

PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*

Programme: Bachelor of Technology

Semester –III

Subject Code	Subject Title	Credit			Theory			Practical		
CBCE-301	Concrete Technology	L	T	P	End Sem (70)	Internal (30)	Total (100)	End Sem (Nil)	Internal (Nil)	Total (Nil)
		3	1	-			Min: 40 (D Grade)			

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance /Attendance / Quiz-Max. Marks: Nil	

Pre-Requisite	Nil
Course Objective	To give an ability to apply the knowledge of strength of concrete on engineering applications and design problems.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. To identify classification, properties, grades, advantage & disadvantages and testing of concrete and ingredients of concrete. 2. To analyze properties of fresh and hardened concrete. 3. To design of concrete mix with different methods such as I.S code method. 4. About production and quality control of concrete. 5. About various types of special concretes.

Unit	Contents (Theory)	Marks Weightage
I	Introduction: Classification, Properties, Grades, Advantages & disadvantages of concrete, Ingredients of concrete, Types of cement, Aggregates, Water, Admixtures, Inspection & testing of materials as per Indian standard specifications.	14
II	Properties of Fresh and Hardened Concrete : Introduction, Workability, Testing of concrete, Factors affecting, Compressive & Tensile strength, Stress and strain characteristics, Shrinkage and temperature effects, Creep of concrete, Permeability, Factors affecting permeability, Durability, Thermal properties & Micro-cracking of concrete.	14
III	Design of Concrete mix: Various methods of concrete mix design, I.S. Code method, Basic considerations and factors influencing the choice of mix design, Acceptance criteria for concrete, Concrete mixes with surkhi and other pozzolanic materials, Design of plastic concrete mix.	14
IV	Production and Quality Control of Concrete: Production of crushed stone aggregate, Batching equipments for production and concreting, Curing at different temperatures, Concreting underwater, Hot & cold weather conditions, Statistical quality control, Field control, Non-destructive testing, Inspection & testing of concrete.	14
V	Special Concretes : Light weight concrete, Ready mix concrete, Vacuum concrete, Ferro cement, Fiber reinforced concrete, Polymer concrete composites, Prestressed concrete, Mass concrete, Green concrete, And also uses of green concrete.	14

Text Book/References Books/ Websites:

1. B.S. Grewal; Higher Engineering Mathematics; Khanna Publications.
2. D.C. Aggarwal; Engineering Mathematics II.; S. Chand publication.
3. KV Suryanarayan; Mathematical Methods; Rao, Scitech Publication.
4. J.H.Mathews and K.D.Fink; Numerical Methods using; P.H.I.
5. M K Jain; Numerical Methods for Scientific and Engg. Computation; New Age Publication.

Suggested List of Laboratory Practical (Expandable): Nil

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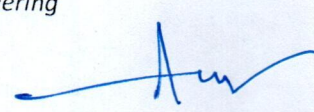
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Programme: Bachelor of Technology

Semester –III

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBCE-302	Transportation Engineering-I	3	1	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance /Attendance / Quiz - Max. Marks: Nil	

Pre-Requisite	Nil
Course Objective	Acquire the knowledge and skill to apply a systems approach to the analysis about railway, roadway and tunnel engineering.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. The tractive and permanent way in TBT. 2. About station, yards, points, crossings and signaling. 3. Site investigation and planning of road and railway bridge. 4. The field of testing, strengthening and construction of bridge. 5. The construction process and types of tunnels used in transportation engineering.

Unit	Contents (Theory)	Marks Weightage
I	Introduction, Tractive Resistances & Permanent Way: Principles of transportation, Modes of transportation, Their importance and limitations, Route surveys and alignment, Railway track, Development and gauges, Hauling capacity and tractive effort, MONO and rapid transit rail (Metro). Rails: Types, Welding of rails, Wear and tear of rails, Rail creep. Sleepers: Types and comparison, Requirement of a good sleeper, Sleeper density. Rail Fastenings: Types, Fish plates, Fish bolts, Spikes, Bearing plates, Chain keys, Check and guard rails. Ballast: Requirement of good ballast, Various materials used as ballast, Quantity of ballast.	14
II	Station & Yards, Points & Crossings & Signaling & Interlocking: Formation, Cross sections, Super elevation, Equilibrium, Cant and cant deficiency, Various curves, Speed on curves, Types, locations, General equipments, Layouts, Marshalling yards, Definition, Layout details, Types of signals in stations and yards, Principles of signaling and inter-locking.	14
III	Bridge Site Investigation and Planning: Loading standards & component parts, Selection of site, Alignment, Collection of bridge design data, Essential surveys, Scour, Depth of bridge foundation, Economical span, Clearance, Afflux. Type of Road & Railway Bridges: Design loads and forces, Impact factor, Indian loading standards for railway bridges and highway bridges, Bridge super structures and sub-structures, Abutments, Piers, Wing walls, Return walls, Approaches, Choice of super structure.	14
IV	Bridge Foundations, Construction, Testing and Strengthening of Bridges: Different types of foundation, Piles and wells, Sinking of wells, Cofferdams, Details of construction underwater and above water, Sheet piles coffer dams, Girders, Equipments and plants, Inspection and data collection, Strengthening of bridges, Bridge failure.	14
V	Tunnels: Selection of route, Engineering surveys, Alignment, Shape and size of tunnel, Tunnel approaches, Construction of tunnels in soft soil, Hard soil and rock, Different types of lining, Methods of lining, Mucking operation, Drainage and ventilation, Examples of existing important tunnels in India and abroad.	14

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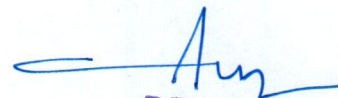
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Semester –III

Text Book/References Books/ Websites:

1. S.P. Bindra; Principles and Practice of Bridge Engineering; Dhanpat Rai & Sons.
2. Ponnuswamy; Bridge Engineering; TMH Publication.
3. Arora & Saxena; Railway Engineering ; Dhanpat Rai & Sons.
4. Dr.S.C. Saxena, Railway; Bridges & Tunnels; Dhanpat Rai & Sons.
5. R. Srinivasan; Harbour, Docks & Tunnel Engineering; Charotar Publication.

Suggested List of Laboratory Practical (Expandable): Nil**CHAIRMAN****BOARD OF STUDIES (ENGINEERING)
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(Applicable for Admitted from Academic Session 2021-22 onwards)

Programme: Bachelor of Technology

Semester –III

Subject Code	Subject Title	Credit			Theory			Practical		
CBCE-303	Strength of Materials	L	T	P	End Sem (70)	Internal (30)	Total (100)	End Sem (35)	Internal (15)	Total (50)
		3	1	1			Min: 40 (D Grade)			Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test -Max Marks: 20	Assignment/Quiz/Attendance -Max. Marks: 10
Practical Internal Max Marks: 15	Lab Performance /Attendance/ Quiz - Max. Marks: 15	

Pre-Requisite	Fundamental of Civil Engineering and applied mechanics
Course Objective	To make students aware of the behavior of structural member subjected to different kinds of stresses, forces like tension/compression, shear, bending, torsion etc. This subject deals as a base for students in field of structural engineering.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. The simple stresses and strains in various bodies. 2. About understand the principal stresses and strains. 3. About bending and deflections in various types of beam and column. 4. The torsion of shaft. 5. About column, struts with various formulas.

Unit	Contents (Theory)	Marks Weightage
I	Simple Stresses and Strains: Concept of elastic body, Stress and strain, Hooke's law, Various types of stress and strains, Elastic constants, Stresses in compound bars, Composite and tapering bars, Temperature stresses.	14
II	Principal stresses and strains: Mohr's circle of stresses, Combined bending and torsion, Theories of failure, Support reactions, Shear force and bending moment diagram for cantilever & simply supported beam with concentrated, Distributed load and couple.	14
III	Bending & Deflection: Theory of simple bending, Concept of pure bending, Equation of bending, Neutral axis, Section-modulus, Determination of bending stresses in simply supported, Cantilever and overhanging beams subjected to point load and uniformly distributed loading, Bending & shear stress distribution across a section in beams, Deflection of beams, Double integration method, Conjugate beam method, Macaulay's method, area moment method.	14
IV	Torsion of Shafts: Concept of pure torsion, torsion equation, Determination of shear stress and angle of twist of shafts of circular section, Hollow shafts, Leaf spring, Spiral spring, Pressure vessels, Stress due to internal pressure, Change in diameter and volume, Compound cylinders and shrink fittings.	14
V	Columns and Struts: Euler's buckling load for uniform section, Various end conditions, Slenderness ratio, Stress in columns, Rankine formula, Eccentric loading on columns.	14

Text Book/References Books/ Websites:

1. Negi; Strength of Materials; TMH Publication.
2. Sadhu Singh; Strength of Materials, Khanna Publication.
3. Rattan SS; Strength of Materials; TMH Publication.
4. R.Subramaniam; Strength of Materials; Oxford Publication.
5. National Building Code of India, Part-IV Code.

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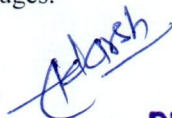
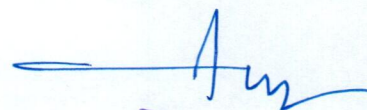
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1. The experimental work to tension, compression, bending, impact test on the RCC, mild steel.
2. To study the Universal Testing Machine (U.T.M.).
3. To determine hardness of mild steel.
4. To perform torsion test on mild steel.
5. To determine impact strength test by Izod test).
6. To determine impact strength test by Charpy Test.
7. To determine Young's Modulus of elasticity of different material of beam simply supported at ends.
8. To perform shear test on metals.
9. To determine the stiffness of the spring and modulus of rigidity of the spring wire.
10. To study various types of strain gauges.

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Programme: Bachelor of Technology

Semester –III

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)
CBCE-304	Building Design & Drawing	3	1	1						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: 15	Lab Performance /Attendance / Quiz - Max. Marks: 15	

Pre-Requisite	Basic knowledge of engineering graphics and unit conversion.
Course Objective	To understand the concept of building planning and architecture in view of various building codes
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. The symbol sign from the given drawing of building elements. 2. To understand building planning concept. 3. Designing and drawing of various types of buildings. 4. Designing and drawing of various types of staircase. 5. About perspective drawings.

Unit	Contents (Theory)	Marks Weightage
I	Drawing of Building Elements: Drawing of various elements of building, Types of footing, Open foundation, Raft, Grillage, Pile and well foundation, Drawing of frames of doors, Window, Various types of door, window and ventilator, Lintels and arches, Stairs and staircase, Trusses, Flooring, Roofs etc.	14
II	Building Planning: Provisions of national building code, Building bye-laws, Open area, Setbacks, FAR terminology, Principle of architectural composition (i.e. Unity, contrast, etc.), Principles of planning, Orientation of building.	14
III	Building Services: Introduction of building services like water supply and drainage, Electrification, Ventilation, lightening and staircases, Fire safety, Thermal insulation, Acoustics of buildings.	14
IV	Design and Drawing of Building: Design and preparation of detailed drawings of various Types of buildings like residential building, Institutional buildings and commercial buildings, Detailing of doors, Windows, Ventilators and staircases etc.	14
V	Perspective Drawing: Elements of perspective drawing involving simple problems, One point and two point perspectives, Energy efficient buildings.	14

Text Book/References Books/ Websites:

1. Malik & Meo; Building Design and Drawing, Asian Publishers /Computech Publications Pvt. Ltd.
2. Shah, Kale & Patki; Building Design and Drawing; TMH Publication.
3. Gurucharan Singh & Jagdish Singh; Building Planning, Design and Scheduling; Standard Publishers Distributors.
4. S.S. Bhavikatti, M.V. Chitawadagi; Building Planning and Drawing; I.K. International Publishing House Pvt. Ltd.
5. A.D.Pawar, V.S. Limaye; Building Design and Drawing; Nirali Prakashan.

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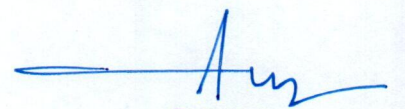
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1. Sketches of various building components.
2. One drawing sheet of various types of foundation.
3. One drawing sheet of various building components containing doors, windows & ventilators.
4. One drawing sheet of Stairs case.
5. One drawing sheets each for services and interiors of buildings.
6. One drawing sheet containing detailed planning of one/two BHK residential building (common to all students).
7. One drawing sheet containing detailed planning residential and institutional building (each student perform different drawing).
8. Use of AutoCAD for preparation of drawings.
9. One drawing sheet of one point and two point perspective.
10. One drawing sheet of Plan, Elevation & Section for 1BHK.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)
CBCE-305	Rock Mechanics & Engineering	1	-	1						

Duration of Theory (Externals): 2 Hours

Theory Internal- Max Marks: 15	Best of Two Mid Semester Test - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05
Practical Internal Max Marks: 15	Lab Performance /Attendance / Quiz - Max. Marks: 15	

Pre-Requisite	General knowledge about geography of world and our country.
Course Objective	To make the students familiar with physical geology, petrology and mineralogy etc.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> About various physical and geological properties of rocks. About mineralogy and crystallography. About various physical features of India. The design criteria of fold and joints. The various methods for preparation of applied geology.

Unit	Contents (Theory)	Marks Weightage
I	Introduction and Physical Geology : Objects and scope of geology, The crust and the interior of the earth, Origin and age of the earth, Sub-aerial and sub-terrain weathering, Denudation and deposition, Wind, river, Glacial and marine erosion, Volcanoes , Soil formation, Soil profile, Geological classification of soil and concept of earthquake plate tectonics.	07
II	Mineralogy and Crystallography: Fundamentals of mineralogy, Study of common rock forming minerals, Ores and minerals of economic importance to civil engineering, Elements of crystallography and introduction to crystal systems.	07
III	Petrology: Composition of earth's crust, Study of igneous, Sedimentary and metamorphic rocks and their formation, Characteristics classification, Rocks of civil engineering Importance. Geology of India: Physical features of India, Brief geological history of India, Occurrence of important ores and minerals in India.	07
IV	Structural Geology: Structures related to rocks, Dip, Strike and outcrops, Classification and detailed studies of geological structures i.e. Folds, Faults, Joints, Unconformity and their importance in civil engineering.	07
V	Applied Geology: Introduction to applied geology and its use in civil engineering, Properties of rocks, Selection of sites for roads, Bridges, Dams, Reservoirs and tunnels, Prevention of engineering structures from seismic shocks, Stability of hill sides, Water bearing strata, Artesian wells, Use of remote sensing techniques in selection of above sites.	07

Text Book/References Books/ Websites:

1. Prabin Singh; Engineering and General Geology; Katson Books.
2. Gulati ; Geotechnical Engineering; TMH publications.
3. P.K. Mukerjee ;A Text Book of Geology; World Publisher.
4. S.K. Garg ;A text book of physical and engineering geology; Khanna Publisher.
5. Varghese P.C: Engineering Geology for civil engineering; PHI Publications.

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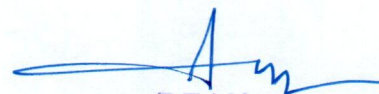
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1. Identification of simple rock forming minerals and important ores.
2. Identification of rock and their properties.
3. Study of simple map of world geology.
4. Field visit / geological excursion.
5. To study the earth and interior of the earth.
6. To study about the sun and planets according to size, distance, description of satellite with the help of chart.
7. To study the land forms of the earth by land form models.
8. To study about ground water, glacier, sea water, rivers, denudation, wind eolian system with the help of chart.
9. To study the charts showing topography of the ocean floor, psunami, map of ocean current.

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Programme: Bachelor of Technology

Semester –III

Subject Code	Subject Title	Credit			Theory			Practical		
CBCE-306	Software Lab-I	L	T	P	End Sem (Nil)	Internal (Nil)	Total	End Sem (Nil)	Internal (50)	Total (50)
		-	-	1			(Nil)			Min: 20 (D Grade)

Duration of Theory (Externals): -Nil

Theory Internal- Max Marks: -Nil	Best of Two Mid Semester Test - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil
Practical Internal Max Marks: 50	Lab Performance /Attendance / Quiz - Max. Marks: 50	

Pre-Requisite	Student has fundamental knowledge about computer operating.
Course Objective	To make the students familiar with various software used in civil engineering construction as well as designing etc.
Course Outcomes	Students will be able to learn about: <ol style="list-style-type: none"> 1. The basic information about software used in civil engineering. 2. The various command used in Auto CAD. 3. The 2D drawing in Auto CAD. 4. How to prepare plan of any construction object. 5. How to draw plan, elevation and section of building.

Unit	Contents (Theory)	Marks Weightage
I	Students have to understand the working of AutoCAD: Introduction to computer aided drafting software for 2d modeling, Benefit, Software's basic commands of drafting entities like line, Poly line, Scale, Trim, Extend, Circle, Polygon, Rectangle, Editing commands like move, Rotate, Mirror, Array, etc. Practicing commands under draw and dimension menu, Modify menu, Tool menu, Format menu, Express menu.	50

Text Book/References Books/ Websites:

1. C. S. Changeriya; Auto CAD Workbook (Civil); Chetan Publication.
2. Linkan Sagar; Auto CAD; BPB Publications.
3. Cheryl R. Shrock; Beginning Auto CAD; BPB Publications.
4. Azhar Wahab & S.S.R. Krishna; A Hand Book On Auto CAD Tools Practice; National Press.
5. Prof. Sham Tickoo; Auto CAD 2020 Workbook; BPB Publications.

Suggested List of Laboratory Practical (Expandable):

1. Introduction to Civil Engineering software.
2. Introduction to latest version of Auto CAD.
3. Introduction to 2D in Auto CAD.
4. General introduction and practices of various lines used in Auto CAD.
5. Introduction and practices of various editing command used in Auto CAD.
6. Introduction and practices of various scale and area command used in Auto CAD.
7. Introduction and practices of various menu used in Auto CAD.
8. Introduction and practices of various line plans of buildings and objects used in civil engineering.
9. Introduction and practices of various elevations and section of building in 2D.
10. Introduction and practices of 2D modeling in Auto CAD.

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Programme: Bachelor of Technology

Semester –III

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)
CBTE-307	NCC-III	1	-	6						

Duration of Theory (Externals): 2 Hours

Theory Internal- Max Marks: 15	Best of Two Mid Semester Test – Max Marks: 10	Assignment/Quiz/Attendance – Max. Marks: 05
Practical Internal Max Marks: 15	Lab Performance/ Quiz/Attendance - Max. Marks: 15	

Pre-Requisite	Nil
Course Objective	<ol style="list-style-type: none"> Understand the life history and leadership qualities of great leaders, sportspersons & entrepreneurs. Understand the various aspects of types of mindset. Understand public speaking methods & qualities. Understand the organizations related to disaster management and their functioning. Understand the role of NCC cadets in disaster management. Understand the various types of adventure activities. Understand the History, Geography & Topography of Border/ Coastal Areas.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> Admire and get inspired from the accomplishments of leaders from various walks of life. Develop public speaking skills. Understand the importance of positive mindset and optimistic attitude in life. Appreciate the need & requirement for disaster management and his role in disaster management activities. Know the history & geographical peculiarity of our borders & coastal regions.

Unit	Contents (Theory)	Marks Weightage
I	Personality Development 1. Group Discussions - Change your Mindset 2. Public Speaking.	07
II	Leadership Development: Case Studies - APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murthy.	07
III	Disaster Management 1. Disaster Management Capsule. 2. Organization. 3. Types of Disasters. 4. Essential Services. 5. Assistance. 6. Civil Defence Organization.	07
IV	Adventure: Adventure activities.	07
V	Border & Coastal Areas: History, Geography & Topography of Border/ Coastal	07

Note: For NCC-III 05 credits will be allotted after successful completion of camp.

Text Book/References Books/ Websites:

- Cadet's handbook, NCC Directorate, MP, CG.
- Supplementary cadet's handbook, NCC Directorate, MP, CG.

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- Arm Drill.
- Rifle ke saath Savdhan, Vishram aur Aram se.
- Rifle ke saath Parade Par aur Saj, Rifle ke saath Visarjan, Line Tod.
- Bhumi Shastra aur Uthao Shastra, Bagal Shastra aur Baju Shastra.

2. Weapon Training

- Short Range firing.

3. Map Reading

- Setting of Map.
- Findings North and Own Position.

4. Field Craft & Battle Craft

- Observation.
- Camouflage.
- Concealment.

5. Social Service and Community Development


Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level.

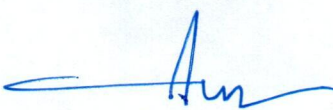
6. Obstacle Training

- Obstacle training - Introduction, Safety-measures, Benefits.
- Obstacle Course- Straight balance, Clear Jump, Gate Vault, Zig- ZagBalance, High Wall

Note: Examination of this NCC course will be conduct as per NCC head quarter norms in consultation with office of COE, PU.


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PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*

Programme: Bachelor of Technology

Semester –III

Subject Code	Subject Title	Credit			Theory			Practical		
CBTE-308	Introduction to Internet of Things	L	T	P	End Sem (70)	Internal (30)	Total (100)	End Sem (35)	Internal (15)	Total (50)
		2	-	1			Min: 40 (D Grade)			Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: 15	Lab Performance /Attendance / Quiz - Max. Marks: 15	

Pre-Requisite	Nil
Course Objective	Internet of Things is a course that deals with the study of how devices are connected and how it helps to stay connected over the Internet. The course teaches the individuals on how the Internet of Things is helpful in our daily lives and how to stay connected over the Internet.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. Fundamental of Internet of Things and its technology. 2. Recognize the factors that contributed to the emergence of IoT. 3. Design and program IoT devices. 4. Use real IoT protocols for communication. 5. Security elements of an IoT device.

Unit	Contents (Theory)	Marks Weightage
I	IoT: What is the IoT and why is it important, Elements of an IoT ecosystem, Technology drivers, Business drivers, Trends and implications, Overview of Governance, Privacy and Security Issues.	14
II	IoT Protocols: Protocol Standardization for IoT – Efforts – M2M , WSN Protocols SCADA and RFID Protocols ,Issues with IoT Standardization – Unified Data Standards Protocols – IEEE802.15.4,BAC Net Protocol– Modbus ,KNX, Zigbee, Network layer, APS layer – Security.	14
III	IoT Architecture: IoT Open source architecture (OIC) - OIC Architecture & Design Principles- IoT Devices and deployment models- IoTivity, An Open source IoT stack, Overview- IoTivity stack architecture, Resource model and Abstraction.	14
IV	Web of Things: Web of Things versus Internet of Things, Two Pillars of the Web, Architecture Standardization for WoT, Platform Middleware for WoT, Unified Multitier WoT Architecture, WoT Portals and Business Intelligence.	14
V	IoT Applications: IoT applications for industry, Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications. Study of existing IoT platforms /middleware, IoT- A, Hydra etc.	14

Text Book/References Books/ Websites:

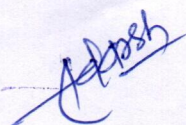
1. Arshdeep Bahga, Vijay Madisetti; Internet of Things (A Hands-on Approach); University Press.
2. Raj Kamal; Internet of things- Architecture and Design Principles; McGraw Hill
3. Cuno Pfister; Getting Started with the Internet of Things; O'Reilly Media
4. Francis daCosta; Rethinking the Internet of Things: A Scalable Approach to Connecting Everything; Apress Open

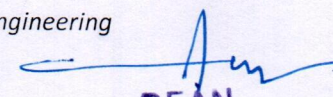
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Programme: **Bachelor of Technology**

Semester –III

Suggested List of Laboratory Practical (Expandable):

1. Starting Raspbian OS, Familiarizing with Raspberry Pi Components and interface, Connecting to ethernet, Monitor, USB.
2. Displaying different LED patterns with Raspberry Pi.
3. Displaying Time over 4-Digit 7-Segment Display using Raspberry Pi.
4. Raspberry Pi Based Oscilloscope.
5. Setting up Wireless Access Point using Raspberry Pi.
6. Controlling Raspberry Pi with Whats App.



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PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*

Programme: Bachelor of Technology

Semester –III

Subject Code	Subject Title	Credit			Theory			Practical		
CBTE-309	Quantitative Aptitude & Logical Reasoning	L	T	P	End Sem (Nil)	Internal (50)	Total (50)	End Sem (Nil)	Internal (Nil)	Total (Nil)
		1	-	-			Min: 20 (D Grade)			

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: 50	Best of Two Mid Semester Test - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks:50
Practical Internal Max Marks: Nil	Lab Performance /Attendance / Quiz - Max. Marks: Nil	

Pre-Requisite	Nil
Course Objective	The logical reasoning and quantitative ability represents a systematic way to judge a candidate's mental capability as how he/she performs certain tasks and reacts to different situations.
Course Outcomes	Student will able to learn: <ol style="list-style-type: none"> 1. Solve the problem of number system. 2. Discuss basic concept of algebra, geometry and complex number. 3. Elaborate the concept of probability, set theory and trigonometry. 4. Analyze actively to do logical reasoning such as binary logic, family tree, logical sequence, reflecting on their work. 5. Explore and apply key concepts in logical and quantitative thinking to business problems.

Unit	Contents (Theory)	Marks Weightage
I	Quantitative Aptitude I: LCM and HCF, Percentages, Profit and Loss, Interest (Simple and Compound), Speed, Time and Distance; Time and Work; Averages; Ratio and Proportion, Number System	10
II	Quantitative Aptitude II: Algebra, Geometry/ Mensuration, Pure Math, Venn diagrams, Linear Equations, Quadratic Equations, Complex Numbers, Logarithm, Progressions	10
III	Quantitative Aptitude III: Permutation and Combination , Binomial Theorem, Surds and Indices, Inequalities, Probability Functions, Set Theory, Mixtures and Allegations, Co-ordinate Geometry, Trigonometry	10
IV	Logical Reasoning I: Clocks, Calendars, Binary logic, Seating Arrangement, Blood Relations (Family Tree), Logical Sequence, Assumption, Premise, Conclusion	10
V	Logical Reasoning II: Linear and matrix arrangement, Team Formation, Direction Sense and Decision Making, Syllogism, Cubes, Rows, Quantitative Reasoning, Puzzles, Logical Reasoning based on Rankings, Critical Reasoning	10

Text Book/References Books/ Websites:

1. Dr. R.S. Aggarwal; Quantitative Aptitude for Competitive Examinations; S. Chand Publication.
2. Dr. R.S. Aggarwal; A Modern Approach To Logical Reasoning; S. Chand Publication.
3. Arun Sharma; How to Prepare for Quantitative Aptitude for CAT ;Mc Graw Hill.
4. Arun Sharma; How to Prepare for Logical Reasoning for CAT; Mc Graw Hill.
5. Sarvesh K Verma ; Quantitative Aptitude Quantum CAT ; Arihant Publication.
6. Jaikishan, Premkishan; How to Crack Test of Reasoning; Arihant Publication.

Suggested List of Laboratory Practical (Expandable): Nil

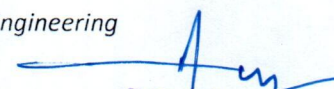
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Subject Code	Subject Title	Credit			Theory			Practical		
CBTE-310	NSS-II/NSO-II	L	T	P	End Sem (Nil)	Internal (Nil)	Total	End Sem (Nil)	Internal (50)	Total (50)
		-	-	1			(Nil)			Min: 20 (D Grade)

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil
Practical Internal Max Marks: 50	Lab Performance /Attendance / Quiz - Max. Marks: 50	

Pre-Requisite	Nil
Course Objective	<ol style="list-style-type: none"> 1. The purpose of this course is to understand the community in which they work. 2. To understand themselves in relation to their community. 3. Identify the needs and problems of the community and involve them in problem solving process.
Course Outcome	Student will be able to learn: <ol style="list-style-type: none"> 1. The quality of educated manpower by fostering social responsibility. 2. Raising society to a higher material and moral level by preparing students towards dedication in the service of nation. 3. Introduce urban students to rural life by living in contact with the community in whose midst their institution is located. 4. Making campus relevant to the needs of the community. 5. To work for community services.


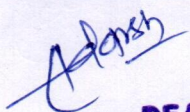
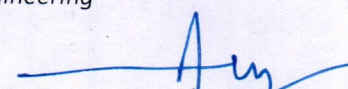
Unit	Contents (Theory)	Marks Weightage
I	Introduction and Basic Concepts of NSS :History and Philosophy & Definition of NSS , Aims & Objectives of NSS, Emblem, flag, Motto, Song, Badge, NSS day etc, Organizational structure (from national to regional level), Roles and responsibilities of various NSS functionaries.	50
II	NSS Programmes and Activities : Concept of regular activities (one day camp), special seven day conduction camping, day and night camps and relevance of celebration of important days recognized by united nations, Centre, State Govt. & University, Basis of adoption of village/slums, methodology of conduction survey , Financial pattern of the scheme , Coordination with different agencies ,Maintenance of the diary	
III	Community Mobilization and Adoption of village: Functioning of community stakeholders, Designing the message in the context of the problem and the culture of the community, Identifying methods of mobilization, Concept of Community development and village adoption.	
IV	Volunteerism and Shraman: Indian tradition of volunteerism, Value system of volunteerism, Motivation and constraints of volunteerism, Shramdan as a part of volunteerism, Role of NSS volunteers in Swach Bharat Abhiyan, Role of NSS volunteers in Digital India.	
V	Project Work/ Practical: The Project should be related from the above topics	

Text Book/References Books/ Websites: Nil**Suggested List of Laboratory Experiments :- (Expandable):**

Project Work/Practical: The Project should be related from the above topics.

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Subject Code	Subject Title	Credit			Theory			Practical		
CBTE-311	Music Vocal-II/Music Instruments-II	L	T	P	End Sem (Nil)	Internal (Nil)	Total (Nil)	End Sem (Nil)	Internal (50)	Total (50)
		-	-	1						Min: 20 (D Grade)

Duration of Theory (Externals): -Nil

Theory Internal- Max Marks: -Nil	Best of Two Mid Semester Test - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil
Practical Internal Max Marks: 50	Lab Performance/ Quiz/Attendance - Max. Marks: 50	

Pre-Requisite	Basic knowledge of rag tal and musical instruments.
Course Objective	Impart a basic knowledge of music sound, sangeet and folk songs (Vocal and Instruments)
Course Outcome	Student will be able to learn: <ol style="list-style-type: none"> 1. Basic knowledge of Sound. 2. Basic Knowledge of Rabindra & Karnatak Sangeet. 3. Knowledge of various Indian Folk Songs.

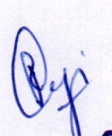
Unit	Contents (Theory)	Marks Weightage
I	Elementary Study of medium Sound, musical sound and noise. Study of vibratory motion, Frequency, Pitch, Magnitude and Timber quality duration. Study of interval, Scale, Octave, major tone, Minor tone and semi tone & value of each of the three tones. General knowledge of Rabindra Sangeet. General knowledge of various folk songs as kajri, Baul, Chaiti, Bhatiali mand, Garba, lavni, Hori, etc.	50

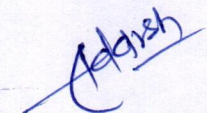
Text Book/References Books/ Websites:

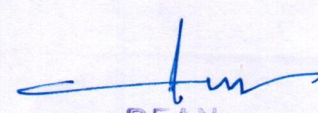
1. Pt. Harishchandra Srivastava; Raga Parichay (Part 1, 2, 3 & 4).
2. Dr. Geeta Banerjee; Raga Shashtra (Part 1 & 2).
3. Shanti Govardhan; Sangeet Shashtra Darpan (Part 1 & 2).
4. Vasant Sangeet Visharad.

Suggested List of Laboratory Experiments (Expandable):

1. Practices on of Rabindra Sangeet and any one folk songs (Vocal and Instrumental)


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Programme: Bachelor of Technology

Semester –III

Subject Code	Subject Title	Credit			Theory			Practical		
CBTE-312	Social Engineering	L	T	P	End Sem (Nil)	Internal (50)	Total (50)	End Sem (Nil)	Internal (Nil)	Total
		-	-	-			Min: 20 (D Grade)			(Nil)

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: 50	Best of Two Mid Semester Test -Max Marks: Nil	Assignment/Quiz/Attendance -Max. Marks: 50
Practical Internal Max Marks: Nil	Lab Performance/Attendance /Quiz - Max. Marks: Nil	

Pre-Requisite	Nil
Course Objective	The program's framework was inspired by the realization that an integrated systems approach is the best way to address the set of competencies needed to address societal problems. Numerous opportunities in the business world, the social sector, and government will arise as a result of this integrated programme.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. Function effectively in teams to accomplish a common goal. 2. An understanding of professional and ethical responsibility. 3. Ability to self-learn and engage in life-long learning. 4. Understanding of the impact of solutions in an economic, societal, and environment context. 5. Psychological manipulation and human behavior of students into performing actions or divulging confidential information.

Unit	Contents (Theory)	Marks Weightage
I	<p>Social engineering is one of the most prolific and effective means of gaining access to secure systems and obtaining sensitive information yet requires minimal technical knowledge, Social engineering works by manipulating normal human behavioral traits and as such there are only limited technical solutions to guard against it, As a result, the best defense is to educate users on the techniques used by social engineers, and raising awareness as to how both humans and computer systems can be manipulated to create a false level of trust, This can be complemented by an organizational attitude towards security that promotes the sharing of concerns, Enforces information security rules and supports users for adhering to them.</p> <p>Contents are as follows: Introduction of Social Engineering: Definition; Types, Psychology in Social Engineering, The social engineering life cycle, Human behavior; Weapons of a social engineer; Defense against social engineering, Social engineering attacks, Examples of social engineering attacks, Guidelines to stay protected against social engineering attacks, Reverse social engineering.</p>	50

Text Book/References Books/ Websites:

1. Kevin Mitnick; The book of the art of deception.
2. www.socialengineer.com/wpcontent/uploads/2017/02/AdvancedPracticalSocialEngineering-Syllabus.pdf.
3. <https://www.exploit-db.com/docs/english/18135-social-engineering---the-human-factor.pdf>.
4. <https://www.jigsawacademy.com/blogs/cyber-security/what-is-social-engineering/>

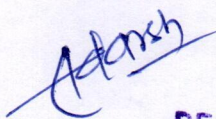
Suggested List of Laboratory Practical (Expandable): Nil

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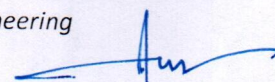
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PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*Programme: **Bachelor of Technology****Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBTE-401	Entrepreneurship and IPR	3	-	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test -Max Marks: 20	Assignment/Quiz/Attendance -Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance/Attendance /Quiz - Max. Marks: Nil	


Pre-Requisite	Nil
Course Objective	The course's major objectives are to educate students with various concepts that are essential to comprehend the processes involved in entrepreneurship, grow small and medium-sized businesses, and promote the entrepreneurial spirit of self-employment. To recognize the importance of IP and to educate the students on basic concepts of Intellectual Property Rights.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. Create and exploit innovative business ideas and market opportunities. 2. Turn market opportunities into a business plan. 3. Demonstrate and present successful work, collaboration and division of tasks in a multidisciplinary and multicultural team. 4. Entrepreneurship and Innovation minors will be able to find problems worth solving. Students advance their skills in customer development, customer validation, competitive marketing and financial analyses, and iteration. 5. Enhanced capability to secure new intellectual properties through Patents and Copyrights

Unit	Contents (Theory)	Marks Weightage
I	Entrepreneurship: Definition and Functions of an Entrepreneur, Qualities of a good entrepreneur; Role of Entrepreneur in Economic Development; Theories of entrepreneur, Socio, Economic, Cultural and Psychological; Entrepreneur Traits and Behavior, Roles in economic growth, employment, social stability, export promotion and indigenization, Creating A Venture, Opportunity Analysis Competitive and Technical Factors, Sources of Fund. Forms of Business Organizations/Ownership – Formation of a Company – procedures and formalities for setting up of New Industry-Sources of information to contact for what and where.	14
II	Management: Importance, Definition and functions; Dimensions of Organizations, Size/Specialization, Behavior Formalization, Authority Centralization, Departmentalization, Span and Line of Control, Technology and Minzberg Organization Typology, Line, Staff & Matrix Organization. Motivation Theories – Maslow, Mc Cullen – Motivation model – need, want, motive and Behavior-Attitude Towards work – Self Assessment and Goal Setting – Achievement, Motivation and Behavior Measurement, SWOT analysis and TA analysis – Stress and Conflict Management; with uncertainty; Creativity and Innovation.	14
III	Marketing: Importance, Definition, Core Concepts of need want and Demand, Project identification and formulation: Sources of Information – Opportunity Guidance – Choice of Technology and its evaluation; Consumer Behavior; Market Survey and research; Preliminary Project Report, Detailed Project Report, Assessing Viability and feasibility of a report. Exchange & Relationships, Product Value, Cost and satisfaction (goods and services) Marketing Environment; Selling, Marketing and Societal Marketing Concepts; Four P's, Product, Price, Placement, Promotion.	14

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PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2021-22 onwards)**Programme: **Bachelor of Technology****Semester –IV**

	Finance: Nature and Scope, Forms of Business Ownerships, Balance Sheet, Profit and loss Account, Fund Flow and Cash Flow Statements, Breakeven Point (BEP) and Financial Ratio analysis, pay-back period, NPV and capital budgeting. Subsidies and concessions for SSI – role of State and Central Government Agencies in Promotion of Small Scale Industry	
IV	Concept of Property: Theories of Property, Types of Intellectual Property- Origin and Development, Theories of Intellectual Property Rights, Need for Protecting Intellectual Property, Commercialization of Intellectual Property Rights by Licensing, Determining Financial Value of Intellectual Property Rights, Negotiating Payments Terms in Intellectual Property Transaction.	14
V	Introduction to Patent Law, (a) Paris Convention , (b) Patent Cooperation Treaty, (c) WTO-TRIPS , Indian Patent Law, The Patents Act, 1970, Patentable Subject Matter, Patentability Criteria, Procedure for Filing Patent Applications, Patent Granting Procedure, Revocation, Patent Infringement and Remedies, Relevant Provisions of the Biological Diversity Act, 2002, Access and Benefit Sharing Issues.	14

Text Book/References Books/ Websites:

1. Arvindrai N. Desai; Environment and Entrepreneur; Ashish Publishing House, New Delhi.
2. Dr. P. Saravanavel; Entrepreneurial Development; Learntech Press Trichy.
3. P Narendra Singh.; Emerging Trends in Entrepreneurship Development Theories & Practices – Entrepreneurship.
4. Dr. S.R.Myneni; Law of Intellectual Property; Asia law House.
5. Dr.G.B Reddy; Intellectual Property Rights and Law; Gogia Law Agency.

Suggested List of Laboratory Practical (Expandable): Nil


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Programme: Bachelor of Technology

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)
CBCE-402	Fluid Mechanics-I	3	-	1						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test -Max Marks: 20	Assignment/Quiz/Attendance -Max. Marks: 10
Practical Internal Max Marks: 15	Lab Performance/Attendance /Quiz - Max. Marks: 15	

Pre-Requisite	Concept of physics and mathematics.
Course Objective	To understand fundamental properties, concept, phenomena, forces generation and fluid mechanism on the fluid.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> About the properties of fluid. Understand the principal kinematics of flow. Determination of dynamics of flow. Determine the dynamic similitude and dimensional analysis. About laminar flow.

Unit	Contents (Theory)	Marks Weightage
I	Review of Fluid Properties: Engineering units of measurement, Mass, Density, Specific weight, Specific volume, Specific gravity, Surface tension, Capillarity, Viscosity, Bulk modulus of elasticity, Pressure, Pressure at a point, Pressure variation in static fluid, Absolute and gauge pressure, Manometers, Forces on plane and curved surfaces buoyant force, Stability of floating and submerged bodies, Relative equilibrium.	14
II	Kinematics of Flow : Types of flow-ideal & real , Steady & unsteady, Uniform & non uniform, one, Two and three dimensional flow, Path lines, Streamlines, Streamline flow and stream tubes, Continuity equation for one and three dimensional flow, Rotational & irrotational flow, Circulation, Stagnation point, Separation of flow, Sources & sinks, Velocity potential, Stream function, Flow nets- their utility.	14
III	Dynamics of Flow: Euler's equation of motion along a streamline and derivation of Bernoulli's equation, Application of Bernoulli's equation, Energy correction factor, Linear momentum equation for steady flow, Momentum correction factor, The moment of momentum equation, Forces on fixed and moving vanes and other applications, Fluid measurements, Velocity measurement etc.	14
IV	Dimensional Analysis and Dynamic Similitude: Dimensional analysis, Dimensional homogeneity, Use of Buckingham-pi theorem, Calculation of dimensionless numbers, Similarity laws, Specific model investigations (submerged bodies, partially submerged bodies, Weirs, Spillways, Rotodynamic machines etc.)	14
V	Laminar Flow: Introduction to laminar & turbulent flow, Reynolds experiment & Reynolds Number, Relation between shear & pressure gradient, Laminar flow through circular pipes, Laminar flow between parallel plates, Laminar flow through porous media, Stokes law, Lubrication principles.	14

Text Book/References Books/ Websites:

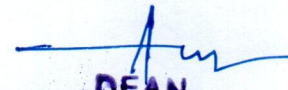
- Modi & Seth; Fluid Mechanics; Standard Book House Delhi.
- R.K. Bansal ; Fluid Mechanics; Laxmi Publications.
- Jnik Dake ; Essential of Engg Hyd.; Afrikan Network & Sc Instt. (Ansti).

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4. R. K. Rajput; Fluid Mechanics and Hydraulic Machines; S Chand & Co Ltd.
5. Cengal; Fluid Mechanics; TMH publication.

Suggested List of Laboratory Practical (Expandable):

1. To determine the local point pressure with the help of Pitot tube.
2. To find out the terminal velocity of a spherical body in water.
3. Calibration of Orifice meter and Venturimeter.
4. Determination of C_c , C_v , C_d of orifices.
5. To verify Bernoulli's theorem.
6. Determination of friction factor of a pipe.
7. To study the characteristics of a centrifugal pump.
8. Verification of impulse momentum principle.
9. Reynolds experiment for demonstration of stream lines & turbulent flow.


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PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*Programme: **Bachelor of Technology****Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
CBCE-403	Construction Material & Techniques	L	T	P	End Sem (70)	Internal (30)	Total (100)	End Sem (35)	Internal (15)	Total (50)
		3	1	1			Min: 40 (D Grade)			Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test -Max Marks: 20	Assignment/Quiz/Attendance -Max. Marks: 10
Practical Internal Max Marks: 15	Lab Performance/Attendance /Quiz - Max. Marks: 15	

Pre-Requisite	Fundamental knowledge of basic civil engineering.
Course Objective	To give knowledge and proficiency in construction as regards to material technology.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> To identify types of stones, timber, tiles and bricks. To analyze properties of advanced construction materials. The design of foundation in different types of soils. The construction of different types of wall. About various types of special floor and slab.

Unit	Contents (Theory)	Marks Weightage
I	Stones: Occurrence, Varieties, Characteristics and their testing, Uses, Quarrying and dressing of stones. Timber: Important timbers, their engineering properties and uses, Defects in timber, Seasoning and treatment, Need for wood substitutes, Alternate materials for shuttering doors/windows, Partitions and structural members etc. Brick and Tile: Manufacturing, Characteristics, Classification and uses, Improved brick from inferior soils, Hand molding and table molding brick, Clay-fly ash brick table, Flooring tiles and other tiles and their characteristics.	14
II	Advance Construction Materials: Use of fly ash in mortars, Concrete, Fly ash bricks, Stabilized mud blocks, Non-erodible mud plinth, D.P.C. materials, Building materials made by industrial & agricultural waste, Clay products P.V.C. materials, Advance materials for flooring, Doors & windows, Facia material, Interiors materials for plumbing, Sanitation & electrification.	14
III	Foundation: Type of soils, Bearing capacity, Soil stabilization and improvement of bearing capacity, Settlement and safe limits, Spread foundations, Wall footings, Grillage, Foundations well foundation, Causes of failure and remedial measures, Under reamed piles, Foundation on shrinkable soils, Black cotton soil, Timbering for trenches, Dewatering of foundations, Damp proof courses, Repairs techniques for foundations.	14
IV	Masonry and Walls: Brick masonry, Bonds, Stone masonry, Casting and laying, Masonry construction, Brick cavity walls, Code provisions regarding load bearing and non load bearing walls, Common defects in construction and their effect on strength and performance of walls, Designed brick masonry, Precast stone masonry block, Hollow concrete block, Plastering and pointing, White and color washing, Distempering, Dampness and its protection.	14
V	Floors and Roofs : Types, Minimum thickness, Construction, Floor finishes, Flat roofs, RCC jack arch, Reinforced brick concrete, Solid slab and timber roofs, Pitched roofs, Fall ceiling, Roof coverings, Fibrocement roofing units, Water proofing, Services, Water supply & drainage, Electrification, Fire protection, Thermal insulation, Air conditioning, Acoustics & sound insulation.	14

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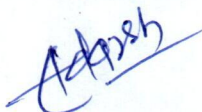
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1. S.C. Rangwala; Engineering Materials; Chorator publishers.
2. Sushil Kumar; Building Construction; Standard Publishers Distributors.
3. B.C. Punmia; Building Construction; Laxmi Publications.
4. Surendra Singh; Engineering Materials; Vikas Publishing.
5. Haimei Zhang; Building Materials in Civil Engineering; Elsevier Science.

Suggested List of Laboratory Practical (Expandable):

1. Determine the various test performed on bricks.
2. Find out the abrasion value by Los angles abrasion test.
3. Find out the impact value of aggregate.
4. Initial and Final setting time of cement by Vicat's apparatus.
5. Determination of uncombined lime by Le-Chateliers apparatus.
6. Determination of compressive strength of concrete with different cement grades.
7. Determination of workability of concrete by slump test.
8. Determination of workability by compacting factor apparatus.
9. Determination of workability of concrete by Vee-Bee apparatus.
10. Nondestructive testing of concrete by rebound hammer test.

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PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*

Programme: Bachelor of Technology

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)
CBCE-404	Surveying-I	3	1	1						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test -Max Marks: 20	Assignment/Quiz/Attendance -Max. Marks: 10
Practical Internal Max Marks: 15	Lab Performance/Attendance /Quiz - Max. Marks: 15	

Pre-Requisite	Fundamental knowledge about unit conversion of various IS units.
Course Objective	To ensure that students begin to understand various types of instrument used in civil engineering.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. To identify classification, advantage & disadvantages and various operations conduct with theodolite. 2. To analyze tachometry principle and their system. 3. The design of various curves with different methods. 4. Angle survey, triangulation principle in control surveying. 5. The basic about hydrographic surveying.

Unit	Contents (Theory)	Marks Weightage
I	Traversing by Theodolite: Traverse computations, Latitude and departures, Adjustments, Computations of co-ordinates, Plotting & adjusting of traverse, Omitted measurements, EDM, Trigonometric leveling.	14
II	Tachometry: Tachometric systems and principles, Stadia system, Uses of anallatic lens, Tangential system, Sub lenses system, Instrument constant, Direct-reading tachometers, Use of tachometry for traversing and contouring.	14
III	Curves: Classification and uses of curves, Elements of circular curves, Calculations, Setting out curves by offsets and by theodolite, Compound curves, Reverse curves, Transition curves, Cubic spiral and lemniscates curves, Vertical curves, Setting out of curves.	14
IV	Control Surveys: Providing frame work of control points, Triangulation principle, Co-naissance, Selection and marking of stations, Angle measurements and corrections, Baseline measurement and corrections, Computation of sides.	14
V	Hydrographic Surveying: Soundings, Methods of observations, Computations and plotting, Principles of photographic surveying, Aerial photography, Tilt and height distortions, Remote sensing, Simple equipments, Elements of image interpretation, Image-processing systems.	14

Text Book/References Books/ Websites:


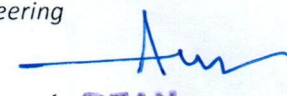
1. T.P. Kanetkar; Surveying & Levelling Volume I & II; Pune Vidhyarthi Griha Prakashan.
2. S.K. Duggal; Surveying & Levelling ; Mc.Graw Hill.
3. B.C. Punmia; Surveying Volume I & II; Laxmi Publications.
4. K.R. Arora; Surveying Volume I & II.; Standard Book House.
5. N.N.Basak; Surveying & Leveling; Mc.Graw Hill.

Suggested List of Laboratory Practical (Expandable):

1. Determination of tachometric constants & uses of tachometer in various field works.
2. Determination of cross sectioning.
3. Determination of profile leveling.
4. Determination of contouring for different objects.

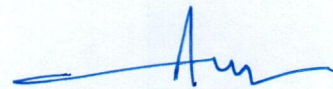
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5. Determination of curve setting by different methods.
6. To find out the reduce level (RL) of given stations by Auto level.
7. To measure included angle by theodolite traversing.
8. Determination of elevation of point trigonometric leveling.
9. To measure the exterior angle by theodolite traversing.
10. To make a contour plan of given area (on full size drawing sheet).

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Subject Code	Subject Title	Credit			Theory			Practical		
CBCE-405	Waste Management	L	T	P	End Sem (35)	Internal (15)	Total (50)	End Sem (35)	Internal (15)	Total (50)
		2	-	1			Min: 20 (D Grade)			Min: 20 (D Grade)

Duration of Theory (Externals): 2 Hours

Theory Internal- Max Marks: 15	Best of Two Mid Semester Test -Max Marks: 10	Assignment/Quiz/Attendance -Max. Marks: 05
Practical Internal Max Marks: 15	Lab Performance/Attendance /Quiz - Max. Marks: 15	

Pre-Requisite	Nil
Course Objective	Fundamental knowledge of solid waste, industrial and agricultural waste.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. The fundamental knowledge in effect of waste on society and animal healths. 2. To collection of municipal waste. 3. About preliminary surveying in the field of E-waste disposal and treatment methods. 4. About how to dispose and how to decide site for disposal. 5. The various types of dumping methods of waste.

Unit	Contents (Theory)	Marks Weightage
I	Introduction: Definition, Various sources, Types of waste, Problem associated with waste, Effects of waste on society, human health & animals, Recycling of waste.	07
II	Municipal & Solid waste: Definition, Sources of solid waste, Types of solid waste, Composition of solid waste, Collection methods and techniques of solid waste, Industrial & agricultural waste.	07
III	Hazardous & E-waste: Definition, Sources of hazardous waste, Collection of hazardous waste, Medical waste, Nuclear waste, Disposal & treatment methods, Sources of E-Waste, E-waste non-recycling impacts, Recycling of E-waste.	07
IV	Collection, Treatment & Disposal: Methods of residential and commercial waste collection, Collection vehicles, Manpower, Segregation & composting of solid wastes, Method & techniques for treatment of solid waste.	07
V	Disposal of Solid Wastes: Refuse disposal systems, Incinerations, Principle features of an incinerator, Site selection and plant layout of an incinerator, Sanitary landfill, Advantages and disadvantages of sanitary land fill site selection, Dumping in open & sea dumping.	07

Text Book/References Books/ Websites:



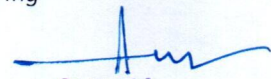
1. Jagbir Singh; Solid Waste Management; I.K. International Publishing House Pvt. Ltd.
2. S.K. Duggal; Surveying & Levelling ; Mc. Graw Hill.
3. K. Sasikumar; Solid Waste Management; Prentice Hall India Learning Pvt. Ltd.
4. P Jayarama Reddy; Municipal Solid Waste Management; BS Publications.
5. Subhash Anand; Solid Waste Management; A Mittal Publications.

Suggested List of Laboratory Practical (Expandable):

1. Survey the MSW of your locality and identify its sources and write composition of MSW.
2. Carryout sample survey of different localities in groups listing properties of municipal solid waste.
3. Survey your locality and based on it suggest methods of solid waste collection.
4. Survey your locality and based on it suggest methods of solid waste disposal.

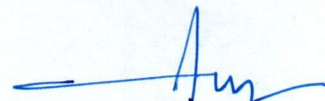
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5. Survey your locality and based on it suggest suitable methods of handling, separation and storage of solid waste
6. Identify & discuss the methods of processing different types of solid waste.
7. Compare different methods of disposal of MSW.
8. Identify methods of hazardous waste disposal during a site visit and follow safety precautions.
9. Identify methods of hazardous waste treated during a site visit and follow safety precautions.
10. Determine the various methods for separation of industrial and solid waste.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (Nil)	Internal (Nil)	Total (Nil)	End Sem (Nil)	Internal (50)	Total (50) Min: 20 (D Grade)
CBCE-406	Software Lab-II	-	-	1						

Duration of Theory (Externals): -Nil

Theory Internal- Max Marks: -Nil	Best of Two Mid Semester Test - Max Marks: Nil	Assignment/Quiz/Attendance -Max. Marks: Nil
Practical Internal Max Marks: 50	Lab Performance/Attendance /Quiz - Max. Marks: 50	

Pre-Requisite	Student has fundamental knowledge about 2D Auto CAD.
Course Objective	To make the students familiar with 3D Auto CAD modeling as well as designing in 3D.
Course Outcomes	Students will able to learn: <ol style="list-style-type: none"> 1. The basic information about software used in civil engineering for 3D modeling. 2. The various command used in 3D Auto CAD. 3. The 3D drawing in Auto CAD. 4. How to prepare 3D plan of any construction object. 5. How to draw plan, elevation and section of building in 3D.

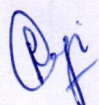
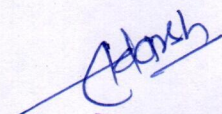
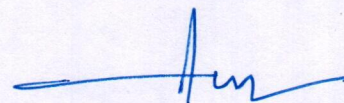
Unit	Contents (Theory)	Marks Weightage
I	Students have to understand the working of 3D AutoCAD: Introduction to computer aided drafting software for 3d modeling, Benefit, Software's basic commands of drafting entities like line, Poly line, Scale, Projection in 3D, Editing commands like move, Rotate, Mirror, Array.etc, Practicing commands under draw and dimension menu in 3D, Modify menu, Tool menu, Format menu, Express menu for 3D.	50

Text Book/References Books/ Websites:

1. C. S. Changeriya; Auto CAD Workbook (Civil); Chetan Publication.
2. Linkan Sagar; Auto CAD; BPB Publications.
3. Cheryl R. Shrock; Beginning Auto CAD; BPB Publications.
4. Azhar Wahab& S.S.R. Krishna; A Hand Book On Auto CAD Tools Practice; National Press.
5. Prof. Sham Tickoo; Auto CAD 2020 Workbook; BPB Publications.

Suggested List of Laboratory Practical (Expandable): Nil

1. Introduction to 3D in Auto CAD.
2. Introduction and practices of various editing command used in Auto CAD in 3D.
3. Introduction and practices of various scale and area command used in Auto CAD in 3D.
4. Introduction and practices of various line plans of buildings and objects used in civil engineering in 3D.
5. Introduction and practices of various elevations and section of building in 3D.
6. Introduction and practices of 3D modeling in Auto CAD.


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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)
CBTE -407	NCC-IV	2	-	1						

Duration of Theory (Externals): 2 Hours

Theory Internal- Max Marks:15	Best of Two Mid Semester Test – Max Marks: 10	Assignment/Quiz/Attendance – Max. Marks: 05
Practical Internal Max Marks: 15	Lab Performance/ Quiz/Attendance - Max. Marks: 15	

Pre-Requisite	Nil
Course Objective	<ol style="list-style-type: none"> 1. Develop a sense of time management and social skills. 2. Understand the life history & leadership qualities of personalities who have contributed in Nation Building and Literature. 3. Understand the role of NCC cadets as 2nd line Defence in 1965 War. 4. Develop awareness about various types of Natural and manmade disasters. 5. Know about life saving tips during disasters. 6. Acquainted about Fire Services. 7. Understand importance of Environmental Awareness & conservation. 8. Understand importance of General Awareness. 9. Know about Armed Forces.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. Effectively manage time. 2. Develop the qualities of social skills. 3. Imbibe leadership qualities. 4. Do group discussions effectively. 5. Be motivated to serve the nation by joining Armed forces. 6. Contribute in environmental awareness and conservation activities. 7. Keep abreast of current affairs & general awareness. 8. Effectively contribute in managing disaster relief tasks.

Unit	Contents (Theory)	Marks Weightage
I	Personality Development : Group Discussions –Social Skills & Time management	07
II	Leadership Development : Case Studies– Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965 war.	07
III	Disaster Management: (i) Initiative Trg, Organising Skills. (ii) Do's and Don'ts. (iii) Natural Disasters. (iv) Man Made Disasters. (v) Fire Services and Fire Fighting.	07
IV	Environmental Awareness: Adventure Environmental Awareness and conservation. General Awareness: General Awareness.	07
V	Armed Forces: Army, Navy, Air Force and Central Armed Police Forces.	07

Text Book/References Books/ Websites:

1. Cadet's handbook, NCC Directorate, MP, CG.
2. Supplementary cadet's handbook, NCC Directorate, MP, CG.

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Programme: **Bachelor of Technology**

Semester –IV

Suggested List of Laboratory Practical (Expandable):**1. Drill**

- Arm Drill.
- Salami Shastra.
- Squad Drill with Arms

2. Weapon Training

- Short Range firing

3. Map Reading

- Map to Ground.
- Ground to Map.

4. Field Craft & Battle Craft

- Fire and Move Capsule.
- Field signal- with hand, with Weapons, Signal with Whistle.
- Field signals as means of giving orders.
- Field signals by day, Field signals by night.
- Section Formation.

5. Social Service and Community Development:

Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level

6. Health & Hygiene

- Hygiene & Sanitation (Hygiene- Personal & Camp Hygiene).
- First Aid in common medical emergencies.
- Treatment & Care of Wounds

Note: Examination of this NCC course will be conduct as per NCC head quarter norms in consultation with office of COE, PU.


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Programme: Bachelor of Technology

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (Nil)	Internal (50)	Total (50) Min: 20 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBTE-408	Research Methodology	1	-	-						

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: 50	Best of Two Mid Semester Test -Max Marks: Nil	Assignment/Quiz/Attendance -Max. Marks: 50
Practical Internal Max Marks: Nil	Lab Performance/Attendance /Quiz - Max. Marks: Nil	


Pre-Requisite	Nil
Course Objective	To get to know about research and its analysis.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. To understand the objective and types of research. 2. To understand basic concepts of research formulations. 3. About various design methods. 4. To know about how data is collected for analyzing process & thesis writing. 5. To understand report and thesis writing.

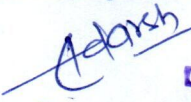
Unit	Contents (Theory)	Marks Weightage
I	Objectives and Types of Research: Motivation and objectives, Research methods vs Methodology, Types of research, Descriptive vs Analytical, Applied vs Fundamental, Quantitative vs Qualitative, Conceptual vs Empirical.	10
II	Research Formulation: Defining and formulating the research problem, Selecting the problem. Necessity of defining the problem, Importance of literature review in defining a problem.	10
III	Research Design and Methods: Research design, Basic Principles, Need of research design, Features of good design, Important concepts relating to research design, Observation and Facts. Developing a research plan, Exploration, Description, Diagnosis and Experimentation.	10
IV	Data Collection and Analysis: Execution of the research, Observation and Collection of data, Methods of data collection, Sampling Methods, Data Processing and Analysis strategies, Data Analysis with Statistical Packages, Hypothesis-testing, Generalization and Interpretation.	10
V	Reporting and Thesis Writing: Structure and components of scientific reports, Types of report, Technical reports and thesis, Significance, Different steps in the preparation, Layout, Structure and Language of typical reports, Illustrations and tables, Bibliography, Referencing and footnotes.	10

Text Book/References Books/ Websites:

1. B.L.Garg, R Karadia, F Agrawal; An introduction to Research Methodology; RBSA Publishers.
2. C.R. Kothari; Research Methodology (Methods and Techniques); New Age International.
3. S. C. Sinha and DIman ; Research Methodology; Ess Publications.

Suggested List of Laboratory Practical (Expandable): Nil


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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (Nil)	Internal (100)	Total (100) Min: 40 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBTE-409	Environmental Science	1	-	-						

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: 100	Best of Two Mid Semester Test-Max Marks: Nil	Assignment/Quiz/Attendance -Max. Marks: 100
Practical Internal Max Marks: Nil	Lab Performance / Quiz/Attendance -Max. Marks: Nil	

Pre-Requisite	Nil
Course Objective	Imparting basic knowledge about the environment and its allied problems and developing an attitude of concern for the environment.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. The conceptual knowledge of energy resources with its applications. 2. To understand the ecosystems and value of these ecosystems to humans and to animals and plants. 3. Developing awareness of biodiversity and its conservation. 4. The different types of pollutions and their control measures. Discover effective methods of waste Management. Analyze global environmental problems and come out with best possible solutions. 5. To understand environmental laws and sustainable development.

Unit	Contents (Theory)	Marks Weightage
I	Energy Resources: Growing energy needs, renewable and non-renewable energy sources, Use of alternate energy sources, Role of an individual in conservation of natural resources, Equitable use of resources for sustainable lifestyles, The multidisciplinary nature of environmental studies, Definition, Scope and Importance, Need for public awareness.	20
II	Ecosystems: Concept of an ecosystem, Structure and function of an ecosystem, Producers, Consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, Food webs and ecological pyramids, Introduction, Types, characteristic features, structure and function of the following ecosystem, a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (Ponds, Streams, Lakes, Rivers, Ocean Estuaries).	20
III	Biodiversity and Its Conservation: Introduction, Definition, Genetic, Species and ecosystem diversity, Bio-geographical classification of India, Value of biodiversity, Consumptive use, Productive use, Social, Ethical aesthetic and option values, Biodiversity at global, National and local level. India as a mega-diversity nation, Hot-spots of biodiversity, Threats to biodiversity, habitat loss, Poaching of wildlife, Man wildlife conflicts, In-situ and Ex-situ conservation of biodiversity.	20
IV	Environmental Pollution: Definition, Causes, Effects and control measures of: a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear pollution, Solid waste management, Causes, Effects and control measures of urban and industrial wastes, Role of an individual in prevention of pollution, Disaster management, Floods, Earthquake, Cyclone and Landslides.	20
V	Environmental Policy: Legislation, Rules and regulations, National environmental policy environmental protection act, Legal aspects air (Prevention and control of pollution) act1981, Water (Prevention and control of pollution) act-1974, Water pollution Act-1977, Forest conservation act, Municipal solid waste management and handling rules, Biomedical waste management and handling rules, Hazardous waste management and handling rules .	20

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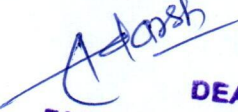
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PEOPLE'S UNIVERSITY, BHOPAL (M.P.)

PEOPLE'S UNIVERSITY, BHOPAL***(Applicable for Admitted from Academic Session 2021-22 onwards)***Programme: **Bachelor of Technology****Semester –IV****Text Book/References Books/ Websites**

1. Dr. S. S. Dara and Dr. D. D. Mishra; A textbook of Environmental Chemistry and Pollution Control, S. Chand & Company Ltd.
2. Dr. Suresh K. Dhameja; Environmental studies; S K Kataria and Sons.
3. A. Ristinen and Jack J. Kraushaar; Energy and the Environment, 2nd Edition: Robert; Shree Sai Publication.
4. Anindita Basak ; Environmental Studies; Pearson Publications.
5. Gilbert M. Masters; Introduction to Environmental Engineering and Science; Prentice-Hall Publications

Suggested List of Laboratory Practical (Expandable): Nil


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PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*Programme: **Bachelor of Technology****Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (Nil)	Internal (Nil)	Total (Nil)	End Sem (Nil)	Internal (50)	Total (50) Min: 20 (D Grade)
CBTE-410	Massive Open Online Courses (MOOCs)-I	-	-	1						

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test - Max Marks: Nil	Assignment/Quiz/Attendance -Max. Marks: Nil
Practical Internal Max Marks: 50	Lab Performance/Attendance /Quiz - Max. Marks: 50	


Pre-Requisite	Nil
Course Objective	MOOCs build on the engagement of learners who self-organize their participation according to learning goals, prior knowledge and skills, and common interests. Objective of this course is to improve the technical skills of students and its gives an opportunity to explore themselves beyond class room teaching.
Course Outcomes	Student will be able to learn: New interesting courses of their own curiosity and improve their knowledge and skills. MOOCs give an opportunity to connect openly on a global scale, with global learners. The ability to experiment with pedagogical methods on a vast scale.

Unit	Contents (Theory)	Marks Weightage
I	<p>Massive Open Online Courses (MOOCs) are online courses that allow participants free access and unrestricted participation in any course of their choice, Besides the conventional modes of teaching such as lectures, videos and reading material, MOOCs also provide a platform for interactive forums.</p> <p>After the III semester End Sem Examination, all students are instructed to register themselves in a minimum IV (Four weeks) MOOC/NPTEL/SWAYAM Certification course in their Engineering discipline.</p> <p>Students must appear in the certification examination conducted by NPTEL/ SWAYAM and submit it to their respective assigned faculty before the end of the semester, A student should give an effective Power Point presentation of a chosen course in the class seminars and receive feedback from each other, This effort will help them to communicate their ideas more clearly.</p> <p>The final evaluation of this course will base on a PowerPoint Presentation and Certification during the academic session by the assigned faculty.</p>	50

Text Book/References Books/ Websites:

1. <https://swayam.gov.in/>
2. <http://nptel.ac.in>
3. <https://onlinecourses-archive.nptel.ac.in>

Suggested List of Laboratory Practical (Expandable): Nil


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School of Research and Technology

Department: Civil Engineering

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2021-22 onwards)

Programme: Bachelor of Technology

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (Nil)	Internal (50)	Total (50) Min: 20 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBTE-411	Sociology	1	-	-						

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: 50	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: 50
Practical Internal Max Marks: Nil	Lab Performance/Attendance /Quiz - Max. Marks: Nil	

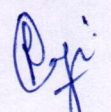
Pre-Requisite	Nil
Course Objective	The objective of this course is to provide students a basic understanding of sociological concepts.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. The meaning of Sociology and its importance. 2. The basic concepts involved in sociology. 3. About the social changes. 4. About the Basic Social structure. 5. Understand the social law and its control.

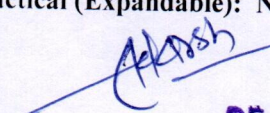
Unit	Contents (Theory)	Marks Weightage
I	Introduction: Sociology, Definitions, aim and objective, Relation with other social sciences law and history, Important theoretical approaches, Evolutionism, Functionalism, Conflict theory, Interactionist theory; Law as a tool of social engineering, Durkheim, Weber, Pound and Bentham.	10
II	Basic Concepts: Social Groups, Cooley and Sumner, Community, Association, Tribes, Social Groups, Status and role.	10
III	Social Change: Social reform movements in India, Raja Ram Mohan Roy, Jyotiba Phule, Naicker, etc., Modernization and Post Modernization, Liberalization and Globalization, Fordism and Mc Donaldization.	10
IV	Social Structure: Culture relativism, Racism, Ethnicity and ethnocentrism, Socialization, Status and role.	10
V	Social Control: Custom as an agency of control, Law as an agency of control, Media as an agency of control, Public opinion as an agency of control.	10

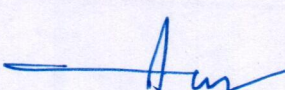
Text Book/References Books/ Websites:

1. Vidya Bhushan and D.R. Sachdeva; An Introduction to Sociology; Kitab Mahal Publisher, New Delhi
2. Desai, N. and M. Krishnaraj; Women and Society in India; Ajanta Publications; 1987
3. Myneni Sociology; Allahabad Law Agency, Faridabad; 2004 Goode, W.J. and P.K. Hatt Methods in Social Research; McGraw- Hills; NewYork; 1952
4. Giddens, A. Sociology; Polity Press, UK; 1993.

Suggested List of Laboratory Practical (Expandable): Nil


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 Department: Civil Engineering

PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*

Programme: Bachelor of Technology

Semester –IV

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (Nil)	Internal (Nil)	Total (Nil)	End Sem (Nil)	Internal (50)	Total (50) Min: 20 (D Grade)
CBTE-412	Fine Arts-II	-	-	1						

Duration of Theory (Externals): -Nil

Theory Internal- Max Marks: -Nil	Best of Two Mid Semester Test- Max Marks: Nil	Assignment/Quiz/Attendance-Max. Marks: Nil
Practical Internal Max Marks: 50	Lab Performance / Attendance / Quiz - Max. Marks: 50	

Pre-Requisite	Basic knowledge of art and drawing.
Course Objective	To teach the core competencies of critical and conceptual thinking through the continual observation and analysis of the visual and social world also provide a strong philosophical and historical foundation of the visual arts and its impact
Course Outcome	Student will able to learn: <ol style="list-style-type: none"> 1. Increase ability to communicate with people. 2. Learn to sketch and take field dimensions. 3. Skillfully create artistic form using techniques and methods appropriate to the intended result. 4. Learn to take data and transform it into graphic drawings.

Unit	Contents (Theory)	Marks Weightage
I	History of Indian Painting II :Cave paintings of India- Ajanta, Bagh, Jain, Pal (Apabhransh), Mughal Painting, Akbar and Jahangir Rajasthani painting- Mewar, Kishangarh, Jaipur.	50

Text Book/References Books/ Websites:

1. Lokesh Chandra Sharma; A Brief History of Indian Painting.
2. R.A. Agrawal; Roop Prad Ke Mool Adhar.

Suggested List of Laboratory Experiments :- (Expandable):

1. Composition :- Human Figure with Background Poster Colour.
2. Copy work :- Indian Miniature.

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Subject Code	Subject Title	Credit			Theory			Practical		
CBTE-5101	Gender Equality	L	T	P	End Sem (70)	Internal (30)	Total (100)	End Sem (Nil)	Internal (Nil)	Total
		3	-	-			Min: 40 (D Grade)			(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance /Attendance / Quiz-Max. Marks: Nil	

Pre-Requisite	Basic knowledge about Constitutional Law and Criminal Law.
Course Objective	This course is aimed at discussing the interface between law and gender equality. It also aims to sensitize and create awareness about gender related issues.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. The concept of gender equality. 2. Relationship between gender and the law. 3. Different aspects of gender discrimination and reforms 4. National and International efforts towards creating gender equality. 5. Presence of Women-Centric Laws in India

Unit	Contents (Theory)	Marks Weightage
I	Introduction: Meaning of Sex and Gender; History of Gender Movements; Gender roles and gendered division of labour, Private vs public divide and gender inequality; Physical difference, attributes and behavioural dispositions.	14
II	Women as Workers: Unpaid, underpaid and casual work; Women in primary, secondary and tertiary sectors; Classification of work in Indian census and NSSO – Main workers, marginal workers, non-workers; Invisibility of women's work, problems in measurement; Non-recognition of women's work in national income accounting.	14
III	Gender and Health: Poverty, Gender Discrimination and Under Nutrition; Epidemiology of Menstruation and Menstrual Disorder; Early Marriage, Unwanted Pregnancy and Unsafe Abortions; Adolescent Pregnancy and Sexually Transmitted Infection and HIV/AIDS; Health issues relating to Violence: Sexual Abuse, Immoral Trafficking, Rape.	14
IV	Gender Based Violence in Community and State: Rape as a weapon of oppression – causes and implications; Sexual abuse and harassment; Trafficking of Women and Girls; State Violence; Custodial violence; Violence by law enforcing agency; Genocide; Armed Conflict, Displacement and Gender Abuse; War crimes and Sexual abuse; Sexual Assault of Refugees and Displaced Women; New Forms of Violence against Women - Online Violence and its Implications.	14
V	Response to Violence Against Women: International & National response: International Initiatives – legal and policy framework, National Human Rights Commission, National Commission for Women, Law Enforcing Agencies: All Women's Police Stations, Vigilance Cells; Legal Aid Cells; Judiciary: Family Courts/ Mahila Courts; Service Providers: Helplines, Women and Children Help lines; Non-State Actors: INGOs and NGOs, Collective protests, Restorative justice in the context of gender violence.	14

Text Book/References Books/ Websites:

1. Chaudhuri; Maitrayee Feminisms in India; Kali for Women New Delhi.
2. Chaudhuri, Maitrayee ; The Indian Women's Movement; Reform and Revival Reprinted. Delhi: Palm Leaf. pp. 1-68.

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PEOPLE'S UNIVERSITY, BHOPAL***(Applicable for Admitted from Academic Session 2021-22 onwards)***Programme: **Bachelor of Technology**

Semester –V

3. Gandhi, N.; When the rolling Pins hit the street; A case study of the Anti-price rise Movement in India. New Delhi: Kali for Women
4. Alexander; Linda Lewis et al (eds) (2009) New Dimensions in Women & Health.

Suggested List of Laboratory Practical (Expandable): Nil

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Semester –V

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBTE-5102	Human Health & Nutrition	3	-	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance / Attendance / Quiz-Max. Marks: Nil	

Pre-Requisite	Nil
Course Objective	Scientific Nutrition is a course that covers the areas of foods and nutrition from a scientific approach. Studies prepare students for many science, dietetics, food industry, and health-related careers.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. Basic concepts in food and nutrition. 2. Know different types of nutrients. 3. The basic food groups. 4. Various cooking methods 5. Normal body parameters.

Unit	Contents (Theory)	Marks Weightage
I	Basic Concepts in Food and Nutrition: Basic terms used in study of food and nutrition, Understanding relationship between food nutrition and health, Functions of food-Physiological, Psychological and social.	14
II	Nutrients: Functions, dietary sources and clinical manifestation of deficiency / excess of the following nutrients: Carbohydrates, Lipids and Proteins, Fat soluble vitamins – A,D,E and K, Water soluble vitamins- thiamin, riboflavin, niacin, pyridoxine, Folate, vitamin B12 and vitamin C, Minerals- calcium, iron and iodine.	14
III	Food Groups: Selection, nutritional contribution and changes during cooking of the following food group: <ul style="list-style-type: none"> ▪ Cereals ▪ Fats and oils ▪ Eggs ▪ Pulses ▪ Fruits and vegetables ▪ Milk and milk products ▪ Meat, poultry and fish 	14
IV	Methods of Cooking and Preventing Nutrient Losses: Dry, moist, frying and microwave cooking, Advantages disadvantages and the effect of various methods of cooking on nutrition's, Minimizing nutrient losses.	14
V	Basic Concepts in Food and Nutrition: Basic terms used in study of food and nutrition, Understanding relationship between food nutrition and health, Functions of food-Physiological, Psychological and social.	14


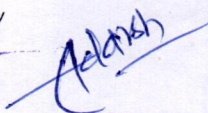
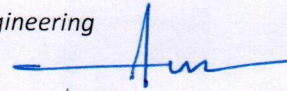
Text Book/References Books/ Websites:

1. Swaminathan; M Hand book of foods and nutrition fifth Ed;Bappco.
2. Srilakshmi B; Nutrition Science 2012; New Age international (P) LTD.
3. Mudambi, SR and Rajagopal; Mv fundamentals of foods Nutrition and Diet Therapy; Fifth Ed: 2012
4. Khanna K Gupta S Seth R Mahana R. Rekhi T.; The AM an and Science of cooking .

Suggested List of Laboratory Practical (Expandable): Nil

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Programme: Bachelor of Technology

Semester –V

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBTE-5103	Ethical Hacking and Cyber Security	3	-	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance /Attendance / Quiz-Max. Marks: Nil	

Pre-Requisite	Student should have basic knowledge of computer.
Course Outcome	To prepare students with the technical knowledge and skills needed to protect and defend computer systems and networks.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. Identify and analyze the stages an ethical hacker requires to take in order to compromise a target system. 2. Techniques to carry out a penetration testing. 3. About various types of attacks, attackers and security threats. 4. Gain knowledge of the tools, techniques and ethical issues likely to face the domain of ethical hacking and ethical responsibilities. 5. Understand details of cybercrime.

Unit	Contents (Theory)	Marks Weightage
I	Introduction: Understanding the importance of security, Concept of ethical hacking and essential Terminologies- Threat, Attack, Vulnerabilities, Target of Evaluation, Exploit, Phases involved in hacking.	14
II	Foot printing: Introduction to foot printing, Types of foot printing, Understanding the information gathering methodology of the hackers, Tools used for the reconnaissance phase.	14
III	System Hacking: Aspect of remote password-guessing Role of Eavesdropping, Various methods of password cracking, Keystroke Loggers, Understanding Sniffers, Comprehending Active and Passive Sniffing, ARP Spoofing and Redirection, DNS, and IP Sniffing, HTTPS Sniffing.	14
IV	Hacking Wireless Networks: Introduction to 802.11, Role of WEP, Cracking WEP Keys, Sniffing Traffic, Wireless DOS attacks, WLAN Scanners, WLAN Sniffers, Hacking Tools, Securing Wireless Networks.	14
V	Introduction to Cybercrime: Defining Cybercrime, Understanding the Importance of Jurisdictional Issues, Quantifying Cybercrime, Differentiating Crimes That Use the Net from Crimes That Depend on the Net, working toward a Standard Definition of Cybercrime, Categorizing Cybercrime, Developing Categories of Cybercrimes, Prioritizing Cybercrime Enforcement, and Reasons for Cybercrimes.	14

Text Book/References Books/ Websites:

1. Rajat Khare; Network Security and Ethical Hacking; Luniver Press
2. Thomas Mathew; Ethical Hacking; EC Council
3. Debby Russell and Sr. G.T Gangemi; Computer Security Basics; O' Reilly Media
4. Thomas R Peltier, Justin Peltier and John blackley; Information Security Fundamentals; Prentice Hall

Suggested List of Laboratory Experiments :- Nil

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Subject Code	Subject Title	Credit			Theory			Practical		
CBTE-5104	Industrial Safety and Environment	L	T	P	End Sem (70)	Internal (30)	Total (100)	End Sem (Nil)	Internal (Nil)	Total (Nil)
		3	-	-			Min: 40 (D Grade)			

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance/ Attendance /Quiz - Max. Marks: Nil	

Pre-Requisite	Student has fundamental knowledge about types of industries.
Course Objective	To make the students familiar with various industrial safety and their relative acts.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. Demonstrate an integrative approach to analyses of safety in various industries. 2. Ability to analyses various types industrial accidents. 3. The ability to apply the fundamental knowledge in environmental factors. 4. Students will understand the basic about industrial hazards. 5. The students will be able to identify types of industrial acts.


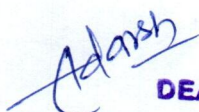
Unit	Contents (Theory)	Marks Weightage
I	Industrial Safety: Electrical safety, Construction safety, Chemical safety, Fire safety, Need of safety, Safety programmes, Industrial safety principle, Safety policy, Safety inspection, Safety legislation, Safety measures, Safety audit.	14
II	Industrial Accidents: Types of accidents, Nature and effect of accidents, Causes, Preventions, Accident management, Reporting, Investigations, Laws and Acts, Safety education and training.	14
III	Environmental Factors: Environment introduction, Need of environment control, Safe working environment, Entry and exit, Housekeeping, Work area, Floors and other surfaces, Workstations, Welfare facilities, Air quality, Temperature, Illumination, Noise, Vibrations, Plant layout, Lighting, Ventilations.	14
IV	Industrial Hazards: Classification, Categories, Hazard management, Identification and hazard control, Physical hazard, Chemical hazard, Biological hazard, Psychosocial hazard, Fire hazard, Health hazard, HAZOP, Major industrial hazard, Security management.	14
V	Industrial Acts: Factories act, 1948, Workers safety act, Provision of acts, Requirements of acts, Duties of inspector, OSHA, Indian electricity act -1910, Indian boiler act -1923, Mines act-1952, Petroleum act-1934, Minimum wages act-1948, The payment of wages Act-1936, Employee state insurance act, Workmen compensation act.	14

Text Book/References Books/ Websites:

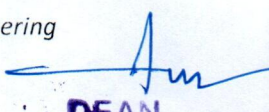
1. Anupama Prashar; Industrial Safety & Environment, S.K. Kataria and Sons Publication.
2. R. K. Jain and Sunil S. Rao; Industrial Safety, Health and Environment Management Systems; Khanna Publishers.
3. Thomas D. Schneid; Safety Law: Legal Aspects in Occupational Safety and Health (Occupational Safety & Health Guide Series), CRC Press.
4. Pravin M.Pathak & Jayant P. Khairnar; Industrial Safety Management: Safety, Health & Environment Management; Notion Press.
5. R.K. Mishra ; Safety Management: Safety, Health & Environment Management; AITBS Publishers.

Suggested List of Laboratory Practical (Expandable): Nil

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Department: Civil Engineering


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PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*Programme: **Bachelor of Technology****Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
CBCE-502	Transportation Engineering-II	L	T	P	End Sem (70)	Internal (30)	Total (100)	End Sem (Nil)	Internal (Nil)	Total (Nil)
		3	-	-			Min: 40 (D Grade)			

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance – Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance/ Quiz/Attendance - Max. Marks: Nil	

Pre-Requisite	Student has fundamental knowledge about Transportation Engineering-I.
Course Objective	To make the students familiar with various fluid and their properties as well as fluid flow.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. To analyses of highway planning and alignment. 2. The various types of pavement. 3. The fundamental knowledge in low cost roads. 4. The basic about airport planning. 5. To identify types of obstructions in airport.

Unit	Contents (Theory)	Marks Weightage
I	Highway planning, Alignment & Geometric design: Principles of highway planning, Road planning in India and financing of roads, Classification patterns, Requirements, Engineering survey required for highway location, Cross sectional elements width, Camber, Super elevation, Sight distances, Extra widening at curves, Horizontal and vertical curves, Numerical problems.	14
II	Bituminous & Cement concrete pavements: Design of flexible pavements, Design of Mixes and stability, WBM, WMM, BM, surface dressing, Interfacial treatment- seal coat, Tack coat, Prime coat, Wearing coats, Grouted macadam, Bituminous concrete specification, Construction and maintenance. Advantages and disadvantages of rigid pavements, general principles of design, Types, Construction, Maintenance and joints, Dowel bars, Tie bars.	14
III	Low cost roads, Drainage of roads, Traffic engineering & Transportation planning: Principles of stabilization, Mechanical stabilization, Requirements, Advantages, Disadvantages and uses, Quality control, Macadam roads types, Specifications, Construction, Maintenance and causes of failures. Surface and Sub-surface drainage, Highway materials: Properties and testing etc. Channelized and unchannelized intersections, At grade & grade separated intersections, description, Rotary-design elements, Advantages and disadvantages, Marking, Signs and Signals, Street lighting, Principles of planning, Inventories, Trip generation, Trip distribution, Model split, Traffic assignment, Plan preparation.	14
IV	Airport Planning, Runway & Taxiway: Airport site selection, Air craft characteristic and their effects on runway alignments, Wind rose diagrams, Basic runway length and corrections, Classification of airports. Geometrical elements: Taxi ways and runways, Pattern of runway capacity.	14
V	Airport, Obstructions, Lightning & Traffic control: Zoning regulations, Approach Area, approach surface-imaginary, Conical, horizontal, Rotating beacon, Boundary lights, Approach lights, Runway and taxiway lighting etc. Instrumental landing system, Precision approach radar, or Enroute traffic control.	14

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1. S.K. Khanna & C.E.G. Justo; Highway Engineering, Nam Chand & Bros Publication.
2. Gurucharan singh; Highway Engineering; Charotar Publications.
3. S.K. Khanna & M. G. Arora; Airport Planning & Design , Nam Chand & Bros.
4. Sharma & Sharma; Principles and Practice of Highway Engineering; Asia Publishing House.
5. Relevant IRC & IS Codes.

Suggested List of Laboratory Practical (Expandable): Nil


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PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*Programme: **Bachelor of Technology****Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
CBCE-503	Design of R.C.C. Structures-I	L	T	P	End Sem (70)	Internal (30)	Total (100)	End Sem (Nil)	Internal (Nil)	Total (Nil)
		3	1	-			Min: 40 (D Grade)			

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance/ Quiz/Attendance - Max. Marks: Nil	

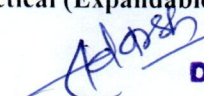
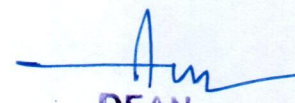
Pre-Requisite	Fundamental of concrete technology and applied mechanics.
Course Objective	To make students aware of the behavior of structural member subjected to different kinds of stresses, forces like tension/compression, shear, bending, torsion etc. This subject deals as a base for students in field of structural engineering.
Course Outcomes	Students will be able to learn: <ol style="list-style-type: none"> About various loads and assumptions to design load. Understand the principal of singly and doubly reinforced beam. About determination of bending and deflections in slab designing. Determine the ultimate load for column and footing. To learn about staircases and their design.

Unit	Contents (Theory)	Marks Weightage
I	Basic Principles of Structural Design : Assumptions, Mechanism of load transfer, Various properties of concrete and reinforcing steel, Introduction to working stress method and limit state methods of design, Partial safety factor for load and material, Calculation of various loads for structural design of singly reinforced beam, Partial load factors.	14
II	Design of Beams: Doubly reinforced rectangular & flanged beams, Lintel, Cantilever, Simply supported and continuous beams, Design of beams for shear and bond stresses.	14
III	Design of Slabs: One way slab: Cantilever, Simply supported and continuous slabs. Two way slab: Circular slabs, Waffle slabs, Flat slabs.	14
IV	Columns & Footings: Effective length of columns, Short and long columns with square, rectangular and circular shapes, Columns subjected to axial loads and bending moments, Isolated and combined footings, Strap footing, Raft foundation.	14
V	Staircases: Staircases with waist slab having equal and unequal flights with different support conditions, Slabless tread riser staircase.	14

Text Book/References Books/ Websites:

1. Jain & Jay Krishna; Plain & Reinforced Concrete Vol. I & II , O.P. Publication.
2. Purushothman; Design of Reinforced Concrete Elements; Tata Mcgraw Hill.
3. Rammuttham; Plain & Reinforced Concrete; Medtech Publication.
4. B.C. Punamia; Plain & Reinforced Concrete; Firewall Media.
5. N.K. Raju; Structural Design & Drawing; CBS Publisher.

Suggested List of Laboratory Practical (Expandable): Nil

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Department: Civil Engineering

PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*

Programme: Bachelor of Technology

Semester – V

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)
CBCE-504	Surveying-II	3	1	1						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: 15	Lab Performance/ Quiz/Attendance - Max. Marks: 15	

Pre-Requisite	Student has fundamental knowledge about surveying-I.
Course Objective	To make the students familiar with advanced surveying instruments.
Course Outcomes	Student will be able to learn : <ol style="list-style-type: none"> 1. To understand the EDM and their related survey. 2. The fundamental knowledge in survey astronomy. 3. Demonstrate an integrative approach to GPS surveying. 4. To carry out preliminary surveying in the field of photogrammetry and their related principal. 5. About remote sensing, GIS & IRSS.

Unit	Contents (Theory)	Marks Weightage
I	Modern Equipments for Surveying : Digital levels and Theodolite, Electronic distance measurement(EDM) , Total station and global positioning systems (GPS), Digital planimeter	14
II	Surveying Astronomy: Introduction and purpose of astronomy, Determination of latitude and longitude azimuth, Definitions of astronomical terms, Coordinate systems for locating heavenly bodies, Geographic, Geodetic, Geocentric, Cartesian, local and projected coordinates for earth resources mapping, Convergence of meridian, Parallel of latitude, Shortest distance between two points on the earth, Determination of latitude and longitude.	14
III	GPS Surveying: Introduction & components of GPS, Space segment, Control segment and user segment, Elements of satellite based surveys-map datums, GPS receivers, GPS observation methods and their advantages over conventional methods, Digital terrain model (DTM), Topographic representation of the terrain and generation of DTM on computers using spot heights and contour maps.	14
IV	Photogrammetry: Principle, Definitions and classifications of terrestrial and aerial photogrammetry, Flight planning for aerial photography, Scale and relief displacements of vertical aerial photographs, Stereoscopic vision on vertical photographs, Computation of position, Length and elevations of objects using photographs and photo mosaic.	14
V	Remote Sensing: Principle, Components, Classification, Remote sensing data acquisition process, Different types of remote sensing satellite imagery with special relevance to Indian Remote Sensing Satellites (IRSS) and applications, Geographic Information Systems (GIS), Definition, Components and advantages.	14

Text Book/References Books/ Websites:

1. T.P.Kanetkar and S.V.Kulkarini; Surveying and Leveling-Part-I&II; Pune Vidyarthi Griha Prakashan
2. A.M.Chandra; Surveying; Problems Solving with Theory and Objective type Questions; New Age International Publishers.
3. A.M. Chandra ; Advance Surveying; New Age International Publishers.
4. S.K. Duggal, Surveying Vol. II; Tata Mcgraw ; Hill Publishing Company Ltd.

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Semester –V

Suggested List of Laboratory Practical (Expandable):

1. To find the R.L. of given stations with the help of Auto Level.
2. Study of electronic total station and to find the horizontal distance and vertical height with the help of Total Station.
3. To set out a transition curve in the field.
4. To set out the simple curve by two theodolite method.
5. To set out the simple curve by single theodolite method.
6. To measure included angle by theodolite traversing.
7. To measure the exterior angle by theodolite traversing.
8. Determination of elevation of point trigonometric leveling.
9. To make a contour plan of given area (on full size drawing sheet).
10. Determination of horizontal distance between two inaccessible points with Theodolite.


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Semester –V

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)
CBCE-505	Fluid Mechanics-II	3	1	1						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance – Max. Marks: 10
Practical Internal Max Marks: 15	Lab Performance/ Quiz/Attendance - Max. Marks: 15	

Pre-Requisite	Concept of fluid mechanics-I
Course Objective	To understand fundamental properties, concept, phenomena, forces generation and fluid mechanism on the fluid.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> About the properties of fluid flow in pipe. Understand the principal of uniform flow. Determination of now uniform flow. Determine the forces on immersed bodies. About turbine and pumps.

Unit	Contents (Theory)	Marks Weightage
I	Turbulent Flow: Laminar and turbulent boundary layers and laminar sub layer, Hydrodynamic ally smooth and rough boundaries, Velocity distribution in turbulent flow, Resistance of smooth and artificially roughened pipes, Commercial pipes, Aging of pipes. Pipe Flow Problems: Losses due to sudden expansion and contraction, Losses in pipe fittings and valves, Concepts of equivalent length, Hydraulic and energy gradient lines, Siphon, pipes in series, Pipes in parallel, Branching of pipes. Pipe Network: Water hammer, Transmission of power, Hardy cross method	14
II	Uniform Flow in Open Channels: Channel geometry and elements of channel section, Velocity distribution, Energy in open channel flow, Specific energy, Types of flow, Critical flow and its Computations, Uniform flow and its computations, Chezy's and manning's formulae, Determination of normal depth and velocity, Normal and critical slopes, Economical sections (rectangular, circular and trapezoidal).	14
III	Non uniform flow in Open Channels : Basic assumptions and dynamic equations of gradually varied flow, Characteristics analysis and computations of flow profiles Rapidly varied flow: Hydraulic jump in rectangular channels and its basic characteristics, Surges in open channels & channel flow routing.	14
IV	Forces on Immersed Bodies: Types of drag, Drag on a sphere, A flat plate, A cylinder and an aerofoil development of lift, Lifting vanes, Magnus effect. Turbines: Classifications, Pelton turbine: Definitions, Similarity laws, Specific speed and unit quantities, Power and efficiency for ideal case, Reaction turbine: Draft tube theory, Runaway speed, Cavitations.	14
V	Pumps: Centrifugal Pumps: Various types and their important components, Manometric head, Total head, Net positive suction head, Specific speed, Shut off head, Energy losses, Cavitations, Principle of working and characteristic curves. Reciprocating Pumps: Principle of working, Coefficient of discharge, Slip, Single acting and double acting pump, Manometric head, Acceleration head.	14

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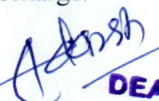
PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*Programme: **Bachelor of Technology****Semester –V****Text Book/References Books/ Websites:**

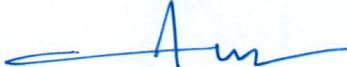
1. Modi & Seth; Fluid Mechanics; Standard Book House.
2. Rangaraju; Open Channel Flow; Tata Mc Graw Hill Publishing Comp. Ltd.
3. A.K. Jain; Fluid Mechanics; Khanna Publishers.
4. K.R. Arora; Fluid Mechanics, Hydraulics & Hydraulic Mechanics ; Standard Publishers Distributors.
5. R. K. Bansal; Fluid Mechanics; Laxmi Publication.

Suggested List of Laboratory Practical (Expandable):

1. Study the performances characteristics of Pelton wheel turbine.
2. Study the performances characteristics of Francis turbine.
3. Study the performances characteristics of Kaplan turbine.
4. Calibration of multistage (two) pumps & study of characteristic of variable speed pump.
5. To study the performance & details of operation of hydraulic ram.
6. Determination of minor losses in pipe flow.
7. Study of the characteristic of the reciprocating pump.
8. Determination of chezy's and manning's constant.
9. Determination of pipe friction factor.
10. Determination of coefficient of discharge.


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Semester –V

Subject Code	Subject Title	Credit			Theory			Practical		
CBCE-506	Estimation & Costing	L	T	P	End Sem (70)	Internal (30)	Total (100)	End Sem (35)	Internal (15)	Total (50)
		3	-	1			Min: 40 (D Grade)			Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: 15	Lab Performance/ Quiz/Attendance - Max. Marks: 15	

Pre-Requisite	Student has basic knowledge of material rates used in civil engineering works.
Course Objective	To make the students familiar about various types of fluid flow, turbines and pumps.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. The fundamental knowledge in various types of estimate. 2. To find out rate analysis. 3. The surveying in the field of detail estimates for civil engineering projects. 4. How to prepare Detailed Project Reports. 5. The various types of valuation.

Unit	Contents (Theory)	Marks Weightage
I	Introduction: Purpose and importance of estimates, Principles of estimating, Methods of taking out quantities of items of work, Mode of measurement, Measurement sheet and abstract sheet, Bill of quantities, Types of estimate, Plinth area rate, Cubical content rate, Preliminary, Original, Revised and supplementary estimates for different projects.	14
II	Rate Analysis: Task for average artisan, Various factors involved in the rate of an item, Material and labor requirement for various trades, Preparation for rates of important items of work, Current schedule of rates. (C.S.R.).	14
III	Detailed Estimates: Preparing detailed estimates of various types of buildings, R.C.C. works, Earth work calculations for roads and estimating of culverts services for building such as water supply, Drainage and electrification.	14
IV	Cost Of Works: Factors affecting cost of work, Overhead charges, Contingencies and work charge establishment, Various percentages for different services in building, Preparation of DPR.	14
V	Valuation: Purposes, Depreciation, Sinking fund, Scrap value, Year's purchase, Gross and net income, Dual rate interest, Methods of valuation, Rent fixation of buildings.	14

Text Book/References Books/ Websites:

1. B.N. Datta; Quantity Surveying & Costing; UBS, Publisher Distributor.
2. G.S. Birdi; Estimating & Costing for Civil Engineering; Dhanpat Rai Publishing Company.
3. Chakraborty; Quantity Surveying & Costing; Satya Prakashan.
4. S.C. Rangawala; Estimating & Costing; Charotar Books.
5. S.P. Mahajan; Quantity Surveying & Valuation; Satyaprakashan.

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Semester –V

Suggested List of Laboratory Practical (Expandable):

1. Prepare an estimate of various types of buildings by centre line method.
2. Prepare an estimate of various types of buildings by short wall method.
3. Prepare an estimate of various types of buildings by long wall method.
4. Prepare detailed estimate of earth work calculation for road.
5. Prepare detailed estimate of a straight wing wall culvert.
6. Prepare detailed estimate of a splayed type wing wall culvert.
7. Prepare detailed project report of road.
8. Prepare detailed estimate of 1BHK.
9. Prepare detailed estimate of 2BHK.
10. Prepare detailed estimate of 3BHK.


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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)	External (35)	Internal (15)	Total (50) Min: 20 (D Grade)
CBTE-507	NCC-V	1	-	6						

Duration of Theory (Externals): 2 Hours

Theory Internal- Max Marks:15	Best of Two Mid Semester Test – Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05
Practical Internal Max Marks: 15	Lab Performance/ Quiz/Attendance - Max. Marks: 15	

Pre-Requisite	Nil
Course Objective	(a) Understand the concept of Team and its functioning. (b) Hone Public speaking skills. (c) Understand the security set up and management of Border/Coastal areas. (d) Acquire knowledge about an Infantry Battalion organization and its weapons. (e) Acquire knowledge about Indo-Pak Wars fought in 1965 & 1971.
Course Outcomes	Student will be able to learn: 1. Participate in team building exercise and value team work. 2. Improve communication skills by public speaking activities. 3. Understand the security mechanism and management of Border/Coastal areas. 4. Get motivated to join armed forces.

Unit	Contents (Theory)	Marks Weightage
I	Personality Development: (i) Group Discussions –Team work. (ii) Public speaking.	07
II	Border & Coastal Areas: Security Setup and Border/Coastal management in the area.	07
III	Introduction to Infantry Battalion and its Equipment: Organization of Infantry Battalion & its weapons.	07
IV	Military History: Study of Battles of Indo-Pak Wars 1965 & 1971.	14

Note: For NCC-V, 05 credits will be allotted after successful completion of camp.

Text Book/References Books/ Websites:


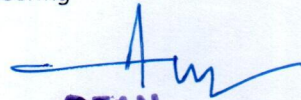
1. Cadet's handbook, NCC Directorate, MP, CG.
2. Supplementary cadet's handbook, NCC Directorate, MP, CG.

Suggested List of Laboratory Practical (Expandable):

1. **Drill**
 - Ceremonial Drill.
 - Guard Mounting.
2. **Field Craft & Battle Craft (Contact Hrs. 04)**
 - Fire control orders.
 - Types of fire control orders.
 - Fire and Movement- when to use fire and movements tactics, Basic considerations, Appreciation of ground cover, Types of cover, Dead ground, Common Mistakes, Map and air photography, Selection of Fire position and fire control.
3. **Map Reading:** Google Maps & applications.
4. **Weapon Training:** Short Range firing

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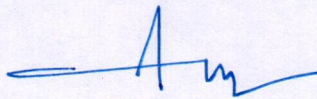
5. **Social Service and Community Development:** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc. as per the requirement and similar announced days- National and State level.
6. **Health & Hygiene:**
- Yoga- Introduction, Definition, Purpose, Benefits.
 - Asanas-Padamsana, Siddhasana, Gyan Mudra, Surya Namaskar, Shavasana, Vajrasana, Dhanurasana, Chakrasana, Sarvaangasana, Halasana etc.
7. **Obstacle Training:**
- Obstacle training – Intro, Safety measures, Benefits.
 - Obstacle Course- Straight balance, Clear Jump, Gate Vault, Zig- Zag Balance, High Wall etc.

Note: Examination of this NCC course will be conduct as per NCC head quarter norms in consultation with office of COE, PU.


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Subject Code	Subject Title	Credit			Theory			Practical		
CBTE-508	Accounting and Finance Management	L	T	P	End Sem (35)	Internal (15)	Total (50)	End Sem (Nil)	Internal (Nil)	Total (Nil)
		2	-	-			Min: 20 (D Grade)			

Duration of Theory (Externals): 2 Hours

Theory Internal- Max Marks: 15	Best of Two Mid Semester Test – Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05
Practical Internal Max Marks: Nil	Lab Performance/Attendance /Quiz - Max. Marks: Nil	

Pre-Requisite	Nil
Course Objective	The objective of this course is to familiarize the students with concepts and methods in accounting as a subject in Business Financial Management.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. To understand basic accounting concepts. 2. To know system of book banking. 3. To understand depreciation methods. 4. To understand the framework of balance sheet. 5. To understand bank reconciliation statement.

Unit	Contents (Theory)	Marks Weightage
I	Accounting: Meaning, scope & relationship with other functional areas, book keeping & accounting.	07
II	Conceptual framework of accounting: Accounting principles, accounting concepts, accounting conventions, systems of books keeping, double entry system of books keeping, journal (Numerical).	07
III	Depreciation Accounting: Concepts causes methods of providing depreciation different assets: Fixed installment method (Numerical), Diminishing balance method (Numerical), Annuity method (Numerical).	07
IV	Final Accounts: Manufacturing account, trading account, profit & loss account, balance sheet and adjustments (Numerical).	07
V	Bank Reconciliation Statement: Objective, Importance & Techniques	07

Text Book/References Books/ Websites:

1. Jain & Narang: Elements of Accounting.
2. S.N. Maheshwari: Fundamentals of Accounting.
3. Shukla, Grewal & Gupta: Advanced Account.

Suggested List of Laboratory Practical (Expandable): Nil

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PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*Programme: **Bachelor of Technology**

Semester –V

Subject Code	Subject Title	Credit			Theory			Practical		
CBCE-509	R.C.C. Structures Lab	L	T	P	End Sem (Nil)	Internal (Nil)	Total	External (Nil)	Internal (50)	Total (50)
		-	-	1			(Nil)			Min: 20 (D Grade)

Duration of Theory (Externals): -Nil

Theory Internal- Max Marks: -Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance Max. Marks: Nil
Practical Internal Max Marks: 50	Lab Performance/ Quiz/Attendance – Max. Marks: 50	

Pre-Requisite	Student has fundamental knowledge about R.C.C.
Course Objective	To make the students familiar with various properties and their related test on concrete.
Course Outcomes	Students will be able to learn: <ol style="list-style-type: none"> 1. The basic information about design of various types of columns. 2. The design of various types of beams. 3. Design of one way and two way slabs. 4. How to how to design various types of footings. 5. How to design staircase.

Unit	Contents (Theory)	Marks Weightage
I	Students have to understand the design and drawing of R.C.C. structural members: Design and drawing of rectangular, Flanged, Cantilever beam, One way and two way slab, Square, Circular rectangular column, Isolated and strap footing, Staircase.	50

Text Book/References Books/ Websites:

1. Jain & Jay Krishna; Plain & Reinforced Concrete Vol. I & II , O.P. Publication.
2. Purushothman; Design of Reinforced Concrete Elements; Tata Mcgraw Hill.
3. Rammutham; Plain & Reinforced Concrete; Medtech Publication.
4. B.C. Punnia; Plain & Reinforced Concrete; Firewall Media.
5. N.K. Raju; Structural Design & Drawing; CBS Publisher.

Suggested List of Laboratory Practical (Expandable):

1. Design and drawing of rectangular and flanged beam.
2. Design and drawing of cantilever beam.
3. Design and drawing of one way slab.
4. Design and drawing of two way slab.
5. Design and drawing of square columns.
6. Design and drawing of rectangular and circular column.
7. Design and drawing of rectangular and combined footing.
8. Design and drawing of isolated footing.
9. Design and drawing of strap footing.
10. Design and drawing of staircase.


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Programme: Bachelor of Technology

Semester –V

Subject Code	Subject Title	Credit			Theory			Practical		
CBCE-510	Industrial Training	L	T	P	End Sem (Nil)	Internal (Nil)	Total (Nil)	External (100)	Internal (Nil)	Total (100)
		-	-	1						Min: 40 (D Grade)

Duration of Theory (Externals): -Nil

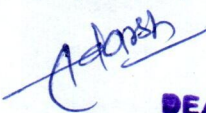
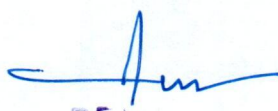
Theory Internal- Max Marks: -Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance Max. Marks: Nil
Practical Internal Max Marks: Nil	Lab Performance/ Quiz/Attendance - Max. Marks: Nil	

Pre-Requisite	Fundamental Engineering concepts of concern discipline.
Course Objective	The objective of industrial training is to provide to students the feel of the actual working environment and to gain practical knowledge and skills, which in turn will motivate, develop and build their confidence.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. Participate in the projects in industries during his or her industrial training. 2. Describe use of advanced tools and techniques encountered during industrial training and visit. 3. Interact with industrial personnel and follow engineering practices and discipline prescribed in industry. 4. Develop awareness about general workplace behavior and build interpersonal and team skills. 5. Prepare professional work reports and presentations.

Unit	Contents (Theory)	Marks Weightage
I	<p>The Course industrial training is to provide work experience, so that student's engineering knowledge is enhanced and employment prospects are improved. Industrial training of the students is essential to overcome the wide gap between the classroom learning and industrial environment.</p> <p>Industrial Training is a practical course, in which the students should undergo in reputed Private / Public Sector / Government organization / companies as industrial training of minimum FOUR weeks in the semester break after IV semester theory examinations.</p> <p>Training period: Minimum of Four weeks or 30 (Thirty) Days.</p> <p>Evaluation: Fifth semester</p> <p>Companies / Areas covered: Any field related to concern branch / discipline of Engineering.</p> <p>Grading: As per Scheme.</p> <p>Note: The presentation is evaluated by your class incharge. Report must be submitted during power point presentation. A Viva voce comprising comprehensive questions based on your presentation and training undergone.</p> <p>Etiquettes: Dress properly, behave well, portray good image as a university student, be punctual, observe work ethics, concern for safety, be professional.</p>	100

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Practical (Expandable): Nil


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Department: Civil Engineering

PEOPLE'S UNIVERSITY, BHOPAL**(Applicable for Admitted from Academic Session 2021-22 onwards)**Programme: **Bachelor of Technology****Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (Nil)	Internal (50)	Total (50) Min: 20 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBTE-511	Indian Constitution	-	-	-						

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: 50	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: 50
Practical Internal Max Marks: Nil	Lab Performance/ Quiz/Attendance - Max. Marks: Nil	


Pre-Requisite	Fluency in English
Course Objective	The objective of this Course is to outline the essential features of the Indian Constitution and to discuss important organs established by it.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. About the fundamental rights and duties 2. About the institutional arrangement provided by the Constitution.(UG) 3. About the institutional arrangement provided by the Constitution.(SG) 4. About the local administration. 5. About the working of election commission.

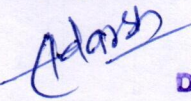
Unit	Contents (Theory)	Marks Weightage
I	Introduction: Constitution-meaning of the term; Indian Constitution: Sources and constitutional history; Features: Citizenship; Preamble; Fundamental Rights and Duties; Directive Principles of State Policy.	10
II	Union Government and its Administration: Structure of the Indian Union: Federalism; Centre- State relationship; President: Role; power and position; PM and Council of ministers; Cabinet and Central Secretariat; Lok Sabha; Rajya Sabha; Supreme Court of India.	10
III	State Government and its Administration: Governor: Role and Position; CM and Council of ministers; State Secretariat: Organization; Structure and Functions; High Courts.	10
IV	Local Administration: District's Administration head: Role and Importance; Municipalities: Introduction; Mayor and role of Elected Representative; CEO of Municipal Corporation; Pachayati raj: Introduction; PRI: Zila Pachayat; Elected officials and their roles; CEO Zila Pachayat: Position and role; Block level: Organizational Hierarchy (Different departments); Village level: Role of Elected and Appointed officials; Importance of grass root democracy.	10
V	Election Commission: Role and Functioning; Chief Election Commissioner and Election Commissioners; State Election Commission: Role and Functioning; Institute and Bodies for the welfare of SC/ST/OBC and women.	10

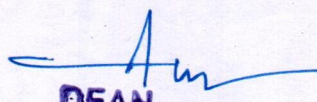
Text Book/References Books/ Websites:

1. Laxmikanth; Indian Polity.
2. Subhash Kashyap; Indian Administration.
3. D.D. Basu; Indian Constitution.
4. Avasti and Avasti; Indian Administration.

Suggested List of Laboratory Practical (Expandable): Nil

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Department: Civil Engineering

PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*Programme: **Bachelor of Technology****Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBCE-6101	Traffic Engineering	3	-	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance – Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance /Attendance / Quiz-Max. Marks: Nil	

Pre-Requisite	Student has fundamental knowledge about highway engineering.
Course Objective	The main object to provide knowledge about safe, comfortable, efficient, convenient and environmentally compatible movement of people, goods and services.
Course Outcomes	Students will be able to learn: <ol style="list-style-type: none"> 1. The concepts and applications in traffic engineering. 2. To identify traffic stream characteristics. 3. About highway safety and control. 4. The design and distribution of street lighting. 5. About accidental studied.

Unit	Contents (Theory)	Marks Weightage
I	Road User's Characteristics: General human characteristics, Physical, Mental and emotional factors, Factors affecting reaction time, PIEV theory. Vehicular Characteristics: Characteristics affecting road design width, Height, Length and other dimensions, Weight, Power, Speed and braking capacity of a vehicle.	14
II	Traffic Studies: Spot speed studies and volume studies, Speed and delay studies purpose, Causes of delay, Methods of conducting speed and delay studies, Origin and destination studies (O & D), Various methods, Collection and interpretation of data, Planning and sampling. Traffic Capacity Studies: Volume, Density, Basic practical and possible capacities, Level of service, Parking studies, Methods of parking studies cordon counts, Space inventories.	14
III	Traffic Operations and Control: Traffic regulations and various means of control, One way streets- advantages and limitations, Traffic signals- isolated signals, Coordinated signals, Simultaneous, Alternate, Flexible and progressive signal systems, Types of traffic signals, Fixed time signals, Traffic actuated signals, Speed control signals, Pedestrian signals, Flashing signals, Clearance interval and problems on single isolated traffic signal.	14
IV	Street Lighting: Methods of light distribution, Design of street lighting system, Definitions- Luminaire, Foot candle, Lumen, Utilization and maintenance factors, Different types of light sources used for street lighting, Fundamental factors of night vision.	14
V	Accident Studies & Mass Transportation: Accident studies, Causes of accidents, Accident studies and records, Condition and collision diagram, Preventive measures, Expressways and freeways, Problems on mass transportation and remedial measures, Brief study of mass transportation available in the country.	14


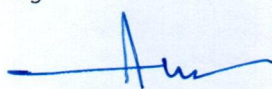
Text Book/References Books/ Websites:

1. L.R. Kadiyali; Traffic Engineering and Transport Planning; Khanna Publishers.
2. Matson W.S. Smith & F.W. Hurd; Traffic Engineering; TMH Publication.
3. G.J. Pingnataro; Principles of Traffic Engineering; W.S. Smith & F.W. Hurd.
4. D.R. Drew; Traffic Flow Theory; TMH Publication.
5. Dr. L.R. Kadiyali; Traffic Engineering and Transport Planning; Khanna Publications.

Suggested List of Laboratory Practical (Expandable): Nil

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Programme: Bachelor of Technology

Semester –VI

Subject Code	Subject Title	Credit			Theory			Practical		
CBCE-6102	Structural Dynamics & Earthquake Engineering	L	T	P	End Sem (70)	Internal (30)	Total (100)	End Sem (Nil)	Internal (Nil)	Total (Nil)
		3	-	-			Min: 40 (D Grade)			

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance – Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance /Attendance / Quiz-Max. Marks: Nil	

Pre-Requisite	Students should have knowledge of seismic zones of India.
Course Objective	To make students aware of the behavior of structural member subjected to different kinds of fatigue, creep, fracture and sway.
Course Outcomes	Students will be able to learn: <ol style="list-style-type: none"> About various fatigue and assumptions to design load. Understand the principal of fatigue fractures. Determination of appearance fracture and history. Determination the vessels and crack tip. To learn about earthquake.


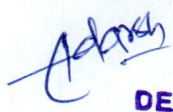
Unit	Contents (Theory)	Marks Weightage
I	Fatigue: Normal conditions concepts of fatigue failure, Statistical methods, Endurance limit, S.N. diagram, Stress cycling, Strain cycling, Goodman and gerber relations & their application to design problems, Review of stress concentration (controlling factors)- effect of frequency of the cyclic stress, Effect of temperature, Size, Form, Surface condition, Surface protection,	14
II	Fatigue Testing Machines: Specimen and test procedures. Appearance of Fatigue Fractures: Surface fatigue, Contact stresses, Brief introduction to random load fatigue.	14
III	Creep: Mechanisms of creep, Transient creep, Viscous creep, Creep fractures, Analysis of creep curves, Stress relaxation, Creep tests.	14
IV	Fracture: Historical background, modes of crack displacement, Opening mode, Sliding mode, Tearing mode, Stress intensity factor of a crack, Stress intensity factor in finite bodies, Fracture criterion- griffith's fracture stress, Fatigue toughness (critical stress intensity factor), Fracture crack propagation, Plastic deformation around crack tip, Crack opening is placement, Application to design of steam turbine rotor discs, Thin walled pressure vessels and thin and parallel pressure piping's.	14
V	Earthquake resistant design of structures, Design of structures for strength & serviceability, Ductility and energy absorption, Provisions of IS: 1893 and IS: 4326 for a seismic design of structures, Code for ductile detailing IS : 13920.	14

Text Book/References Books/ Websites:

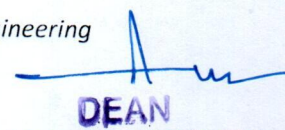
1. Chopra A.K.; Dynamics Of Structures & Earthquake Engineering ; PHI Publications.
2. Berg G.V; Elements of Structural Dynamics; Prentice Hall Of India.
3. Paz Mario; Structural Dynamics; CBS Publishers.
4. P. Agrawal; Earthquake Resistant Design of Structures; Firewall Media.
5. Shashikant K. Duggal; Earthquake Resistant Design of Structures; Oxford Publication.

Suggested List of Laboratory Practical (Expandable): Nil

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Subject Code	Subject Title	Credit			Theory			Practical		
CBCE-6103	Advanced Highway Construction	L	T	P	End Sem (70)	Internal (30)	Total (100)	End Sem (Nil)	Internal (Nil)	Total (Nil)
		3	-	-			Min: 40 (D Grade)			

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance /Attendance / Quiz-Max. Marks: Nil	

Pre-Requisite	Student has basic knowledge about highway construction.
Course Objective	To make the students familiar with various highway construction.
Course Outcomes	Students will able to learn about: <ol style="list-style-type: none"> 1. The basic information about earthwork and soiling. 2. The various bituminous constructions. 3. Advanced cement concrete road construction. 4. How to prepare reinforced cement concrete. 5. How to design and understand CPM and PERT.

Unit	Contents (Theory)	Marks Weightage
I	Earthwork and Soling: Classification of types of highway construction, Suitability of each type under Indian conditions, Selection of base course and surface course, Selection of soils, Construction of embankments, Excavation and compaction equipments, Field and laboratory tests for quality control, Stone soling, Brick soling, Current practices, Construction of earth roads, Gravel roads, Soil stabilized roads, Water bound macadam, Paved roads bricks, Stones.	14
II	Bituminous Construction: Properties, Requirements and specifications of materials, Equipments and plants, Detailed construction procedure of each type, Field and laboratory tests for quality control, Choice of binders under different conditions, IRC, British, and MOST specifications, Bituminous surface treatments, Interface treatments prime coat, and tack coat, Surface dressing and seal coat, Grouted or penetration macadam, Bituminous bound macadam, Sheet asphalt, Bituminous concrete, Mastic asphalt, Dense tar surfacing.	14
III	Cement Concrete Road Construction: Necessity of providing a base course under cement concrete road construction, Selection of materials, Construction's methods, Detailed construction procedure, Quality control tests, Construction equipments, Classification of various types of joints, Necessity of providing each type, Method of construction of joints, Load transfer devices, Dowel bars, Tie bars, Joints filler and sealer materials, IRC specifications.	14
IV	Reinforced Cement Concrete Road Construction: Necessity of providing reinforcement in cement concrete pavements, Continuously reinforced concrete pavements, Pre stressed concrete pavements and fibre reinforced concrete pavements, Selection of the mix, Compaction method and construction procedure for each type, Recommendations under Indian conditions.	14
V	Construction Planning and Management: CPM/PERT in highway construction, Difference between CPM and PERT, Role of CPM & PERT in construction project.	14

Text Book/References Books/ Websites:

1. S. K. Khanna & C.E.G. Justo; Highway Engineering; Nemchand and Sons.
2. MORTH; Hand book; IRC Ministry of road transport and highway.
3. Dr. S. K. Sharma; Principles, Practice & Design of Highway Engg; S Chand and Company.

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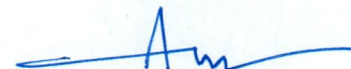
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4. Daniel J. Findley, Christopher M. Cunningham, Thomas H. Brown; Highway Engineering; Butterworth-Heinemann.
5. Athanassios Nikolaides; Highway Engineering: Pavements, Materials and Control of Quality; CRC Press.

Suggested List of Laboratory Practical (Expandable): Nil
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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBCE-6104	Appropriate Technology & Energy Conservation	3	-	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance /Attendance / Quiz-Max. Marks: Nil	

Pre-Requisite	Nil
Course Objective	The main object to provide knowledge to student about appropriate technology, rural housing, energy conservation, rural roads, biogas plants.
Course Outcomes	Students will be able to learn: <ol style="list-style-type: none"> 1. Use statistical concepts and applications in appropriate technology. 2. To identify rural environmental technology and characteristics. 3. Understand energy conservation. 4. The design and distribution of solar and wind energy. 5. To analysis the energy studied.

Unit	Contents (Theory)	Marks Weightage
I	Appropriate Technology: Concept and its role in the present circumstances, Advantages and disadvantages of appropriate technology, Applications of appropriate technology.	14
II	Rural Housing & Rural Environmental Technologies: Planning, Use of locally available materials, Construction techniques, Concept and scope in rural areas planning of water supply schemes in rural areas, Development of preferred sources of water, Springs, wells, Infiltration wells infiltration galleries, Collection of rain water, Specific problems and method's in rural water supply and treatment, Treatment and disposal of waste water.	14
III	Rural roads: Planning of rural roads, Socio-economic aspects, Materials for rural roads, Design aspects, Drainage problems and maintenance of rural roads, WBM road, Construction process of rural road.	14
IV	Energy Conservation: Energy production, Distribution and utilization, A review of global situation, Energy trends, Renewable and non renewable sources, Research reviews, Building designs and energy factors affecting energy budget in buildings and settlements, Design of buildings for minimizing energy. Solar, Wind and tidal energies, A review and their adoptability.	14
V	Low energy materials: Construction techniques and environmental control by using low energy material, Types of low energy materials, Specification, Properties and Advantages of low energy material.	14


Text Book/References Books/ Websites:

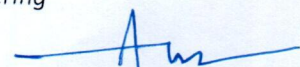
1. Ken Darrow; Appropriate Technology Sourcebook; Volunteers in Asia.
2. Kelvin W Willoughby; A Critique Of The Appropriate Technology Movement; Routledge.
3. John Michael Greer; Appropriate Technologies; Founders House Publishing.
4. Cara New Daggett; The Birth of Energy; Duke University Press Books.
5. Barney L. Capehart; Guide to Energy Management; River Publisher.

Suggested List of Laboratory Practical (Expandable): Nil

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Programme: Bachelor of Technology

Semester –VI

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBCE-602	Theory of Structures-I	3	1	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance /Attendance / Quiz-Max. Marks: Nil	

Pre-Requisite	Students should have knowledge of engineering mechanics and strength of material.
Course Objective	To make the students familiar with various determinate, indeterminate structures and influence lines.
Course Outcomes	Students will be able to learn: <ol style="list-style-type: none"> 1. To understand the principles of energy and virtual work. 2. The fundamental knowledge to find and analysis of indeterminate structure. 3. To design determinate structures. 4. The preliminary surveying in the field of arches and suspension cables. 5. About influence line diagram.

Unit	Contents (Theory)	Marks Weightage
I	Virtual Work and Energy Principles: Principles of virtual work applied to deformable bodies, Strain energy and complementary energy, Energy theorems, Maxwell's reciprocal theorem, Analysis of pin jointed frames for static loads.	14
II	Indeterminate Structures-I: Static and kinematic indeterminacy, Analysis of fixed and continuous beams by theorem of three moments without and with, Effect of sinking and rotation of supports and, Moment distribution method without sway.	14
III	Indeterminate Structures-II: Analysis of beams and frames by slope deflection method.	14
IV	Arches and Suspension cables: Three hinged arches of different shapes, Eddy's theorem, Suspension cable, Stiffening girders, Two hinged and fixed arches rib shortening and temperature effects on two hinged and fixed arches.	14
V	Rolling Loads and Influence Lines: Maximum SF and BM diagrams for various types of rolling loads, EUDL, Influence line diagrams for determinate beams by using Muller Breslau principle, Absolute maximum bending moment.	14

Text Book/References Books/ Websites:

1. Ghali A & Neville M.; Structural Analysis; A Unified Classical & Matrix Approach, Chapman & Hall.
2. C.K. Wang; Intermediate Structural Analysis, McGraw Hill, New York.
3. J. Kinney Streling; Indeterminate Structural Analysis; Addison Wesley.
4. C.S. Reddy; Basic Structural Analysis; Tata McGraw Hill Publishing.
5. C.H. Norris.; Wilbur J.B. and Utkys; Elementry Structural Analysis; McGraw Publication.

Suggested List of Laboratory Practical (Expandable): Nil

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Programme: Bachelor of Technology

Semester – VI

Subject Code	Subject Title	Credit			Theory			Practical		
CBCE-603	Design of R.C.C. Structures-II	L	T	P	End Sem (70)	Internal (30)	Total (100)	End Sem (35)	Internal (15)	Total (50)
		3	1	1			Min: 40 (D Grade)			Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: 15	Lab Performance /Attendance / Quiz-Max. Marks: 15	

Pre-Requisite	Student should have knowledge of design of R.C.C. structures-I.
Course Objective	The main object to provide knowledge about design of multistory building, earth retaining structures, water tank, silos bunkers and slab bridge.
Course Outcomes	Students will be able to learn: <ol style="list-style-type: none"> 1. To understand the design of multistory building. 2. The fundamental knowledge in earth retaining structures. 3. To design of water tank. 4. Carry out preliminary surveying in the field of design and silo and bunkers. 5. About design of T-Beam and slab bridge.

Unit	Contents (Theory)	Marks Weightage
I	Design of Multistory Buildings: Sway and non sway buildings, Shear walls and other bracing elements.	14
II	Earth Retaining Structures: Cantilever and counter fort types retaining walls.	14
III	Water Tanks: Tanks on ground and underground tanks (Square, Rectangular and Circular) Overhead tanks: Square, Rectangular, Circular & Intz tanks.	14
IV	Silos and Bunkers: Design and analysis of Silos and Bunkers.	14
V	T-Beam & Slab Bridges: For highway loading (IRC loads), Pre-stressing concepts, Materials, Systems of pre stressing & losses introduction to working & limit state design.	14

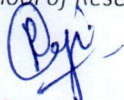
Text Book/References Books/ Websites:

1. O.P. Jain; R.C.C.Vol. II; Nem Chand & Brothers.
2. B.C. Punmia; R.C.C.; Laxmi Publication Pvt. Ltd.
3. D.J. Victor; Essentials of Bridge Engineering; Oxford & IBH Publishing CO. Pvt Ltd.
4. Ponnuswamy; Bridge Engineering; TMH, New Delhi.
5. N.K. Raju; Advanced R.C.C. Design; PHI Learning Private Ltd.

Suggested List of Laboratory Practical (Expandable):

1. Design and drawing of shear wall.
2. Design and sketch of counter fort retaining wall.
3. Design and sketch of cantilever wall.
4. Design and sketch of underground tank.
5. Design and sketch of overhead tank.
6. Design and sketch of intz tank.
7. Design and sketch of silos.
8. Design and sketch of a bunker.
9. Design and sketch of a T-Beam.
10. Design and sketch of a simply supported slab.

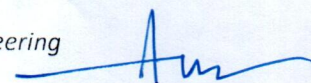
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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)
CBCE-604	Environmental Engineering-I	3	1	1						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance – Max. Marks: 10
Practical Internal Max Marks: 15	Lab Performance /Attendance / Quiz-Max. Marks: 15	

Pre-Requisite	Basic Concept of environment.
Course Objective	To understand water resource, impurities of water, water treatment, distribution system of water rural water supply schemes.
Course Outcomes	Students will be able to learn: <ol style="list-style-type: none"> About the resources of water on surface and ground water. Understand the principal water impurities. Various method of determination of water treatment. Determine the system of water distribution. About rural water supply schemes.

Unit	Contents (Theory)	Marks Weightage
I	Estimation of Ground and Surface Water Resources: Quality of water from different sources, Demand & quantity of water, Fire demand, Water requirement for various uses, Fluctuations in demand, Forecast of population.	14
II	Impurities of Water and Their Significance: Water-borne diseases, Physical, Chemical and bacteriological analysis of water, Water standards for different uses, Intake structure, Pipe materials, Pumps - operation & pumping stations.	14
III	Water Treatment Methods: Screening, Sedimentation, Coagulation & flocculation, Filtration, Disinfection, Aeration & water softening, Modern trends in sedimentation & filtration, Miscellaneous methods of treatment.	14
IV	Distribution Systems: Layout and hydraulics of different distribution systems, Pipe fittings, Valves and appurtenances, Analysis of distribution system, Hardy cross method, Leak detection, Maintenance of distribution systems, Service reservoir capacity and height of reservoir.	14
V	Rural water supply schemes: Financing and management of water supply project, Water pollution control act, Conservation & water carriage system, Sanitary appliance and their operation, Building drainage system of plumbing.	14

Text Book/References Books/ Websites:

1. B.C. Punmia ; Water Supply Engineering; Laxmi Publications.
2. G.S. Birdi; Water Supply & Sanitary Engineering; Laxmi Publications.
3. Mark J.Hammer; Water & Waste Water Technology; Prentice Hall Of India.
4. H.S. Peavy & D.R.Rowe; Environmental Engineering; Mc Graw Hill Book Company.
5. G.M. Fair & J.C. Geyer; Water & Waste Water Technology; Scranton Publishing Company.

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PEOPLE'S UNIVERSITY, BHOPAL***(Applicable for Admitted from Academic Session 2021-22 onwards)***Programme: **Bachelor of Technology****Semester –VI****Suggested List of Laboratory Practical (Expandable):**

1. To study the various standards for water.
2. To study about measurement of turbidity.
3. To determine the coagulant dose required to treat the given turbid water sample.
4. To determine the chlorides in a given water samples.
5. Determination of hardness of the given sample.
6. Determination of residual chlorine by Chloroscope.
7. Determination of alkalinity in a water samples.
8. Determination of acidity in a water samples.
9. Determination of distribution system of water.
10. Determination of pH values for different water.


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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)
CBCE-605	Geotechnical Engineering-I	2	-	1						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance – Max. Marks: 10
Practical Internal Max Marks: 15	Lab Performance /Attendance / Quiz-Max. Marks: 15	

Pre-Requisite	Nil
Course Objective	To make the students familiar about engineering properties of soil.
Course Outcomes	Students will be able to learn: <ol style="list-style-type: none"> 1. The fundamental knowledge in various types of index properties. 2. To find out seepage and seepage pressure. 3. The field of stress distribution in soil. 4. To understand stability of slop. 5. About various types of lateral earth pressure.

Unit	Contents (Theory)	Marks Weightage
I	Basic Definitions & Index Properties: Definition and scope of soil mechanics, Historical development, Formation of soils, Soil composition, Minerals, Influence of clay minerals on engineering behavior, Soil structure, Three phase system, Index properties and their determination, Consistency limits, Classification systems based on particle size and Consistency limits.	14
II	Soil Water and Consolidation: Soil water, Permeability determination of permeability in laboratory and in field, Seepage and seepage pressure, Flow nets, Uses of a flow net, effective, Neutral and total stresses, Compressibility and consolidation, Relationship between pressure and void ratio, Theory of one dimensional consolidation, Consolidation test, Fitting time curves, Normally and over consolidated clay, Determination of pre consolidation pressure, Settlement analysis, Calculation of total settlement.	14
III	Stress Distribution in Soils and Shear Strength of Soils: Stress distribution beneath loaded areas by boussinesq and wester-gaard's analysis, New mark's influence chart, Contact pressure distribution, Mohr - coulomb's theory of shear failure of soils, Mohr's stress circle measurement of shear strength, shear box test, Triaxial compression test, Unconfined compression test, Value shear test, Measurement of pore pressure, Pore pressure parameters, Critical void ratio, Liquefaction.	14
IV	Stability of Slopes: Infinite and finite slopes, Types of slope failures, Rotational slips, Stability number, Effect of ground water, Selection of shear strength parameters in slope stability analysis, Analytical and graphical methods of stability analysis, Stability of earth dams.	14
V	Lateral Earth Pressure: Active, Passive and earth pressure at rest, Rankine's, coulomb's, Terzaghi and culmann's theories, Analytical and graphical methods of determination of earth pressures on cohesion-less and cohesive soils, Effect of surcharge, Water table and wall friction, Arching in soils, Reinforced earth retaining walls.	14

Text Book/References Books/ Websites:

1. Dr. K.R. Arora; Soil Mechanics & Foundation Engineering; Standard Publishers.
2. Dr. B.C.Punmia; Soil Mechanics & Foundation Engineering; Laxmi Publications.
3. Dr. L Aram Singh; Modern Geotechnical Engineering; IBT Publishers.

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4. C. Venkatramaiah; Geotechnical Engineering; New Age International Publishers.
5. V.N.S. Murthy; Geotechnical Engineering; V.N.S. Murthy Prakashan.

Suggested List of Laboratory Practical (Expandable):

1. Determination of hygroscopic water content.
2. Different particle size analysis.
3. Determination of specific gravity of soil particles.
4. Determination of plastic limit.
5. Determination of liquid limit.
6. Determination of shrinkage limit.
7. Determination of permeability tests.
8. Determination of direct shear test.
9. Determination of optimum dry density and moisture content by standard proctor test.
10. Determination of optimum dry density and moisture content by modify proctor test.


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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBTE-606	Human Resource Management	2	-	-						

Duration of Theory (Externals): 2 Hours

Theory Internal- Max Marks: 15	Best of Two Mid Semester Test – Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05
Practical Internal Max Marks: Nil	Lab Performance/Attendance / Quiz - Max. Marks: Nil	

Pre-Requisite	Nil
Course Objective	The objective of the course is to acquaint students with the techniques and principles to manage human resource of an organization.
Course Outcomes	Student will able to learn: <ol style="list-style-type: none"> 1. To understand the basis concept of HRM. 2. To learn the techniques for the acquisition of Human Resource. 3. To understand the concept of training and development. 4. To understand the factors responsible for performance appraisal. 5. Human Resource Maintenance.

Unit	Contents (Theory)	Marks Weightage
I	Introduction: Human Resource Management: Definition, Nature and Scope of Human Resources Management, Functions Role Competencies of HR Manager, HR Policies, HRM vs HRD. Emerging Challenges of Human Resource Management.	07
II	Acquisition of Human Resource: Human Resource Planning-Definition, Objective, Significance, Process of Human Resources Planning, Factor influencing HRP job analysis-job description and job specialization; Recruitment-process, Methods, Sources, Selection-Concept and process; Test and interview; placement and induction & Orientation.	07
III	Training and Development: Concept and Importance; Identifying Training and Development Needs; Training Programmes, Types of Training , Evaluating Training Effectiveness; Training Process Outsourcing; Management Development; Career Development, Managing employee well being and concept of work life balance and quality of work life.	07
IV	Performance Appraisal: Nature, objectives and importance; Techniques and systems of performance appraisal; performance appraisal forms potential appraisal and employee counseling; well being and concept of work life balance and quality of work life.	07
V	Maintenance: Employee health and safety; employee welfare; social security; Employer-Employee relations-an over view; concept of redeployment, redundancy, attrition, VRS, downsizing, layoffs and retrenchment, ethics and HRM.	07

Text Book/References Books/ Websites:

1. Bohlendar and Snell; Principal of Human Resource Management; Cengage Learning.
2. Neeru Kapoor; Human Resource Management, Dhanpat Rai & Co.; Delhi.
3. Robert L. Mathis and John H. Jackson; Human Resource Management; PHI Learning.

Suggested List of Laboratory Practical (Expandable): Nil

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)
CBTE-607	NCC-VI	2	-	1						

Duration of Theory (Externals): 2 Hours

Theory Internal- Max Marks:15	Best of Two Mid Semester Test – Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05
Practical Internal Max Marks: 15	Lab Performance/ Quiz/Attendance - Max. Marks: 15	

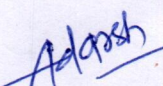
Pre-Requisite	Nil
Course Objective	<ol style="list-style-type: none"> 1. Get acquainted about counselling process its need and importance. 2. Know about SSB procedure and different tasks and tests. 3. Know about the conduction during the interview. 4. Understand the security challenges & role of cadets in Border Areas. 5. Know about the modes of entry in Armed forces, CAPF & police. 6. Understand the life history & leadership qualities of great generals. 7. Learn about 1999 Kargil war. 8. Acquire the knowledge about various wars and their heroes. 9. Know about various components of communication process.
Course Outcomes	Student will able to learn: <ol style="list-style-type: none"> 1. Get motivated to join Armed forces, police & CAPF. 2. Write their CV effective and appealing. 3. Face SSB interview effectively in their future. 4. Understand individual responsibilities & role in meetings the security challenges on Border/Coastal areas. 5. Imbibe the feeling of patriotism. 6. Communicate more effectively.

Unit	Contents (Theory)	Marks Weightage
I	Personality Development: <ol style="list-style-type: none"> (i) Career Counselling. (ii) SSB Procedure. (iii) Interview Skills 	07
II	Border & Coastal Areas: Security Challenges & Role of cadets in Border management.	07
III	Armed Forces : Modes of Entry into Army, Police and CAPF.	07
IV	Military History : <ol style="list-style-type: none"> (i) Biographies of Renowned Generals. (ii) War Heroes : Param Veer Chakra Awardees. (iii) Study of Battles of Kargil. (iv) War Movies. 	07
V	Communication: Introduction to Communication & Latest Trends.	07

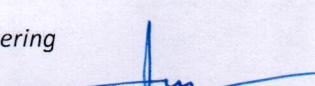
Text Book/References Books/ Websites:

1. Cadet's handbook, NCC Directorate, MP, CG.
2. Supplementary cadet's handbook, NCC Directorate, MP, CG.

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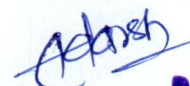

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1. **Drill**
 - Ceremonial Drill.
 - Guard of Honour.
2. **Weapon Training (WT):** Short Range firing.
3. **Map Reading (MR) :** Google maps and Applications.
4. **Field Craft & Battle Craft (FCBC) :** Knots, Lashing and Stretchers.
5. **Social Service and Community Development (SSCD) :** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days-National and State level.
6. **Introduction of Infantry Weapons & Equipment (INF):** Characteristics of 5.56MM INSAS Rifle, Ammunition, Fire Power, Stripping, Assembling & Cleaning Practice.
7. **Communication (COM)**
 - Basic Radio Telephony (RT) Procedure.
 - Introduction, Advantages, Disadvantages, Need for standard procedures.

Note: Examination of this NCC course will be conduct as per NCC head quarter norms in consultation with office of COE, PU.


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Subject Code	Subject Title	Credit			Theory			Practical		
CBTE-608	Company and Compensation Law	L	T	P	End Sem (35)	Internal (15)	Total (50)	End Sem (Nil)	Internal (Nil)	Total (Nil)
		2	-	-			Min: 20 (D Grade)			

Duration of Theory (Externals): 2 Hours

Theory Internal- Max Marks: 15	Best of Two Mid Semester Test – Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05
Practical Internal Max Marks: Nil	Lab Performance/Attendance / Quiz - Max. Marks: Nil	

Pre-Requisite	Fluency in English.
Course Objective	The objective of this course is to teach students about the origin, management and winding up of companies. Students will also learn about social security legislations.
Course Outcomes	Student will able to learn: <ol style="list-style-type: none"> 1. Basic concepts of company law. 2. Memorandum of Association and Articles of Association. 3. Conduct meeting and its documentations. 4. Basic concepts of compensation law. 5. Social Welfare Legislations.

Unit	Contents (Theory)	Marks Weightage
I	Introduction: Characteristics of a company, lifting of corporate veil Types of companies including one person company, Small company, Formation of company –promoters, Their legal position, Pre-incorporation contract and provisional contracts Online registration of a company.	07
II	Documents and Shares: Memorandum of association, Articles of association, prospectus, Shelf and red herring prospectus, Misstatement in prospectus, Issue, Allotment and forfeiture of share, Debentures, Transmission of shares, Buyback, Issue of bonus shares.	07
III	Management and Meetings: Classification of directors, Women directors, Independent director, Small shareholder's director, Disqualifications, Director identity number (DIN), appointment, legal positions, Powers and duties, Removal of directors, Key managerial personnel, Meetings of shareholders and board, Types of meeting, Convening and conduct of meetings, Postal ballot, Meeting through video conferencing, E-voting.	07
IV	Compensation Law: Employees state insurance Act, 1948, Minimum Wages Act, 1948; Employees' Compensation Act, 1923.	07
V	New Developments in Compensation Law: Code on social security 2020, History, Significance and important provisions.	07

Text Book/References Books/ Websites:

1. Malik, K.L.; Industrial Laws and Labour Laws; Eastern Book Company, Lucknow.
2. Sharma, J.P.; An Easy Approach to Company and Compensation Laws; Ane Books Pvt Ltd, New Delhi.
3. Srivastava, S.C.; Industrial Relations & Labour Laws; Vikas Publishing House (P) Ltd.
4. Companies Act and Corporate Laws; Bharat Law House Pvt Ltd, New Delhi.
5. Company Law Digest; Bharat Law House Pvt Ltd, New Delhi.

Suggested List of Laboratory Practical (Expandable): Nil

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Subject Code	Subject Title	Credit			Theory			Practical		
CBCE-609	Theory of Structure Lab	L	T	P	End Sem (Nil)	Internal (Nil)	Total	End Sem (Nil)	Internal (50)	Total (50)
		-	-	1			(Nil)			Min: 20 (D Grade)

Duration of Theory (Externals): -Nil

Theory Internal- Max Marks: -Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance Max. Marks: Nil
Practical Internal Max Marks: 50	Lab Performance/Attendance / Quiz - Max. Marks: 50	

Pre-Requisite	Student should have fundamental knowledge about engineering mechanics.
Course Objective	To understand two hinged arch for horizontal thrust, bar pin joint, deflection and unsymmetrical bending of a cantilever, Muller Breslau principal.
Course Outcomes	Students will able to learn about: <ol style="list-style-type: none"> 1. The basic information about two hinged arch for influence line. 2. The analysis of various bar pin jointed truss 3. The study of deflection and unsymmetrical bending of a cantilever beam. 4. How to analysis of Muller Breslau principal. 5. How to analyses an elastically coupled beam.

Unit	Contents (Theory)	Marks Weightage
I	Students have to understand & identify: Analysis of horizontal thrust for influence line, Analysis of three bar pin jointed truss, Analysis of deflection and unsymmetrical bending, verification of Muller Breslau principal, Analytical study of elastic coupled beam.	50

Text Book/References Books/ Websites:

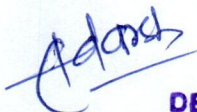
1. Ghali A & Neville M.; Structural Analysis; A Unified Classical & Matrix Approach, Chapman & Hall.
2. C.K. Wang; Intermediate Structural Analysis, Mcgraw Hill, New York.
3. J. Kinney Streling; Indeterminate Structural Analysis; Addison Wesley.
4. C.S. Reddy; Basic Structural Analysis; Tata Mcgraw Hill Publishing.
5. C.H. Norris.; Wilbur J.B. and Utkys; Elementry Structural Analysis; Mcgraw Publication.

Suggested List of Laboratory Practical (Expandable):

1. Experiment on a two hinged arch for horizontal thrust and influence line for horizontal thrust.
2. Experiment and analysis of three bar pin jointed truss.
3. Experimental and analytical study of deflection and unsymmetrical bending of a cantilever beam.
4. Begg deforester verification of Muller Breslau principal.
5. Experimental and analytical study of an elastically coupled beam.


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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem	Internal	Total	End Sem	Internal	Total
CBTE-610	Universal Human Ethics	2	1	-	(Nil)	(100)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (External): Nil

Theory Internal- Max Marks: 100	Best of Two Mid Semester Test – Max Marks: 50	Assignment/Quiz/Attendance – Max. Marks: 50
Practical Internal Max Marks: Nil	Lab Performance / Attendance / Quiz - Max. Marks: Nil	

Pre-Requisite	Nil
Course Objective	<ol style="list-style-type: none"> To help the students appreciate the essential complementarity between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings. To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way. To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature.
Course Outcomes	<p>Student will able to learn:</p> <ol style="list-style-type: none"> To start exploring themselves: get comfortable with each other and with the teacher; they start appreciating the need and relevance for the course. Their desires and are able to see that all physical facility they are required for a limited time in a limited quantity. The natural acceptance and see that respect is right evaluation, and only right evaluation leads to fulfillment in relationship. Differentiate between the characteristics and activities of different orders and study the mutual fulfillment among them, feel confident that they can understand the whole existence; nothing is a mystery in this existence. Grasp the right utilization of their knowledge in their streams of Technology/Engineering to ensure mutual fulfillment.

Unit	Contents (Theory)	Marks Weightage
I	Introduction to Value Education: Understanding Value Education, Self-exploration as the Process for Value Education ,Sharing about Oneself ,Continuous Happiness and Prosperity – the Basic Human Aspirations, Right Understanding, Relationship and Physical Facility ; Exploring Human Consciousness , Happiness and Prosperity – Current Scenario, Method to Fulfill the Basic Human Aspirations ,Exploring Natural Acceptance.	20
II	Harmony in the Human Being : Understanding Human being as the Co-existence of the Self and the Body ,Distinguishing between the Needs of the Self and the Body ,Exploring the difference of Needs of Self and Body ,The Body as an Instrument of the Self, Understanding Harmony in the Self , Exploring Sources of Imagination in the , Harmony of the Self with the Body , Programme to ensure self-regulation and Health.	20
III	Harmony in the Family and Society : Harmony in the Family – the Basic Unit of Human Interaction, Values in Human-to-Human Relationship, 'Trust' – the Foundational Value in Relationship, Exploring the Feeling of Trust, 'Respect' – as the Right Evaluation , Exploring the Feeling of Respect , Understanding Harmony in the Society, Vision for the Universal Human Order , Exploring Systems to fulfill Human Goal.	20

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IV	Harmony in the Nature/Existence: Understanding Harmony in the Nature, Interconnectedness, self-regulation and Mutual Fulfillment among the Four Orders of Nature, Exploring the Four Orders of Nature, Realizing Existence as Co-existence at All Levels, The Holistic Perception of Harmony in Existence, Exploring Co-existence in Existence.	20
V	Implications of the Holistic Understanding – a Look at Professional Ethics: Natural Acceptance of Human Values, Definitiveness of (Ethical) Human Conduct , Exploring Ethical Human Conduct, A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order, Competence in Professional Ethics, Exploring Humanistic Models in Education, Holistic Technologies, Production Systems and Management Models Typical Case Studies, Strategies for Transition towards Value-based Life and Profession, Exploring Steps of Transition towards Universal Human Order.	20

Text Book/References Books/ Websites:

1. R.R Gaur; R Sangal; G P Bagaria; A foundation course in Human Values and professional Ethics; Excel books; New Delhi.
2. B L Bajpai; Indian Ethos and Modern Management; New Royal Book Co.
3. A.N. Tripathy; Human Values; New Age International Publishers.
4. Value Education websites, <http://uhv.ac.in>.

Suggested List of Laboratory Practical (Expandable): Nil

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBCE-7101	Pavement Design	3	-	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance/ Quiz/Attendance - Nil Max. Marks: Nil	

Pre-Requisite	Student has fundamental knowledge about foundations.
Course Objective	The main object to provide knowledge about flexible and rigid pavement and their design.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. About statistical concepts and applications ESWL. 2. To identify flexible pavement and their concepts. 3. Understand rigid pavement and their concept and design. 4. About different types of rigid pavement ie IRC & PCA method. 5. To analyze the accidental studied.

Unit	Contents (Theory)	Marks Weightage
I	Equivalent Single Wheel Load (ESWL): Definition, Calculation of ESWL, Repetition of loads and their effects on the pavement structures.	14
II	Flexible Pavements: Component parts of the pavement structures and their functions, Stresses in flexible pavements, Stress distribution through various layers, Boussinesque's theory, Burmister's two layered theory, Methods of design, Group index method, CBR method, Burmister's method and North Dakota cone method.	14
III	Rigid Pavements: Evaluation of sub grade, Modulus-k by plate bearing test and the test details, Westergaard's stress theory stresses in rigid pavements, Temperature stresses, Warping stresses, Frictional stresses, Critical combination of stresses, Critical loading positions.	14
IV	Rigid Pavement Design: IRC method, Fatigue analysis, PCA chart method, Joints, Design and construction & types, Aashto method, Reliability analysis.	14
V	Evaluation and Strengthening of Existing Pavements: Benkleman beam method, Serviceability index method, Rigid and flexible overlays and their design.	14

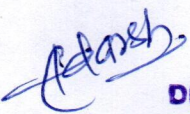
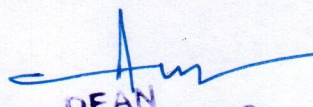
Text Book/References Books/ Websites:

1. E.J. Yoder & M.W. Witzak; Principles of Pavement Design; Wiley Publication.
2. Aasho; Aasho Interim Guide for Design of Pavement Structures; Washington, D.C.
3. Portland Cement Association; Guidelines for Design of Rigid Pavements; Washington Code.

Suggested List of Laboratory Practical (Expandable): Nil

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Department: Civil Engineering

PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*

Programme: Bachelor of Technology

Semester –VII

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBCE-7102	Cost Effective & Eco Friendly Construction	3	-	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance – Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance/ Quiz/Attendance - Max. Marks: Nil	

Pre-Requisite	Nil
Course Objective	To make students aware of the behavior of cost effective and eco friendly construction material and their uses in the field of civil engineering constructions.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> About various energy efficient and cost effective material. Understand the principal of cost effective construction. Determination of cost effective sanitation. Determine the process of low cost road construction. About cost analysis.

Unit	Contents (Theory)	Marks Weightage
I	Concepts of Energy Efficient & Environment Friendly Materials and Techniques, Cost Effective Materials: Soil, Fly Ash, Ferro cement, Lime, Fibres, Stone dust, Red mud, Gypsum, Alternate wood, Polymer. Energy Efficient & Environment Friendly Building Material Products: Walls - Stabilized and sun dried soil blocks & bricks, Solid & hollow concrete blocks, Stone masonry blocks, Fibrocement partitions. Roofs: Precast R.C plank & joists roof, Precast channel roof, Precast one panel roof, Precast funicular shells, Ferro cement shells, Filler slab, Seasal fibre roof, Improved country tiles, Thatch roof, Micro concrete roof tiles.	14
II	Cost effective construction techniques and equipments: Rat trap bond construction, Energy efficient roofing, Ferrocement technique, Mud technology. Equipments: Brick molding machine, Stabilized soil block making machine and plants for the manufacturing of concrete blocks, M.C.R. tile making machine, Ferro cement wall panel & roofing, Channel making machine, R.C.C. chaukhat making M/C.	14
III	Cost Effective Sanitation: Waste water disposal system, Cost effective sanitation for rural and urban areas, Ferro cement drains.	14
IV	Low Cost Road Construction: Cost effective road materials, Stabilization, Construction techniques tests, Equipment used for construction, Drainage, Maintenance.	14
V	Cost Analysis And Comparison: All experimental materials, All experimental techniques.	14

Text Book/References Books/ Websites:


1. Peurify; Construction Equipment; THM Publication.
2. L.S. Srinath; CPM; East-West Press Pvt. Ltd.
3. S. Seetharaman; Construction Management; Umesh Publishers.
4. Weist & Levy; CPM & PERT; Prentice Hall.
5. V.N. Vazirani and S.P. Chandola; Construction, Management & Account; Khanna Publishers.

Suggested List of Laboratory Practical (Expandable): Nil

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Programme: Bachelor of Technology

Semester –VII

Subject Code	Subject Title	Credit			Theory			Practical		
CBCE-7103	Design of Hydraulic Structures	L	T	P	End Sem (70)	Internal (30)	Total (100)	End Sem (Nil)	Internal (Nil)	Total (Nil)
		3	-	-			Min: 40 (D Grade)			

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance/ Quiz/Attendance - Max. Marks: Nil	

Pre-Requisite	Nil
Course Objective	To make the students familiar with various highway construction.
Course Outcomes	Students will be able to learn about: <ol style="list-style-type: none"> 1. The basic information about gravity dam. 2. The various earth dam and its constructions. 3. Various type of spillway. 4. How to prepare energy dissipation. 5. How to design and understand hydro power plant.

Unit	Contents (Theory)	Marks Weightage
I	Gravity Dams: Design criteria, Forces acting on gravity dams, Elementary profile, Low and high gravity dams, Stability analysis, Evaluation of profile by method of zoning, Practical profile, Foundation treatment, Construction joints, Galleries in gravity dams.	14
II	Earth Dams: Types, Causes of failure and design criteria, Soils suitable for earth dam construction, Construction methods, Foundation requirements, Typical earth dam sections, Estimation of seepage through and below the dam, Seepage control, Stability of slopes by slip circle method of analysis, Pore pressures, Sudden draw down, Steady seepage and construction pore pressure condition. Rock Fill Dams: Types, Merits and demerits, Conditions favourable for their adoption.	14
III	Spillways : Ogee spillway and its design, Details of Syphon, Shaft, Chute and side channel spillways, emergency spillways	14
IV	Energy Dissipations and Gates: Principles of energy dissipation, Energy dissipators based on tail water rating curve and jump height curves, Spillway crest gates, Vertical lift and radial gates, Their design principles and details, Design of canal regulating structures, Detailed design of sarda falls, Design of cross drainage works, Syphon aquaduct.	14
V	Hydropower Plants: Introduction of hydropower development, assessment of power potential, Types of hydropower plants, General features of hydro-electric schemes, Selection of turbines, Draft tubes, Surge tanks, Penstocks, Power house dimensions, Development of microhydel stations, Tidal plants, Pumped storage plants and their details.	14


Text Book/References Books/ Websites:

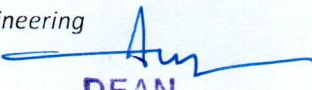
1. Creager, Justin & Hinds; Engineering for Dams Volumes I, II & III; Wiley Newyork.
2. Creager; Hydroelectric Hand Book; John Wiley & Sons.
3. Varshney; Hydraulic Structures; Nem Chand & Brother.
4. Punmia & Pandey ; Irrigation & Water Power Engg; Laxmi Publications.

Suggested List of Laboratory Practical (Expandable): Nil

School of Research and Technology

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBCE-7104	City & Regional Planning	3	-	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance/Attendance /Quiz - Max. Marks :Nil	

Pre-Requisite	Basic concepts of urban planning.
Course Objective	The main object to provide knowledge to student about regional planning.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. The socio political and technological forces and their consequences on human. 2. To identify and process of urbanizations. 3. Understand scope of regional planning. 4. The design of spatial structure. 5. About analysis the regional planning in India.

Unit	Contents (Theory)	Marks Weightage
I	Understanding The City as An Organism: The socio-political and technological forces and their consequences on human settlements and their planning, inner city issues and problems, approach to Development, urban development and renewal.	14
II	Definition and Process of Urbanizations: Urban rural relationship, Hierarchy of cities urban growth and system of cities, Growth of metropolitan cities and mega cities and its impact on natural development, Focus on the issues in metropolitan management and governance and possible alternative strategies to metropolitan growth control, Development of new towns, Small and medium town development.	14
III	Aims, Objectives, Relevance and Scope of Regional Planning: Concept and classification of regions, Characteristics of a planning region, Delineation of regions, Regional development plans, Planning process and implementation, Methods and techniques of regional analysis and development planning.	14
IV	Theories of Spatial Structure: Regional imbalances and growth models, Regional analysis techniques Central place theory, Agricultural land use model, Weber's theory of location, Rank size rule, Input output analysis, Growth pole model, Misra's growth foci approach, Core periphery model, Cumulative causation theory.	14
V	Regional Planning in India: Evolution of regional planning, Institutional framework from national planning level to regional development plans, relevant policies and programmes, Regional inequalities, their causes and alleviation measures, Integrated rural- urban development Case studies from other developing and developed nations.	14

Text Book/References Books/ Websites:

1. Bhatt Caste; Class and Politics; Manohar Book Sevice.
2. Ministry of Urban Affairs & Employment, Govt. of India, New Delhi – Urban Development Plans Formulation & Implementation Guidelines Code.
3. AEJ Morris; History of Urban; Pre-History to Renaissance Publication.

Suggested List of Laboratory Practical (Expandable): Nil

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBCE-7201	Management of Quality & Safety in Construction	3	-	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance – Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance/ Quiz/Attendance - Nil Max. Marks: Nil	

Pre-Requisite	Nil
Course Objective	To make the students familiar with various concepts of quality management and construction.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. The principles of quality control. 2. To find and analyse of quality manual. 3. About training in quality and quality management system. 4. About preliminary surveying in the field of demolition. 5. About safety for training.

Unit	Contents (Theory)	Marks Weightage
I	Introduction to Quality: Planning and control of quality during design of structures, Quantitative techniques in quality control, Quality assurance during construction, Inspection of materials and machinery, In process inspection and test.	14
II	Preparation of Quality Manuals: Check-list and inspection report, Establishing quality assurance system, Quality standards/codes in design and construction, Concept and philosophy of total quality management (TQM).	14
III	Training in quality and quality management systems (ISO-9000): Concept of safety, Factors affecting safety, Physiological, Psychological and technological, Planning for safety provisions, Structural safety, Safety consideration during construction.	14
IV	Demolition: During use of equipment, Management of accidents/injuries and provision of first aid, Provisional aspect of safety, Site management with regard to safety recommendations.	14
V	Training for Safety Awareness and Implementation: Formulation of safety manuals, Safety legislation, Standards/codes with regard to construction, Quality vs. Safety, Case Studies.	14

Text Book/References Books/ Websites:

1. Richard J. Coble, Theo C. Haupt, Jimmie Hinze; The Management of Construction Safety and Health; CRC Press.
2. Abdul Razzak Rumane; Quality Management in Construction Projects; CRC Press.
3. Tim Howarth, Paul Watson; Construction Safety Management; Wiley Black Well.
4. Phil Hughes, Ed Ferrett; Introduction to Health and Safety in Construction: The Handbook for Construction.
5. C.H. Norris.; Wilbur J.B. and Utkys; Elementary Structural Analysis; Mcgraw Hill Publication.

Suggested List of Laboratory Practical (Expandable): Nil**CHAIRMAN**

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Subject Code	Subject Title	Credit			Theory			Practical		
CBCE-7202	Construction Planning & Management	L	T	P	End Sem (70)	Internal (30)	Total (100)	End Sem (Nil)	Internal (Nil)	Total
		3	-	-			Min: 40 (D Grade)			(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance /Attendance / Quiz - Max. Marks: Nil	

Pre-Requisite	Nil
Course Objective	The main object to provide knowledge about design of preliminary and detailed investigation of CPM & PERT.
Course Outcomes	Student will able to learn: <ol style="list-style-type: none"> About the preliminary and detailed investigation method. Understand the construction equipments. About various method of determination of contracts. To determine the system of public work account. About site organization & system approach to planning.

Unit	Contents (Theory)	Marks Weightage
I	Preliminary and Detailed Investigation Methods: Methods of construction, Form work and centering, Schedule of construction, Job layout, Principles of construction management, Modern management techniques like CPM/PERT with network analysis.	14
II	Construction Equipments: Factors affecting selection, Investment and operating cost, Output of various equipments, Brief study of equipments required for various jobs such as earth work, Dredging, Conveyance, Concreting, Hoisting, Pile driving, Compaction and grouting.	14
III	Contracts: Different types of controls, Notice inviting tenders, Contract document, Departmental method of construction, Rate list, Security deposit and earnest money, Conditions of contract, Arbitration, Administrative approval, Technical sanction.	14
IV	Specifications & Public Works Accounts: Importance, Types of specifications, Specifications for various trades of engineering works, Various forms used in construction works, Measurement book, Cash book, Materials at site account, Impress account, Tools and plants, Various types of running bills, Secured advance, Final bill.	14
V	Site Organization & Systems Approach to Planning: Accommodation of site staff, Contractor's staff, Various organization charts and manuals, Personnel in construction, Welfare facilities, Labour laws and human relations, Safety engineering, Problem of equipment management, Assignment model, Transportation model and waiting line modals with their applications, Shovel truck performance with waiting line method.	14

Text Book/References Books/ Websites:

1. Peurify; Construction Equipment; TMH Publication.
2. L.S. Srinath ; CPM.; Affiliated East-West Press (Pvt.) Ltd.
3. S. Seetharaman; Construction Management; Umesh Publications.
4. Weist & Levy; CPM & PERT; Prentice Hall India Learning Pvt. Ltd.
5. N.K. Raju; Advanced R.C.C. Design; PHI Learning Pvt. Ltd.

Suggested List of Laboratory Practical (Expandable): Nil

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBCE-7203	Advanced Foundation Engineering	3	-	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance/Quiz/Attendance - Max Marks: Nil	


Pre-Requisite	Student has fundamental knowledge about soil and foundation.
Course Objective	The main object to provide knowledge about advanced foundation and their design in the soil.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> About statistical concepts and applications shallow foundation. To identify pile foundation and their concepts. Understand geosynthetics and their concept and design. The design different types of bridge component. To analysis the marine substructures.

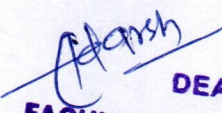
Unit	Contents (Theory)	Marks Weightage
I	Shallow Foundations: Bearing Capacity, Terzaghis analysis, Computations of bearing capacity factors, Skempton's analysis, Meyerhof's analysis, Balla's theory, Hansen's theory, Design of shallow foundations.	14
II	Pile Foundation: Use of piles, Types of piles, Design of piles, Group action in cohesive and cohesionless soils, Negative skin friction, Laterally loaded piles, Piles under inclined loads, Pile load test, Hrennikoff method.	14
III	Engineering with Geosynthetics: Introduction basic mechanism of reinforced earth strength characteristics of reinforced soil.	14
IV	Bridge Substructures: Introduction, Elements of bridge substructure, Stability analysis of well foundation, Design of pie & abutments, Sinking of wells.	14
V	Marine Substructures: Introduction, Types of marine structures elements, Design criteria, Design of gravity wall, Piled wharf structure breakwaters.	14

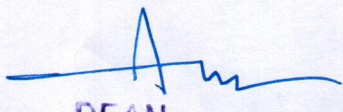
Text Book/References Books/ Websites:

1. V.N.S. Marshy; Soil Mechanics & Foundation Engineering; CBS Publisher.
2. P. Purshotham Raj; Soil Mechanics & Foundation Engineering; Dorley Kindersley Pvt. Ltd.
3. P.C. Varghese; Foundation Engineering; PHI Publication.
4. Bikash Chandra Chattopadhyay and Joyanta Maity; Foundation Engineering; PHI Learning.
5. R.K. Khitoliya; Foundation Engineering; I K International Publishing House.

Suggested List of Laboratory Practical (Expandable): Nil


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PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*Programme: **Bachelor of Technology****Semester –VII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBCE-7204	Land Economics & Management	3	-	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance – Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance/Quiz/Attendance - Max Marks: Nil	

Pre-Requisite	Nil
Course Objective	The key objective of this Land Economics program is to provide admitted students with a sound theoretical and practical base to enable them conduct valuations, investment reports and optimally manage land, landed property and real estate developments
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. About economics, positive & negative economics, classical. 2. To value of commodity, perfect market conditions. 3. About Von Thunen, Alonso's bid rent function theory. 4. To understand the nature of Indian economy. 5. About various approaches and methods of valuation.

Unit	Contents (Theory)	Marks Weightage
I	Introduction: Types of economics, Classical & Non-classical economics, Macro & micro economics, etc, Economics & planning, Land Economics, Urban economics, Regional Economics, etc. Economic development & economic growth, Measurements of economic development, Gross national product, Gross national product per capita, Welfare, Social Indicators, etc.	14
II	Land Economics: Value of commodity, Perfect market conditions, etc. Land characteristics, Immobility, Divisibility, Modification, Non-standardised commodity, etc. Attributes of land, Location, Area, Configuration, Permissibility, Restriction, etc. Effect of govt. Policies & taxation on land as resource, etc.	14
III	Land Uses and Land Values: Determination of price of land, Ricardian theory of the land market, Agricultural land rent theory by von thunen, Alonso's Bid Rent Function theory, etc. determination of location of land Uses, Types of land uses, Factors determining land Uses, Locational choices, Pattern of land use, Invasion & succession, etc. approaches to industrial location theory, Least cost approach, Market area analysis, Profit maximization approach etc.	14
IV	Nature of Indian Economy: Stages of development, Undeveloped, Underdeveloped, Developed etc, Different criteria of underdeveloped, Poverty, Ignorance, Diseases, Mal-distribution of national income, Administrative incompetence, Social disorganization, etc. Characteristics of underdevelopment country, Poverty, Dualistic economy, Unemployment & disguised unemployment, Backwardness, etc. Obstacle to economic development, Vicious circles of poverty, Market imperfection etc.	14
V	Approaches to Valuation: Cost approach – Land and building method and reinstatement, Replacement method, Market approach, Direct comparison, Hypothetical development (layout / building) method, Belting method, Investment or income capitalization approach, Benefit approach (Valuation of Infrastructure Projects), Valuation of properties for various purposes, Sale, Lease, Mortgage, Municipal taxation, Direct taxes, Insurance, Assessment of compensation for land acquisition including severance, Injuries affection, loss of business etc. Compensation, Betterment problem in relation to Planning.	14

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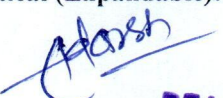
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1. S. K. Misra & V. K. Puri ; Indian Economy; Himalaya Publishing House, Delhi.
2. M. L. Jhingan; The Economics of Development & Planning; Virendra Publication (P) Ltd.
3. V.V. Subrahmanyam and R.L. Bawa ; Urban Economic Development in India; Vedam Books Pvt. Ltd, New Delhi.
4. Roshan Namavati; Principles & Practice of Valuation; Virendra Publication (P) Ltd.

Suggested List of Laboratory Practical (Expandable): Nil


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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBCE-703	Design of Steel Structures	3	-	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance/ Quiz/Attendance - Max. Marks: Nil	

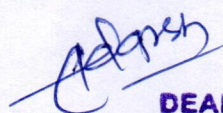
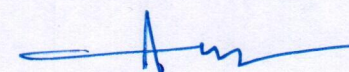
Pre-Requisite	Nil
Course Objective	To make the students familiar about steel structures and their components.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. The fundamental knowledge in various types of loads. 2. To design compressive members. 3. The field of design beam and girders. 4. Understand lacings, battens and footing. 5. About various types of frames.

Unit	Contents (Theory)	Marks Weightage
I	Various loads and mechanism of the load transfer, Partial load factors, And structural properties of steel, Design of structural connections, Bolted riveted and welded connections.	14
II	Design of compression members, Tension members, Roof trusses angular & tubular, Lattice girders.	14
III	Design of simple beams, Built-up beams, Plate girders and gantry girders.	14
IV	Effective length of columns, Design of columns simple and compound, Lacings & battens, Design of footings for steel structures, Grillage foundation.	14
V	Design of industrial building frames, Multistory frames, Bracings for high rise structures, Design of transmission towers.	14

Text Book/References Books/ Websites:

1. Arya & Azmani Nemchand & Bros; Design of Steel Structures; Nemchand Publication.
2. P. Dayaratnam; Design of Steel Structures; S. Chand Publication.
3. Ramchandra; Design of Steel Structures Vol. I & II; Scientific Publishers.
4. L.S. Negi; Design of Steel Structures; TMH Publication.
5. Punmia; Design of Steel Structures; Laxmi Publications.

Suggested List of Laboratory Practical (Expandable): Nil

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PEOPLE'S UNIVERSITY, BHOPAL (N.)

School of Research and Technology

Department: Civil Engineering

PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*Programme: **Bachelor of Technology****Semester –VII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)
CBCE-704	Theory of Structures-II	3	-	1						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: 15	Lab Performance/ Quiz/Attendance - Max. Marks: 15	

Pre-Requisite	Basic concepts of theory of structure-I.
Course Objective	The main object to provide knowledge to student about analysis of civil structures.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. Understanding the analysis of frame structures. 2. To identify and process of plastic limits. 3. Understand scope of multistorey building. 4. The design and analysis of force and displacement method by matrix. 5. To analysis the influence lines.

Unit	Contents (Theory)	Marks Weightage
I	Moment distribution method in analysis of frames with sway, Analysis of box frames, Analysis of portals with inclined members, Analysis of beams and frames by Kani's method.	14
II	Plastic analysis of beams and frames.	14
III	Analysis of tall frames, Wind and earthquake loads, codal provisions for lateral loads, Approximate analysis of multistory frames for vertical and lateral loads.	14
IV	Matrix method of structural analysis, Force method and displacement method.	14
V	Influence lines for intermediate structures, Muller breslau principle, Analysis of beam-columns.	14


Text Book/References Books/ Websites:

1. Wang C.K.; Intermediate Structural Analysis; Mcgraw Hill, New York.
2. Reddy C.S.; Basic Stgtructural Analysis; Tata Mcgraw Hill Publishing Company, New Delhi.
3. C.H Wilbur J.B. & Utkys; Elementary Structural Analysis; Mcgraw Hill Publication.
4. S. Ramamrutham and R. Narayanan; Theory of Structure; Dhanpat Rai Publishing.
5. R C Hibbeler; Structural Analysis by Pearson; Pearson Education.

Suggested List of Laboratory Practical (Expandable):

1. Analysis of sway in portal frame demonstration.
2. To study the cable geometry and statics for different loading condition.
3. To plot stress and strain curve for concrete. Use of mechanical and electrical strain and stress gauge.
4. Experiment on a 2 hinged arch for horizontal thrust and influence line for horizontal thrust.
5. Experimental and analytical study of a 3 bar pin jointed truss.


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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (35)	Internal (15)	Total (50) Min: 20 (D Grade)
CBCE-705	Environmental Engineering-II	3	1	1						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance – Max. Marks: 10
Practical Internal Max Marks: 15	Lab Performance /Attendance / Quiz - Max. Marks: 15	

Pre-Requisite	Basic concepts of theory of environmental engineering-I.
Course Objective	The main object to provide knowledge to student about analysis and design of sewage.
Course Outcomes	Student will able to learn: <ol style="list-style-type: none"> 1. To understand the principles of energy and virtual work. 2. To find and analysis of indeterminate structure. 3. The design of determinate structures. 4. About the field of arches and suspension cables. 5. About advanced waste water treatment.

Unit	Contents (Theory)	Marks Weightage
I	Sewerage Schemes and Their Importance: Collection & conveyance of sewage, Storm water quantity, Fluctuation in sewage flow, Flow through sewer, Design of sewer, Construction & maintenance of sewer, Sewer appurtenances, Pumps & pumping stations.	14
II	Characteristics and Analysis of Waste Water: Cycles of decomposition, Physical, Chemical & biological parameters, Oxygen demand i.e. Bod & COD, TOC, TOD, OD, Relative stability, Population equivalent, Instrumentation involved in analysis, Natural methods of waste water disposal i.e. By land treatment & by dilution, Self purification capacity of stream, Oxygen sag analysis.	14
III	Unit Operations for Waste Water Treatment: Preliminary treatment such as screens, Grit chamber, Floatation tank, Sedimentation and chemical clarification, Role of micro-organism in biological treatment, Sewage filtration- theory & design.	14
IV	Methods of Biological Treatment (Theory & Design): Activated sludge process, Oxidation ditch, Stabilization ponds, Aerated lagoon, Anaerobic lagoons, Septic tank & imhoff tank, Sources & treatment of sludge, Sludge thickening and digestion sludge drying beds, Sludge disposal.	14
V	Advanced waste water treatment: Diatomaceous earth filters, Ultra filtration, Adsorption by activated carbon, Phosphorus removal, Nitrogen removal, Physico chemical waste water treatment, Solid waste disposal classification, Composition, Collection, & disposal methods, Rural sanitation collection & disposal of refuse, Sullage & night soil.	14

Text Book/References Books/ Websites:

1. G.S. Birdie; Water Supply & Sanitary Engineering, Dhanpat Rai Publishing.
2. B.C. Punmia; Waste Water Engineering; Laxmi Publication.
3. M.L. Davis & D.A. Cornwell; Environmental Engineering; Mc Graw Hill Company.
4. Sawyer & Mc Carty; Chemistry for Environmental Engineering; Mc Graw Hill Book Company
5. Mark J Hammer; Water & Waste Water Technology; Prentice Hall of India.

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Semester –VII

Suggested List of Laboratory Practical (Expandable):

1. To study the various standards for waste water.
2. To study the sampling techniques for waste water.
3. To determine the alkalinity in water sample.
4. To determine the acidity in water sample.
5. Determination of dissolved oxygen in the water and waste water sample.
6. Determination of biological oxygen demand of a waste water sample.
7. Determination of chemical oxygen demand of a waste water sample.
8. Determination of various types of solids in the waste water sample.
9. Determination of bacterial number by membrane filters technique.
10. Determination of bacterial colonies by standard plat count method.


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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (70)	Internal (30)	Total (100) Min: 40 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBCE-706	Geotechnical Engineering-II	3	1	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab Performance /Attendance / Quiz - Max. Marks: Nil	

Pre-Requisite	Student has fundamental knowledge about geotechnical engineering-I.
Course Objective	The main object to provide knowledge about advanced geotechnical engineering and their design.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. About statistical concepts and applications shallow foundation. 2. About identify deep foundation and their concepts. 3. Understand soil improvement techniques their concept and design. 4. Design different types of soil exploration. 5. To analysis the sheet pile and machine foundation.

Unit	Contents (Theory)	Marks Weightage
I	Shallow Foundations: Type of foundations shallow and deep, Bearing capacity of foundation on cohesion less and cohesive soils, General and local shear failures, Factors effecting B.C. Theories of bearing capacity - Prandle, Terzaghi, Balla, Skempton, Meyerh of and Hansan. I.S. code on B.C. determination of bearing capacity, limits of total and differential settlements, Plate load test.	14
II	Deep Foundation: Pile foundation, Types of piles, Estimation of individual and group capacity of piles in cohesion less and cohesive soils, Static and dynamic formulae, Pile load test, Settlement of pile group, Negative skin friction, Under- reamed piles and their design, Piles under tension, Inclined and lateral load caissons, Equilibrium of wells, Analysis for stability tilts and shifts, Remedial measures.	14
III	Soil Improvement Techniques: Compaction, Field and laboratory methods, Proctor compaction tests, Factors affecting compaction, Properties of soil affected by compaction, Various equipment for field compaction and their suitability, Field compaction control, lift thickness, Soil stabilization, Mechanical, Lime, Cement, Bitumen, Chemical, Thermal, Electrical-stabilization and stabilization by grouting, Geo-synthetics, Types, Functions, Materials and uses.	14
IV	Soil Exploration and Foundations on Expansive and Collapsible Soils: Methods of soil exploration, Planning of exploration programmed for buildings, Highways and earth dams, Disturbed and undisturbed samples and samplers for collecting them, Characteristics of expansive and collapsible soils, Their treatment, Construction techniques on expansive and collapsible soils, CNS layer.	14
V	Sheet Piles/Bulkheads and Machine Foundation: Classification of sheet piles/bulkheads, Cantilever and anchored sheet piles, Cofferdams, Materials, Types and applications, Modes of vibration, Mass-spring analogy, Natural frequency, Effect of vibration on soils, Vibration Isolation, Criteria for design, Design of block foundation for impact type of machine.	14

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Semester –VII

Text Book/References Books/ Websites:

1. Dr. K.R. Arora; Soil Mechanics & Foundation Engineering; Standard Publication.
2. Dr. B.C.Punmia; Soil Mechanics & Foundation Engineering; Laxmi Publications.
3. Dr.L Aram Singh; Modern Geotech Engineering; IBT Publishers.
4. C. Venkatramaiah; Geotech Engineering; New Age International Publishers, Delhi.
5. S.K. Garg; Soil Mechanics & Foundation Engineering; Khanna Publishers, Delhi.

Suggested List of Laboratory Practical (Expandable): Nil


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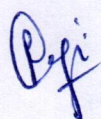
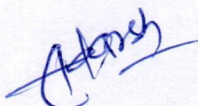
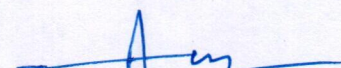
Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (Nil)	Internal (Nil)	Total (Nil)	End Sem (Nil)	Internal (50)	Total (50) Min: 20 (D Grade)
CBCE-707	Innovative Project Lab	-	-	1						

Duration of Theory (Externals): -Nil

Theory Internal- Max Marks: -Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance Max. Marks: Nil
Practical Internal Max Marks: 50	Lab Performance/ Quiz/Attendance - Max. Marks: 50	

Pre-Requisite	Fundamental Engineering concepts of concern discipline.
Course Objective	This course sets in motion an exploration of the fundamental approaches that underpin the making and development of an innovation. It draws on ideas and practices such as - interdisciplinary, creativity, collaboration and entrepreneurship to identify problems and opportunities that give rise to innovation.
Course Outcomes	Students will be able to learn about: <ol style="list-style-type: none"> 1. Carry out independent and/or collaborative research in the planning and scoping of a creative industry project that seeks to present an innovative outcome. 2. Identify, analyze & define the problem. 3. Generate alternative solutions to the problem identified. 4. Compare & select feasible solutions from alternatives generated. 5. To work effectively in a team.

Unit	Contents (Theory)	Marks Weightage
I	<p>Students shall be encouraged to form groups (Maximum 5) to do a Project on technical topic of concern branch. The student should prepare a working system or some design or understanding of a complex system (on minor level) that he/she has selected for his/her innovative project work using system analysis tools and submit the same in the form of a write-up i.e. detail project report.</p> <p>The student should maintain proper documentation of different stages of project such as concept evaluation, requirement specification, objectives, work plan, analysis, design, implementation and test plan wherever applicable.</p> <p>Each student is required to prepare a project report based on the above points and present the same at the final examination with a demonstration of their project.</p>	50

Text Book/References Books/ Websites: Nil**Suggested List of Laboratory Practical (Expandable): Nil**

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School of Research and Technology

Department: Civil Engineering

PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*Programme: **Bachelor of Technology****Semester –VII**

Subject Code	Subject Title	Credit			Theory			Practical		
CBTE-708	Introduction to MATLAB	L	T	P	End Sem (Nil)	Internal (Nil)	Total (Nil)	End Sem (Nil)	Internal (50)	Total (50)
		-	-	1						Min: 20 (D Grade)

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil
Practical Internal Max Marks: 50	Lab Performance/ Quiz/Attendance - Max. Marks: 50	

Pre-Requisite	C Programming, Basics of Engineering Mathematics, Basic computer literacy is expected.
Course Objective	<ol style="list-style-type: none"> To Impart the Knowledge to the students with MATLAB software to enhances programming knowledge in Research and Development. To introduce students the use of a high-level programming language, MATLAB for scientific problem solving with engineering applications.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> Understand the basics of MATLAB. Break a complex task up into smaller, simpler tasks. To prepare programmes under Case Study (Any two Modules). Tabulate results and analyze.

Unit	Contents (Theory)	Marks Weightage
I	<ol style="list-style-type: none"> Introduction- Starting MATLAB, Using MATLAB as a calculator, Creating MATLAB variables, Making corrections, Miscellaneous commands Mathematical functions- Creating simple plots, Adding titles, axis labels, and annotations, multiple data sets in one plot, Matrix generation, entering a vector, Matrix indexing. Array operations and Linear equations- Array arithmetic operations, Matrix inverse, Matrix functions. Introduction to programming in MATLAB - M-File Scripts, Script side-effects, Anatomy of a M-File function, Input and output arguments, Input to a script file, Output commands. Debugging M-files - Debugging process , Preparing for debugging, Setting breakpoints, Running with breakpoints. 	50

Text Book/References Books/ Websites:

- <http://www.matlabtutorials.com/mathforum/>
- <http://www.mathworks.in/matlabcentral/>
- MATLAB Manuals and Handbooks

Suggested List of Laboratory Practical (Expandable):

- Study of introduction to MATLAB.
- Find the factorial of 5 using MATLAB command.
- Generate the following row vector $b=[1, 2, 3, 4, 5, \dots, 9, 10]$, then transpose it to column vector.
- Write a programme to Solve the following system $x+y=1$ $x-y+z=0$ $x+y+z=2$
- Write a programme, let $x=[2 \ -3 \ 5; 0 \ 11 \ 0]$, then a) find elements in x that are greater than 2 b) find the number of nonzero elements in x.
- Plot Sinc function, where $\text{Sinc}(x) = \sin(x) / x$, and $-2\pi \leq x \leq 2\pi$
- Study of M file, Script file and function file in MATLAB with suitable examples.
- Two case studies related to your respective disciplines.

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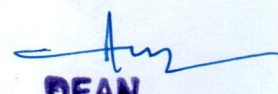
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Programme: Bachelor of Technology

Semester –VII

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (Nil)	Internal (50)	Total (50) Min: 20 (D Grade)	End Sem (Nil)	Internal (Nil)	Total (Nil)
CBTE-709	Psychology	1	-	-						

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: 50	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: 50
Practical Internal Max Marks: Nil	Lab Performance/ Quiz/Attendance - Max. Marks: Nil	

Pre-Requisite	Nil
Course Objective	This course makes the students able to understand and deal with personal and professional aspects of life. They become able to deal with common psychological problems encountered in an engineer's life. Their ability to deal with societal aspects of behavior is enhanced. By application of knowledge their quality of personal living and job is maximized.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. Be able to understand and deal with personal and organization phenomenon. 2. Be able to deal with common psychological aspects related to an Engineer's life. 3. Be able to understand the impact of social environment on individuals, groups and communities. 4. Be able to utilize the knowledge of Sociology and to improve the quality of living of self and social relationship at large.

Unit	Contents (Theory)	Marks Weightage
I	Psychology: Introduction Definition and Scope of Psychology; Psychology as a science, Personality: Definition, types of personality, Measurement of Personality. Perception, Motivation and Learning.	10
II	Application of Psychology: Stress-management, Well-being; Self-development: Application of Psychology in building memory and creativity.	10
III	Sociology: Introduction, Importance of Sociology for Engineers, Sociology: Definition and nature; Origin of Society, Social Processes: – Competition, Cooperation Conflict, Accommodation and Assimilation, Social groups – Types and Characteristics; Social Institutions: Marriage: and Family; Religion: Functions and dysfunctions of religion.	10
IV	Social concerns Social Stratification: Nature and types, Prejudices, Social Mobility. Social Changes: – Urbanization, Westernization, and Pluralism. Social Disorganization, Social Problems: – Deviance, Delinquent behavior amongst youth, Crime, Prostitution, Gender injustice, Child Abuse, Terrorism. Social Movements.	10
V	Cognitive Psychology. An introduction to human mental processes, problem solving, pattern recognition, imagery, memory retention, language comprehension Attention & Perception: Definition, types of attention, perception.	10

Text Book/References Books/ Websites:

1. Eastwood and Atwater; Psychology for living: Adjustment, growth and behavior today; Prentice Hall.
2. Meena Hariharan and Radhanath Rath, Coping with life stress. Sage Publications, ;
3. Shankar Rao; C .N, Sociology; S.Chand & Co Ltd.
4. S. K. Mangal; General Psychology; Sterling Publishers Pvt. Ltd.
5. Baron A. Robert; Psychology; Prentice Hall of India.

Suggested List of Laboratory Practical (Expandable): Nil

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (Nil)	Internal (Nil)	Total (Nil)	End Sem (Nil)	Internal (50)	Total (50) Min: 20 (D Grade)
CBTE-710	Massive Open Online Courses (MOOCs)-II	-	-	1						

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil
Practical Internal Max Marks: 50	Lab Performance/ Quiz/Attendance - Max. Marks: 50	


Pre-Requisite	Nil
Course Objective	MOOCs build on the engagement of learners who self-organize their participation according to learning goals, prior knowledge and skills, and common interests. Objective of this course is to improve the technical skills of students and its gives an opportunity to explore themselves beyond class room teaching.
Course Outcomes	Student will able to learn: New interesting courses of their own curiosity and improve their knowledge and skills. MOOCs give an opportunity to connect openly on a global scale, with global learners. The ability to experiment with pedagogical methods on a vast scale.

Unit	Contents (Theory)	Marks Weightage
I	<p>Massive Open Online Courses (MOOCs) are online courses that allow participants free access and unrestricted participation in any course of their choice. Besides the conventional modes of teaching such as lectures, videos and reading material, MOOCs also provide a platform for interactive forums.</p> <p>After the VI semester End Sem Examination, all students are instructed to register themselves in a minimum IV (Four weeks) MOOC/NPTEL/SWAYAM Certification course in their Engineering discipline.</p> <p>Students must appear in the certification examination conducted by NPTEL/ SWAYAM and submit it to their respective assigned faculty before the end of the semester. A student should give an effective PowerPoint presentation of chosen course in the class scientific seminars and receive feedback from each other. This effort will help them to communicate their ideas more clearly.</p> <p>The final evaluation of this course will base on a PowerPoint Presentation and Certification during the academic session by the assigned faculty.</p>	50

Text Book/References Books/ Websites:

1. <https://swayam.gov.in/>
2. <http://nptel.ac.in>
3. <https://onlinecourses-archive.nptel.ac.in>

Suggested List of Laboratory Practical (Expandable): Nil


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Subject Code	Subject Title	Credit			Theory			Practical		
CBTE-711	Professional Ethics and Proficiency	L	T	P	End Sem (Nil)	Internal (Nil)	Total (Nil)	End Sem (35)	Internal (15)	Total (50)
		-	-	1						Min: 20 (D Grade)

Duration of Theory (Externals): -Nil

Theory Internal- Max Marks: -Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance Max. Marks: Nil
Practical Internal Max Marks: 15	Lab performance/Quiz/Attendance: Max. Marks: 15	

Pre-Requisite	Nil
Course Objective	To enable the students to imbibe and internalize the values and ethical behaviour in personal and professional live.
Course Outcome	Student will be able to learn: <ol style="list-style-type: none"> 1. Understand the core values that shape the ethical behaviour of a professional. 2. The need for professional ethics, codes of ethics and roles. 3. The ethical issues related to engineering. 4. The responsibilities and rights of an engineer in the society. 5. The knowledge of human values and social values to contemporary ethical values and global issues.

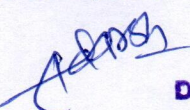
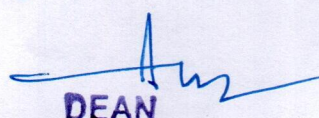
Unit	Contents (Theory)	Marks Weightage
I	Introduction to Professional ethics. Basic concepts, Governing ethics , Personal and Professional ethics, Ethical Dilemmas, Life Skills, Emotional intelligence, Thoughts of Ethics, Value education, Dimension of ethics, Professional associations, Professional risks, Professional accountabilities, Professional success, Ethics and profession .	50
II	Engineering Ethics & Professionalism. Senses of Engineering Ethics - Variety of moral issues- Types of inquiry- Moral dilemmas –Moral Autonomy – Kohlberg's theory- Gilligan's theory- Consensus and Controversy-Profession and Professionalism- Models of professional roles-Theories about right action –Self interest-Customs and Religion- Uses of Ethical Theories.	
III	Engineering as social Experimentation. Engineering as Experimentation – Engineers as responsible Experimenters- Codes of Ethics- Plagiarism-A balanced outlook on law.	
IV	Responsibilities and Rights. Collegiality and loyalty – Managing conflict- Respect for authority- Collective bargaining- Confidentiality-Role of confidentiality in moral integrity- Conflicts of interest- Occupational crime- Professional rights-Employee right- IPR Discrimination.	
V	Global Ethical Issues. Multinational Corporations- Environmental Ethics- Business Ethics- Computer Ethics -Role in Technological Development-Engineers as Managers- Consulting Engineers- Engineers as Expert witnesses and advisor -Moral leadership.	

Text Book/References Books/ Websites:

1. M. Govindarajan, S .Natarajan and V. S. Senthil Kumar; Engineering Ethics; PHI Learning Private Ltd, New Delhi, 2012.
2. R S Naagarazan; A text book on professional ethics and human values; New age international (P) limited, New Delhi, 2006.
3. Mike W Martin and Roland Schinzinger; Ethics in Engineering, 4th edition; Tata McGraw Hill Publishing Company Pvt Ltd, New Delhi, 2014.

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4. Charles D Fleddermann; Engineering Ethics; Pearson Education/ Prentice Hall of India, New Jersey, 2004.
5. <http://www.slideword.org/slidestag.aspx/human-values-and-Professional-ethics>.

Suggested List of Laboratory Practical (Expandable): Nil

Students should prepare and submit hard and soft copy of their report to assigned faculty before End Semester Examination.


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PEOPLE'S UNIVERSITY, BHOPAL*(Applicable for Admitted from Academic Session 2021-22 onwards)*

Programme: Bachelor of Technology

Semester –VII

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	End Sem (Nil)	Internal (Nil)	Total (Nil)	End Sem (Nil)	Internal (50)	Total (50) Min: 20 (D Grade)
CBTE-712	GD/Seminar	-	-	1						

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil
Practical Internal Max Marks: 50	Lab Performance/Attendance /Quiz - Max. Marks: 50	

Pre-Requisite	Nil
Course Objective	To enable the students perform as a team player and also emerge as a leader in the group.
Course Outcomes	Student will be able to: <ol style="list-style-type: none"> 1. Understand nature, importance and characteristics of group discussion. 2. Familiarise himself/herself with the different types of group discussions. 3. Learn to identify areas of evaluation in selection group discussions. 4. Chalk out strategies for making individual contributions in group discussion. 5. Learn the method of in-depth study in a specialized area and prepare and present the report of the same.

Unit	Contents (Theory)	Marks Weightage
I	Group Discussion: <ul style="list-style-type: none"> • Nature, importance and characteristics of group discussions. • Selection Group Discussions • Group Discussion Strategies • Techniques for Individual Contribution • Group Interaction Strategies 	50
	Seminar: <ul style="list-style-type: none"> • In depth study in a specialized area by doing literature survey, understanding different aspects of the problem and arriving at a status report in that area. • Learn investigation methodologies, study relevant research papers, correlate work of various authors/researchers critically, study concepts, techniques, prevailing results etc., analyze it and present a seminar report. 	

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Practical (Expandable):

Students should prepare and submit hard and soft copy of their report to assigned faculty before End Semester Examination.

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FACULTY OF ENGINEERING
PEOPLE'S UNIVERSITY, BHOPAL

Department: Civil Engineering

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ACADEMIC AFFAIRS
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PEOPLE'S UNIVERSITY, BHOPAL***(Applicable for Admitted from Academic Session 2021-22 onwards)***

Programme: Bachelor of Technology

Semester –VIII

Subject Code	Subject Title	Credit			Theory			Practical		
CBCE-801	Project Internship and Viva-Voce	L	T	P	End Sem (Nil)	Internal (Nil)	Total (Nil)	End Sem 300	Internal 200	Total (500)
		-	-	10						Min: 200 (D Grade)

Duration of Theory (Externals): Nil

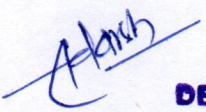
Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil
Practical Internal Max Marks: 200	Lab Performance/Attendance /Quiz - Max. Marks: 200	

Pre-Requisite	Must have practical knowledge of respective program.
Course Objective	The course aimed to expose technical students to the industrial environment, which cannot be simulated in the classroom and hence creating competent professionals for the industry. Provide possible opportunities to learn understand and sharpen the real time technical / managerial skills required at the job. Exposure to the current technological developments relevant to the subject area of training.
Course Outcomes	Student will be able to learn: <ol style="list-style-type: none"> 1. After completion of this semester long course the student trained in his specialized area of operation. 2. Will be able to critically think, observe and communicate. 3. Will acquire the work experience through advance learning (in terms of depth, complexity and engagement) in an industrial environment. 4. Will be able to apply, extend and test the knowledge gained from class room experience to understand and mitigate complex issues and address real industry challenges. 5. Will be able to assimilate technical and administrative or managerial skills from his interactions with a variety of individuals, systems and practices.

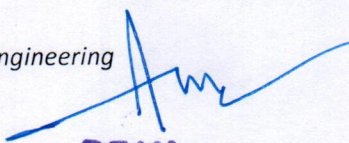
Unit	Contents (Theory)	Marks Weightage
I	<p>The purpose of the Internship Program is to provide each student practical experience in a standard work environment. The students must undergo industrial training/internship for a minimum period of 120 days during the 8th semester in any of the reputed Govt. or private industry/ Government-sponsored Research & Development Organization/ reputed academic institution/foreign universities. The student will give a seminar with help of power point presentation based on his/her internship report before an departmental expert committee constituted by the concerned department as per norms of the institute and submit a report in hard copy to the department in prescribed format from college. The evaluation will be based on the following criteria:</p> <ul style="list-style-type: none"> • Internal departmental presentation to check knowledge & experience of Project Internship. • External Viva-Voce to evaluate Project Internship work done by student. 	500

Text Book/References Books/ Websites: Nil**Suggested List of Laboratory Practical (Expandable): Nil**

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