrate various gauge, signals, fasteners, turnouts, crossing etc.	2			2	2	2	2					2		2
	CO5	Apply construction methods of railway tunnels.	2	1		2	2	2	2	2	2	2	2	2		2
9110211: Integrated Waste Management for Smart City	CO1	Explain the principles & concepts of waste management.	1			2		1		1				1		1
	CO2	Apply various techniques of handling the waste.	2	2		3	1	3	3					2	2	2
	CO3	Apply various techniques of energy recovery from waste.	2	2		3	1	3	3					2	2	2
	CO4	Plan an effective & efficient waste management system.	2	1	1	1	1	2	2	3	2	2	2	3	3	2
12: Safety & Quality management	CO1	Explain the quality management systems and utilize the ISO 9000 family of	2	2				1					2	2	2	



		standards.																
	CO2	Improve the quality of the project through tools and techniques.	2	2			2	1						2				
	CO3	Perform the environmental impact assessment (EIA) for construction projects towards quality.	2	2		2		1	2					2				
	CO4	Analyse the quality assurance and quality control, quality improvement tools and techniques.	2	2		3		1						2				
	CO5	Evaluate the contract and inspection procedures.	2	2		3		1						2				
	CO6	Identify the safety management practices in construction industry.	2	2				1					2	2				
110716: Software Application for Solving Civil Engineering Problems	CO1	Design various beams, slabs & multistorey building's using various software's.	1			2		1	1	1				1			2	
	CO2	Design water supply & sewer networks using various software's.	1			2		1	1	1				1			2	
	CO3	Practice MS Excel in estimation works.	2	2	1	2	2	2	2	2	2	1	1	2	2	2		
	CO4	Produce land use land cover maps and geo contour maps using various software's.	2	1	2	2	1	1	1	2	2	3			2			
	CO5	Practice Primavera and MS-Project softwares.	2	2	2	2	2	2	2	2	2	2	1	3	2	2		
110717: Creative Problem Solving	CO1	Identify various on field problems.	1	1				1	1					2			1	
	CO2	Practice various methods to solve problems.	2	2	1	2	2	2	2	2	2	1	1	2	2	2		
	CO3	Produce solutions to various problems.	2	1	2	2	1	1	1	2	2	3			2			
	CO4	Demonstrate various problems solving skills.	1			1									2			



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(Deemed to be University)

NAAC Accredited with A++ Grade

Department of Civil Engineering



110821: Internship/Project	CO1	Observe various activities of civil engineering works.	3	3	3	3		2	2	1	2	1	2	3	2	2
	CO2	Recognize various engineering problems and techniques to solve them.	3	3	3	3	2	2	2	1	2	1	2	3	2	2
	CO3	Reproduce to solution of the problem upon the need of society.	3	3	3	3	2	2	2	1	2	1	2	3	2	2
	CO4	Develop the writing and communication skills for various engineering problems	3	3	1		1	2	2	1	2	2	1	3	2	2
	CO5	Adapt lifelong learning for benefit of society	3	3	3	2	1	2	2	1	2		2	3	2	2



Course Wise PO Attainment of Batch Admitted 2020-2024

DIRECT PO ATTAINMENT	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
100015: Energy, Environment, Ecology & Society		3.00	3.00	3.00		3.00	2.94	2.91	2.29		2.94	1.96		
110211: Building Planning & Design	1.83	1.25	1.10	1.16	1.10	2.02	2.20	2.04	1.55	1.85	1.83	2.38	2.19	1.83
110311: Building Materials & Construction	2.00	1.50	1.00	1.80	1.33	2.00	1.40	1.50				1.80	2.00	1.00
110311 (P): Building Materials & Construction	1.80	1.25	1.33	3.00	2.00	2.00	1.60	2.00	2.00	3.00		2.00	2.00	1.40
110312: Fluid Mechanics-I	1.57	1.62	0.78	1.57	1.12	1.32	1.32					1.57		1.37
110312 (P): Fluid Mechanics-I	1.89	1.90	0.96	2.60	1.89	1.85		1.91	1.89	1.89		1.89		1.59
110313: Surveying	1.80	2.29		2.15	1.48			1.44	1.01	1.01		1.63		1.33
110314: Strength of Materials	1.70	1.42	1.28	1.70	1.04	1.04	0.60	1.40				1.18		1.04
110314 (P): Strength of Materials	1.66	1.66	1.90	2.49	1.66	1.66	1.66	1.66	1.66	2.49		1.66	1.66	1.66
110315: Surveying Practice Lab	1.83	1.65	0.92	2.29	1.68	0.91		1.65	1.99	2.44		2.14		1.53
110316: Self Learning / Presentation	1.33	1.50	2.00	1.99	1.33	1.99	1.99	1.33	2.38	2.38	0.99	2.18	1.50	1.66



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(Deemed to be University)

NAAC Accredited with A++ Grade

Department of Civil Engineering



110411: Geotechnical Engineering – I	1.90	2.28	0.92	2.25	1.62	1.90	1.73	0.95				1.90	0.97	1.90
110411 (P): Geotechnical Engineering – I	2.00	1.75		3.00	2.00	2.00	2.00	2.00	2.00	3.00		2.00		1.50
110412: Theory of Structures – I	0.89	0.82	0.31	1.15	0.47	0.70	0.41	0.50				0.89		0.89
110413: Transportation Engineering	1.88	1.30	0.95	1.60	1.80	1.48	1.48	1.70	1.59	1.59	1.59	1.68	2.70	1.48
110413 (P): Transportation Engineering	1.93	1.68		2.90	1.93	1.93	2.00	1.93	1.93	2.90		1.93		1.43
110414: Water Resources Engineering	1.58	2.56	1.21	2.21	1.40	1.41	1.41	1.50	0.90	0.90		1.73	0.90	2.23
110415: Civil Drawing Lab	1.84	1.22	1.85	1.56	1.52	0.93	0.93	1.61	2.06	2.75		2.06	0.89	
110520: Data Science	1.53	1.48	0.67	1.11	1.23	0.74						1.26		
110511: Water Supply Engineering	1.01	1.04	0.98	1.03	0.68	1.19	1.19	0.85	0.39	0.79	0.38	1.01	1.10	0.76
110511 (P): Water Supply Engineering	1.75	1.57	0.98	2.53	1.68	1.79	1.68	1.72	1.63	2.48	0.38	1.75	1.10	1.31
110512: Theory of Structures-II	0.97	0.97		0.97		0.65						0.65		0.32
110513: S.D.D (RCC)	1.07	1.07	0.85	0.71	0.56	0.71	0.60	0.85	0.34	0.69		0.92	1.07	0.56
110514: Fluid Mechanics-II	0.83	0.76	0.82	0.83	0.66	0.48	0.51	0.71				0.70		0.48
110515: Minor Project – I	2.26	2.26	2.26	2.42	2.18	2.26	2.26	1.94	2.71	2.52	1.62	2.52	2.43	1.94
110516: Self Learning Presentation	0.50	0.26	0.36	0.89	0.50	0.89	0.89	0.50	1.22	1.22	0.44	1.02	0.26	0.56
110620: Artificial Intelligence & Machine Learning	2.62	1.75		2.62	1.75	1.75						1.75		



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed to be University)
NAAC Accredited with A++ Grade
Department of Civil Engineering



110621: Waste Water Engineering	1.99	2.06	2.46	1.99	1.37	2.32	2.32	1.67	0.82	1.64	0.82	1.99	2.16	1.49
110622: Structural Design & Drawing (Steel)	1.81	1.68	1.51	1.29	1.38	1.16	0.99	1.64	0.69	1.38		1.81	1.81	1.29
110623: Estimating Costing & Contracting	1.63	2.18	0.78	1.31	1.23	1.63	1.31	1.62	1.64	1.64	2.45	1.96		2.12
110624: Minor Project – II	2.33	2.33	2.33	2.50	2.25	2.33	2.33	2.00	2.80	2.60	1.67	2.60	2.50	2.00
110731: Hydraulic Structure	0.65	0.57		0.72	0.33	0.85	0.92	0.66			0.31	0.65	0.74	0.59
110732: Advanced Structure Design (RCC)	0.86	0.78	0.54	0.62	0.41	0.54	0.32	0.62	0.31	0.62		0.70	0.86	0.47
110733: Railway, Airport & Tunnel Engineering	1.83	1.36	0.96	1.49	1.61	1.36	1.36	1.76	1.61	1.61	1.61	1.59	2.88	1.36
900211- Integrated Waste Management for Smart City (OC - 2)	0.97	0.70	0.84	1.16	0.49	1.13	1.20	1.72	1.67	1.67	1.67	1.18	1.26	0.97
900212 - Safety & Quality Management	1.20	1.20		1.27	0.62	0.60	1.59				1.59	1.20	1.58	
110716- Software Application for Solving Civil Engineering Problems	1.60	1.67	1.67	2.00	1.67	1.40	1.40	1.60	2.00	2.00	1.00	1.80	2.00	2.00
110718 - Summer Internship Project – III	2.00	2.00	1.67	2.00	2.00	2.00	1.75	2.00	1.60	1.80	1.33	2.40	1.80	1.80
110717 - Creative Problem Solving	1.50	1.33	1.50	1.67	1.50	1.33	1.33	2.00	2.00	2.00	1.00	2.00	2.00	1.50
110821 Internship/Project	3.00	3.00	2.60	2.75	1.50	2.00	2.00	1.00	2.00	1.25	1.80	3.00	2.00	2.00
DIRECT PO ATTAINMENT	1.59	1.53	1.27	1.78	1.34	1.45	1.44	1.53	1.60	1.88	1.31	1.64	1.61	1.33



PO Attainment

PO ATTAINMENT	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
DIRECT PO ATTAINMENT	1.59	1.53	1.27	1.78	1.34	1.45	1.44	1.53	1.60	1.88	1.31	1.64	1.61	1.33
AVERAGE INDIRECT PO ATTAINMENT	2.12	2.30	2.27	2.36	2.16	2.28	2.23	2.33	2.19	2.22	2.17	2.45	2.29	2.41
OVERALL PO ATTAINMENT	1.69	1.68	1.47	1.90	1.50	1.62	1.60	1.69	1.72	1.95	1.48	1.80	1.75	1.55

