PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
BT-1301	Engineering Mathematics-II	3	1	-			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 work & Session – Max Marks: Nil	Assignment / Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	Fundamental knowledge of mathematics such as algebra and trigonometry.
Course Outcome	1. Experience mathematics outside of your regular course work.
	2. Use knowledge and skills necessary for immediate employment or acceptance into a graduate program.
	3. Maintain a core of mathematical and technical knowledge that is adaptable to changing technologies and provides a solid foundation for future learning.

Unit	Contents (Theory)	Marks Weightage
I	**Fourier Series:** Introduction of Fourier series, Fourier series for discontinues functions, Fourier series for even and odd function, Half range sine and cosine series and Fourier transform.	**14**
II	**Laplace Transformations :** Introduction of Laplace Transform of elementary functions, Properties of Laplace transform ,Change of scale property, Shifting property, Laplace transform of the derivative, Inverse Laplace transform and its properties, Convolution theorem and applications of Laplace transformation to solve the ordinary differential equations.	**14**
III	**Second Order Linear Differential Equations with Variable Coefficients:** Methods one integral is known, Removal of first derivative, Changing of independent variable and variation of parameter, Solution by series method.	**14**
IV	**Linear & Non Linear Partial Differential Equations of First Order :** Formulation of partial differential equations, Solution of equation by direct integration, Lagrange's linear equation, Non linear partial differential equation and Charpit's method, Linear homogeneous and non-homogeneous partial differential equation of second and higher order with constant coefficients.	**14**
V	**Vector Calculus :** Differentiation of vectors, Scalar and vector point function, Geometrical meaning of gradient, Unit normal vector and directional derivative, Physical interpretation of divergence and curl, Line integral, Surface integral and volume integral, Green's Stroke's and Gauss divergence theorem.	**14**

Text Book/References Books/ Websites

1. D.C. Aggarwal ;Engg. Mathematics – II; S Chand Publication.
2. BS Grewal ;Higher Engineering Mathematics; Khanna Publication.
3. S.Arumungam ;Mathematics for Engineers; SCITECH Publications.
4. Erwin Kreyszig ;Advanced Engineering Mathematics; Wiley India.
5. D.G.Guffy ;Advance Engineering Mathematics; Jones & Bartlett.
6. S Sastri; Engineering Mathematics; P.H.I. Publication.
7. Peter V.O'Neil, Thomson Learning ;Advanced Engineering Mathematics; CENGAGE Learning Custom Publishing.

Suggested List of Laboratory Practical (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total
CET-1302	Transportation Engg.-I	3	1	-	External (70)	Internal (30)	Min: 40 (D Grade)	External (Nil)	Internal (Nil)	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 work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. To study about tractive resistances & permanent way, principles of transportation, modes of transportation, their importance and limitations.
	2. Geometric design of station & yards, points & crossings, super elevation, equilibrium, cant and cant deficiency, various curves, layout details.
	3. To study about bridge site investigation and planning, collection of bridge design data type of road & railway bridges.

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 railways bridges and highway bridges, Bridge super structure 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, Coffer-dams, 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**

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.

Suggeted List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total 100	External (35)	Internal (15)	Total (50)
CET-1303	Strength of Materials	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. Study about the simple stress and strains: various types of stress and strains.
	2. To know about the principal stresses and strains, Mohr's circle of stresses, support reactions, shear force and bending moment.
	3. To give knowledge about the torsion of shafts & its applications.

Unit	Contents (Theory)	Marks Weightage
I	**Simple Stress and Strains**: Concept of elastic body, Stress and strain, Hook'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 formulae, Eccentric loading on columns.	**14**

Text Book/References Books/ Websites

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

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –III**

Suggested List of Laboratory Experiments :- (Expandable):

I	The experimental work to tension, compression, bending, impact test on the RCC, steel ,mild steel ,cat iron ,timber etc.
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 matels.
9	To determine the stiffness of the spring and modulus of rigidity of the spring wire.
10	To study various types of strain gauges.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total 100	External	Internal	Total (50)
CET-1304	Building Design and Drawing	3	1	1	(70)	(30)	Min 40 (D Grade)	(35)	(15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**	
Course Outcome	1	Drawing of various elements of buildings like footing, door and windows, staircase, lintel and arches.
	2	Use of national building code for building planning, principles of planning and orientation.
	3	To demonstrate building services like water supply, electrification, ventilation, fire safety.

Unit	Contents (Theory)	Marks Weightage
I	**Drawing of Building Elements** : Drawing of various elements of buildings like various, 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, Set backs, FAR terminology, Principle of architectural composition (i.e. Unity, contrast, etc.), Principles of planning, Orientation.	**14**
III	**Building Services** : Introduction of building services like water supply and drainage, Electrification, Ventilation and 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.
3. Gurucharan Singh & Jagdish Singh Building Planning, Design and Scheduling, Standard Publishers Distributors.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –III**

Suggested List of Laboratory Experiments :-

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 bed room residential building (common to all students).
7	One drawing sheet each of residential and institutional building (each student perform Different drawing).
8	Use of AutoCAD for preparation of drawings.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total 100	External	Internal	Total (50)
CET-1305	Rock Mechanics and Engineering	3	1	1	(70)	(30)	Min 40 (D Grade)	(35)	(15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**	
Course Outcome	1	To study about crust and interior of earth, deposition of soil and classification of soils.
	2	To demonstrate fundamentals of mineralogy and elements of crystallography.
	3	To understand composition of earth's crust, geology of India.

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.	**14**
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.	**14**
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.	**14**
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.	**14**
V	**Applied Geology:** Introduction to applied geology and its use in civil engg., 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.	**14**

Text Book/References Books/ Websites

1. Prabin Singh; Engineering and General Geology; Katson Books.
2. Gulati ; Geotechnical Engineering; TMH.
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.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –III**

Suggested List of Laboratory Experiments :-

1	Identification of simple rock forming minerals and important ores.
2	Identification of rock.
3	Simple map exercises.
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.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (Nil)	External	Internal	Total (50)
BT-1306	C++ Programming	-	-	1	(Nil)	(Nil)	Nil	(35)	(15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	Students have basic knowledge of programming
Course Outcome	1.An understanding of the concepts of inheritance and polymorphism
	2. An understanding basic concepts of C++ programming
	3.An ability to incorporate exception handling in object-oriented programs

Unit	*Contents (Theory)*	Marks Weightage
I	**C++ Basics:** Structure of a C++ program, Data types, Declaration of variables, Expressions, Operators, Operator Precedence, Evaluation of expressions, Type conversions, Pointers, Arrays, Strings, Structures, conditional statement, control structure, switch-case, break, go to statements. **OOPS :** Introduction to OOPS, differences Between OOP and Procedure Oriented Programming, Overview of OOP principles. **Function & Classes:** Scope of variables, Parameter passing, Default arguments, inline function, Recursive function, Dynamic memory allocation and reallocation, operators-new and delete, Preprocessor directives, **Classes:** Class Definition, Class Structure, Class Scope, object, Friends to a class, Static class members, Constructors and Destructors, Dynamic creation and destruction of objects, Data Abstraction. **Inheritance:** Inheritance, Defining a class hierarchy, Different forms of inheritance, Defining the Base and Derived classes, Access to the base class member. **Polymorphism:** Function overloading, Operator Overloading , Virtual Function Polymorphism: Static and Dynamic binding, Base and Derived class virtual functions, Pure virtual functions, Abstract classes, C++ Exception Handling and File Handling, Comparison of C++ with C, Java and C#.	**50**

Text Book/References Books/Websites

1. E. Balaguruswamy;Object Oriented programming with C++; TMH, 2001
2. Yashwant Kanitkar; Let us C++
3. Radha Ganesan;Object Oriented Programming with C++"; Scitech Publication PVT.LTD. Chennai
4. Padam Gulwani & Anshuman Sharma;Elementary Concepts of Computer Design and Hardware

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –III**

Suggested List of Laboratory Experiments :- (Expandable):

1. Program to print any Message
2. Program for Conditional Statements, Looping Statements and Switch Case
3. Program to implement Arrays, Strings and Pointers
4. Program to implement Functions and Dynamic Memory Allocation
5. Program to implement Class and Objects
6. Program to implement Friend Functions and Constructors
7. Program for Inheritance
8. Program for Polymorphism
9. Program for File Handling
10. Program for Exception Handling

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total 100	External	Internal	Total (50)
BT-1307	Professional Skills	-	-	1	(Nil)	(Nil)	Nil	(Nil)	(50)	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 work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: 50

Pre-Requisite	**Nil**	
Course Outcome	1	Team work and leadership qualities of a leader.
	2	Task planning and its execution.
	3	Business communication and its necessary skills.

Unit	Contents (Theory)	Marks Weightage
I	**Social Skills:** Society, Social structure, Develop sympathy and empathy. **SWOT Analysis**: – Concept, How to make use of SWOT.	**50**
II	**Inter personal Relation:** Sources of conflict, Resolution of conflict; Ways to enhance interpersonal relations.	
III	**Quantitative Aptitude:** Percentages/Profit & Loss, Time and work, Simple and compound Interest, Series and progression.	
IV	**Reasoning :** Puzzles and seating arrangement, Data sufficiency, Coding-decoding, Blood relation, Order and ranking, Alpha numeric symbol series, Logical reasoning:	
V	**English**: Free quizzes related to synonyms, Antonyms, One word substitution, Idioms and phrases, Spelling correction, Fill in the blanks and common errors in english.	

Text Book/References Books/ Websites : Nil

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total Nil	External	Internal	Total (50)
CET-1308	AutoCAD-I	-	-	1	(Nil)	(Nil)	Nil	(35)	(15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**	
Course Outcome	1	To give knowledge about the Auto Cad designing Software.
	2	To give knowledge about how to draw Plan of any structures.
	3	To study of all command uses in drawing.

Unit	Contents (Theory)	Marks Weightage
I	**Students Have to Understand the Working of AutoCAD:** Introduction to computer aided drafting software for 2d and 3d modeling, Benefit, Software's basic commands of drafting entities like line, Polyline , Scale, Trim, Extend, Circle, Polygon, Rectangle editing commands like move, Rotate, Mirror, Array**.** . Practicing commands under draw and dimension menu. . Practicing commands under modify menu. . Practicing commands under tool menu. . Practicing commands under format menu. . Practicing commands under express menu.	**50**

Text Book/References Books/ Websites :- Nil

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
BT-1401	Engineering Mathematics-III	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	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 work & Session – Max Marks: Nil	Assignment / Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	Fundamental knowledge of basic mathematics such as Algebra and Trigonometry
Course Outcome	1. Experience mathematics outside of your regular course work.
	2. Use knowledge and skills necessary for immediate employment or acceptance into a graduate program.
	3. Maintain a core of mathematical and technical knowledge that is adaptable to changing technologies and provides a solid foundation for future learning.

Unit	Contents (Theory)	Marks Weightage
I	**Functions of Complex Variables :** Analytic functions, Harmonic conjugate, Cauchy – riemann equations, Line integral, Cauchy's theorem, Cauchy's integral formula, Singular points, Poles and residues, Residue theorem and evaluation of real integral.	**14**
II	**Solution of Algebraic & Simultaneous Equations :** Solutions of algebraic and transcendental equations(Regula Falsi, Newton-Raphson, Iterative, Graffee's root squaring methods) and solutions of simultaneous algebraic equations (Gauss Elimination, Gauss Jordan, Jacobi Iterative, ,Gauss Seidel and Crout's Traingularization).	**14**
III	**Numerical Analysis:** Difference operators, Errors and approximations, Interpolation, Inverse interpolation, Numerical differentiation, Numerical integration by using Simpson's method, Weddle's rule and Trapezoidal Rule.	**14**
IV	**Solution to Differential Equations:** Solutions of ordinary differential equations (Taylor's Series, Picard's Method, Euler's Method, Modified Euler's method, Runge method and Runge Kutta Method), Solve differential equation Milne's predictor and corrector method	**14**
V	**Concept of Probability:** Probability mass function, Probability density function, Discrete distribution binomial, Poisson's, continuous distribution, Normal distribution, Exponential distribution, Curve fitting(method of least square)	**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. MKJain, Iyengar and RK Jain ; Numerical Methods for Scientific and Engg. Computation ; New Age International Publication.
6. Pobability and Statistics by Ravichandran ,Wiley India.
7. Mathematical Statistics by George R., Springer.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total 100	External (Nil)	Internal (Nil)	Total
CET-1402	Concrete Technology	3	1	-			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 work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Classification, properties, grades, advantage & disadvantages and testing of concrete and ingredients of concrete.
	2. Design of concrete mix with different methods such as I.S code method, computer aided design of concrete mix.
	3. Study of different special concretes such as ready mix concrete, fiber reinforced concrete, prestressed concrete.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction**: Classification, Properties, Grades, Advantage & 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, Factor 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 condition, 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. Varshney R S; Concrete Technology; Oxford & Ibh Publishing Co.
2. Gambhir M L; Concrete Technology – TMH
3. Sinha S N; Reinforced Concrete Technology; TMH
4. Mohan Rai & M.P. Jai Singh; Advances In Building Materials & Construction
5. A.M. Neville, Properties Of Concrete , Pearson Education

Suggested List of Laboratory Experiments:- Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total (50)
CET-1403	Construction Material and Techniques	3	1	1	External (70)	Internal (30)	Min 40 (D Grade)	External (35)	Internal (15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. Study of different building materials such as stone, timber, brick, tiles etc.
	2. Study of different advance building materials such as use of fly ash in mortars, concrete, fly ash bricks, stabilized mud blocks, D.P.C etc.
	3. To give the knowledge of different type of soils, bearing capacity, soil stabilization and design of different types of foundation.

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 brick table, 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: T**ype 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**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –IV**

V	**Floors and Roofs : T**ypes, 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**

Text Book/References Books/ Websites:

1. S.C. Rangwala; Engineering Materials; Chorator publishers.
2. Sushil Kumar; Building Construction; Standard Publishers Distributers.
3. B.C. Punmia; Building Construction; Laxmi Publications.
4. Surendra Singh; Engineering Materials; Vikas Publishing.

Suggested List of Laboratory Experiments:-

1 Tests on bricks.
2 Los angles abrasion test.
3 Aggregate impact test.
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

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total (50)
CET-1404	Surveying-I	3	1	1	External (70)	Internal (30)	Min 40 (D Grade)	External (35)	Internal (15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. To study of hydrographic survey by using different method, use of remote sensing in the field in civil engineering.
	2. Study of different types of curves use in the field and its plotting using the surveying instruments.
	3. To give the knowledge of traversing with the help of Theodolite using different methods

Unit	Contents (Theory)	Marks Weightage
I	**Traversing by Theodolite:** Traverse computations, Latitude and departures, Adjustments, Computations of co-ordinates, Plotting & adjusting or traverse, Omitted measurements, EDM, Trigonometric leveling.	**14**
II	**Tachometry:** Tachometric systems and principles, Stadia system, Uses of anallatic lens, Tangential system, Sub lense system, Instrument constant, Direct-reading tacheometers, Use of tacheometry 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, Vertical curves, Setting out.	**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, Vol. I & II; Pune Vidhyarthi Griha Prakashan
2 Duggal, Surveying I & II ; Mc.Graw Hill, New York.
3 Basak; Surveying And Leveling; Mc.Graw Hill, New York.
4 R.E.Devis; Surveying Theory & Practice, Mc.Graw Hill, New York.
5 B.C. Punmia; Surveying Vol. I, II, III; Laxmi Publications New Delhi.
6 K.R. Arora; Surveyhing Vol. I & II.; Standard Book House, New Delhi.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –IV**

Suggested List of Laboratory Experiments :-

1. Determination of tachometric constants & uses of tachometer in various field works.
2. Profile leveling, contouring & cross sectioning
3. Curve setting by different methods.
4. To find the R.L. of given stations with the help of auto level.
5. To measure included angle by theodolite traversing.
6. To measure the exterior angle by theodolite traversing.
7. Determination of elevation of point trigonometric leveling.
8. To make a contour plan of given area (on full size drawing sheet).

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total (50)
CET-1405	Fluid Mechanics-I	3	1	1	External (70)	Internal (30)	Min 40 (D Grade)	External (35)	Internal (15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. Study of different types of properties of fluid, fluid pressure, buoyancy and floatation
	2. Kinematics of flow, ideal & real , steady & unsteady, uniform & non-uniform path lines streamlines, continuity equation flow nets- their utility
	3. To give the knowledge of dynamics of flow, Bernoulli's equation, momentum equation, fluid measurements.

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, Streamlines 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:

1. Modi & Seth; Fluid Mechanics; Standard Book House, Delhi.
2. R.K. Bansal ; Fluid Mechanics; Laxmi Publications(P Ltd).
3. Cengal; Fluid Mechanics; TMH.
4. White ; Fluid Mechanics ; TMH.
5. Jnik Dake ; Essential of Engg Hyd.; Afrikan Network & Sc Instt. (Ansti).
6. Franiss Jrd ; A Text Book of Fluid Mech. for Engg. Student.

Suggested List of Laboratory Experiments:-

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 Bernoullis 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

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total (50)
CET-1406	Material Testing Lab	-	-	1	External (Nil)	Internal (Nil)	Nil	External (35)	Internal (15)	20 (D Grade)

Duration of Theory (Externals): 3 Hours

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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. To understand the basic knowledge of Indian standard light compaction test.
	2. To be able to understand the use of Indian standard heavy compaction test.
	3. To get to know about the use of determination of field density.

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- (Expandable): Nil

1 Indian standard light compaction test/std. proctor test.
2 Indian standard heavy compaction test/modified proctor test,
3 Determination of field density by core cutter method
4 Determination of field density by sand replacement method
5 Determination of field density by water displacement method
6 CBR test
7 Tests on aggregates.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total			Total (50)
BT-1407	Social Engineering	-	-	1	External (Nil	Internal (Nil)	(Nil)	External (Nil)	Internal (50)	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: Nil	Lab work & Sessional – Max Marks: Nil	Assignment / Quiz/Attendance Max. Marks: 50

Pre-Requisite	***Nil***
Course Outcome	1. An outcome refers to psychological manipulation and human behavior of students into performing actions or divulging confidential information.

Unit	Contents (Theory)	Marks Weightage
I	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. Contents are as follows: Introduction of Social Engineering, Types, Psychology in social engineering; The social engineering life cycle ,Human behavior Weapons of a social engineer ,Defense against social engineering, Examples, Reverse social engineering.	**50**

Text Book/References Books/ Websites:

1. Kevin Mitnick; The book The Art Of Deception.
2. www.socialengineer.com/wpcontent/uploads/2017/02/AdvancedPracticalSocialEngineering-Syllabus.pdf.
3. www.youtube.com/watch?v=b-yqbNM3s7c&feature=related
4. **https://www.exploit-db.com/docs/english/18135-social-engineering---the-human-factor.pdf.**
5. **http://www.ittoday.info/AIMS/DSM/82-10-43.pdf**

Suggested List of Laboratory Experiments :- (Expandable):

Students should prepare a hand written report on social engineering as assigned by faculty.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total Nil			Total (50)
CET-1408	AutoCAD-II	-	-	1	External (Nil)	Internal (Nil)	Nil	External (35)	Internal (15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. Practicing plan, section and elevation of residential buildings.
	2. Practicing plan, section and elevation of commercial buildings.
	3. Practicing plan, elevation and side view of institutional buildings.

Unit	Contents (Theory)	Marks Weightage
I	**Students have to understand the working of AutoCAD** Practicing plan, Section and elevation of residential buildings, Practicing plan, Section and elevation of commercial buildings, Practicing plan, Elevation and side view of institutional buildings.	**50**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total 100	External (Nil)	Internal (Nil)	Total
BT-1501	Entrepreneurship & IPR	3	1	-			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 work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. It gives the knowledge entrepreneurship, role of entrepreneur in different field Forms of business organizations/ownership - formation of a company etc.
	2. To give the knowledge of working of management, its qualities, Motivation Theories - motivation model, SWOT analysis and TA analysis to the students.
	3. Marketing, its different types, its impact, its importance, Finance, Break Even Point, Role of state and central government agencies in promotion of small scale industry.

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, Spam 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. **Finance:** Nature and scope, Forms of business ownerships, Balance sheet, Profit and loss account, fund flow and cash flow statements, Break Even 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.	**14**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –V**

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 Handbook for New Entrepreneurs, EDII, Ahmadabad.
2 P.Saravanavel; Entrepreneurial Development; S. S. Khanka.
3 Tandon B.C.;Environment and Entrepreneur ; Asian Publishers, New Delhi.
4 Singh P.Narendra; Emerging Trends in Entrepreneurship Development Theories & Practices Entrepreneurship
5 Rao Gangadhara N; Growth of Enterprise in Industrial Estates ; N. Gangadhara Rao. Deep & Deep Publications.

Suggested List of Laboratory Experiments: - Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total
CET-1502	Transportation Engineering-II	3	1	-	External (70)	Internal (30)	Min 40 (D Grade)	External (Nil)	Internal (Nil)	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 work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. To tell about highway planning, alignment & geometric design: principles of highway planning to the students.
	2. It gives knowledge about design of bituminous & cement concrete pavements WBM, WMM, BM, IBM, surfaces.
	3. It explain about low cost roads, drainage of roads, traffic engg. & transportation planning, surface and sub-surface drainage, highway materials to the students.

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, Engg. Survey required for highway location, Cross sectional elements- width, Camber, Super-elevation, Sight distances, Extra Widening at curves, Horizontal and vertical curves, and 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 Engg. & 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: T**axi 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 lending system, Precision approach radar, or Enroute traffic control.	**14**

Text Book/References Books/ Websites:

1 S.K. Khanna & C.E.G. Justo, Highway Engineering, Nam Chand & Bros.
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 Experiments: - Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total (50)
CET-1503	Design of R.C.C. Structures-I	3	1	1	External (70)	Internal (30)	Min 40 (D Grade)	External (35)	Internal (15)	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: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. It gives knowledge of basic principles of structural design, calculation of various loads for structural design
	2. Detail design of beams for different shear and bond.
	3. Design of different types of slabs, on way & two way.

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, Beams with compression reinforcement, Design of beam for shear and bond.	**14**
III	**Design of Slabs:** Slabs spanning in one direction, Cantilever, Simply supported and continuous slabs, Slabs spanning in two directions, Circular slabs, Waffle slabs, Flat slabs.	**14**
IV	**Columns & Footings:** Effective length of columns, Short and long columns- square, Rectangular and circular columns, Isolated and combined footings, Strap footing, Columns subjected to axial loads and bending moments (sections with no tension), Raft foundation.	**14**
V	**Staircases:** Staircases with waist slab having equal and unequal flights with different support conditions, Slab less 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, New Delhi.
3. Rammuttham; Plain & Reinforced Concrete; Medtech.
4. B.C. Punnia; Plain & Reinforced Concrete; Firewall Media.
5. N.K.Raju ; Structural Design & Drawing; CBS Publisher.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –V**

Suggested List of Laboratory Experiments:-

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 and strap footing.
9 Design and drawing of staircase.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total (50)
CET-1504	Surveying-II	3	1	1	External (70)	Internal (30)	Min 40 (D Grade)	External (35)	Internal (15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks:05

Pre-Requisite	**Nil**
Course Outcome	1. Different types of modern equipments for surveying its application and their uses in the field.
	2. The detail knowledge of astronomy & its use in the surveying.
	3. GPS, its detail working and application in surveying.

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 datum's, 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**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –V**

Text Book/References Books/ Websites:

1 T.P. Kanetkar and S.V. Kulkarini; Surveying and Leveling-Part-I & II ; Pune Vidyarthi Griha Prakashan, Pune.

2 A.M. Chandra; Surveying: Problems Solving with Theory and Objective type Questions; New Age International Publishers N. Delhi.

3 A.M. Chandra ; Advance Surveying; New Age International Publishers N. Delhi.

4 S.K. Duggal, Surveying Vol. II; Tata Mcgraw ; Hill Publishing Company Ltd. New Delhi.

Suggested List of Laboratory Experiments:-

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.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total (50)
CET-1505	Fluid Mechanics-II	3	1	1	External (70)	Internal (30)	Min 40 (D Grade)	External (35)	Internal (15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. It gives the knowledge of different types of flows and its related problems, pipe network, water hammer. transmission of power.
	2. To study uniform flow in open channels, specific energy, critical flow.
	3. To give the knowledge of different types of forces on immersed bodies such as sphere, cylinder, flat plate

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.	**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, Venturi flume.	**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.	**14**
V	**Turbines:** Classifications, Definitions, Similarity laws, Specific speed and unit quantities, Pelton turbine-their construction and settings, Speed regulation, Dimensions of various elements, Action of jet, Torque, Power and efficiency for ideal case, Characteristic curves, Reaction turbines, Construction & settings, Draft tube theory, Runaway speed, simple theory of design and characteristic curves, Cavitations. **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**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –V**

Text Book/References Books/ Websites:

1. Modi & Seth ; Fluid Mechanics; Standard Book House, Delhi.
2. Rangaraju; Open Channel Flow; Tata Mc Graw - Hill Publishing Comp. Ltd., New Delhi.
3. A.K. Jain; Fluid Mechanics; Khanna Publishers, Delhi.
4. K.R. Arora; Fluid Mechanics, Hydraulics & Hydraulic Machanics ; Standard Publishers Distributors 1705- B, Nai Sarak, Delhi-6.
5. R K Bansal; Fluid Mechanics; Laxmi publication.

Suggested List of Laboratory Experiments:-

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.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total Nil			Total (50)
CET-1506	Highway Material Testing Lab	-	-	1	External (Nil)	Internal (Nil)	Nil	External (35)	Internal (15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments:-

1. Aggregate Crushing Value Test.
2. Determination of Aggregate Impact Value.
3. Determination of Los Angeles Abrasion Value.
4. Determination of California Bearing Ratio values
5. Determination of Penetration value of bitumen
6. Determination of Viscosity of bituminous material.
7. Determination of Softening Point of bituminous material.
8. Determination of Flash point and Fire point of bituminous material.
9. Determination of bitumen content by Centrifuge Extractor.
10. Determination of Stripping Value of road aggregate.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total Nil			Total 100
CET-1507	Industrial Training-I	-	-	2	External (Nil)	Internal (Nil)	Nil	External (70)	Internal (30	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: 30	Lab work & Sessional - Max Marks: 25	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	Nil
Course Outcome	1. It gives the knowledge and importance of industrial training for the engineering students. Its requirement after completion of our studies.
	2. It gives the knowledge and importance of Training and Placement Officer (TPO)
	3. It gives the knowledge of how to present a seminar on their training and will face viva-voce on training in the institute

Unit	Contents (Theory)	Marks Weightage
I	The objective of undertaking 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 bridge the wide gap between the classroom and industrial environment. As a part of B. Tech. curriculum, CET-507, Industrial Training -I is a Practical course, which the students should undergo in reputed Private / Public Sector / Government organization / companies as industrial training of minimum two weeks to be undergone by the student in the semester break after IV semester theory examinations. **Training period**: Minimum of two weeks or 15 (Fifteen) Days. **Evaluation:** Fifth semester **Companies / Areas covered**: Any field related to concern branch / discipline of Engineering. **Grading**: As per Scheme. **Note:** Presentation will take place the following week after completion your training. The presentation is evaluated by your class in charge. Report must be submitted during power point presentation. A Viva voce comprising comprehensive questions based on your presentation and training undergone. **Etiquettes:** Dress properly, Behave well, Portray good image as a university student, Be punctual, Observe work ethics, Concern for safety, Be professional.	**100**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments:- Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (50)			Total
BT-1508	Indian Constitution	2	-	-	External (35)	Internal (15)	Min: 20 (D Grade)	External (Nil)	Internal (Nil)	Nil

Duration of Theory (Externals): 2 Hours

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

Pre-Requisite	**Nil**
Course Outcome	1. Understand the functions of the Indian government.
	2. Understand and abide the rules of the Indian constitution.

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.	**07**
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.	**07**
III	**State Government and its Administration:** Governor, Role and position, CM and council of ministers, State secretariat, Organization, Structure and functions.	**07**
IV	**Local Administration:** District's administration head, Role and Importance, Municipalities, Introduction, Mayor and role of elected representative, CEO of municipal corporation, panchayati raj, Introduction, PRI: Zila Panchayat, Elected officials and their roles, CEO Zila Panchayat, Position and role, Block level, Organizational Hierarchy (Different departments), Village level, Role of Elected and Appointed officials, Importance of grass root democracy.	**07**
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.	**07**

 # Mandatory (Non Credit) subject according to AICTE. Non University Examination; End Sem marks not to be included in total marks and credit. Students must pass in this subject.

Text Book/References Books/ Websites:

1. Laxmikanth ;Indian Polity; McGraw Hill Education.
2. Subhash Kashyap ;Indian Administration; National Book Trust.
3. D.D. Basu; Indian Constitution; Lexis Nexis; Twenty-Third 2018 edition.
4. Avasti and Avasti ; Indian Administration; Lakshmi Narain Agarwal Educational Publishers.

Suggested List of Laboratory Experiments:-Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total
BT-16101	Ethical Hacking & Cyber Security	3	1	-	External (70)	Internal (30)	Min 40 (D Grade)	External Nil	Internal Nil	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 work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	Student should have basic knowledge of computer.
Course Outcome	1. Identify and analyse the stages an ethical hacker requires to take in order to compromise a target system.
	2. To identify tool and techniques to carry out a penetration testing.

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, Foot printing**,** Introduction to foot printing, Understanding the information gathering methodology of the hackers, Tools used for the reconnaissance phase.	**14**
II	**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**
III	**Hacking Wireless Networks:** Introduction to 802.1I,Role of WE?, Cracking WEP keys, Sniffing traffic, Wireless DOS attacks, WLAN scanners, WLAN sniffers, Hacking tools, Securing wireless networks.	**14**
IV	**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, Reasons for cybercrimes.	**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, Reasons for cybercrimes.	**14**

Text Book/References Books/ Websites:

1. Aare; NetworkSecurity;Ethical Hacking Rajat; LuniverPress 30-Nor-2006.
2. Thomas Mathew ; Ethical !lacking; Publisher, 28-Nor-2003.

Suggested List of Laboratory Experiments :- Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External Nil	Internal Nil	Total
BT-16102	Human Health & Nutrition Disorder	3	1	-	(70)	(30)	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 work & Sessional – Max Marks : Nil	Assignment / Quiz /Attendance – Max. Marks : Nil

Pre-Requisite	Nil
Course Outcome	1. To understand basic concepts in food and nutrition.
	2. To be able to know different types of nutrients.
	3. To know the basic food groups and methods of cooking.

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, Foliate, 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: ▪ Cereals ▪ Pulses ▪ Fruits and vegetables. ▪ Milk and milk products ▪ Eggs ▪ Meat, poultry and fish ▪ Fats and oils	**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**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VI**

V	**Nutritional Problems and programs** • Nutritional problems in India • National nutritional policy • National nutritional program in India.	**14**

Text Book/References Books/ Websites:

1. Swaminathan; M Hand book of foods and Nutrition, Fifth Ed : 1986 Bappco,
2. Srilakshmi B; Nutrition Science 2012;New Age international (P) LTD.
3. Mudambi, S R and Rajagopal; MV fundamentals of foods Nutrition and Diet Therapy; Fifth Ed: 2012
4. Potter N.M. Hotchkiss; Jh Food Sciences; Fifth ed.2006
5. Khanna K Gupta, S. Seth, R Mahana, R. Rekhi T. ;The AM an and Science of cooking
6. Suri.S and Malhotra; A food science nutrition & Food safety Pearson India Ltd. 2014.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total
BT-16103	Human Resource Management	3	1	-	External (70)	Internal (30)	Min 40 (D Grade)	External Nil	Internal Nil	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 work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	The objective of the course is to equip students with various human resource management concepts and current practices in managing human resources in knowledge based environment.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction to Human Resource Management**: Definition and concept, Features , Objectives, Functions, Scope and development of human resource management, Importance of human resource management, Human resource planning.	**14**
II	**Job Analysis and Design:** Job analysis, Job description, Job specification, Job design, Recruitment, Selection.	**14**
III	**Induction Programme:** Contents, Need for induction; **Training**: Concept and significance of training, Training needs, Training methods, Types of training.	**14**
IV	**Performance Appraisal:** Concept of performance appraisal, Purpose of performance appraisal, Process, Methods of performance appraisal, Major issues in performance appraisal.	**14**
V	**Industrial Relation & Trade Unions:** Employee welfare, Employees empowerment, Grievance procedure ,Collective bargaining, Settlement of disputes, Human resource accounting, Separation, Retirement schemes, Resignation, Suspension, Layoff.	**14**

Text Book/References Books/ Websites:

1. Gupta & Joshi; Human Resource Management; Kalyani Publication, 2nd Edition 2004.
2. Rao VSP; Human Resource Management; Excel Books, New Delhi2005.
3. Aswathappa, K.; Human Resource and Personnel Management'; Tata McGraw-Hill, 1997.
4. Gupta, P.K.; Human Resource Management; Dreamtech Press, 2011.
5. Mamoria C.B.; Personnel Management; Himalaya Pub. House.
6. Khanka S.S; Human Resource Management; S.Chand, New Delhi,2009.
7. Dessler Gary; Human Resource Management; PHI, New Delhi,10th Edition, 2005.
8. Bhattacharya D.K; Human Resource Management; Excel Books, New Delhi, 2006.
9. Subba Rao; Essentials of HRM & Industrial Relations; Text & Cases, Himalaya Pub. House,2011.
10. Gupta C.B.; Human Resource Management; Sultan Chand & Sons, New Delhi, 2004.

Suggested List of Laboratory Experiments :- Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total 100	External Nil	Internal Nil	Total
CET-1602	Theory of Structure-I	3	1	-			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 work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Study of virtual work and energy principles.
	2. Analysis of different indeterminate structures.
	3. Detail analysis of indeterminate structures by slope deflection method and column analogy method.

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 kinematics indeterminacy, Analysis of fixed and continuous beams by theorem of three moments, Effect of sinking and rotation of supports, 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.	**14**
V	**Rolling Loads and Influence Lines:** Maximum SF and BM curves for various types of rolling loads, EUDL, Influence lines for determinate structures- beams.	**14**

Text Book/References Books/ Websites:

1 Ghali A & Neville M.; Structural Analysis ; A Unified Classical and Matrix Approach, Chapman and Hall, New York.

2 Wang C.K. ; Intermediate Structural Analysis, Mcgraw Hill, New York.

3 Kinney Streling J. ;Indeterminate Structural Analysis; Addison Wesley.

4 Reddy C.S.; Basic Structural Analysis; Tata Mcgraw Hill Publishing Company, New Delhi.

5 Norris C.H.; Wilbur J.B. And Utkys. Elementry Structural Analysis; Mcgraw Hill Intern.

Suggested List of Laboratory Experiments :- Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total (50)
CET-1603	Design of RCC Structure-II	3	1	1	External (70)	Internal (30)	Min 40 (D Grade)	External (35)	Internal (15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. To give the knowledge of design of multistory buildings: sway and non sway buildings, shear walls.
	2. Design of earth retaining structures: cantilever and counter fort types retaining walls
	3. Design of different types of water tanks.

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 counterfort types retaining walls.	**14**
III	**Water Tanks: Tanks on ground and underground tanks:** Square, Rectangular, Circular tanks, **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 (P) 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 Learing Private Ltd.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VI**

Suggested List of Laboratory Experiments:

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..

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total (50)
CET-1604	Environmental Engg.-I	3	1	1	External (70)	Internal (30)	Min 40 (D Grade)	External (35)	Internal (15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. Estimation of ground and surface water resources, demand & quantity of water, fire demand, water requirement for various uses.
	2. To know how to evaluate the impurities present in the water and their significance.
	3. Theory and design of water treatment plants and miscellaneous methods of treatment.

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**: Theory and design of sedimentation, Coagulation, 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 (P) Ltd. New Delhi.
2 G.S. Birdi ;Water Supply & Sanitary Engg. ; Laxmi Publications (P) Ltd. New Delhi.
3 Mark J.Hammer; Water & Waste Water Technology; Prentice - Hall Of India, New Delhi.
4 H.S. Peavy & D.R.Rowe; Environmental Engineering ; Mc Graw Hill Book Company, New Delhi.
5 G.M. Fair & J.C. Geyer; Water & Waste Water Technology; Scranton Publishing Company.
6 Relevant IS Codes.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VI**

Suggested List of Laboratory Experiments:-

1 To study the various standards for water
2 Measurement of turbidity
3 To determine the coagulant dose required to treat the given turbid water sample
4 To determine the conc. Of 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

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total 100	External	Internal	Total (50)
CET-1605	Geotechnical Engg.- I	3	1	1	(70)	(30)	Min 40 (D Grade)	(35)	(15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Course Outcome	1. To study about the basic definitions & index properties of soil.
	2. To give the knowledge of soil water and its consolidation.
	3. To give the knowledge of stress distribution in soils and shear strength of soils.

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-gard'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, coulomb, 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 Mech. & Found. Engg ; Std. Publishers Delhi.
2. Dr. B.C.Punmia ; Soil Mech. & Found.; Laxmi Publications, Delhi.
3. Dr.L Aram Singh; Modern Geo-tech Engg ; Ibt Publishers, Delhi.
4. C. Venkatramaiah; Geo-tech Engg. ; New Age International Publishers, Delhi.

Suggested List of Laboratory Experiments:

1 Determination of hygroscopic water content.
2 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 Permeability tests.
8 Direct shear test.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total Nil			Total (50)
CET-1606	Theory of Structure Lab	-	-	1	External (Nil)	Internal (Nil)	Min Nil	External (35)	Internal (15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	
Course Outcome	1. Introduction to group discussion, structure and dynamics; techniques of effective participation in group discussion
	2. To give the knowledge of necessity, how to prepare for interviews; language and style to be used in interview.

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments: -

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 defometer –verification of Muller Breslau principal.
5 Experimental and analytical study of an elastically coupled beam.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total (50)
BT-1607	Research Methodology	-	-	1	(Nil)	(Nil)	Nil	(Nil)	(50)	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 work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: 50

Pre-Requisite	**Nil**
Course Outcome	1. To study about different types of research, its motivation and objectives.
	2. To give the knowledge of basic principles need for research design and features of good design.
	3. To give the knowledge of writing and reporting of the thesis of given research report.

Unit	Contents (Theory)	Marks Weightage
I	**Research Methodology:** Meaning, Objective & its types, Research approaches , Significance of research, Research methods vs. methodology, Research process, Criteria of good research, Meaning of research problem, Sources of research problem, Errors in selecting a research problem, Scope and objectives of research problem, Effective literature studies approaches, Plagiarism, Research ethics, Problems encountered by researchers in India.	**50**
II	**Concept and Importance in Research:** Features of a good research design, Exploratory research design, Concept types and uses, Descriptive research designs, Concept, Types and uses, Experimental design, Concept of independent & dependent variables, Interpretation , Meaning & technique, Precaution in interpretation , Significance of report writing; layout of the research report, Types of reports, Precautions for writing research reports, Effective technical writing, Role of computer software in report writing.	
III	**Data Collection:** Collection of primary data, Observation method, Interview method, Collection of data through questionnaires, Collection of data through schedules, Difference between questionnaires and schedules, Collection of secondary data.	
IV	**Hypothesis**: Null hypothesis & alternative hypothesis, Basic concepts concerning testing of hypotheses, Procedure for hypothesis testing, Flow diagram for hypothesis testing, Qualities of a good hypothesis.	
V	**Nature of Intellectual Property:** Patents, Designs, Trade and copyright, Process of patenting and development, Technological research, Innovation, Patenting; Development, International scenario, International cooperation on intellectual property, Procedure for grants of patents, Patenting under PCT, patent rights**,** scope, licensing and transfer of technology, Patent information and databases, Geographical indications, New developments in IPR, Administration of patent system, IPR of biological systems.	

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VI**

Text Book/References Books/ Websites:

1. C . R. Kothari; Research Methodology; New Age Publication.
2. Wayne Goddard and Stuart Melville; Research Methodology;An Introduction.
3. Ranjit Kumar; Research Methodology; A Step by Step Guide for beginners.
4. Robert P. Merges, Peter S. Menell; Mark A. Lemley; Intellectual Property in New Technological Age.
5. T. Ramappa; Intellectual Property Rights Under WTO ; S. Chand; 2008.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total			Total (50)
BT-1608	GD/Seminar	-	-	1	External (Nil	Internal (Nil)	(Nil)	External (Nil)	Internal (50)	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 work & Sessional – Max Marks: Nil	Assignment / Quiz/Attendance Max. Marks: 50

Pre-Requisite	**Nil**
Course Outcome	1. Develop confidence and students should able to share their views publically.
	2. Understand and critique scientific presentations.

Unit	Contents (Theory)	Marks Weightage
I	Objective of GD and seminar is to improve the mass communication and convincing/ understanding skills of students and it is to give student an opportunity to exercise their rights to express themselves. Effective power point presentation of scientific research of concern discipline where students will prepare, Practice, Present short scientific seminars, Receive feedback from each other that will help us give even better presentations in the future, This effort will help them to communicate their ideas more clearly. Evaluation will be done by assigned faculty based on group discussion and power point presentation.	**50**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- (Expandable):

Students should prepare and submit hard and soft copy of their report to assigned faculty before end semester examination.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total 100	External	Internal	Total
CET-17101	Traffic Engineering	3	1	-	(70)	(30)	Min 40 (D Grade)	Nil	Nil	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 work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Transportation Engineering -II**
Course Outcome	1. To give detailed information about the road user's characteristics, vehicular characteristics.
	2. To give detailed information about the traffic studies, traffic capacity, parking studies.
	3. To give the knowledge of traffic operations and control, traffic signals- isolated signals.

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, Parking practices.	**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**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VII**

Text Book/References Books/ Websites:

1. L.R. Kadiyali ; Traffic Engineering and Transport Planning; Khanna Publishers, Delhi
2. Matson W.S.Smith & F.W. Hurd ; Traffic Engineering; TMH.
3. G.J. Pingnataro; Principles Of Traffic Engineering; W.S.Smith & F.W.Hurd.
4. D.R.Drew; Traffic Flaw Theory; TMH.

Suggested List of Laboratory Experiments: - Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total 100	External Nil	Internal Nil	Total
CET-17102	Cost Effective and Eco friendly Construction	3	1	-			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 work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. To give detailed information about concepts of energy efficient & environment friendly materials and techniques.
	2. To give detailed information about the cost effective construction techniques and equipments.
	3. To give the knowledge of cost effective sanitation.

Unit	Contents (Theory)	Marks Weightage
I	**Concepts of Energy Efficient & Environment Friendly Materials and Techniques,** **Cost Effective Materials:** Soil, Fly Ash, Ferrocement, 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: P**recast R.C plank & joists roof, Precast channel roof, Precast l-panel roof, Precast funicular shells, Ferro cement shells, Filler slab, Seasal fibre roof, Improved country tiles, Thatch roof, M.C.R. tile.	**14**
II	**Cost effective construction techniques and equipments :** **Techniques:** Rat trap bond construction, Energy efficient roofing, Ferrocement technique, Mud technology. **Equipments :** Brick moulding machine, Stabilized soil block making machine and plants for the manufacturing of concrete blocks, M.C.R. tile making machine, Ferrocement 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.
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 Prof. S.P. Chandola; Construction, Management & Account; Khanna Publishers.

Suggested List of Laboratory Experiments:- Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total
CET-17103	Design of Hydraulic Structure	3	1	-	External (70)	Internal (30)	Min 40 (D Grade)	External Nil	Internal Nil	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 work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. To give detailed information about gravity dams.
	2. To give detailed information about the earth and rock fill dams.
	3. To give the detailed knowledge of spillways.

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, Sphypon 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; Johnwiley & Sons.
3. Varshney ; Hydraulic Structures ; Nem Chand & Bro.
4. Punmia & Pandey ; Irrigation & Water Power Engg; Laxmi Publications.

Suggested List of Laboratory Experiments:-Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total 100	External Nil	Internal Nil	Total
CET-1702	Design of Steel Structure-I	3	1	-			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 work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. To give overview about the structural properties of steel and designing of various connections.
	2. To give the knowledge of designing of compression members, tension members, roof trusses - angular & tubular, lattice girders.
	3. To give the knowledge of designing simple beams, built-up beams, plate girders and gantry girders.

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, Roorkee ; Design of Steel Structures; Nem-Chand Delhi.
2. P.Dayaratnam; Design of Steel Structures; S. Chand.
3. Ramchandra; Design of Steel Structures Vol. I & II; Scientific Publishers jodhpur.
4. L.S. Negi ; Design of Steel Structures; TMH.
5. Ramammutham; Design of Steel Structures ; Danpat Rai Publishers.
6. Punmia; Design of Steel Structures; Laxmi Publications.

Suggested List of Laboratory Experiments: - Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total (50)
CET-1703	Theory of Structure-II	3	1	1	External (70)	Internal (30)	Min 40 (D Grade)	External (35)	Internal (15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. Detail analysis about the moment distribution method and kani's method.
	2. To give the knowledge of designing and analysis of plastic analysis of beams and frames.
	3. To give the knowledge of matrix method of structural analysis.

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 Stgructural Analysis; Tata Mcgraw Hill Publishing Company, New Delhi.
3. Norris C.H.,Wilbur J.B. And Utkys.;Elementary Structural Analysis; Mcgraw Hill International,Tokyo.
4. Weaver W & Gere Jm; , Matrix Methods of Framed Structures; CBS Publishers & Distributors, Delhi.

Suggested List of Laboratory Experiments:-

1 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.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total 100	External (35)	Internal (15)	Total (50)
CET-1704	Environmental Engineering-II	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. To give the knowledge of characteristics and analysis of waste water, cycles of decomposition
	2. To give the knowledge of unit operations for waste water treatment, preliminary treatment such as screens
	3. To give the knowledge of advanced waste water treatment - diatomaceous earth filters

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 Engg., Dhanpat Rai Publishing Company, (P) Ltd. New Delhi
2 B.C. Punmia, Waste Water Engg., Laxmi Publication (P) Ltd. New Delhi
3 M.L. Davis & D.A. Cornwell , Environmental Engg., Mc Graw Hill Company
4 Sawyer & Mc Carty , Chemistry for Environmental Engg, Mc Graw Hill Book Company New Delhi
5 Mark J Hammer , Water & Waste Water Technology, Prentice - Hall Of India, New Delhi
6 Metcalf & Eddy , Waste Water Engineering, Mc Graw Hill Book Company New Delhi

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VII**

Suggested List of Laboratory Experiments :-

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 filter technique
10. Determination of bacterial colonies by standard plat count method

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total Nil	External	Internal	Total (50)
CET-1705	Steel Structure Lab-I	-	-	1	(Nil)	(Nil)	Nil	(Nil)	(50)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. To give the knowledge of design of columns-simple and compound
	2. To give the knowledge of bracings for high rise structures
	3. To give the knowledge of design of industrial building frames

Unit	Contents (Theory)	Marks Weightage
I	**Designing:** Design of industrial building frames, multistory frames, bracings for high rise structures, design of transmission towers. Design of compression members, tension members, and roof trusses. Design of simple beams, built-up beams, plate girders and gantry girders. Design of columns-simple and compound, lacings & battens. Design of footings for steel structures, grillage foundation.	**50**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments:-

Student should submit the Design and drawings of any five members from the content as per assigned by the subject faculty.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total Nil			Total 150
CET-1706	Minor Project	-	-	3	External (Nil)	Internal (Nil)	Min: Nil	External (105)	Internal (45)	Min: 60 (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: 45	Lab work & Sessional - Max Marks: 40	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. The major project work provides students an opportunity to do something on their own and under the supervision of a guide.
	2. It also give the knowledge of each student shall work on an approved project, which should be selected from some real life problem as far as possible.

Unit	Contents (Theory)	Marks Weightage
I	Students shall be encouraged to form groups (Maximum 5) to do a Minor 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 has selected for his/her minor project work using system analysis tools and submit the same in the form of a write-up i.e. detail project report. 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. 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.	**150**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments:-

List of experiments covered by contained from the syllabus.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total Nil	External	Internal	Total (100)
CET-1707	Industrial Training-II	-	-	2	(Nil)	(Nil)	Min: Nil	(70)	(30)	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: 30	Lab work & Sessional - Max Marks: 25	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. Give the knowledge of the objective of undertaking industrial training is to provide work experience so that student's engineering knowledge is enhanced and employment prospects are improved.
	2. It also give the knowledge of industrial training of the students is essential to bridge the wide gap between the classroom and industrial environment.

Unit	Contents (Theory)	Marks Weightage
I	The objective of undertaking 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 bridge the wide gap between the classroom and industrial environment. As a part of B. Tech. curriculum, CET1707, Industrial Training -II is a Practical course, which the students should undergo in reputed Private / Public Sector / Government organization / companies as industrial training of minimum two weeks to be undergone by the student in the semester break after VI semester theory examinations. **Training period**: Minimum of four weeks or 30 (Thirty) Days. **Evaluation:** Seventh semester **Companies / Areas covered**: Any field related to concern branch / discipline of Engineering. **Grading**: As per Scheme. **Note:** Presentation will take place the following week after you complete your training. The presentation is evaluation by your class in charge. Report must be submitted during power point presentation. The report evaluation is done by your class in charge. A Viva voce comprising comprehensive questions based on your presentation and training undergone will be put forth after your presentation. **Etiquette:** Dress properly, Behave well, Portray good image as a university student, Be punctual, Observe work ethics, Concern for safety, Be professional.	**100**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments:-

List of experiments covered by contained from the syllabus.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VIII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total 100	External Nil	Internal Nil	Total
CET-18101	Pavement Design	3	1	-			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 work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Knowledge of Transportation Engg.-II & Traffic Engineering subject.**
Course Outcome	1. To give the knowledge of about the equivalent single wheel load (ESWL).
	2. To give the knowledge of flexible pavements.
	3. To give the knowledge of evaluation and strengthening of existing pavements.

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. Witczak ; Principles of Pavement Design; Wiley. Publication

2 Aasho;Aasho Interim Guide for Design Of Pavement Structures; Washington, D.C.

3 Portland Cement Association; Guidlines for Design of Rigid Pavements; Washington.

Suggested List of Laboratory Experiments:-Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VIII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total
CET-18102	Structural Dynamic and Earthquake Engineering	3	1	-	External (70)	Internal (30)	Min 40 (D Grade)	External Nil	Internal Nil	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 work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. To give the knowledge about the fatigue concept, failure, stress etc.
	2. To give the knowledge about the fatigue testing machines and making of specimen and testing procedures.
	3. Study about the creep of material with their various properties.

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, Residual stresses environment(corrosion fatigue), Fretting of surfaces in contact and effect of under stresses and overstress.	**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: H**istorical background, modes of crack displacement, Opening mode, Sliding mode, Tearing node, 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 - Theory And Applications To Earthquake Enginering ; Prentice Hall Of India, New Delhi.
2 Berg G.V; Elements Of Structural Dynamics; Prentice Hall Of India, Englewood Cliffs, Nj.
3 Paz Mario; Structural Dynamics; CBS Publishers, Delhi.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VIII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total
CET-18103	Construction Planning & Management	3	1	-	External (70)	Internal (30)	Min 40 (D Grade)	External Nil	Internal Nil	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 work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. To give the knowledge about the preliminary and detailed investigation methods for any construction activity.
	2. To give the knowledge about the selection procedure for construction equipments.
	3. Study about the contract procedure, tender invitation, contract documents etc.

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.
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 Private Limited.
5 H Singh,Construction; Management & Account; TMH.

Suggested List of Laboratory Experiments: - Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VIII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total 100	External Nil	Internal Nil	Total
CET-1802	Design of Steel Structure-II	3	1	-			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 work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. To give the knowledge of about the plate girder bridges.
	2. To give the knowledge of trussed girder bridges for railways and highways.
	3. To give the knowledge of water tanks, pressed steel tanks.

Unit	Contents (Theory)	Marks Weightage
I	Plate girder bridges (riveted and welded).	**14**
II	Trussed girder bridges for railways and highways (IRC & IRS holding), Bearings for bridges.	**14**
III	Water tanks, Pressed steel tanks, Tanks with ordinary plates, Square, Rectangular, Circular with hemispherical bottom and conical bottom.	**14**
IV	Chimneys, Guyed and self supporting steel stacks.	**14**
V	Bunkers, Silos & towers.	**14**

Text Book/References Books/ Websites:

1 Ramammutham; Design of steel structures; Dhanpat Rai, Publishing,Co (P) Ltd.
2 B.C. Punmia; Design of steel structures; Laxmi, publication.
3 Ramchandra; Steel structures. Vol II; Standard Publisher, Distributors.
4 Arya & Ajmani.; Steel structures; Nem Chand.
5 L.S. Negi; Design of steel structures, TMH.

Suggested List of Laboratory Experiments :- Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VIII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total 100	External (35)	Internal (15)	Total (50)
CET-1803	Geotechnical Engg.-II	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. To give the knowledge about the foundations and bearing capacity of foundation.
	2. To give the knowledge about the deep foundation and pile foundation.
	3. Study about the soil improvement techniques compaction. various equipment for field compaction and their suitability.

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**

Text Book/References Books/ Websites:

1 Dr. K.R. Arora ; Soil Mech. & Found. Engg.; Std. Publishers Delhi.
2 Dr. B.C.Punmia ; Soil Mech. & Found.; Laxmi Publications, Delhi.
3 Dr.L Aram Singh ; Modern Geotech Engg.; IBT Publishers, Delhi.
4 C. Venkatramaiah ; Geotech Engg.; New Age International Publishers, Delhi
5 S.K. Garg ; Soil Mech. & Found. Engg.; Khanna Publishers, Delhi.

Suggested List of Laboratory Experiments:-

1 Determine the bearing capacity of soil by Plate Load Test.
2 Determine the bearing capacity of soil by Cyclic Plate Load Test.
3 To find out California bearing ratio of soil by CBR.
4 Determine c & ϕ by Standard Penetration Test.
5 Determine c & ϕ by Triaxial Test.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VIII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total 100	External	Internal	Total (50)
CET-1804	Estimation & Costing	3	1	1	(70)	(30)	Min 40 (D Grade)	(35)	(15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. Study about the cost of works: factors affecting cost of work, overhead charges.
	2. To give the knowledge about the valuation depreciation, sinking fund, scrap value.
	3. To give the knowledge about the principles of estimating and mode of measurement

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, Pvt Ltd.
2 G.S. Birdi; Estimating & Costing For Civil Engg.; Dhanpat Rai, Publishing Company Pvt Ltd, New Delhi.
3 Chakraborty; Quantity Surveying & Costing; Satya Prakashan, New Delhi.
4 S.C. Rangawala; Estimating & Costing; Charotor Books, Distric-Anand.

Suggested List of Laboratory Experiments:-

1 Prepare an estimate of various types of buildings by centre line method.
2 Prepare an estimate of various types of buildings by long wall, short wall method.
3 Prepare detailed estimate of earth work calculation for road.
4 Prepare detailed estimate of a culvert.
5 Prepare detailed project report of road.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VIII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (Nil)	Internal (Nil)	Total Nil	External (Nil)	Internal (50)	Total (50)
CET-1805	Steel Structure Lab-II	-	-	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: 15	Lab work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	Knowledge of design of steel structure subject.
Course Outcome	1. Designing of plate girder bridges, guyed and self supporting steel stacks, pressed steel tanks, tanks with ordinary plates, square, rectangular

Unit	Contents (Theory)	Marks Weightage
1	**Designing:** Plate girder bridges, Guyed and self supporting steel stacks, Pressed steel tanks, Tanks with ordinary plates, Square, Rectangular, Circular with hemispherical bottom and conical bottom, Trussed girder bridges for railways and highways, Bunkers, Silos & towers.	**50**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments:-

Students should prepare a Design and Drawing sheet of any five members as assigned by the subject faculty.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VIII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total			Total (200)
CET-1806	Major Project	-	-	4	External (Nil)	Internal (Nil)	Nil	External (140)	Internal (60)	Min: 80 (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: 60	Lab work & Sessional - Max Marks: 55	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Knowledge of all previously studied subjects**
Course Outcome	The student will be able to-Utilize technical resources:
	1. Identify, analyze & define the problem.
	2. Generate alternative solutions to the problem identified.
	3. Compare & select feasible solutions from alternatives generated.
	4. Design, develop, manufacture & operate equipment/program.
	5. Acquire higher-level technical knowledge by studying recent development in Engineering field.
	6. Compare machines/devices/apparatus for performance practices.
	7. Work effectively in a team.

Unit	Contents (Theory)	Marks Weightage
I	Students shall be encouraged to form groups (Maximum 5) to do a minor project on technical topic of concern branch, The student should prepare a working system or some design or understanding of a complex system that he has selected for his project work using system analysis tools and submit the same in the form of a write-up i.e. detail project report, The student should maintain proper documentation of different stages of project such as need analysis, Market analysis, Concept evaluation, Requirement specification, Objectives, Work plan, Analysis, Design, Implementation and test plan wherever applicable, Each group of students is required to prepare a project report based on the above points and present the same at the final examination with a demonstration of the working system. Evaluation will be based on his performance in technical work pertaining to the solution of a small size problem, Project report and presentation of work and defending it in a viva-voce.	**200**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VIII**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total			Total (50)
BT-1807	Professional Ethics and Proficiency	-	-	1	External (Nil)	Internal (Nil)	Nil	External (35)	Internal (15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. To give the knowledge of business ethics, etiquettes in social and office settings, email etiquettes, telephone etiquettes.
	2. To give the knowledge about the career oriental communication covering, resume and bio-data.
	3. To give the knowledge about the communication and personality development.

Unit	Contents (Theory)	Marks Weightage
I	**Ethics**: Business ethics, Etiquettes in social and office settings, Email etiquettes, Telephone Etiquettes, Engineering ethics, Managing time, Role and responsibility of engineer, Work culture in jobs, Personal memory, Rapid reading, Taking notes, Complex problem solving, Creativity.	**50**
II	Communication and personality development covering, Psychological aspects of communication, Cognition as a part of communication, Emotional Intelligence, Politeness and etiquette in communication, Cultural factors that influence communication, Mannerisms to be avoided in communication, Language and persuasion, Language and conflict resolution.	
III	Career Oriental Communication covering, Resume and biodata, Design & style, Applying for a job, Language and format of job application, Job Interviews, purpose and process.	
IV	Advanced Techniques in Technical Communication covering, Interview through telephone/video-conferencing.	
V	**Power-point presentation**: Structure and format, Using e-mail for business communication, Standard e-mail practices, Language in e-mail, Using internet for collecting information, Referencing while using internet materials for project reports.	

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :-

Students should prepare a hand written report on Professional Ethics and Proficiency as assigned by faculty.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
DCE1301	Strength of Material	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know mechanical properties of metal such as elasticity.
	2. Student should able to know shear force and bending moment.
	3. Student should able to know bending stresses in beams.

Unit	Contents (Theory)	Marks Weightage
I	**Stress & Strain**: Mechanical properties of metal such as elasticity & elastic limit , Definition of stress, Strain, Modulus of elasticity, S.I. Unit, Classification of stress, Strain, Sign convention, Stress, Strain curve for mild steel and HYSD bar, Yield stress/ proof stress, Ultimate stress, Breaking stress and percentage elongation.	**14**
II	**Elastic Constants & Principal Stresses**: Definition of lateral strain, Poisson's ratio, Change in lateral dimensions, Volumetric strain & change in volume, Definition of bulk modulus, Relation between modulus of elasticity, Modulus of rigidity and bulk modulus, Definition of principal planes & principal stresses.	**14**
III	**Shear Force And Bending Moment** : Types of beams - cantilever, Simply supported, Fixed and continuous beams and over hanging beam, Types of loading- point load, Uniformly distributed load, Support reactions for determinate structures, Concept of shear force and bending moment, Sign convention, Relation between bending moment, Shear force and rate of loading.	**14**
IV	**Stresses In Beams**: Bending Stresses in Beams, Concept of pure bending, theory of simple bending, Assumptions in theory of bending, Neutral axis, Bending stresses and their nature, Bending stress distribution diagram, Moment of resistance. **Moment Of Inertia**: Concept of moment of inertia, M.I of plane areas such as rectangle, Triangle, circle, Semicircle and quarter circle, Parallel axis and perpendicular axis theorem, M.I of composite sections.	**14**
V	**Columns**: End conditions, and Equivalent length, Radius of gyration and slenderness ratio classification as per mode of failure, Euler's and Rankine's formulae, Use of Euler's and Rankine's formulae.	**14**

Text Book/References Books/ Websites

1. S. Ramamurtham ; Strength of Materials ; **Dhanpat** RaiPublishing Company (P) Limited.
2. R. S. Khurmi ; Strength of Materials ; S. Chand & Company, Delhi.
3. S. B. Junnarkar ; Volume - I & II Mechanics of Structures ; Charotar Publishing House, Anand.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (35)	Internal (15)	Total (50)
DCE1302	Building Design & Drawing	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: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Engineering Graphics**
Course Outcome	1. Student should able to know conventions types of lines.
	2. Student should able to know principles of planning of residential and public building.
	3. Student should able to know , area statement and other details.

Unit	Contents (Theory)	Mark Weightage
I	**Conventions** : Unit conversation, Types of Lines - Visible line, Centerline, Hidden line, Section line, Dimension line, Extension line, Pointers, Arrow heads or dots, Dimensioning systems, Symbols, Reading of available ammonia prints of residential buildings.	**14**
II	**Planning Of Building:** Principles of planning of Residential and Public building, Space requirements and norms for various units of Residential and Public building. Rules and byelaws of local governing authorities for construction, Drawing of line plans for Residential and Public building, Principle of Architecture.	**14**
III	**Building Drawing:** Development of plan from line plan of a residential building, Elevation, Section, Foundation plan, Area statement and other details, Submission Drawing and Working Drawing, Map Study.	**14**
IV	**Detailed Drawing:** Drawing of staircase, Drawing of steel truss & lean to roof, Drawing of layout plan of water supply, Layout plan of sanitary line work, Septic tank, Sanitary fittings, Position of wash basin, Sink.	**14**
V	**Perspective Drawing :** Definition, Principles of Perspective Drawing, Terms used in perspective drawing, Types of perspective views, One point perspective, Two point perspective view of a small object like pedestal, step block, Small single storied building with flat roof.	**14**

Text Book/References Books/ Websites

1. V.B.Sikka; Building Drawing; S.K. Kataria & Sons.
2. D. M. Mahajan ; Elements of Building Drawing ; Pune Vidyarthi Griha Prakashan.
3. Y. S. Sane ; Planning and Design of Building ; distributor: Allies Book Stall.
4. Malik & Meo ; Civil Engineering Drawing ; New Asian Publishers New Delhi.

Suggested List of Laboratory Experiments :- (Expandable):

1. Drawing various types of lines, lettering and symbols of materials.
2. Drawing the plans of buildings residential Building.
3. Public Building – School building, Primary health center / Hospital building, Bank, Post Office, Hostel building etc.(At least two).
4. Drawing of a residential Building (Load bearing/ Framed structure Type) , showing Plan , Elevation, Sections, Construction notes, Schedule of openings, Site Plan, Area statement etc.
5. Submission Drawing of two storied residential building (Framed structure type) showing Plans , Elevation, Sections, Foundation Plan ,construction notes, Schedule of openings, Site Plan ,Area Statement etc.
6. Working drawing of above drawing sheet preferably one plan, section through stair case to scale 1:50.
7. Two point perspective view of a building drawn in submission drawing.
8. Tracing of a submission drawing prepared at Sr. No.4 above.
9. Ammonia print of submission drawing prepared at Sr. No.4 above.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total (50)
DCE1303	Fluid Mechanics	3	1	1	(70)	(30)	Min: 40 (D Grade)	(35)	(15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know physical properties of fluid.
	2. Student should able to know pressure in horizontal and vertical direction.
	3. Student should able to know concept of pressure head and its unit.

Unit	Contents (Theory)	Marks Weightage
I	**Properties Of Fluid:** Definition of fluid, Difference in behavior of fluid with respect to solids. Introduction to fluid mechanics and hydraulics, Branches of hydraulics- Hydrostatics and hydrodynamics, Physical properties of fluid Mass density, Weight density, Specific volume, Specific gravity, Surface tension and capillarity, Compressibility, Viscosity, Newton's law of viscosity – Dynamic and kinematics viscosity.	**14**
II	**Hydrostatic Pressure:** Free liquid surface, Definition of pressure and its SI unit, Hydrostatic pressure at point, Pascal's law, Variation of pressure in horizontal and vertical direction in static liquid, Pressure diagram, Total hydrostatic pressure and center of pressure, Determination of total pressure & center of pressure on vertical & inclined faces of dams, sluice gates, sides and bottom of water tanks. Numerical Problems.	**14**
III	**Measurement Of Liquid Pressure In Pipes:** Concept of pressure head and its unit, Intensity of pressure, Variation of pressure with depth of liquid, Types of pressure- atmospheric gauge and absolute pressure. Conversion of pressure head of one liquid in to other, devices for pressure measurements in pipes – Piezometer, U-tube manometer, Bourdon's pressure gauge.	**14**
IV	**Fundamentals Of Fluid Flow:** Concept of flow, Gravity flow and pressure flow. Types of flow, Laminar and turbulent. Reynolds number and its application Discharge and its units, Continuity equation for fluid flow. Datum head, pressure head, velocity head and total head, Bernoulli's theorem, its assumptions and limitations. Loss of head Application of Bernoulli's theorem. Simple Numerical Problems.	**14**
V	**Flow Through Open Channel:** Types of channels- artificial & natural, purposes of artificial channel Chezy's equation and Manning's equation for calculation of discharge through an open channel, common range of values of Chezy's constants and Manning's constant of different types of channel surfaces. Critical, sub-critical and supercritical flow in channel, Hydraulic jump its occurrence in field, uses of hydraulic jump.	**14**

Text Book/References Books/ Websites

1. S.Chand ; Fluids Mechanics & Hydraulics Machines ; S.Chand & Company Ltd. New Delhi.
2. R.K.Rajpu ; Fluids Mechanics Hydraulics Machines ; Chand & Company Ltd. New Delhi.
3. Dr. Jagdish Lal ;Metropolitan Fluids Mechanics & Hydraulics ;Dr. Jagdish Lal,Metropolitan Book Co Private Ltd.
4. Dr. P.N.Modi & Dr. S.M.Seth ; Hydraulics & Fluids Mechanics ; Standard Book House, Delhi.

Suggested List of Laboratory Experiments :- (Expandable):

1. Measurements of pressure and pressure head by Piezometer, U-tube manometer.
2. Measurement of pressure difference by U-tube differential manometer. Study of bourdon's gauge.
3. Verification of Bernoulli's theorem.
4. Determination of Darcy's friction factor for a given pipe.
5. Determination of Minor losses in pipes (any two).
6. Determination of Manning's constant or Chezy's constant for given rectangular channel section.
7. Demonstration of Hydraulic jump.
8. Demonstration and use of Pitot tube and current meter.
9. Study & use of water meter.
10. Study of a model of centrifugal and reciprocating pump.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)			Total (50)
DCE 304	Surveying	3	1	1	External (70)	Internal (30)	Min: 40 (D Grade)	External (35)	Internal (15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know definition & objects of surveying.
	2. Student should able to know direct and indirect ranging & chaining.
	3. Student should able to know conversion of bearings.

Unit	Contents (Theory)	Marks Weightage
I	**Types Of Survey:** Definition, Objects of Surveying, Principles of Surveying, Classification of Surveying, Method of surveying, Object of surveying, Surveying for building work.	**14**
II	**Curves**: Classification and use, Elements of circular curves, Calculations, Setting out Curves by offsets and Theodolite, Compound curves, Reverse curves, Transition curves, Cubic Spiral and lemniscates, Vertical curves, Setting out.	**14**
III	**Compass Survey:** Principle of Compass Survey, Bearing of lines – Meridian –True, Magnetic, and Arbitrary, Bearing –fore bearing, Back bearing, Whole circle bearing, Quadrennial bearing system and Reduced bearing, Conversion of bearings, Finding included angles from bearings. Traversing – traversing by compass, Open traverse, Closed traverse.	**14**
IV	**Leveling : M**eaning of various terms used in leveling, Reduced level(RL), Bench mark (BM) Dumpy level –Foresight (FS), Back sight (BS), Intermediate sight (IS), Change point (CP), Height of collimation, Temporary adjustments of dumpy level. Method of Reduction of levels – Height of instrument method and Rise and fall method, Arithmetical checks, Numerical problems, Computation of missing readings.	**14**
V	**Area And Volume Measurements:** Definitions of Contour, Characteristics of contours .Method of locating contours. Uses of Contour Maps. Study and use of Digital Planimeter .Concept of computation of Volume by Trapezoidal and Prismoidal formulae.	**14**

Text Book/References Books/ Website:

1. N.N.Basak ; Surveying and Levelling ; Tata Mc Graw-Hill.
2. T .P. Kanetkar & S. V.Kulkarn ; Surveying and Levelling, Part I and II ; Pune Vidhyarthi Griha Prakashan.
3. Dr. B. C. Punmiya ; Surveying And Leveling - Vol. I and II ; Laxmi Plublication.
4. S.K.Husain & M.S. Nagaraj ; Surveying ; Chand And Company.
5. S. K. Duggal ; Surveying And Levelling -Vol. I And II ; Tata Mc Graw-Hill.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –III**

Suggested List of Laboratory Experiments :- (Expandable):

1. Measurement of Area by Chain and cross staff survey.
2. Measurement of distances with chain & tape on ground with direct or indirect ranging.
3. Use of prismatic compass and observing fore bearing and back bearing.
4. Construction and use of optical square and open cross staff for setting out Perpendicular and running a survey line for locating details.
5. Measuring Fore bearing and Back bearing of side closed polygon. Identifying stations affected by local attraction and calculation of corrected F.B. & B.B.
6. Measuring fore bearing and back bearing for an open traverse. Calculate direct angles between successive lines.
7. Use of Dumpy level, temporary adjustments and taking reading on leveling staff. Recording readings in field book.
8. Differential leveling practice, reduction of level by H.I. method.
9. Differential leveling practice, reduction of level by rise & fall method.
10. Measurement of Area of irregular figure by polar planimeter.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total (50)
DCE1305	Engineering Geology	3	1	1	(70)	(30)	Min: 40 (D Grade)	(35)	(15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Geology**
Course Outcome	1. Student should able to know objects and scope of geology.
	2. Student should able to know introduction to crystal systems.
	3. Student should able to know brief geological history of India.

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.	**14**
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.	**14**
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.	**14**
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.	**14**
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.	**14**

Text Book/References Books/ Websites

1. Prabin Singh ; Engineering and General Geology ; S.K. Kataria & Sons.
2. Gulati ; Geotechnical Engineering; TMH.
3. P.K. Mukerjee ; Geology ; World Press.
4. S.K. Garg ; Physical And Engineering Geology ; Khanna Publishers.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –III**

Suggested List of Laboratory Experiments :- (Expandable):

1. Study the identification of simple rock forming minerals and important ores.
2. Identification of rock.
3. Simple map exercises
4. Field visit / geological excursion.
5. To study the earth and interior of the earth.
6. To study the land forms of the earth by land form models.
7. Use of Dumpy level, temporary adjustments and taking reading on leveling staff. Recording readings in field book.
8. To study about ground water, glacier, sea water, rivers, denudation, wind erosion system with the help of chart.
9. To study the charts showing topography of the ocean floor, Tsunami, map of ocean current.
10. To study the hardness by Mohr scale of hardness.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total (50)
DCE1306	Software Lab	-	-	1	(Nil)	(Nil)	(Nil)	(35)	(15)	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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know Introduction to Computer Aided Drafting software for 2D.
	2. Student should able to know 3D Modeling, benefit, software's basic commands of drafting entities.
	3. Student should able to know like line, circle, polygon, polyhedron, cylinders; transformations and editing commands like move, rotate, mirror, array.

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- (Expandable):

S. No.	List of Experiments	Marks Weightage
1	Introduction to Computer Aided Drafting software for 2D and 3D Modeling, benefit, software's basic commands of drafting entities like line, circle, polygon, polyhedron, cylinders; transformations and editing commands like move, rotate, mirror, array**.** 1. Practicing commands under draw and dimension menu 2. Practicing commands under modify menu. 3. Practicing commands under tool menu. 4. Practicing commands under format menu. 5. Practicing commands under express menu.	**50**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total (50)
DPE1307	Professional Skill	-	-	1	(Nil)	(Nil)	(Nil)	(Nil)	(50)	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 work & Sessional - Max Marks: 25	Assignment/Quiz/Attendance - Max. Marks: 25

Pre-Requisite	**Nil**
Course Outcome	Able to solve problems ask in the competitive exams.

Unit	Contents (Theory)	Marks Weightage
I	**Quantitative Aptitude:** Percentages/profit & loss, Time and work, Simple and compound interest, Series and progression.	**50**
II	**Reasoning :** Puzzles and seating arrangement, Data sufficiency, Coding-decoding, Blood relation, Order and ranking, Alpha numeric symbol series, Logical reasoning:	
III	**English**: Free quizzes related to synonyms, Antonyms, One word substitution, Idioms and phrases, Spelling correction, Fill in the blanks and common errors in English.	

Text Book/References Books/ Websites

1. R.S. Aggarwal; Quantitative Aptitude for Competitive Examinations.
2. Arihant Publications; Fast Track Objective Arithmetic.
3. R S Aggarwal; Verbal and Nonverbal Reasoning.
4. M K Pandey; Analytical Reasoning.
5. B S Sijwali, Indu Sijwal; A New Approach to Reasoning Verbal and Non-Verbal (English) 1st Edition.
6. SP Bakshi; Objective General English.
7. Wren and martin; English grammar book.
8. Neetu singh; Plinth to paramount English.
9. Norman Lewis; Word power made easy (Mainly for development of vocab)
10. https://www.playquiz2win.com/engquizmenu.html
11. https://www.sawaal.com

Suggested List of Laboratory Experiments :- (Expandable):

Students should solve various problems and quiz on the above mention topics, and prepare an assignment.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
DPE14011	E-Commerce and E- Business	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. To understand technical aspect of E-commerce and E-Business.
	2. To describe the process of E-commerce and E-business.
	3. To understand Infrastructure design issues of E-commerce.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction of E- Commerce:** Definition of E-com , Different types of E-com, E-commerce trade cycle, Advantages and disadvantages of E-commerce, Traditional commerce Vs E - commerce.	14
II	**Overview Of Hardware And Software Technologies Of E-Commerce:** Client side programming (Dream weaver , Front page), Server side programming (PHP), Database connectivity ,Session tracking , Middleware technologies from e com.	14
III	**Payment System Of E-Commerce**: Traditional payment model, Characteristics of payment, System, SET Protocol for credit card payment, E-cash, E-check, Smart cards.	14
IV	**Introduction To E Business:** Definition of E-business, Characteristics, Elements of E-business, roles, Impact of E-business, Challenges of E-business.	14
V	**Developing E Business-Models:** E-business structure, Evolution of E-business and its business models stages, Characteristics of Internet based software and E-business solutions.	14

Text Book/References Books/ Websites

1. Henry Chan; E-Commerce Fundamentals and application; Wiley publication
2. Dave Chaffey; E –business and E – commerce Management; Pearson, 3rd edition

Suggested List of Laboratory Experiments :- (Expandable):Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
DPE14012	Rural Technology & Community Development	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. To understand rural areas problems.
	2. To describe the process by which we improve the living conditions of rural India.
	3. To understand how we help community of rural areas.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction;** Introduction to rural technology, Technology for natural resources development and conservation, Technology for rural livelihood development, Technology for infrastructure.	14
II	**Rural Energy Planning:** Energy sources - conventional, Non-conventional-wind, Bio-gas, Solar; Energy audits: Energy conversion & conservation program, Elements of energy accounting, Energy planning, Demand and supply forecasting.	**14**
III	**Housing:** Housing in rural areas, Rural housing programmes, low cost housing appropriate technologies in rural housing, Drinking water supply: Sources problems, Programmes to solve drinking water problems, Problems of sanitation in rural areas low cost toilets.	**14**
IV	**Rural Community Facilities & Services:** Types of community facilities and services: water, Sanitation, Electricity, Provider of community facilities, Government, Non-governmental organizations, Philanthropic organization.	**14**
V	**Various Program Under Community Facilities and Services;** Various models in providing drinking water and sanitation in India, Rural transportation system - modes of transportation - rural economy, Rural health care and delivery systems.	**14**

Text Book/References Books/ Websites

1. Vikram Singh ; Rural Development in India; Satyam Law International.
2. Katar Singh; Rural Development Principle Policies & Management;
3. Jerry W. Rabinson; Introduction to Community Development; SAGE.
4. Rhonda Phillips, Robert H. Pittman; An Introduction to Community Development; Taylor & Fransis

Suggested List of Laboratory Experiments :- (Expandable):Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
DPE14013	Waste Management	3	1	-			Min: 40 (D Grade)			(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Ability to understand about basic concept of waste management.
	2. Ability to understand about recycling of various wastes.
	3. Ability to understand about waste collection, handling and disposal.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction:** Definition, Various sources, Types of waste, Problem associated with waste, Effects of waste- on society, On human health, On animals, Recycling of waste.	14
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.	14
III	**Hazardous & E-waste**: Definition- sources of hazardous waste, Collection of hazardous waste, Medical waste & Nuclear waste, disposal method and treatment, Definition- sources of E-Waste, E-waste – non-recycling impacts, Recycling of E-waste.	14
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.	14
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-open & sea dumping.	14

Text Book/References Books/ Websites

1. Jagbir Singh, AL. Ramanathan; Solid Waste Management ; Present and future challenges; I.K. International Publishing House Pvt Ltd
2. George Tchobanoglous and Hillary theisen ; Samuel Vigil ; Integrated solid waste management, McGraw Hill.
3. T. V. Ramachandra ; Management of Municipal Solid Waste ; TERI press.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
DCE1402	Transportation Engg.-I	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know modes of transportation system.
	2. Student should able to know super elevation, limits of Super elevation on curves.
	3. Student should able to know RCC girder bridge, pre-stressed girder bridge.

Unit	Contents (Theory)	Marks Weightage
I	**Overview Of Transportation Engineering**: Modes of transportation system – roads, Railway, Airways, Waterways, Importance of each mode, Comparison and their relative merits and demerits, Necessity & importance of cross drainage works for roads & railways.	14
II	**Railway Engineering**: Alignment and gauges, Classification of Indian Railways, zones of Indian Railway. Alignment- Factors governing rail alignment, Rail gauges – types, Factors affecting selection of gauge, Rail track cross sections – standard cross section of BG & M.G Single & double line in cutting and embankment, Permanent ways. Station and Yards: Site selection for railway stations, Requirements of railway station, Types of stations.	14
III	**Ideal Requirement, Component Parts**: **Rails**: function & its types. Rail Joints – requirements, types. **Creep of rail**: causes & prevention of creep. **Sleepers**: functions & Requirement and types, sleeper density. **Ballast**: function & different types with their properties, relative merits & demerits. **Plates**: fish Plates, keys. **Rail Fixtures & Fastenings**: Coning of wheels, tilting of rails, Gradient & its types, Super elevation, limits of Super elevation on curves, Cant deficiency, negative cant, and grade compensation on curves. Branching of Tracks. Definition of point & crossing, Deficiencies in Rail, wear of rail, Rail Creep.	14
IV	**Tunnel Engineering**: Definition, Necessity, Advantages, Disadvantages, Classification of tunnels, Shape and size of tunnels, Tunnel investigations and surveying –Tunnel surveying locating center line on ground, transferring center line inside the tunnel. Shaft – its purpose & construction, Methods of tunneling in soft rock , Methods of tunneling in hard rock –Types of explosives used in tunneling, Tunnel lining and ventilation.	14
V	**Bridge Engineering**: Site selection and investigation Factors affecting selection of site of a bridge. Bridge alignment Component parts of bridge. Plan & sectional elevation of bridge showing component parts of substructure & super structure.. Foundation – function, types Piers-function, requirements, types of Abutment, RCC girder bridge, pre-stressed girder bridge, cantilever, and suspension bridge. Inspection & Maintenance of Bridge - Inspection of bridges, Maintenance of bridges & types, routine & special maintenance.	14

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –IV**

Text Book/References Books/ Websites

1. Birdi & Ahuja ; Road, Railway and Bridges, ; Birdi & Ahuja. Std. Book House.
2. S.C. Saxena ; Railway Engineering, ; Dhanpatrai & sons Pvt. Ltd Mumbai.
3. S.C. Rangwala ; Principles of Railway Engineering, ; Charotar Publication.
4. D. Johnos Victer ; Elements of Bridges ; Oxford & IBH Publishing co.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (35)	Internal (15)	Total (50)
DCE1403	Structural Design & Drawing-I (RCC)	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: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know purpose of reinforcement.
	2. Student should able to know assumptions of WSM, ULM and LSM.
	3. Student should able to know concept of Pre-stressed Concrete.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction To RCC:** S.I. Units, Meaning of R.C.C. Purpose of reinforcement, Materials of reinforcement steel as a reinforcing material, Types of steel used for reinforcement mild steel, Tor steel, Permissible stresses in concrete and steel, Different mixes of concrete to be used for R.C.C. Work use of I.S. code No. 456-2000 and I.S. 875-1984 for designing R.C.C. Structures, Advantages and disadvantages of RCC.	**14**
II	**Working Stress Method & Ultimate Load Method (ULM):** Assumptions of W.S.M&ULM Equivalent bending stress distribution diagram for singly reinforced section, Concept of under-reinforced, Over-reinforced and balanced section, Neutral axis co-efficient Simple numerical problems on determining design constants, Moment of resistance and area of steel for singly & doubly reinforced beam.	**14**
III	**Limit State Method :** Assumption of LSM **Analysis And Design Of Singly & Doubly Reinforced Sections (LSM):** General features, Necessity of providing singly & doubly reinforced section reinforcement ,T beam and slab, One way and two way slab.	**14**
IV	**Design Of Axially Loaded Column And Footing (LSM):** Classification of columns, Effective length of column, Specification for minimum reinforcement, Cover, maximum reinforcement, Number of bars in rectangular, Square and circular sections, Diameter and spacing of lateral ties.	**14**
V	**Pre-stressed Concrete:** Concept of Pre-stressed Concrete, Externally and internally Pre-stressed member and advantages and disadvantages of pre-stressed concrete and difference between pre-stressed concrete and RCC structure and numerical problem.	**14**

Text Book/References Books/ Websites

1. Dr. V.L. Shah & Late Dr. S.R. Karve, Limit State Theory & Design of Reinforced Concrete Structure.
2. N.C. Sihna & S.K. Roy, Fundamentals of Reinforced concrete, S.Chand & Company.
3. N.Krishna Raju R.N. Pranesh, Reinforced concrete Design (IS 456-2000) ,Principles & Practice New Age

Suggested List of Laboratory Experiments :- (Expandable):

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –IV**

1. To determine the bending moment in given beam by using deference forces.
2. To determine the horizontal and vertical reaction in given continuous beam by using deference forces.
3. To determine the ultimate moment in given T- beam by using deference forces.
4. Analysis the given one way slab for deflection.
5. Analysis the given column for axial load.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total (50)
DCE1404	Advance Surveying	3	1	1	(70)	(30)	Min: 40 (D Grade)	(35)	(15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Duration of Theory (Externals): 3 Hours

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know electronic digital theodolite.
	2. Student should able to know remote sensing system- passive system.
	3. Student should able to know use of theodolite as a Tacheometer.

Unit	Contents (Theory)	Marks Weightage
I	**Advanced Survey Equipments:** Construction and use of one second, Micro optic theodolite, Electronic digital theodolite, Features of electronic theodolite, Principle of E.D.M, Components of E.D.M and their functions, Use of E.D.M, Total station.	**14**
II	**Theodolite Survey**: Components of transit theodolite and their functions, Technical terms used, Temporary adjustments of transit theodolite, Swinging the telescope, Transiting, Changing the face, Measurement of horizontal angle, Method of repetition, Errors eliminated by method of repetition, Measurement of deflection angle, Measurement of vertical angle, Measurement of magnetic bearing of a line by theodolite. Prolonging a straight line.	**14**
III	**Traversing with Theodolite** – Method of included angles, Locating details, Checks in closed traverse, Calculation of bearings from angles, Traverse computation - Latitude, Departure consecutive co-ordinates error of closure, Distribution of a angular error, Balancing the traverse by Bowditch rule and Transit Rule, Gale's traverse table, Simple problems on above topic.	**14**
IV	**Aerial Survey and Remote Sensing**: Aerial survey introductions, Definition, Aerial photograph, Remote sensing – introduction, Electro-magnetic energy, Remote sensing system- passive system, Active system, Applications – mineral, land use / land cover, Natural hazards and environmental engineering system.	**14**
V	**Tacheometric Survey**: Principle of tacheometry, Essential requirements of tacheorneter, Use of theodolite as a Tacheometer with staff held in vertical and fixed hair method (No derivation), Determination of tacheometric constants, Simple numerical problems on above topics.	**14**

Text Book/References Books/ Websites

1. A.M.Chandra ; Higher Surveying ; New Age International Publishers
2. S. K. Duggal ; Surveying and Levelling Vol. I and II ; Tata Mc Graw-Hill
3. Plane Surveying ; A.M.Chandra ; New Age International Publishers

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –IV**

Suggested List of Laboratory Experiments :- (Expandable):

1. Understanding the components of Theodolite and their functions, reading the vernier and temporary adjustments of theodolite.
2. Measurement of Horizontal angle by transit theodolite.
3. Measurement of Horizontal angle by method of Repetition.
4. Measurement of vertical angles by theodolite.
5. Measurement of Magnetic bearing of a line using theodolite.
6. Measurement of deflection angle by taking open traverse of sides.
7. To find reduced levels and horizontal distances using theodolite as a Tacheometer.
8. To find constants of a given Tacheometer.
9. Study and use of 1 second Micro Optic Theodolite for measurement of Horizontal and Vertical angles.
10. Study of E.D.M. for knowing its components.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total (50)
DCE1405	Public Health Engineering	3	1	1	(70)	(30)	Min: 40 (D Grade)	(35)	(15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know demands of water.
	2. Student should able to know construction of dug well.
	3. Student should able to know , water borne disease.

Theory Internal Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Unit	Contents (Theory)	Marks Weightage
I	**Introduction:** Duties of P.H. Engineer, Need and importance of P.H.E. **Quantity of Water & Source of Water**: Demands of water, Domestic, Industrial, Commercial & Institutional, Public use, Losses and wastes, Fire demand; Factors affecting rate of Demand, Variations of water demands, Forecasting of population, Methods of forecasting of population, Design period for water supply scheme. Estimation of quantity of water supply required for a town or city, Types of water supply schemes.	**14**
II	**Source Of Water:** Surface and Subsurface sources of water ,Ground water, Open well, Tube-Well, infiltration well, Infiltration gallery, Infiltration pipes, Construction of dug well, Construction of tube well, Well Testing, Yield of well. Intake Structures-Definition and types, Factors governing the location of an intake structure, Factors governing the location of an intake Factors governing the location of an intake structure – Necessity Importance and advantages.	**14**
III	**Quality of Water & Purification of Water:** Effect of different impurities on water, Surface/ground water, Water borne disease, Need for analysis of water, Characteristics of water-Physical, Chemical and Biological, Testing of water for Total Solids, hardness, Chlorides, Dissolved Oxygen, pH, Bacteriological tests, Sampling of water, Water quality standards as per I.S.	**14**
IV	**Purification of Water :** Screening- Types of screens, Aeration- objects and methods of aeration, Plain sedimentation, Sedimentation with coagulation, Principles of coagulation, Types of coagulants, Jar Test, process of coagulation, Types of sedimentation tanks, Filtration theory of filtration. **Classification of Filters**: Slow sand filter, Rapid sand filter, Pressure filter, domestic filter, Filter media, Construction and working of slow sand filter and rapid sand filter, Disinfection: Objects, methods of disinfection, Chlorination- Application of chlorine, Forms of chlorination, Types of chlorination practices, Residual chlorine and its importance, Flow diagram of water treatment plants and R.O Plant.	**14**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –IV**

V	**Conveyance And Distribution of Water:** Types of Pipes used for conveyance of water, Choice of pipe material, Types of joints & Types of valves- their use, Location and function on a pipeline, Methods of distribution of water- Gravity, Pumping, and combined system Service reservoirs – functions and types, Layouts of distribution of water- Dead end system, Grid iron system, Circular system, Radial system, their suitability, Advantages and disadvantages.	**14**

Text Book/References Books/ Websites

1. G.S. and Bridie J.S. Birdie ; Water supply and Sanitary Engg ; Dhanpat Rai & Sons, Delhi
2. Gurucharan Singh; Water Supply & Sanitary Engg; Standard Publishers.
3. Santosh Garg ; Environmental Engg. (Volume I & II); Khanna Publishers.
4. S.C. Rangwala ; Water Supply & Sanitary Engg ; Charottas Publishing House.

Suggested List of Laboratory Experiments :- (Expandable):

1 To perform turbidity test for difference sources of water simple.
2 To perform Color test for water sample .
3 Test for PH, Hardness, Chlorides, Iron & manganese.
4 To perform MPN test for difference sources.
5 To measure the residual chlorine in the water sample
6 Test for total, volatile, fixed suspended and settable solid.
7 To find out D.O., B.O.D., C.O.D.for different water sample.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total (50)
DCE1406	Concrete Lab	-	-	1	(Nil)	(Nil)	(Nil)	(35)	(15)	Min: 20 (D Grade)

Duration of Theory (Externals): Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should know how to control the quality of concrete.
	2. Student should know about properties of concrete.
	3. Student should know about working of concrete.

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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- (Expandable):

1 Initial and Final setting time of cement by Vicat's apparatus.
2 Determination of uncombined lime by Le-chateliers apparatus.
3 Determination of compressive strength of concrete with different cement grades.
4 Determination of workability of concrete by slump test.
5 Determination of workability by compacting factor apparatus.
6 Determination of workability of concrete by Vee-Bee apparatus.
7 Non-destructive testing of concrete by rebound hammer test.
8 Study of Non destructive testing by ultrasonic pulse velocity test.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –IV**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total (100)
DCE1407	Industrial Training-I	-	-	2	(Nil)	(Nil)	(Nil)	(70)	(30)	Min: 40 (D Grade)

Duration of Theory (Externals): -Nil

Theory Internal- Max Marks: -	Best of Two Mid Semester Test - Max Marks: - Nil	Assignment/Quiz/Attendance - Max. Marks: - Nil
Practical Internal Max Marks: 30	Lab work & Sessional - Max Marks: 25	Assignment / Quiz/ Attendance - Max. Marks: 05

Pre-Requisite	**Fundamental Engineering Concepts.**
Course Outcome	1. To develop general confidence, ability to communicate and attitude, in addition to basic technological concepts through Industrial visits, expert lectures, seminars on technical topics and group discussion.
	2. Ability to learn actual working environment.

Unit	Contents (Theory)	Marks Weightage
I	As a part of the Diploma in Engineering curriculum, DPE1407, Industrial Training -I is a Practical course, which the students should undergo in reputed Private / Public Sector / Government organization / companies as industrial training of minimum two weeks to be undergone by the student in the semester break after III semester theory examinations. **Training period**: Minimum of two weeks or 15 (Fifteen) Days. **Companies / Areas covered**: Any field related to concern branch / discipline of Diploma in Engineering. **Grading**: As per Scheme. **Note:** Presentation will take place the following week after you complete your training. The presentation is evaluated by your class in charge. Report must be submitted during power point presentation. A Viva voce comprising comprehensive questions based on your training undergone. **Etiquette:** Dress properly, Behave well, Portray good image as a university student, Be punctual, Observe work ethics, Concern for safety, Be professional.	**100**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
DCE15011	Sanitation Engineering	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Marks: Nil

Pre-Requisite	**Public Health Engineering**
Course Outcome	1. Student should able to know to building sanitation-water pipe.
	2. Student should able to know manholes and drop Manhole-component parts.
	3. Student should able to know environmental sanitation necessity and importance.

Unit	Contents (Theory)	Marks Weightage
I	**Building Sanitation :** Importance and necessity of sanitation,- Sewage, Sullage, Types of sewage, Definitions of the terms related to building sanitation-Water pipe, Rain water pipe, Soil pipe , Sullage pipe, Vent pipe, Building sanitary fittings- water closet – Indian and European type, Flushing cistern, Wash basin, Sinks, Urinals, Traps- types, Systems of plumbing – One pipe, Two pipe, Single stack, layout plan for building sanitary fittings (drainage plan) , Inspection and junction chambers, Their necessity, location.	**14**
II	**Systems Of Sewerage:** Types of sewers, Systems of sewerage, Principle of design of sewers, Self cleansing velocity and non scouring velocity laying, Testing and maintenance of sewers, Sewer appurtenances, Manholes and drop Manhole-component parts, location, Spacing, Sewer inlets, Street inlets, Flushing tank.	**14**
III	**Analysis Of Sewage:** Characteristics of sewage, BOD & COD and significance, Aerobic and anaerobic process, Pollution Control board norms for the discharge of treated sewage.	**14**
IV	**Treatment Of Sewage :** Objects of sewage treatment, General layout and flow diagram, Screening, Grit removal, Skimming, Sedimentation of sewage, Sludge digestion, Trickling filters, Activated sludge process, Disposal of sewage, Septic tank, Oxidation pond, Oxidation ditch, Common complaints in the operation of septic tank and remedies and Soak pit.	**14**
V	**Rural Sanitation:** Environmental sanitation necessity and importance, Rural sanitation-Types of Privies – Aqua privy and bore hole latrine construction and working composting (Nadep or Vermiculture).	**14**

Text Book/References Books/ Websites

1. G.S. and Bridie, J.S Birdie ;Water supply and Sanitary Engg ; Dhanpat Rai & Sons, Delhi.
2. Gurucharan Singh ; Water Supply & Sanitary Engg ; Standard Publishers.
3. Santosh Garg ; Enironmental Engg. (Volume I & II) ; Khanna Publishers.
4. S.C. Rangwala ; Water Supply & Sanitary Engg ; Charottas Publishing House.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
DCE15012	Material Technology	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know strength of bricks, proportions of burnt.
	2. Student should able to know physical properties of cement.
	3. Student should able to know concrete, necessity of supervision for concreting.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction :** Importance of material technology for civil engineer, Name of common engineering materials used in construction. **Masonry Materials:** Building stones- classification of rocks, Requirement of good building stone &, Dressing of stones, Quarrying of stones, Artificial or cast stones, Bricks – properties of good building bricks, Conventional bricks , Standard bricks, Composition of clay brick, Method of preparation of bricks, Strength of bricks, Proportions of burnt clay bricks , Testing of bricks, Special bricks, Hollow blocks, Fly ash bricks sand lime brick and concrete brick.	**14**
II	**Binding Materials:** Properties of Morrum and sand for road work and building construction, Lime - types and properties of lime: Fat lime, Hydraulic lime, Quick lime, Cement - Different ingredients used for manufacturing cement with their percentage, Physical properties of ordinary portland cement (OPC), Hydration of cement, Physical properties of cement, Different grades of OPC and their specification of physical properties as per relevant IS codes, Field test of cement, Storing cement at site, Types of cement and their functional uses.	**14**
III	**Aggregates:** Properties of fine aggregates - Concept of size, Shape, Surface texture, Strength, specific gravity, Bulk density, Water Absorption, Surface moisture, Soundness, Bulking impurities, Determination of fineness modulus & grading zone of sand by sieve analysis, Determination of silt content in sand, Bulking of sand, Phenomenon of bulking, Its effect on concrete mix proportion, Properties of coarse aggregates, Tests on aggregates used in road and building construction.	**14**
IV	**Mortars:** Classifications, Lime mortar, Cement mortar, Special mortars, Functions of mortar, Proportions, Properties of mortar and tests for mortar. **Concrete**: Introduction to concrete - Definition of concrete, Necessity of supervision for concreting operation, Different grades of concrete (as per provisions of IS 456- 2000), minimum and cube test of grade of concrete for R.C.C Water cement (w/c) ratio, Definition of workability, Factors affecting workability of concrete.	**14**
V	**Timber, Paint, Varnish, Colors, Primers, Steel And Aluminum Sections:** Classification, manufacturing and its uses, Advantage and disadvantage of different materials.	**14**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –V**

Text Book/References Books / Websites :

1. Rangwala ; Engineering Materials ; Charotar public house.
2. S.K. Duggal ; Building Materials ; Dhanpat Rai Publication .
3. Surendra Singh ; Engineering Materials ; McGraw Hill Education.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
DCE15013	Design of Hydraulic Structures	3	1	-			Min: 40 (D Grade)			(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Irrigation Engineering**
Course Outcome	1. Student should able to know about dam, weirs and canals.
	2. Student should able to know understand different types of crops and their water requirements.
	3. Student should able to know understand how electricity generated by hydropower plants.

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 favorable for their adoption.	**14**
II	**Spillways :** Ogee spillway and its design, Details of siphon, 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, Siphon aqueduct.	**14**
V	**Hydropower Plants: I**ntroduction 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) ; Shelley and Son Books
2. Creager Hydroelectric Hand Book; JOHN WILEY & SONS; 2nd edition (1950).
3. Varshney ; Hydraulic Structures ;Varshney Book Publiser.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
DCE1502	Building Construction Technology	3	1	-			Min: 40 (D Grade)			(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Irrigation Engineering**
Course Outcome	1. Student should able to know building components and types of structure.
	2. Student should able to know job layout – necessity and procedures.
	3. Student should able to know brick laying ,. comparison between brick and stone masonry.

Unit	Contents (Theory)	Marks Weightage
I	**Building Components and Materials:** Building components and types of structure - building components & their function, Substructure – foundation, plinth, Superstructure – walls, Sill, lintel, Doors & windows, Floor, Roof etc. Types of structures – load bearing structures, Framed structures, Composite structures.	**14**
II	**Construction of Sub Structure :** Job layout – necessity and procedures, Site clearance, Preparing job layout, Layout for load bearing structure and framed structure by center line And face line method, Precautions while marking layout on ground, Earthwork - excavation for foundation, timbering and strutting, Earthwork for embankment, Material for plinth filling, Tools and plants used for excavation and earthwork, Foundation - importance and necessity, Types of foundation, Shallow and deep.	**14**
II	**Construction of Super Structure:** Stone masonry, Brick masonry: Common terms used in brick masonry, Requirements of good brickwork, and bonds in brick masonry, English, Flemish, stretcher and header bonds only. Brick laying , Comparison between brick and stone masonry, Doors and windows, Stair case, Elevators, Escalators etc. Scaffolding and shoring purpose, Merits and demerits of different types of scaffolding.	**14**
IV	**Building Finishes :** Floors and roofs - Process of laying and construction, Finishing and polishing of floors, Roofing materials – AC sheets, GI sheets, Plastic sheets, Fiber sheets, etc. Types of trusses. R.C.C. slab, Wall finishes: Plastering, Precaution to be taken while plastering, Defects in plaster, Pointing – necessity and procedure of pointing, Difference between plastering and pointing, Painting – necessity, Surface preparation, Method of application, Selecting suitable painting material, White wash and colour wash.	**14**
V	**Building Maintenance:** Cracks - causes and types of cracks, Identification and repair of cracks, Guniting and grouting, Settlement - causes and remedial measures plinth protection – necessity and materials used, Demolition - necessity, method of demolition.	**14**

Text Book/References Books / Websites

1. S. P. Arora and Bindra; Building Construction; Dhanpat Rai Publication.
2. S. C. Rangawala; Building Construction ; Charotar Publication.
3. Sushil Kumar; Building Construction ; Standard Publication.
4. B. C. Punmia; Building Construction; Laxmi Publication.
5. S.K. Sharma; Building Construction ;Tata McGraw-Hill.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total (50)
DCE1503	Transportation Engineering-II	3	1	1	(70)	(30)	Min: 40 (D Grade)	(35)	(15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal Max Marks : 30	Best of Two Mid Semester Test Max - Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks :15	Lab work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Transportation Engineering - I**
Course Outcome	Student should able to know classification of roads according to Nagpur plan.
	Student should able to know road accident and PIEV theory.
	Student should able to know methods of soil stabilization.

Unit	Contents (Theory)	Marks Weightage
I	**Road Engineering:** Importance of road in India, Classification of roads according to Nagpur plan (Location and function), and third road development plan, Traffic and tonnage, Classification of urban roads, Different road yojana, like Pradhan Mantri Gram Sadak Yojana, Mukhya Mantri Sadak Yojana.	**14**
II	**Traffic Engineering:** Traffic volume study, Traffic control devices-road signs, Marking, Signals, Traffic Island, Road intersections: intersections at grade and grade separator intersections. Road accident and PIEV Theory.	**14**
III	**Construction Of Roads Pavements And Materials:** Types of road materials Pavement – objective of pavement, Structure of pavement, Function of pavement components, types of pavement. Soil stabilized roads: Necessity, Methods of soil stabilization, Brief details of mechanical soil stabilization. Water bound macadam roads: Materials used, size and Grading of aggregates and Screening, Construction procedure including precautions in rolling. Construction of bituminous roads. Types of bituminous surface: Prime coat, Tack coat, Seal coat, Surface dressing: Procedure of Construction bituminous penetration macadam, and Bitumen/Tar carpets.	**14**
IV	**Hill Roads:** Parts and functions of hill road components, Types of curves, Hill road formation. Landslides- causes and prevention. Structures- drainage structures. **Drainage of Roads**: Surface drainage – Side gutter, Catch water drains, Surface drainage. Sub-surface drainage: Longitudinal drains and Cross drains.	**14**
V	**Maintenance And Repairs of Roads:** Necessity of maintenance of roads, Classification of maintenance operation – ordinary, Routine and periodic maintenance. Maintenance of W.B.M., Bituminous and cement concrete roads. Arboriculture: Road side arboriculture, necessity, Planning of plantation of trees selection of types of threes and development of nursery considering the environment aspects.	**14**

Text Book/References Books/ Websites

1. N.L.Arora,S.P. Luthara ;Transportation ; I.P.H. New Delhi.
2. Biridi & Ahuja ; Road , Raqilway,Bridges ; S.B.H New Delhi.
3. Kamala ; Transportation Engineering ;T.M.H. New Delhi.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –V**

Suggested List of Laboratory Experiments :- (Expandable):

1. Aggregate crushing value test.
2. Determination of aggregate impact value.
3. Determination of Los angles abrasion value.
4. Determination of California bearing ratio values.
5. Determination of penetration value of bitumen.
6. Determination of shape tests on aggregate.
7. Determination of softening point of bituminous material.
8. Determination of bitumen content by centrifuge extractor.
9. Determination of flash point and fire point of bituminous material.
10. Determination of stripping value of road aggregate.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total (50)
DCE1504	Structural Design & Drawing –II (Steel)	3	1	1	(70)	(30)	Min: 40 (D Grade)	(35)	(15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal Max Marks: 30	Best of Two Mid Semester Test Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know grades of steel and strength characteristics.
	2. Student should able to know riveted and bolted connection**.**
	3. Student should able to know criteria of failure of short column and long column.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction** : Types of sections used, Hollow square section rectangular section tubular section, Z-Section, Angle section- T, I, C, L-Section etc., Grades of steel and strength characteristics: Advantages and disadvantages of steel as construction material: Use of steel table and relevant I. S. code, Types of loads on steel structure and its I. S. code specification.	**14**
II	**Connections**: Riveted and bolted connection, Types of rivets and their use, Nominal diameter, Gross dia. unwin's formula, Pitch of rivets, Edge distance, Tacking rivets, Permissible stress in rivet riveted joint and its failure, Strength of riveted joint and efficiency of a riveted joint, Assumptions in theory of riveted joint, Design of riveted joint for axially loaded member, Eccentric riveted connection welded connection introduction, Permissible stress in weld, Strength of weld, Advantages and disadvantages of welded joint, Types of weld and their symbols, Design of fillet weld and butt weld subjected to axial load.	**14**
III	**Tension Member**: Types of sections used, Permissible stresses in axial tension, Gross and net cross sectional area of tension member, Analysis and design of tension member with welded and riveted connection.	**14**
IV	**Compression Member**: Criteria of failure of short column and long column, End conditions effective length of a column, Slenderness ratio and corresponding compressive stress : Angle struts types of sections used, Analysis and design of axially loaded angle struts with welded and riveted connection, Stanchion and columns, Types of sections used, Simple and built up sections, Analysis and design of axially loaded column, Design of compound column, Design of lacing angles and batten plates.	**14**
V	**Column Bases**: Types of column bases ,Design of slab base & concrete block, Cleat angles, Their use, Introduction to gusseted base (no numerical problems on gusseted base) roof truss: Types of steel roof truss & its selection criteria, Span and slope, Rise and pitch, Loads acting on the roof, Dead load; live load and wind load as per I.S. 875-1987.	**14**

Text Book/References Books/ Websites

1. Ramanatham ; Steel structures ;Vazirani Publisher.
2. Dr. N.R. Chandak ;,Design of steel Structure ; S.K.Kataria and Sons .
3. Malhotra M.M, ; Steel Structures ;Malhotraand Bright Group Of Publication.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –V**

Suggested List of Laboratory Experiments :- (Expandable):

1. Sketching of different types of riveted joints and welded joints. Typical sketches of sections of tension member, determination of net effective cross-sectional area of tension member for angle section.
2. Typical sketches of sections of compression member, lacing and battening.
3. Graphical solution of frames to find out the stress in the member. Type of trusses for different spans.
4. Working drawing of steel truss with the details of joint.
5. Detailed drawing of slab base and gusseted base.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total (50)
DCE1505	Soil Mechanics & Techniques - I	3	1	1	(70)	(30)	Min: 40 (D Grade)	(35)	(15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know formation of soils, soil composition.
	2. Student should able to know soil water, permeability, flow nets.
	3. Student should able to know pressures on cohesion-less and cohesive soils.

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, Porosity and degree of saturation and specific gravity.	**14**
III	**Stress Distribution in Soils and Shear Strength of Soils**: Stress distribution beneath loaded areas by Boussinesq and water gaurd's analysis. Newmark'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, Coulomb, 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 and retaining and counterfort retaining wall.	**14**

Text Book/References Books/ Websites

1. Dr. B. C. Punmia ; Soil Mechanics & Foundation Engineering ; Standard Book house, New Delhi
2. V.N.S. Murthi ; Soil Mechanics & Foundation Engineering ; Tata McGraw Hill , New Delhi
3. K.R. Arora ; Soil Mechanics & Foundation Engineering ; Tandard Publishers
4. Gulhati & Dutta ; Geo-technical Engineering ; Tata McGraw Hill, New Delhi.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –V**

Suggested List of Laboratory Experiments :- (Expandable):

1. Determination of Hygroscopic water content
2. 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. Permeability tests
8. Direct shear test
9. Consolidation test

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total (50)
DPE1506	Minor Project	-	-	1	(Nil)	(Nil)	(Nil)	(35)	(15)	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 work & Sessional - Max Marks: 10	Assignment / Quiz/ Attendance - Max. Marks: 05

Pre-Requisite	**Student should have basic knowledge of engineering principles.**
Course Outcome	The student will be able to-An ability to utilize technical resources:
	1. Identify, analyze & define the problem.
	2. Generate alternative solutions to the problem identified.
	3. Compare & select feasible solutions from alternatives generated.
	4. Compare machines/devices/apparatus for performance practices.
	5. Work effectively in a team.

Unit	Contents (Theory)	Marks Weightage
I	The student should prepare a working system or some design or understanding of a complex system (on minor level) that he has selected for his/her minor project work using system analysis tools and submit the same in the form of a write-up i.e. detail project report. 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. 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.	**50**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total			Total (100)
DCE1507	Industrial Training - II	-	-	2	External (Nil)	Internal (Nil)	(Nil)	External (70)	Internal (30)	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: 30	Lab work & Sessional - Max Marks: 25	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Fundamental Engineering concepts.**
Course Outcome	1. To develop general confidence, ability to communicate and attitude, in addition to basic technological concepts through Industrial visits, expert lectures, seminars on technical topics and group discussion.
	2. Ability to learn actual working environment.

Unit	Contents (Theory)	Marks Weightage
I	As a part of the Diploma in Engineering curriculum, DCE1507, Industrial Training -II is a Practical course, which the students should undergo in reputed Private / Public Sector / Government organization / companies as industrial training of minimum two weeks to be undergone by the student in the semester break after IV semester theory examinations. **Training period**: Minimum of two weeks or 15 (Fifteen) Days. **Companies / Areas covered**: Any field related to concern branch / discipline of Diploma in Engineering. **Grading**: As per Scheme. **Note:** Presentation will take place the following week after you complete your training. The presentation is evaluated by your class in charge. Report must be submitted during power point presentation.. A Viva voce comprising comprehensive questions based on your training undergone. **Etiquette:** Dress properly, Behave well, Portray good image as a university student, Be punctual, Observe work ethics, Concern for safety, Be professional.	**100**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
DCE16011	Construction Planning and Management	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know CPM/PERT with network analysis.
	2. Student should able to know factors affecting selection, investment and operating cost.
	3. Student should able to know notice inviting tenders, contract document.

Unit	Contents (Theory)	Marks Weightage
I	**Preliminary And Detailed Investigation Methods:** Methods of construction, 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 of construction equipment 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 contracts, 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, 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, Welfare facilities, labour laws and human relations, Safety engineering, Problem of equipment management.	**14**

Text Book/References Books/ Websites

1. Roberts Peurify ; Construction planning Equipment and method ; McGraw-Hill Education (India) Pvt Limited.
2. L.S. Srinath ; CPM ; Affiliated East-West Press Pvt Ltd.
3. S. Seetharaman ; Construction Management ; Dhanpat Rai Publication.
4. Weist & Levy ; CPM & PERT ; Phi Learning.
5. Harpal Singh Construction ; Management & Accounts ; Tata McGraw-Hill Publishing Company Limited.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)			Total
DCE16012	Traffic Engineering	3	1	-	External (70)	Internal (30)	Min: 40 (D Grade)	External (Nil)	Internal (Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Transportation Engg. -II**
Course Outcome	1. To give detailed information about the road user's characteristics, vehicular characteristics.
	2. To give detailed information about the traffic studies, traffic capacity, parking studies.
	3. To give the knowledge of traffic operations and control, traffic signals- isolated signals.

Unit	Contents (Theory)	Marks Weightage
I	**Traffic Characteristics:** **(i) Road User's Characteristics** - general human characteristics, physical, mental and emotional factors, factors affecting reaction time, piev theory. **(ii) 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**: (i) Spot speed studies and volume studies. (ii) Speed and delay studies: purpose, Causes of delay, methods of conducting speed and delay studies. (iii) Origin and destination studies (O & D): various methods, collection and interpretation of data, planning and sampling. (iv) Traffic capacity studies**:** volume, density, basic practical and possible capacities, level of service. (v) Parking studies: methods of parking studies cordon counts, space inventories, parking practices.	**14**
III	**Traffic Operations and Control:** (i) Traffic regulations and various means of control. (ii) One way streets- advantages and limitations. (iii) 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:** (i) Methods of light distribution. (ii) Design of street lighting system. (iii) Definitions- luminarie, foot candle, lumen, utilization and maintenance factors. (iv) Different types of light sources used for street lighting. (v) Fundamental factors of night vision.	**14**
V	**Accident Studies & Mass Transportation**: (i) Accident studies: causes of accidents, accident studies and records, condition and collision diagram, preventive measures. (ii) 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 Khanna ; Traffic Engineering and Transport Planning ; L.R. Kadiyali Khanna Publishers, New Delhi.

2 Matson W.S.Smith & F.W. Hurd ;Traffic Engineering ; Matson W.S.Smith & F.W. Hurd publisher.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
DCE16013	Pavement Design	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. To give the knowledge of about the Equivalent Single Wheel Load (ESWL).
	2. To give the knowledge of Flexible Pavements.
	3. To give the knowledge of Rigid Pavements.

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. Witczak ; Principles of Pavement Design ; E.J.Yoder & M.W. Witczak Ltd.

2 Washington, D.C.Aasho Interim Guide for Design Of Pavement Structures ; Washington, D.C.Aasho Interim Guide for Design Of Pavement Structures ; Publication.

3 Code for Flexible Pavement Design IRC:37:2012, Code for Rigid Pavement Design IRC:58:2015.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
DCE1602	Irrigation Engineering	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know Definition – Irrigation, advantages of irrigation.
	2. Student should able to know Hydrological cycle, rain gauge, types of rain gauges.
	3. Student should able to know Crop period base period Duty Delta.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction**: Definition – Irrigation, Advantages of irrigation, ill effects of over irrigation, and types of irrigation project purpose wise and administrative wise, Methods of irrigation, Weir and barrages, lift irrigation scheme, Its suitability, advantages and limitations crop Rainfall, Seasonal crops.	**14**
II	**Hydrology :** Hydrological cycle, Rain gauge, Types of rain gauges (names only) average annual rain fall and its calculation , Definition of runoff, Factor affecting run off, Calculation of run off by runoff coefficient, English formula, Maximum flood discharge and methods of calculation. Unit hydrograph ,Yield and Dependable yield and methods of calculation.	**14**
III	**Water Requirement Of Crops:** Cropping seasons and crop in Madhya Pradesh, Definition – Crop period base period Duty Delta , Factors affecting Duty , Relation between Duty Delta and base period Definition – CCA , GCA, IA, Intensity of irrigation time factor capacity factor, Crop rotation, Problems on water requirement and capacity of canal, Assessment of irrigation water.	**14**
IV	**Dams And Spillways:** Types of dams –Comparison of earthen and gravity dams with respect to foundation, Earthen Dams, Methods of constructions, Types of failure of earthen dams and remedial measures, Typical cross section, Drainage gallery, Joint in gravity dam, High dam and low dam Spillways, Type of Spillway.	**14**
V	**Canals:** Classification of canals according to alignment and position in the canal network. Design of most economical canal section. Canal lining : Definition, purpose, types of canal lining Advantages of canal lining properties of good canal lining material, Cross drainage canal- falls, escapes, cross regulators and canal outlets.	**14**

Text Book/References Books/ Websites

1. B.C. Punmia ; Irrigation and water power Engineering ; Laxmi Publication, Delhi.
2. B.C. Punmia ; Introductory Irrigation Engineering ; Laxmi Publication, Delhi.
3. S.K. Garg ; Irrigation Engineering. & Hydraulic structures ; Khanna publisher, New Delhi.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (35)	Internal (15)	Total (50)
DCE1603	Quantity Surveying & Costing	3	1	1			Min: 40 (D Grade)			Min: 20 Grade

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know definition – irrigation, advantages of irrigation.
	2. Student should able to know hydrological cycle, rain gauge, types of rain gauges.
	3. Student should able to know . typical cross section, drainage gallery.

Unit	Contents (Theory)	Marks Weightage
I	**Estimate Of R.C.C. Structure:** Estimate of slab, beam, T-beam, Estimate of R.C.C. column with its footing, Preparation of abstract of above items, Preparation of bar bending schedule, And to calculate amount of steel**.**	**14**
II	**Detailed Estimates:** Preparing detailed estimates of various types of buildings, R.C.C. works, Earth work, Services for building such as water supply, Drainage and electrification, Types of cross drainage structure.	**14**
III	**Estimate of Culverts & Bridges:** Estimate of Hume pipe culvert with splayed type of wing wall, Turn wall and face wall, Estimate of R.C.C. slab bridge, Straight type wing walls.	**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 & Rent Fixation:** Definition, necessity of valuation, Definition, Cost price, Value, Types of value, Book, Market value, Depreciation, Obsolescence, Sinking fund, Methods of calculation of depreciation, Quantity survey method, Computation of capitalized value, Gross income, Outgoing, Net income, Years purchase, Types of outgoing and their percentages, Valuation of lands & buildings, Factors affecting their valuation, Fixation of rent as per PWD practice.	**14**

Text Book/References Books/ Websites

1. B.N. Dutta ; Estimating and Costing ; S.Datta & Co. Tagroe Path Motilal Bose Road, Lucknow.
2. Rangwala Charotar ; Estimating and Costing & Valuation ; By Publications Station Road, Anand.
3. Birdie, J.C, Kapoor ; Estimating & Costing ; Dhanpat Rai & Sons Delhi and Jullunder.
4. J.C. Malhotra,; Estimating & Costing ; Vol-I & Vol.-II Khanna Publishers New Delhi.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –VI**

Suggested List of Laboratory Experiments :- (Expandable):

1. Use of different Schedule of Rates like .PWD,C.P.W.D, D.S.R,RES, HOUSING BOARD, IRRIGATION & PHE.
2. Estimating & abstract and rate analysis with the help of different software eg. QE-PRO, ESTIMATOR, & Print out of report.
3. Taking out quantities of following items for small R.C.C. Hall Concreting for footing, Column, Beam, slab.
4. Reinforcement for above items by preparing Schedule of bars form work for all above items.
5. Preparing Rate analysis of following items: Building work – Brick work, P.C.C., R.C.C., Plastering, Flooring, Doors, Windows
6. Taking out quantities of Steel work for given shed supported on steel trusses & having GI sheet/profile sheet roofing.
7. Taking out quantities of work for pipe culvert. (Drawings shall be provided for the above exercises by subject teacher.)

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total (50)
DCE1604	Soil Mechanics & Techniques -II	3	1	1	(70)	(30)	Min: 40 (D Grade)	(35)	(15)	Min: 20 Grade

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know type of foundations shallow and deep
	2. Student should able to know estimation of individual and group
	3. Student should able to know factors affecting compaction

Unit	Contents (Theory)	Marks Weightage
I	**Shallow Foundations:** Type of foundations, 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, Meyerhoff and Hansan. I.S. code on B.C. Determination of bearing capacity, 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 caissons, well foundation.	**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, 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 programme 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:** Classification of sheet piles/bulkheads. Cantilever and anchored sheet piles, Cofferdams, materials, types and applications.	**14**

Text Book/References Books/ Websites

1. Dr. K.R. Arora, Soil Mechanics & Foundation Engg, Std. Publishers Delhi
2. B.C. Punmia ,Soil Mechanics & Foundation Engg, Laxmi Publiscations Delhi
3. Dr. Alam Singh ,Modern Geotech. Engg.IBT Publishers Delhi.
4. C.Venkatramaiah ,Geotech. Engg, New AGe International Publishers, Delhi

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –VI**

Suggested List of Laboratory Experiments :- (Expandable):

1. Determination of field density by core cutter method.
2. Determination of field density by sand replacement method.
3. Determination of field density by water displacement method.
4. Modified Proctor test.
5. Triaxial compression test.
6. Vane shear test.
7. C.B.R. test.
8. Demonstration of plate load test.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total (250)
DCE1605	Major Project	-	-	5	(Nil)	(Nil)	(Nil)	(175)	(75)	Min: 100 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: 75	Lab work & Sessional – Max Marks: 70	Assignment/Quiz/Attendance Max. Marks: 05

Pre-Requisite	**Knowledge of concerned subject.**
Course Outcome	The student will be able to-An ability to utilize technical resources:
	1. Identify, analyze & define the problem.
	2. Generate alternative solutions to the problem identified.
	3. Compare & select feasible solutions from alternatives generated.
	4. Design, develop, manufacture & operate equipment/program.
	5. Acquire higher-level technical knowledge by studying recent development in Engineering field.
	6. Compare machines/devices/apparatus for performance practices.
	7. Work effectively in a team.

Unit	Contents (Theory)	Marks Weightage
I	The student should prepare a working system or some design or understanding of a complex system that he has selected for his project work using system analysis tools and submit the same in the form of a write-up i.e. detail project report. The student should maintain proper documentation of different stages of project such as need analysis, market analysis, concept evaluation, requirement specification, objectives, work plan, analysis, design, implementation and test plan wherever applicable. 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 the working system, if applicable. Evaluation will be based on his performance in technical work pertaining to the solution of a small size problem, project report, and presentation of work and defending it in a viva-voce.	**250**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total (50)
DPE1606	Development of Professional Ethics	-	-	1	(Nil)	(Nil)	(Nil)	(35)	(15)	Min: 20 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 work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	Ability to use of presentation aids, Presentation skills, Interview Technique and ethics.

Unit	Contents (Theory)	Marks Weightage
I	**Presentation Skills** Body Language - Dress like the audience. Posture, Gestures, Eye contact and facial expression. Presentation skill – Stage fright, Voice and language – Volume, Pitch, Inflection, Speed, Pause; Pronunciation, Articulation, Language, Practice of speech; Use of aids –OHP,LCD projector, White board	**50**
	Group Discussion and Interview Technique – Introduction to group discussion, Ways to carry out group discussion. Parameters— Contact, Body language, Analytical and logical thinking, Decision making **Interview Technique** Necessity, Tips for handling common questions.	
	Working in Teams: Understand and work within the dynamics of a groups, Tips to work effectively in teams, Establish good rapport, Interest with others and work effectively with them to meet common objectives, Tips to provide and accept feedback in a constructive and considerate way, Leadership in teams, Handling frustrations in group.	
	Professional Ethics: The foundations and norms of professional ethics, The need for separate code of conduct for professionals, The relation between professional and general ethics, Moral conflict and the issue of autonomy of professional ethics, Impact of violation of professional ethics on society, Remedies.	

Text Book/References Books/ Websites

1. Michael Hatton ;Presentation Skills (Canada – India Project) ;ISTE New Delhi.
2. Richard Hale ,Peter;Target setting and Goal Achievement; Whilom Kogan page India.
3. Chakravarty, Ajanta ;Time management ;Rupa and Company.
4. Harding ham; Working in Teams;.A Orient Longman.
5. Koehn, D.; The Ground of Professional Ethics, Routledge, 1995.
6. Wuest, D.E; Professional Ethics and Social Responsibility, Rowman & Little field, 1994.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Diploma in Engineering** **Semester –VI**

Suggested List of Laboratory Experiments :- (Expandable):

1. Deliver a seminar for 10-12 minutes using presentation aids on the topic given by your teacher.
2. Watch/listen an informative session on social activities. **Make a report** on topic of your interest using audio/visual aids.
3. **Mini Project** on Task Management. Decide any task to be completed in a stipulated time with the help of teacher. Write a report on the group task assigned by teacher related to social and technical activities.
4. Conduct an interview of a personality and write a report on it.
5. Discuss a topic in a group and prepare minutes of discussion. **Write thorough description** of the topic discussed.
6. **Arrange an exhibition**, displaying flow-charts, posters, paper cutting, photographs etc on the topic given by your teacher.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –I**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
MT1101	Research Methodology & IPR	3	1	-			Min: 40 (D Grade)			(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Students will be able to understand research problem formulation.
	2. Able to analyze research related information and follow research ethics.
	3. Understand the importance of IPR and its protection for further research work.

Unit	Contents (Theory)	Marks Weightage
I	**Research Methodology:** Meaning, Objective & its types, Research approaches , Significance of research, Research methods vs. methodology, Research process, Criteria of good research, Meaning of research problem, Sources of research problem, Errors in selecting a research problem, Scope and objectives of research problem, Effective literature studies approaches, Plagiarism, Research ethics, Problems encountered by researchers in India.	**14**
II	**Concept and Importance in Research:** Features of a good research design, Exploratory research design, Concept types and uses, Descriptive research designs, Concept, Types and uses, Experimental design, Concept of independent & dependent variables, Interpretation , Meaning & technique, Precaution in interpretation , Significance of report writing; layout of the research report, Types of reports, Precautions for writing research reports, Effective technical writing, Role of computer software in report writing.	**14**
III	**Data Collection:** Collection of primary data, Observation method, Interview method, Collection of data through questionnaires, Collection of data through schedules, Difference between questionnaires and schedules, Collection of secondary data.	**14**
IV	**Hypothesis**: Null hypothesis & alternative hypothesis, Basic concepts concerning testing of hypotheses, Procedure for hypothesis testing, Flow diagram for hypothesis testing, Qualities of a good hypothesis.	**14**
V	**Nature of Intellectual Property:** Patents, Designs, Trade and copyright, Process of patenting and development, Technological research, Innovation, Patenting; Development, International scenario, International cooperation on intellectual property, Procedure for grants of patents, Patenting under pct, **patent rights,** scope, licensing and transfer of technology, Patent information and databases, Geographical indications, New developments in IPR, Administration of patent system, IPR of biological systems.	**14**

Text Book/References Books/ Websites:-

1. C . R. Kothari; Research Methodology; New Age Publication.
2. Wayne Goddard and Stuart Melville; Research Methodology: An Introduction.
3. Ranjit Kumar; 2 nd Edition ; Research Methodology: A Step by Step Guide for beginners.
4. Robert P. Merges; Peter S. Menell; Mark A. Lemley; Intellectual Property in New Technological Age.
5. T. Ramappa; Intellectual Property Rights Under WTO ; S. Chand; 2008.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –I**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
MTCM1102	Composite Materials	3	1	-			Min: 40 (D Grade)			(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to understand fibre reinforced concrete.
	2. Student should able to understand fly ash concrete & polymer concrete.
	3. Student should able to understand Ferrocement & high performance concrete.

Unit	Contents (Theory)	Marks Weightage
I	**Fibre Reinforced Concrete:** Properties of constituent materials, Mix proportions, Mixing and casting procedures, Properties of freshly mixed FRC, Mechanics and properties of fibre reinforced concrete, Composite material approach, Application of fibre reinforced concrete.	**14**
II	**Fly Ash Concrete & Polymer Concrete:** Classification of Indian fly ashes, Properties of fly ash, Proportioning of fly ash concretes, Properties of fly ash concrete in fresh and hardened state, Durability of fly ash concrete, Terminology used in polymer concrete, Properties of constituent materials, Polymer impregnated concrete, Polymer modified concrete, Properties and applications of polymer concrete and polymer impregnated concrete.	**14**
III	**Ferro Cement & High Performance Concrete:** Constituent materials and their properties, Mechanical properties of ferro-cement, Construction techniques and application of ferro-cement, Materials for high performance concrete, Supplementary cementing materials, Properties and durability of high performance concrete, Introduction to silica fume concrete, Properties and applications of silica fume concrete.	**14**
IV	**Sulphur Concrete & Sulphur Infiltrate Concrete:** Process technology, Mechanical properties, Durability and applications of sulphur concrete, Sulphur infiltrated concrete, Infiltration techniques, Mechanical properties, Durability and applications of sulphur infiltrated concrete.	**14**
V	**Light Weight Concrete:** Properties of light weight concretes pumice concrete, Aerated cement mortars, No fines concrete, Design and applications of light weight concrete.	**14**

Text Book/References Books/ Websites:

1. P.K. Mehta, and P.J.M. Monterio;Concrete, its Properties and Microstructure; McGraw-Hill Education.
2. Malhotra and Ramezanianpour; Flyash in Concrete; CANMET Natural Resources Canada (1994).
3. Bentur and Mindess ;Fibre Reinforced Concrete; Modern Concrete Technology Series.
4. B.K. Paul, and R.P. Pama ;Ferrocement; International Ferrocement Information Center (1978).

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –I**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
MTCM1103	Geotechnical Engineering	3	1	-			Min: 40 (D Grade)			(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to understand stress distribution in soils.
	2. Student should able to understand well foundations & coffer dams.
	3. Student should able to understand & design machine foundations.

Unit	Contents (Theory)	Marks Weightage
I	**Site Investigations & Stress Distribution in soils:** Brief review of various methods of subsurface explorations, Soil sampling, Subsurface soundings, Geophysical explorations, Stress distribution beneath loaded areas by Boussinesq, Westergaard's and Steinbrenner methods, Newmark's influence chart, Contact pressure distribution, Settlement analysis.	**14**
II	**Well Foundations & Coffer Dams:** Types of caissons, Wells, and their design criteria, IS and IRC codes and their provisions, Tilt and shift in wells and their rectifications, Types, Design data for cellular dams, Stability analysis, Interlock stresses, Methods of design of cellular coffer dams.	**14**
III	**Machine Foundations:** Theory of vibrations, Single and double degree of freedom system, Damped and undamped vibrations, Types of machine foundations, Mass spring model of analysis, Apparent mass of soil, Design of block foundations for impact type of machinery, Indian standard on design and construction of foundations for reciprocating machines.	**14**
IV	**Foundations on Expansive Soils:** Characteristics and treatment of expansive soils, Construction techniques in expansive soils, Use of under-reamed piles and their design criteria, CNS Layer techniques, Construction on collapsible soil.	**14**
V	**Rock Mechanics:** Problems in rock mechanics, Classification of rocks, physical, geological and mechanical properties of rocks, Mechanics of rock, Deformation and fracture under load, The range and scope of rock mechanics in relation to civil engineering projects.	**14**

Text Book/References Books/ Websites:

1. Dr. K.R. Arora ;Soil Mechanics & Foundation Engg.; Std. Publishers Delhi.
2. B.C. Punmia ;Soil Mechanics & Foundation Engg.; Laxmi Publiscations Delhi.
3. Dr. Alam Singh ;Modern Geotech. Engg.;IBT Publishers Delhi.
4. C.Venkatramaiah ;Geotech. Engg;New AGe International Publishers, Delhi.
5. G A Leonards; Found. Engg ;McGraw Hill Book Co. Inc.
6. Relevant IS Code.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –I**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
MTCM1104	Concrete Construction Technology	3	1	-			Min: 40 (D Grade)			(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know strength, permeability & durability.
	2. Student should able to know concreting operations-practices and equipment.
	3. Student should able to understand special concrete operations, shotcrete, grouting, guniting.

Unit	Contents (Theory)	Marks Weightage
I	Introduction of concrete materials, Admixtures, Fly ash, Polymers, Early age properties, Strength, Permeability & durability, Principles of concrete mix design, Concrete mix design procedure by IS/ACI/British standards.	**14**
II	Concreting operations-practices and equipment, Batching; Mixing; Transporting; Placing and compacting, Curing, Properties and technique of construction for concrete, Fiber reinforced concrete, light weight concrete, Heavy weight concrete, Foam concrete, High performance concrete.	**14**
III	Special concrete operations, Shotcrete, Grouting, Guniting, under water concreting, Hot and cold weather concrete, Pumpable concrete, Construction techniques for reinforced concrete elements-materials, Principles and procedures for beams, Slabs, Columns, Foundations, Walls and tanks, Design and fabrication of form work for R.C.C elements.	**14**
IV	Prestressed concrete construction-principle, Methods, Materials, System, Tools and equipment for the construction of a prestressed bridge, Pre tensioning and post tensioning, Losses of prestressed.	**14**
V	Inspection and quality control of concrete construction-stages, Principles, Checklist, Statistical controls, Procedures, Role of quality control in construction.	**14**

Text Book/References Books/ Websites:

1. M.L. Gambhir; Concrete Technology; Tata Mc Grew Hill Publishing Company Ltd.
2. Neville and Brooks ;Concrete Technology; Person Publication.
3. P.K. Mehta and PJM Monteiro; Concrete Microstructure, Properties and Materials; McGraw Hill Education.
4. M.S. Shetty;Concrete Technology; S. Chand Publishing.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –I**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
MTCM1105	Low Cost Housing Materials and Construction Technology	3	1	-			Min: 40 (D Grade)			(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	Student should able to know soil, fly ash, ferrocement, lime, fibers, stone dust.
	Student should able to know low cost building material products.
	Student should able to understand low cost construction techniques and equipment.

Unit	Contents (Theory)	Marks Weightage
I	**Concepts of Low Cost Materials:** Soil, Fly ash, Ferrocement, Lime, Fibers, Stone dust, Boulders and oversize metal, Bitumen etc.	**14**
II	**Low Cost Building Material Products:** Walls - Stabilized and sun dried, Soil blocks & bricks, Hollow concrete blocks, Stone masonry blocks, Ferro-cement partitions, Roofs - Precast R.C. plank & joists roof, Precast channel roof, Precast L-panel roof, Precast Funicular shells, Ferrocement shells, Filler slab, Seasal fibre roof, Improved country tiles, Thatch roof.	**14**
III	**Low Cost Construction Techniques And Equipment:** Techniques- Rat trap bond construction, Precast R.C. and ferrocement technique, Mud technology, Equipments- Brick moulding machine, Stablilised soil block making machine and plants for the manufacturing of concrete blocks, Low cost roads- Murrum road, WBM road, Earthen road, GSB road.	**14**
IV	**Low cost sanitation:** Waste water disposal system**,** Low cost sanitation for rural and urban areas**,** Ferrocement drains.	**14**
V	**Cost analysis and comparison:** Low cost materials **,** Low cost techniques.	**14**

Text Book/References Books/ Websites:

1. A.K. Lal; Hand book of Low cost Housing;

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –I**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total			Total (100)
MTCM1106	Material Testing-I	-	-	2	External (Nil)	Internal (Nil)	(Nil)	External (70)	Internal (30)	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: 30	Lab work & Sessional - Max Marks: 15	Assignment/Quiz/Attendance- Max. Marks: 15

Pre-Requisite	**Nil**
Course Outcome	1. To understand the basic knowledge of Indian standard light compaction test.
	2. To be able to understand the use of Indian standard heavy compaction test.
	3. To get to know about the use of determination of field density.

Unit	Contents (Theory)	Marks Weightage
I	Indian standard light compaction test/std. proctor test, Indian standard heavy compaction test/modified proctor test, Determination of field density by core cutter method, Determination of field density by sand replacement method, Determination of field density by water displacement method, To find the coefficient of permeability of soil by constant head and variable head method, CBR test, To find the Hardness of Aggregate by Crushing test, Aggregate Impact Value test, Elongation and Flakiness index test, Abrasion Test of aggregate.	**100**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments:-

Student should perform any Seven test as per assigned by subject faculty.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –I**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total			Total (100)
MTCM1107	Software Lab –I	-	-	2	External (Nil)	Internal (Nil)	(Nil)	External (70)	Internal (30)	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: 30	Lab work & Sessional - Max Marks: 15	Assignment/Quiz/Attendance- Max. Marks: 15

Pre-Requisite	**Nil**
Course Outcome	1. To be able to understand the concept of Auto CAD.
	2. To understand the STAAD Pro.
	3. To get to know about the Auto Plotter

Unit	Contents (Theory)	Marks Weightage
I	Plan a Commercial/Residential/Industrial/Institutional building using Auto CAD, Analysis a different types of building frames/Structures using STAAD Pro, Prepare a Commercial /Residential/Industrial/Institutional building drawing using 3 D max, Prepare a Commercial/ Residential/Industrial/Institutional building drawing using 3 D Studio.	**100**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments:-

Student should prepare a report using any of the software as per assigned by subject faculty.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –I**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (50)	External	Internal	Total
MT1108	Audit Course - I (Value Education)	-	-	-	(35)	(15)	Min: 20 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 2 Hours

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

Pre-Requisite	**Nil**
Course Outcome	1.Knowledge of self-development.
	2.Learn the importance of Human values.
	3.Developing the overall personality.

Unit	Contents (Theory)	Marks Weightage
I	Values and self-development –Social values and individual attitudes, Work ethics, Indian vision of humanism, Moral and non- moral valuation, Standards and principles, Value judgments.	**07**
II	Importance of cultivation of values, Sense of duty, Devotion, Self-reliance, Confidence, Concentration, Truthfulness, Cleanliness, Honesty, Humanity, Power of faith, National Unity, Patriotism, Love for nature, Discipline.	**07**
III	Personality and Behavior Development - Soul and Scientific, attitude, Positive Thinking. Integrity and discipline, Punctuality, Love and Kindness, Avoid fault Thinking, Free from anger, Dignity of labour.	**07**
IV	Universal brotherhood and religious tolerance, True friendship, Happiness Vs suffering, love for truth, Aware of self-destructive habits, Association and Cooperation, Doing best for saving nature.	**07**
V	Character and Competence –Holy books vs Blind faith, Self-management and Good health, Science of reincarnation, Equality, Nonviolence, Humility, Role of Women, All religions and same message, Mind your Mind, Self-control, Honesty, Studying effectively.	**07**

 # Mandatory (Non Credit) subject according to AICTE. Non University Examination, End Sem marks not to be included in total marks and credit. Students must pass in this subject.

Text Book/References Books/ Websites

1. S.K. Chakroborty ; Values and Ethics organizations theory and practice; Oxford University Press, New Delhi.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTCM12101	Construction Management	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment / Quiz - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should be able to know types of construction contract, lump sum, unit rate.
	2. Student should be able to know technical specifications, drawings, tender bond, labour , material payment.
	3. Student should be able to know manage tender.

Unit	Contents (Theory)	Marks Weightage
I	**Contract Management - I :** Types of construction contract, Lump sum, Unit rate, Cost plus-fee, Cost plus percentage-fee, Incentive contracts, Nature of contract, Contract documents and contracting procedures, Contract revisions, Negotiated contracts, Contract claims.	**14**
II	**Contract Management – II:** Technical specifications, Drawings, Tender bond, Labour and material payment bonds, Scrutiny of tenders, Acceptance, letter of indent, Important contract clauses, Terms of payment, Retention acceptance and final payment, Maintenance period, Time for completion, Extension of time, Variation in work and conditions, Claims and disputes, liquidated damages, Termination rights and responsibility of client, Architect, Engineer, Contractor, Professional liability. Disputes in contracts, Sub-contracts purchase orders as contracts, Insurance contract and claims, Arbitration, Accounts.	**14**
III	**Tender Management:** Advance techniques of estimating, Principles of analysis of rates and specification, Writing for different types of construction industries, Capital structure, Theories.	**14**
IV	**Legal Frame Work of Construction:** Constitutional provisions relating to business and industry, Master plans, Indian contract Act, Arbitration act.	**14**
V	**Labour Laws and Legislation:** Contract labour (RRA) ACT 1970, laws relating to wages, Bonus & industrial disputes.	**14**

Text Book/References Books/ Websites:

1. B. N. Dutta ;Estimating & Costing; UBS Publisher Distributor (P) Ltd.
2. Sanjay Mahajan.; Quantity Surveying & Costing ;Shatya Prakashan.
3. Neeraj Kumar Jha; Construction Project Management; Person.
4. M.P.P.W.D. Code.;Laws relating to building & Engg. contracts in India.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTCM12102	Bridge Engineering	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment / Quiz - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know earthwork and soling.
	2. Student should able to understand bituminous properties, requirements& specification .
	3. Student should able to understand cement concrete road construction.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction:** Definition and components of a bridge, Classification of bridges, Choice of a bridge type. **Investigation for Bridges:** Need for investigation, Selection of bridge site, Determination of design discharge for river bridge, Linear waterway, Economical span, Vertical clearance, Scour depth, Afflux, Traffic projection.	**14**
II	**Standard Specifications for Road Bridges:** Indian road congress bridge code, Width of carriageway, Clearances, Loads to be considered, Dead load, I.R.C. standard live loads, Impact effect, Application of live load on decks, Wind load, Longitudinal forces, Centrifugal forces, Horizontal forces due to water current, Buoyancy effect, Earth pressure, Deformation stresses, Erection stresses, Temperature effects, and Seismic force.	**14**
III	**Reinforced Concrete Bridges:** General, Types of bridges, Balanced cantilever bridges, Continuous girder bridges, Rigid frame bridges, Portal frame and arch bridges, Detailed design of solid slab and T-beam bridges.	**14**
IV	**Sub-structure and Foundation:** Design of piers and abutments (Masonry & R.C.C.). Types of foundations, Shallow, Pile, and Well foundations including their construction details.	**14**
V	**Bearings & Appurtenances:** Different types of bearings, joints and handrails, Construction and Maintenance of bridges, Methods of construction of concrete bridges, Causes of bridge failures, Inspection and maintenance.	**14**

Text Book/References Books/ Websites:-

1. Johnson Victor;Essentials of Bridge Engineering; Oxford & Ibh Publishing Co Pvt Ltd
2. Khadilkar;A text book of bridge Construction; McGraw Hill Education.
3. S. P. Bindra ;Bridge Engg; Dhanpat Rai Publications.
4. Raina.; Concrete bridges Handbook; Shroff Publishers.
5. Concrete Bridge Design SP-23 (ACI Publication)

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTCM12103	Remote Sensing & GIS	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment / Quiz - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know introduction of remote sensing ,electro magnetic spectrum.
	2. Student should able to understand opto mechanical electro optical sensors.
	3. Student should able to understand concepts of Tessellations Attributes and Levels of Measurement .

Unit	Contents (Theory)	Marks Weightage
I	**Introduction To Remote Sensing:** Introduction of remote sensing ,Electromagnetic spectrum, Effects of atmosphere, Scattering, Absorption-atmospheric window, Energy interaction with surface features, Spectral reflectance of earth objects and land covers, Resolution concepts, Types, Satellites, Orbits and missions.	**14**
II	**Data Acquisition In Different Platforms:** Historical development, Opto mechanical electro optical sensors, Across track and along track scanners, Multi spectral scanners, Characteristics of different types of platforms, Medium and high resolution missions, Future missions, Data products and characteristics, Formats	**14**
III	**GIS Data Input And Data Models:** Concepts of point, line polygon / area, Elevation and surface, Concepts of tessellations attributes and levels of measurement, Data sources, Ground and remote sensing survey, Collateral data collection, Input map scanning and digitization, Registration and geo referencing, Concepts of RDBMS, Raster data model, Grid, Data encoding, Data compression, Vector data model, Topological properties, Arc node data structure, Raster vs. vector comparison, File formats for raster and vector, Data conversion between raster and vector.	**14**
IV	**GPS Satellite System:** Different segments, Space, Control and user segments, Satellite configuration, GPS signal structure, Orbit determination and representation, Anti spoofing and selective availability, Task of control segment, GPS receivers.	**14**
V	**GPS Data Processing & GPS Observations:** Code and carrier phase observation, linear combination and derived observables, Concept of parameter estimation, Downloading the data ,Data processing, oftware modules -solutions of cycle slips, ambiguities, RINEX format. Concepts of rapid, static methods with GPS - semi Kinematic and pure Kinematic methods -basic constellation of satellite geometry & accuracy measures - applications-long baseline processing- use of different softwares available in the market.	**14**

Text Book/References Books/ Websites:-

1. Paul R.Wolf; Elements of Photogrammetry; McGraw-Hill Science, 2001.
2. Rueger, J.M.; Electronic Distance Measurement; Springer-Verlag, Berlin, 4th edition, 1996.
3. Laurila, S.H. ; Electronic Surveying in Practice; John Wiley and Sons Inc, 1993
4. Rueger, J.M.; Electronic Distance Measurement; Springer-Verlag, Berlin, 4th edition, 1996.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTCM1202	Prefabrication Design & its Construction Tech.	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment / Quiz - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know prefabricated construction, necessity, advantages, disadvantages.
	2. Student should able to know modular coordination, basic module, planning and design modules .
	3. Student should able to know understand foundation, columns, beams, roof and floor panels.

Unit	Contents (Theory)	Marks Weightage
I	**Prefabricated Construction:** Prefabricated construction, Necessity, Advantages, Disadvantages, Mass produced steel, Reinforced concrete and masonry systems, Industrialised buildings.	**14**
II	**Modular Construction :** Modular coordination, Basic module, Planning and design modules, Modular grid systems, National building code specification, Standardizations, Dimensioning of products, Preferred dimensions and sizes, Tolerances and deviations layout and processes.	**14**
III	**Prefabricates:** Classification, Foundation, Columns, Beams, Roof and floor panels, Wall panels, Clay units, Box prefabricates, Erection and assembly.	**14**
IV	**Design of prefabricated Elements:** Lift points, Beams, Slabs, Columns, Wall panels, Footings, Design of joints to transfer axial forces, Moments and shear forces.	**14**
V	**Construction Techniques:** Large panel construction, Lift slab system, Glover system, constrains' jack-block system, Constain V-Plate system, Bis on system, Silber-Kuhi system, Control of construction processes.	**14**

Text Book/References Books/ Websites:-

1. Ryan E Smith; Prefab Architecture ;John Wiley and Sons.
2. Modern Modilur by Jill Herbers; Harper Design Publication.
3. David Bergman ;Sustainable Design;Princeton Architectural Press.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTCM1203	Construction Equipment and Material Management	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment / Quiz - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should be able to know planning and selection of construction equipment
	2 . Student should be able to know production estimates, sizing and matching .
	3. Student should be able to know economics of construction equipment.

Unit	Contents (Theory)	Marks Weightage
I	**Planning and Selection of Construction Equipment :** Advantage of mechanization of construction industry, Merits of labour intensive construction, Planning for construction equipments, Analytical studies, Equipment operation, Selection of construction machinery & equipments.	**14**
II	**Production Estimates, Sizing and Matching :** Cycle time capacity ratings and output of excavators, Power shovels, Drag lines, Scrapper, Bulldozers, Tractor shovels rippers, Motor graders etc., Sizing and matching, Capacity ratings and output of compactors, Aggregate processing plant concrete production plants.	**14**
III	**Economics of Construction Equipment :** Equipment working rates, Investment cost, Depreciation cost, Major repair cost, Cost of fuel and lubricants, Cost of labour, Servicing and field repairs, Overheads, Recommendations of statutory bodies.	**14**
IV	**System Approach :** Problems of equipment management, Application of CPM in equipment management, Application of the assignment model, Transportation model and waiting line models in equipment management.	**14**
V	**Material Management :** Materials planning and budgeting, Role and functions at different levels of management and budgeting variations, Stages of materials management, A.B.C. analysis, Advantages, Mechanics purpose cautions, limitations and tabular analysis, Purchasing parameters and inter relationships, Time source quantity, Price, Quality, Grading systems, Special purchasing systems, Obsolescence, Scrap disposal.	**14**

Text Book/References Books/ Websites:-

1. Sitaraman ;Construction Planning & Managemen; Galgotia Publication Pvt Ltd.
2. S C Sharma ;Construction Equipment & Management; Khanna Book Publisher.
3. Dr. Mahesh Verma; Construction Equipment & its planning & application; Metropolitan Book Corporation.
4. S V Deodhar; Construction Equipment & job planning; Khanna Publication.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTCM1204	Financial Management in Construction Industries	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment / Quiz - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know principle of personnel management qualities of a personnel manager.
	2. Student should able to know principles of industrial trade unionism .
	3. Student should able to understand waste management man power waste, energy waste

Unit	Contents (Theory)	Marks Weightage
I	**Personnel Management:** Principle of personnel management, Qualities of a personnel manager, Objective of personnel management, Personnel policed procedures and programmes, Man power resources, Performance standards, Work rules, Recruitment and selection process, Training of personnel's, Need for training, Management development programmes, Wage and salary management, Profit sharing features-Fringe benefits general scope, Different types of fringe benefits and awards.	**14**
II	**Labour Management:** Trade Unions - Principles of industrial trade unionism, Objectives and functions, Essentials of trade union, Objectives, Forms levels and growth of worker's participation in management, Principles and main features of collective bargaining, Different industrial regulations and labour laws and acts – Industrial health and safety, Provisions under factory act, Accident and safety at construction sites, Nature and causes of accident, Safety programmes and their principles.	**14**
III	**Waste Management:** Introduction to waste and waste management, The concept of productivity and its inter relationship with productivity, Systems concept of waste, Complementarity of waste and resource management, Identification of construction waste material waste, Man power waste, Energy waste, Space waste time waste, Equipment waste, Capital waste, Utilities and services waste, Data and information waste, Design of waste reduction in construction, Reduction, Collection, Recycling treatment and disposal of waste in construction systems, Modelling of resources and waste flow in construction systems waste management and cost reduction.	**14**
IV	**Financial Management:** Managerial economics & financial statement nature and scope of managerial economics, Economic theories, Demand analysis and fore casting, Elasticities of demand, Cost and production analysis, Pricing decisions, Policies and practices, Break even analysis, Time value of money, Economics, Comparisons using time value of money basic of comparisons, Decision making amongst alternatives, Cash flow, Discounted cash flow, Taxation and inflation, Sinking fund provisions, Risks and uncertainties, Project risk and firm risk, Finances & working capital, Capital budgeting & Performance budgeting, Project selection, Control and evaluation, Pre-project and post project evaluation.	**14**
V	**Capital Generation & Financial Accounting Banking:** Financial Institutes like IFCI, IBI, International financing etc. Book keeping process in construction, Journals, ledgers etc. for labour cost, Materials and purchases miscellaneous ledgers and accounting procedures, Types of financial statements in govt.	**14**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –II**

Text Book/References Books/ Websites:-

1. I.M. Pandey; Financial Management; Vikash Publication House.
2. S. B. Jha & Subhash Chander; Construction Management System; Jain Brother.
3. V. K. Shrivastava; Construction Planning & Management; Galgotia Publication.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTCM1205	Appropriate Technology and Energy Conservation	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment / Quiz - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know appropriate technology - concept and its role in the present circumstances.
	2. Student should able to understand rural housing & rural environmental technologies.
	3. Student should able to understand rural roads - planning of rural roads, socio-economic aspects.

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 gallaries, Collection of rain water, Specific problems and method's in rural water supply and treatment, Treatment and disposal of waste water, Community and sanitary latrines, Compact and simple waste water disposal systems, Biogas plants.	**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	Construction techniques and environmental control, Types of low energy materials, Specification, Properties and Advantages of low energy material.	**14**

Text Book/References Books/ Websites:-

1. www.icevirtuallibrary.com

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total			Total (100)
MTCM1206	Material Testing-II	-	-	2	External (Nil)	Internal (Nil)	(Nil)	External (70)	Internal (30)	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: 30	Lab work & Sessional - Max Marks: 15	Assignment / Quiz - Max. Marks: 15

Pre-Requisite	**Nil**
Course Outcome	1. To understand the basic knowledge of Indian standard penetration value of bitumen.
	2. To be able to understand the use of Indian standard stripping value of road aggregate.
	3. To get to know about the use of determination of field density Stability value for bituminous mix.

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments:-

1. Determination of Penetration value of Bitumen.
2. Determination of Viscosity of Bituminous Material.
3. Determination of Softening point of bituminous material.
4. Determination of Ductility of the bitumen.
5. Determination of Flash point and Fire point of bituminous material.
6. Determination of Bitumen content by centrifuge extractor.
7. Determination of Stripping value of road aggregate.
8. Determination of Marshall Stability value for bituminous mix.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total			Total (100)
MTCM1207	Software Lab-II	-	-	2	External (Nil)	Internal (Nil)	(Nil)	External (70)	Internal (30)	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: 30	Lab work & Sessional - Max Marks: 15	Assignment / Quiz - Max. Marks: 15

Pre-Requisite	**Nil**
Course Outcome	1. To be able to understand the concept of MX Roads.
	2. To understand the 3DS Max.
	3. To get to know about the Auto Plotter

Unit	Contents (Theory)	Marks Weightage
I	Primavera, MX Roads, Auto Plotter, 3DS Max, IREVIT	**100**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :-

Student should prepare a report on a project (Highway or Building) using any of the software as per assigned by subject faculty.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (50)	External	Internal	Total
MT1208	Audit Course - II (English For Research Paper Writing)	-	-	-	(35)	(15)	Min: 20 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 2 Hours

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

Pre-Requisite	**Nil**
Course Outcome	1. Student will understand that how to improve your writing skills and level of readability.
	2. Learn about what to write in each section of research article.
	3. Understand the skills needed when writing a Title.

Unit	Contents (Theory)	Marks Weightage
I	Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing, Redundancy, Avoiding Ambiguity and Vagueness.	**07**
II	Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticizing, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts, Introduction.	**07**
III	Review of the Literature, Methods, Results, Discussion, Conclusions, The Final Check.	**07**
IV	Key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature.	**07**
V	Skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the Conclusions, useful phrases, how to ensure paper is as good as it could possibly be the first- time submission	**07**

Text Book/References Books/ Websites

1. R. Goldbort (2006) ;Writing for Science;Yale University Press (available on Google Books).
2. R. Day (2006); How to Write and Publish a Scientific Paper; Cambridge University Press.
3. N Highman ;(1998), Handbook of Writing for the Mathematical Sciences; SIAM. Highman's book.
4. Adrian Wallwork ; English for Writing Research Papers; Springer New York Dordrecht Heidelberg London, 2011
5.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTCM13101	Industrial Safety	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	Functioning of Engineering equipments and industry work culture.
Course Outcome	1. Student should be able to apply standard safety procedures in an industrial environment.
	2. An ability to identify, formulate, and solve broadly-defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to the safety.

Unit	Contents (Theory)	Marks Weightage
I	**Industrial Safety:** Accident, Causes, Types, Results and control, Mechanical and electrical hazards, Types, Causes and preventive steps/procedure, Describe salient points of factories act 1948 for health and safety, Wash rooms, Drinking water layouts, Light, Cleanliness, Fire, Guarding, Pressure vessels, etc, Safety color codes, Fire prevention and firefighting, Equipment and methods.	**14**
II	**Fundamentals Of Maintenance Engineering:** Definition and aim of maintenance engineering, Primary and secondary functions and responsibility of maintenance department, Types of maintenance, Types and applications of tools used for maintenance, Maintenance cost & its relation with replacement economy, Service life of equipment.	**14**
III	**Wear And Corrosion And Their Prevention:** Wear- Types, Causes, Effects, Wear reduction methods, Lubricants-types and applications, Lubrication methods, General sketch, Working and applications of screw down grease cup, Pressure grease gun, Splash lubrication, Gravity lubrication, Wick feed lubrication, Side feed lubrication, Ring lubrication, Definition, Principle and factors affecting the corrosion, Types of corrosion, Corrosion prevention methods.	**14**
IV	**Fault Tracing:** Fault tracing-concept and importance, Decision tree concept, Need and applications, Sequence of fault finding activities, Show as decision tree, Draw decision tree for problems in machine tools, Hydraulic, Pneumatic, Automotive, Thermal and electrical equipment's like, Any one machine tool, Pump ,Air compressor, Internal combustion engine, Boiler, Electrical motors, Types of faults in machine tools and their general causes.	**14**
V	**Periodic and Preventive Maintenance**: Periodic inspection-concept and need, Degreasing, Cleaning and repairing schemes, Overhauling of mechanical components, Overhauling of electrical motor, Common troubles and remedies of electric motor, Repair complexities and its use, Definition, need, Steps and advantages of preventive maintenance, Steps/procedure for periodic and preventive maintenance of, Machine tools, Pumps, Air compressors, schedule of preventive maintenance of mechanical and electrical equipment, Advantages of preventive maintenance, Repair cycle, concept and importance.	**14**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –III**

Text Book/References Books/ Websites:

1. Maintenance Engineering Handbook; Higgins & Morrow; Da Information Services.
2. Maintenance Engineering; H. P. Garg; S. Chand and Company.
3. Pump-hydraulic Compressors; Audels; Mcgrew Hill Publication.
4. Foundation Engineering Handbook; Winterkorn; Hans; Chapman & Hall London

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTCM13102	Waste to Energy	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should be able to apply the knowledge about the operations of waste to energy plants.
	2. Apply the knowledge in planning and operations of waste to energy plants.
	3. Able to analyze the various aspects of waste to energy management systems.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction to Energy from Waste:** Classification of waste – agro based, Forest residues, Domestic waste, Industrial waste (hazardous and non-hazardous), Characterization of waste for energy utilization, Conversion devices – Incinerators, Gasifiers, digestors ,Waste production in different sectors i.e. domestic, Industrial, Agriculture, Postconsumer waste etc. Waste Selection criteria.	**14**
II	**Technologies for Waste to Energy Biochemical Conversion** – Energy production from organic waste through anaerobic digestion and fermentation, Thermo-chemical conversion – combustion, Incineration and heat recovery, Pyrolysis, Gasification, Plasma Arc Technology.	**14**
III	**Waste to Energy Options**: Landfill gas, Collection and recovery, Refuse Derived Fuel (RDF) – fluff, Briquettes, Pellets, Alternate Fuel Resource (AFR) – production and use in cement plants, Thermal power plants and industrial boilers, Conversion of wastes to fuel resources for other useful energy applications, Energy from plastic wastes – non-recyclable plastic wastes for energy recovery, Energy recovery from wastes and optimization of its use, Benchmarking and standardization.	**14**
IV	**Centralized and Decentralized Waste to Energy Plants**: Collection, Segregation, transportation and storage requirements, Location and Siting of waste to energy, Plant,. Industry specific applications – In-house use – sugar, Distillery, Pharmaceuticals, Pulp and paper, Refinery and petrochemical industry and any other industry, Centralized and decentralized energy production, Distribution and use, Comparison of centralized and decentralized systems and its operations.	**14**
V	**Waste To Energy & Environmental Implications**: Environmental standards for waste to energy plant operations and gas clean-up, Savings on non-renewable fuel resources, Carbon Credits, Carbon foot calculations and carbon credits transfer mechanisms, Energy analysis, Global best practices in waste to energy production and use, Indian scenario on waste to energy production distribution and use in India, Role of the Government in promoting 'Waste to Energy'.	**14**

Text Book/References Books/ Websites:

1. Industrial and Urban Waste Management in India; TERI Press.
2. Banwari Lal and Patwardhan; Wealth from Waste: Trends and Technologies; TERI Press.
3. S.N Mukhopadhyay; Fundamentals of waste and Environmental Engineering; TERI Press.
4. www.envfor.nic.in www.cpcb.nic.in
5. www.eai.in/ref/ae/wte/typ/clas/india_industrial_wastes.html
6. www.teriin.org/projects/green/pdf/National-Waste.pdf

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTCM13103	Cost Management of Engineering Projects	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Students should be able to perform and evaluate present worth, future worth and annual worth and more economic alternatives.
	2. Able to carry out and evaluate benefit/cost, life cycle and break-even analyses on one or more economic alternatives.

Unit	Contents (Theory)	Marks Weightage
I	Introduction and overview of the strategic cost management process cost concepts in decision-making, Relevant cost, Differential cost, Incremental cost and opportunity cost, Objectives of a costing system, Inventory valuation, Creation of a database for operational control, Provision of data for decision-making.	**14**
II	Project: meaning, Different types, Why to manage, Cost overruns centers, Various stages of project execution, Conception to commissioning, Project execution as conglomeration of technical and nontechnical activities, Detailed engineering activities, Pre project execution main clearances and documents project team, Role of each member, Importance project site, Data required with significance, Project contracts, Types and contents, Project execution project cost control, Bar charts and network diagram.	**14**
III	Project commissioning, Mechanical and process cost behavior and profit planning marginal Costing, Distinction between marginal costing and absorption costing, Break-even analysis, Cost-volume-Profit Analysis, Various decision-making problems, Standard costing and variance analysis.	**14**
IV	Pricing strategies. Pareto analysis. Target costing, life cycle costing, Costing of service sector Just-in-time approach, Material requirement planning, Enterprise resource planning, Total quality management and theory of constraints Activity-based cost management, Bench marking, Balanced score card and value-chain analysis, Budgetary control, Flexible budgets, Performance budgets, Zero-based budgets, Measurement of divisional profitability pricing decisions including transfer pricing.	**14**
V	Quantitative techniques for cost management, linear programming, PERT/CPM, Transportation problems, Assignment problems, Simulation, learning curve theory.	**14**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –III**

Text Book/References Books/ Websites:

1. Cost Accounting A Managerial Emphasis; Prentice Hall of India; New Delhi.
2. Charles T. Horngren and George Foster; Advanced Management Accounting .
3. Robert S Kaplan Anthony A. Alkinson; Management & Cost Accounting.
4. Ashish K. Bhattacharya; Principles & Practices of Cost Accounting A. H. Wheeler publisher.
5. N.D. Vohra; Quantitative Techniques in Management; Tata McGraw Hill Book Co. Ltd.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTCM13201	Management of Quality and Safety in Construction	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	Student should be able to know control of quality during design of structures.
	Student should be able to understand quality standards/codes in design and construction.
	Student should be able to understand training in quality and quality management systems.

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 and 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 Professionals and Students on Nebosh and Other Construction Courses; Routledge Publisher 2008.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTCM13202	Advanced Highway Construction	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know earthwork and soling.
	2. Student should able to understand bituminous properties, requirements& specification .
	3. Student should able to understand cement concrete road construction.

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-primecoat, and tackcoat, 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, Constructions methods, Detailed construction procedure, Quality control tests (Lab. And Field), 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, Prestressed concrete pavements and fibre reinforced concrete pavements, Selection of the mix, Compaction method and construction prucedure 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; Priciples, Practice & Design of Highway Engg; S Chand and Company.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTCM13203	Advanced Foundation Engineering	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know shallow foundations bearing capacity, Terzaghis analysis.
	2. Student should able to know use of piles, types of piles, design of piles.
	3. Student should able to know mechanism of reinforced earth strength.

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 Geosythetics:** 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 engg.; CBS Publisher.
2. P. Purshotham Raj; Soil Mech. & foundation engg.; Dorley Kindersley Pvt. Ltd.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Construction Technology & Management **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total (300)
MTCM1303	Pre-Dissertation	-	-	6	(Nil)	(Nil)	(Nil)	(200)	(100)	Min: 120 (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: 100	Lab work & Sessional - Max Marks: 50	Assignment/Quiz/Attendance- Max. Marks: 50

Pre-Requisite	Knowledge of concerned discipline of Engineering.
Course Outcome	1. Identify literature and problem identification of research.
	2. Apply engineering principles through efficient handling of project.
	3. Identify appropriate techniques to analyze complex engineering problems.

Unit	Contents (Theory)	Marks Weightage
I	**Pre- Dissertation:** Students are required to select a topic of their interest in the third semester and prepare a dissertation on it. Mid semester presentation will include identification of the problem based on the literature review on the topic referring to latest literature available. End semester presentation should be done along with the report on identification of topic for the work and the methodology adopted involving scientific research, collection and analysis of data, determining solutions and must bring out individuals contribution. The student must submit a synopsis at the end of the semester for the approval from the research Approval committee in the specified format and submitted to the university for further Approval and give the power point presentation of the same for Evaluation/Approval.	**300**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –I**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MT1101	Research Methodology & IPR	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Students will be able to understand research problem formulation.
	2. Able to analyze research related information and follow research ethics.
	3. Understand the importance of IPR and its protection for further research work.

Unit	Contents (Theory)	Marks Weightage
I	**Research Methodology:** Meaning, Objective & its types, Research approaches , Significance of research, Research methods vs. methodology, Research process, Criteria of good research, Meaning of research problem, Sources of research problem, Errors in selecting a research problem, Scope and objectives of research problem, Effective literature studies approaches, Plagiarism, Research ethics, Problems encountered by researchers in India.	**14**
II	**Concept and Importance in Research:** Features of a good research design, Exploratory research design, Concept types and uses, Descriptive research designs, Concept, Types and uses, Experimental design, Concept of independent & dependent variables, Interpretation , Meaning & technique, Precaution in interpretation , Significance of report writing; layout of the research report, Types of reports, Precautions for writing research reports, Effective technical writing, Role of computer software in report writing.	**14**
III	**Data Collection:** Collection of primary data, Observation method, Interview method, Collection of data through questionnaires, Collection of data through schedules, Difference between questionnaires and schedules, Collection of secondary data.	**14**
IV	**Hypothesis**: Null hypothesis & alternative hypothesis, Basic concepts concerning testing of hypotheses (Chi square Test), Procedure for hypothesis testing, Flow diagram for hypothesis testing, Qualities of a good hypothesis.	**14**
V	**Nature of Intellectual Property:** Patents, Designs, Trade and copyright, Process of patenting and development, Technological research, Innovation, Patenting; Development, International scenario, International cooperation on intellectual property, Procedure for grants of patents, Patenting under pct, patent rights**,** scope, licensing and transfer of technology, Patent information and databases, Geographical indications, New developments in IPR, Administration of patent system, IPR of biological systems.	**14**

Text Book/References Books/ Websites:-

1. C . R. Kothari; Research Methodology; New Age Publication.
2. Wayne Goddard and Stuart Melville; Research Methodology: An Introduction.
3. Ranjit Kumar; 2 nd Edition ; Research Methodology: A Step by Step Guide for beginners.
4. Robert P. Merges; Peter S. Menell; Mark A. Lemley; Intellectual Property in New Technological Age.
5. T. Ramappa; Intellectual Property Rights Under WTO ; S. Chand; 2008.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –I**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTUP1102	History & Theory of Urban Planning	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know brief history of human settlements.
	2. Student should able to know settlements and physical form, Town plans.
	3. Student should able to know the form of the modern city in the age of automobile.

Unit	Contents (Theory)	Marks Weightage
I	**Brief History:** Brief history of human settlements from stone age and milestones in prehistoric to historic period, Evolution of physical forms as a result of geographical, Geological, Climatic, Social, Economic, Political, and technological aspects of human settlements, Ancient river valley civilizations (Egyptian, Mesopotamian, Indus valley and Chinese).	**14**
II	**History of Indian Town Planning :** Settlements in prehistoric, Vedic, Harappa, Types of plans described in vedic scripts, Settlements and their physical forms during various dynasties up to 18th century and during colonization (Case studies- Jaipur, New Delhi etc.), Town planning after independence (Case studies- Chandigarh, Gandhinagar etc.), Human settlements and physical form town plans, During Sumerian, Egyptian.	**14**
III	**Town Planning in 18th Century:** Industrial revolution, Transition to the industrial city. Evolution of towns as per the functions of the towns, Constraints on city form, Elements of urban structure - Networks, Buildings, Open spaces etc, The form of the modern city in the age of automobile - Inner city & Suburban area, Utopian concepts and contribution of planners, (Case studies - Garden Cities, Satellite Towns, First generation towns and new towns).	**14**
IV	**Theory of Urban Planning:** Scope, Purpose and methods of planning, The nature and purpose of town and country planning at national, Regional and local levels ,The physical planning process and the relation between surveys and plan, Land-use planning, Economic base of the city, Various surveys for physical planning and techniques of analysis realization of the plan, Site layout and development, Zoning and density control.	**14**
V	**Spatial Aspects:** Rural and urban settlements in their regional setting hinterlands. Towns and cities their geographical characteristics, Urban concentrations historical, Administrative, location, Economic, Socio-economic consequences, Morphological aspects in town planning, Geological factors affecting urban development, Urban geological factors governing the growth of ancient cities. **Urban Models**: Urban models, Classification of towns by form, Function, The city and its region, Dickson, Smailes, Location, Christaller theory etc.	**14**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –I**

Text Book/References Books/ Websites

1. B. Gallion, S. Eisner ;The Urban Pattern;Van Nostrand Reinhold Company.
2. G. Peter Hall;Urban and Regional Planning;Routledge publisher.
3. F. S. Hudson; Geography of Settlements; And Evans Ltd. Estover, Plymouth PL 6 7 PZ UK

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –I**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTUP1103	Housing and Community Planning	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1.Student should be able to know housing as integral component of comprehensive urban.
	2.Student should be able to know housing situation in India in quantitative and qualitative terms.
	3.Student should be able to know basic considerations for the formulation of viable housing policy.

Unit	Contents (Theory)	Marks Weightage
I	**Definition of housing and community:** Housing as integral component of comprehensive urban and regional development, Housing and community form as shaped by physical, Technological, Socio-economic, Demographic and political factors, Role of housing in social and economic development, Housing as an index for social welfare, Housing in relation to stages of development particularly as related to developing economy.	**14**
II	**Micro and Macro Economic View of The Housing Sector:** Housing situation in India in quantitative and qualitative terms, Housing statistics, Obstacles to provision of housing in India and emerging issues and priorities in urban and rural housing.	**14**
III	**Basic considerations:** Basic considerations for the formulation of viable housing policy and programmers in consonance with availability of resources and feasibility of implementation and management, Housing policy options in developing communities.	**14**
IV	**Housing Programmes in Five Year Plans of India:** Social housing programmes, Role of private and corporate sectors in housing, Housing in the informal sector, Problems of slums and squatting.	**14**
V	**Public Housing Programmes:** Site and services and slums up gradation approach, The concept of housing standards and issues involved in formulation of standards, Housing and its relation to non- residential components of settlement, Socio cultural perspective of housing, Housing and family life, Principles of community organization, Social sources of residential satisfaction, Community participation in design and implementation of housing programmes, Public housing agencies in India at National, State and settlement level, Their functions and programmes.	**14**

Text Book/References Books/ Websites

1. P. K. Guha ;Housing an Indian Perspective; New Central Book agency Pvt. Ltd. Calcutta.
2. Charles Correa; Urban Landscape; Hatje Cantz Publisher.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –I**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTUP1104	Traffic and Transportation Planning	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1.Student should able to know design of urban roads in relation to different types of traffic.
	2.Student should able to know traffic management, principles, methods.
	3.Student should able to know concepts of basic needs, formation of objectives.

Unit	Contents (Theory)	Marks Weightage
I	**Transportation Systems:** National, Regional and local requirements for transport by road, Rail, Water and air both for passengers and goods, Traffic Engineering, Urban road hierarchy, Road geometric and cross-sectional elements of urban roads, Traffic surveys and their interpretation, Traffic capacity, level of service concept, Traffic regulation and control, Requirements of different types of traffic moving and stationary.	**14**
II	**Design of Urban Roads:** Design of urban road in relation to different types of traffic, Segregation of traffic, Canalization, Parking needs, On and off street parking, Estimation of short term and long term parking demand and planning including planning of terminals, Planning, Engineering and management criteria for road junction.	**14**
III	**Traffic management:** Principles, Methods, Traffic operation plan, Its scope and objective, Non- Motorise transportation, Transport and environment, Detrimental effects of traffic on human life, Traffic noise, noise abatement measures, Analytical transport planning, The quantitative transport planning process, Surveys, Zoning and network building, Transport model, Prediction of future use of transportation systems, Transport policy and evaluation.	**14**
IV	**Planning for Urban Infrastructure:** Concepts of basic needs, Formation of objectives, Norms and standards, Data requirements for program planning of urban networks and services, Feasibility planning studies for structuring the infrastructure systems.	**14**
V	**Utility services:** Solid waste disposal, Site selection and management, Other services – planning for fire protection services and space standards, Space standards for electricity networks, Space standards for burial around cemetery etc, Urban Energy systems, Energy management, Energy requirement, Non conventional energy systems, Management of solar energy, Wind energy, Tidal energy, biomass energy, Energy from waste, Energy economics, Impact of energy utilization on environment, Energy efficient housing.	**14**

Text Book/References Books/ Websites

1. L. R. Kadiyali ;Traffic Engineering and Transport Planning; Khanna publication.
2. B. G. Hutchinson ; Principals of Urban Transport Systems Planning; Khanna publication.
3. B. J. Bruton ;Introduction to Transport Planning; B. J. Bruton publication.
4. Indian Road Congress ;Space Standards for Roads in Urban Areas by IRC 69-1977.
5. Indian Road Congress ;Guidelines on Regulations and Control of Mixed Traffic in Urban Areas by IRC 70-1977.
6. Indian Road Congress ;Geometric Design Standards for Urban Roads in Plain by IRC 86-1983.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –I**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTUP1105	Evolution and Planning Thought	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1.Student should able to know development of planning thought and principles from ancient times.
	2.Student should able to know city as a living spatial entity, Ekistics and the city.
	3.Student should able to know aims and objectives of physical planning, levels of planning in India.

Unit	Contents (Theory)	Marks Weightage
I	Development of planning thought and principles from ancient times and its relevance in modern context, Historical determinants, Mobility, Socio –cultural beliefs, Climate, Technology, Political power, Geographical location etc, Settlement types and patterns, Ancient medieval renaissance and industrial age, Planning concept in India, Ancient, Pre independence and post independence development.	**14**
II	City as a living spatial entity, Ekistics and the city, Contribution of Ebenezer Howard, Geddes, Mumford and others in city planning.	**14**
III	Aims and objectives of physical planning, levels of planning in India and their interrelationships, Physical nature and characteristics of urban environment and its components, Land uses –physical structure and relationship of parts of the city, Models of urban structure.	**14**
IV	Models of planning process, Different strategies and approaches in planning like systems approach mixed scanning and approach to land use planning, Choice theory and advocacy planning and their relevance, Comprehensive planning.	**14**
V	Different types of urban plans at micro and macro level study , Development of any city.	**14**

Text Book/References Books/ Websites

1. Erich Jantsch; Design for Evaluation: Self Organization & Planning in The Life of Human System; George Braziller.
2. Mahesh Chand, V.K. Puri; Regional Planning in India; Allied Publisher Ltd.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –I**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total			Total (100)
MTUP1106	Planning Studio-I	-	-	2	External (Nil)	Internal (Nil)	(Nil)	External (70)	Internal (30)	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: 30	Lab work & Sessional - Max Marks: 15	Assignment/Quiz/Attendance- Max. Marks: 15

Pre-Requisite	**Nil**
Course Outcome	1. To understand the basic knowledge of preparation detailed layout plan with model.
	2. To be able to understand the detailed layout Plan with model for commercial.
	3. To get to know about the site visit to town planning scheme in Bhopal city.

Unit	Contents (Theory)	Marks Weightage
I	Detailed layout plan with for one of the followings: Residential, Commercial, Industrial, Site visit to town planning scheme in Bhopal city, Presentation on planner's contributions, Site visit: Neighborhood planning, Case study: Urban renewal/redevelopment project for an urban area including surveys, Analysis, Costing, Phasing and methodology of implementation.	**100**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments:-

Student should prepare a detailed layout report or case study as per the topic assigned by subject faculty.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –I**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total (100)
MTUP1107	Planning Studio Seminar- I	-	-	2	(Nil)	(Nil)	(Nil)	(70)	(30)	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: 30	Lab work & Sessional - Max Marks: 15	Assignment/Quiz/Attendance- Max. Marks: 15

Pre-Requisite	**Nil**
Course Outcome	1. To be able to understand the design and lay out for an industrial, commercial.
	2. To understand the design of dwelling units.
	3. To get to know about the study of planning proposals.

Unit	Contents (Theory)	Marks Weightage
I	**Minor Problem:-** Design and lay out for an Industrial, Commercial, Institutional areas etc. on an existing site of about 10 hectares land .The items to be submitted may include: (I) Site analysis clearly indicating all physical features, potentials and problems as well as land suitable for buildings (II) Design of dwelling units-All plans and at least, two elevations and one section on 1:100 scale. (III) Layout of buildings and roads. (IV) Layout showing trunk sewer, main waterlines and refuse collection points. (V) Layout showing landscaping proposal along with buildings and roads all on 1:1000 scale (VI) Report not more than 25 double –spaced typed pages of A-4 size containing introduction site analysis, area calculation s etc. followed in design process. **Major Problem:-** Study of an existing Town for its Urban Development and Planning. The proposal may include (I) An existing land uses map indicating all its subcategories and extent and nature of use/ activity. (II) A map showing the future proposal as given in the development plan along with all facts and figures. (III) Analysis of standards adopted in the Development Plan regarding the various land uses, with suggestion of improvements and various techniques etc. (IV) A comprehensive report of not more then 75 double spaced typed pages of A-4 size containing introduction, reasons for selection of the Town and the planning alternatives with analysis, calculations, observations and recommendation etc.	**100**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments:-

Student should prepare a detailed layout report as per the topic assigned by subject faculty.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –I**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (50)	External	Internal	Total
MT1108	Audit Course - I (Value Education)	-	-	-	(35)	(15)	Min: 20 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 2 Hours

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

Pre-Requisite	**Nil**
Course Outcome	1. Knowledge of self-development.
	2. Learn the importance of human values.
	3. Developing the overall personality.

Unit	Contents (Theory)	Marks Weightage
I	Values and self-development –Social values and individual attitudes, Work ethics, Indian vision of humanism, Moral and non- moral valuation, Standards and principles, Value judgments.	**07**
II	Importance of cultivation of values, Sense of duty, Devotion, Self-reliance, Confidence, Concentration, Truthfulness, Cleanliness, Honesty, Humanity, Power of faith, National Unity, Patriotism, Love for nature, Discipline.	**07**
III	Personality and Behavior Development - Soul and Scientific, attitude, Positive Thinking. Integrity and discipline, Punctuality, Love and Kindness, Avoid fault Thinking, Free from anger, Dignity of labour.	**07**
IV	Universal brotherhood and religious tolerance, True friendship, Happiness Vs suffering, love for truth, Aware of self-destructive habits, Association and Cooperation, Doing best for saving nature.	**07**
V	Character and Competence –Holy books vs Blind faith, Self-management and Good health, Science of reincarnation, Equality, Nonviolence, Humility, Role of Women, All religions and same message, Mind your Mind, Self-control, Honesty, Studying effectively.	**07**

 # Mandatory (Non Credit) subject according to AICTE. Non University Examination, End Sem marks not to be included in total marks and credit. Students must pass in this subject.

Text Book/References Books/ Websites

1. S.K. Chakroborty; Values and Ethics organizations Theory and practice; Oxford University Press, New Delhi.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTUP12101	Project Management	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know various apex bodies in the country planning, programming.
	2. Student should able to know planning and development administration at national.
	3. Student should able to know governance in relation to planning process.

Unit	Contents (Theory)	Marks Weightage
I	**Professional Practice:** Aims and objects of the professional institute, Sister bodies, Role of professionals and planning consultants, Code and conducts of professional ethics and scale of professional charges as laid down by the various apex bodies in the country, Planning, application of PERT and CPM, O- error method and such other systems evaluated for the same, Executing consultancy agreements awarding contracts, Inviting tenders, Management aspect, Role in inter-disciplinary groups, Appreciation of the decision making process and the process in relation to varied consultancy agreements / assignments in planning.	**14**
II	**Planning Administration:** System of local self govt. in India, Planning related acts in Madhya Pradesh state and its governance in relation to planning process, Planning and development administration at national level, State level and district level and local level of the country, Functions and powers, Structure and funding resources to the local government and their performance.	**14**
III	**Identification of Other Non-Government Development Doing Organizations and Their Relationship with local Governments**: System of local self govt. in India, Planning related acts in Madhya Pradesh state and its governance in relation to planning process, Process of decision making in the process, Further implementation and execution and management process.	**14**
IV	**Public Relation And Their Effective Participation In Planning And Implementation process**: Citizens approach to the planning process and their effective participation in the process, Personnel management, Manpower planning, Performance appraisal, Motivation, monitoring and improvement in moral etc, Organizational behavior, Organization theory, Authority and conflict, leadership in administration, Organizational changes, Organizational structure and plan implementation agencies.	**14**
V	**Project Formulation:** Introduction to the plan preparation life cycle of the project, Project identification, Importance of the projects implementation timely, Quick formulation of the project and its appraisal, Important role of PPM method i.e. planning, Programming and its effective management for implementation and execution, Costs saving etc, Effective decision making by the physical planners in the process for the benefit of the public at large. **Project Evaluation :**Stages in oproject evaluation methods of project evaluation cost-benefit analysis net present value criterion (NPV) internal rate of return (IRR) relation between NPV and IRR	**14**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –II**

Text Book/References Books/ Websites:-

1. Dr. A. N. Sachithanandan, Reading Material on Project Formulation & Appraisal, Institute of Town Planners, India, New Delhi.
2. M. L. Jhingan, The Economics of Development & Planning, Vrinda publications Pvt. Ltd. India .

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTUP12102	Socio-economic Basis for Planning	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know traditional patterns and trends of change in Indian society.
	2. Student should able to know social aspects of housing.
	3. Student should able to know economic resource, typology of goods, production economics.

Unit	Contents (Theory)	Marks Weightage
I	Man and environment, Traditional patterns and trends of change in Indian society, Concept of social structure, Culture and social institutions.	**14**
II	Relation between social structure and spatial structure, Social aspects of housing, Social problems of slums.	**14**
III	Economic resource, Typology of goods, Production economics, Process, laws, Product and Costs, Economies of scale, External economies, Valuation, Typology of markets, land and real estate market, Macro-economic concepts.	**14**
IV	Basic economic analysis, Economic principles, and land use, Economic rent, land use pattern and land values.	**14**
V	Development of land and real property, Financial balance sheet of land development, Land and real property markets, Private ownership and social control over land.	**14**

Text Book/References Books/ Websites:-

1. NAILY ; Social Theory for Planning ; McGrew Hill Publisher.

2. Agarwal; Economic Planning; New Age Publisher.

3. S.C. Patnaik; Economics of Regional Development & Planning in Third World Countries; New Delhi : Associated Pub. House, c1981.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTUP12103	City & Metropolitan Planning	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know growth of metropolitan and mega cities.
	2. Student should able to know - human settlement planning and urban development.
	3. Student should able to know socio-economic and political issues in India.

Unit	Contents (Theory)	Marks Weightage
I	**Urban Growth:** System of cities, Growth of metropolitan and mega cities scale, Complexity and its impact on national development.	**14**
II	**National and International Concepts:** Human settlement planning and urban development, Relevance to Indian context.	**14**
III	**Metropolitan growth:** Trends, Characteristics, Problems, Socio-economic and political issues in India with reference to Asia.	**14**
IV	**Changing Urbanity:** Urbanity between a city and a metropolis, Anatomy, Growth and trends of metropolitan development, Components of metropolitan plan, Economics, Transportation, etc. in evolving metropolitan framework.	**14**
V	**Metropolitan Region:** Problems of major agglomerations, Studies in conjunction with the theories of major cities, Dynapolis and Megalopolis, Special problems of the central area, Migration and sub-urban development, Emerging social and economic characteristics of the central city and the suburbs, Impact on government systems and public services.	**14**

Text Book/References Books/ Websites:-

1. A.B.Gallion; The Urban pattern: City planning & design; CBS Publication.
2. Bacon, N.Edmund; Design of cities; Penjuin USA Publisher.
3. Lynch, Kevin; The Image of the City; MIT Press.
4. Kalser H.Harvey; The Building of Cities: Development and Conflict; Cornell University Press.
5. Peter; Metropolitan planning – the planning system of Greater London; Routledge Publisher.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTUP1202	City and Regional Planning	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know understanding the city as an organism, the socio-political.
	2. Student should able to know definition and process of urbanizations, urban- uural relationship.
	3. Student should able to know aims, objectives, relevance and scope of regional planning.

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, With 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 disparities, 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, 1975; Class and Politics; Manohar Book Sevice, Delhi.
2. AEJ Morris; History of Urban Form from Pre-history to Renaissance; Routledge, London.
3. Aidan Southall ;The City Time and Space; Cambridge University Press.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTUP1203	Land Economics and Management	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know economics, positive & negative economics, classical.
	2. Student should able to know value of commodity, perfect market conditions.
	3. Student should able to know theory by von thunen, alonso's bid rent function theory.

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**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –II**

Text Book/References Books/ Websites:-

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 Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTUP1204	Environmental planning and management	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know environment, ecology, man-environment relationship.
	2. Student should able to know global issues (1) global warming (2) ozone depletion.
	3. Student should able to know air & noise pollution; definition, terminology.

Unit	Contents (Theory)	Marks Weightage
I	Introduction to environment, Ecology, Man-environment relationship, Scope and necessity of environmental management in town planning, Interaction with man, Systems approach to environmental management, Factors of environment-physical, Social, Aesthetic, Economic and technological environment, Impact of advanced agricultural methods urbanization & industrialization on nature, Ecological balance and ecological degradation in urban areas.	**14**
II	Environmental Issue, Global issues, Global warming, Ozone depletion, Biodiversity, International agreements and protocols related to these issues.	**14**
III	**Air & Noise Pollution:** Definition, Terminology, Air pollutants effects of air pollution on plants, Animals and property, traffic planning as control of noise & air pollution air (prevention & control) pollution control 1981.	**14**
IV	Introduction to land use planning, principles, Strategies and land use planning , Framework for LUP, Need for LUP, land use control, Natural resource base, Zoning regulations, land use planning process, The relationships between economic development and environmental protection, Open space and farmland preservation, Brown field redevelopment, Tran boundary environmental issues, and environmental justice, Natural features protection engineering fundamentals, Presentation, Discussion on how the development of land is regulated, How natural features are protected including, Storm water management, Woodland, Wetland, Floodplain protection and landscaping, Engineering fundamentals.	**14**
V	Engineering geological investigation and interpretation of data for the need of city planning, Designing and construction, Terrain evaluation, Use of engineering geological maps, Environmental concerns in town planning - traffic, Garbage, Sewage, Water supply, Residential, Industrial and commercial zones, etc. Environmentally compatible regional development, Environmental impact assessment and its importance in planning.	**14**

Text Book/References Books/ Websites:-

1. Pramod Singh; Ecology of Urban India; Ashish Publishing House.
2. M. Lakshmi Narasaiah; Man and Environment; Discovery Publishing House, 2004, New Delhi
3. Agarwal, Sunita Narain and Shrabani Sen; State of India's Environment, citizens fifth Report.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTUP1205	Urban Regeneration & Conservation Techniques	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know quality of historic cities and areas: problems and issues.
	2. Student should able to know planning procedures: inspection and surveys, investigation.
	3. Student should able to know implementation of plans and urban management.

Unit	Contents (Theory)	Marks Weightage
I	**Quality of Historic Cities and Areas:** Problems and issues, Cultural resource management, Integrated urban conservation, Principles, International charters, Guidelines and standards for conservation of historic monuments, Sites and heritage zones, Aesthetic and social dimensions, Economic, legal and tourism aspects.	**14**
II	**Planning Procedures:** Inspection and surveys, Investigation techniques, Methods for inventories and documentation, Identification and reporting on heritage zones, Programs for adaptive reuse, Restoration, Rehabilitation and Infill or New constructions.	**14**
III	**Implementation of Plans and Urban Management:** Phasing, Resource mobilization, Incentives, Acts and legal tools, People's awareness and participation, Role of various action groups, Concept of urban redevelopment, Urban Renewal, Urban reconstruction, Urban rejuvenation.	**14**
IV	Symptoms and pre-conditions that warrant the need for regeneration of cities, Economic, Social and physical environmental aspects, Perception of urban regeneration in the context of evolution of selected urban centers of the West and the East.	**14**
V	National urbanization policy, Goals and objectives of urban regeneration of Indian cities, Process to evolve a feasible set of goals and objectives for urban regeneration.	**14**

Text Book/References Books/ Websites:-

1. Alan Dobby; Conservation & Planning; Hutchinson Educational.
2. Lance Craighead; Conservation Planning Shaping the future; ESRI.
3. Milwaukee; Conservation, Redevelopment, Organization, Strategy; Milwaukee Publisher the department 1964.
4. Folli, Maria Grazia; Sustainable Conservation and Urben Regeneration; Springer International Publishing.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total (100)
MTUP1206	Planning Studio-II	-	-	2	(Nil)	(Nil)	(Nil)	(70)	(30)	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: 30	Lab work & Sessional - Max Marks: 15	Assignment/Quiz/Attendance- Max. Marks: 15

Pre-Requisite	**Nil**
Course Outcome	1. To understand the basic knowledge of preparation of a development plan for a town or city including surveys.
	2. To be able to understand the use of town planning schemes including costing & phasing.
	3. To get to know about the use of analysis, costing, phasing and methodology of implementation.

Unit	Contents (Theory)	Marks Weightage
I	Preparation of a development plan for a town or city including surveys, Analysis, Costing, Phasing and methodology of implementation, Town planning schemes including costing & phasing as part of development proposal for extended area of case study, Improvement of traffic junctions for urban landscape including costing and phasing, Conservation and preservation of old core as a port of development proposal for old core in case study.	**100**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments:-

Student should prepare a detailed layout report or case study as per the topic assigned by subject faculty.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total (100)
MTUP1207	Planning Studio Seminar- II	-	-	2	(Nil)	(Nil)	(Nil)	(70)	(30)	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: 30	Lab work & Sessional - Max Marks: 15	Assignment/Quiz/Attendance- Max. Marks: 15

Pre-Requisite	**Nil**
Course Outcome	1. To be able to understand the concept of planning evaluation.
	2. To understand the surveys conducted for the preparation of plans.
	3. To get to know about the study of planning proposals.

Unit	Contents (Theory)	Marks Weightage
I	**Minor Problem:-** I. Planning evaluation and appraisal of small & medium town/ central metropolitan areas/business districts / residential/industrial areas schemes. II. Identify and explain the objectives of the problem. III. Surveys conducted for the preparation of plans. IV. Study of Physical Growth of socio Economic potentials, directly related to land use. V. Planning Proposals. VI. Implementation procedures and development control regarding selected land use. VII. Appraisal of plan , Report submission. **Major problem:-** I. Preparation of development / redevelopment plans for small and medium town /metropolitan cities reasons for selection of towns with II. Surveys. III. Data collection. IV. Maps preparation. V. Planning proposals & analysis, calculation, recommendations. VI. Feasibility, implementation reports.	**100**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments:-

Student should prepare a detailed layout report as per the topic assigned by subject faculty.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –II**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (50)	External	Internal	Total
MT1208	Audit Course - II (English For Research Paper Writing)	-	-	-	(35)	(15)	Min: 20 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 2 Hours

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

Pre-Requisite	**Nil**
Course Outcome	1. Student will understand that how to improve your writing skills and level of readability.
	2. Learn about what to write in each section of research article.
	3. Understand the skills needed when writing a Title.

Unit	Contents (Theory)	Marks Weightage
I	Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing, Redundancy, Avoiding Ambiguity and Vagueness.	**07**
II	Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticizing, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts, Introduction.	**07**
III	Review of the Literature, Methods, Results, Discussion, Conclusions, The Final Check.	**07**
IV	Key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature.	**07**
V	Skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the Conclusions, useful phrases, how to ensure paper is as good as it could possibly be the first- time submission	**07**

Text Book/References Books/ Websites

1. R. Goldbort (2006) ;Writing for Science;Yale University Press (available on Google Books).
2. R. Day (2006); How to Write and Publish a Scientific Paper; Cambridge University Press.
3. N Highman ;(1998), Handbook of Writing for the Mathematical Sciences; SIAM. Highman's book.
4. Adrian Wallwork ; English for Writing Research Papers; Springer New York Dordrecht Heidelberg London, 2011

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTUP13101	Industrial Safety	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	Functioning of Engineering equipments and industry work culture.
Course Outcome	1. Student should be able to apply standard safety procedures in an industrial environment.
	2. An ability to identify, formulate, and solve broadly-defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to the safety.

Unit	Contents (Theory)	Marks Weightage
I	**Industrial Safety:** Accident, Causes, Types, Results and control, Mechanical and electrical hazards, Types, Causes and preventive steps/procedure, Describe salient points of factories act 1948 for health and safety, Wash rooms, Drinking water layouts, Light, Cleanliness, Fire, Guarding, Pressure vessels, etc, Safety color codes, Fire prevention and firefighting, Equipment and methods.	**14**
II	**Fundamentals Of Maintenance Engineering:** Definition and aim of maintenance engineering, Primary and secondary functions and responsibility of maintenance department, Types of maintenance, Types and applications of tools used for maintenance, Maintenance cost & its relation with replacement economy, Service life of equipment.	**14**
III	**Wear And Corrosion And Their Prevention:** Wear- Types, Causes, Effects, Wear reduction methods, Lubricants-types and applications, Lubrication methods, General sketch, Working and applications of screw down grease cup, Pressure grease gun, Splash lubrication, Gravity lubrication, Wick feed lubrication, Side feed lubrication, Ring lubrication, Definition, Principle and factors affecting the corrosion, Types of corrosion, Corrosion prevention methods.	**14**
IV	**Fault Tracing:** Fault tracing-concept and importance, Decision tree concept, Need and applications, Sequence of fault finding activities, Show as decision tree, Draw decision tree for problems in machine tools, Hydraulic, Pneumatic, Automotive, Thermal and electrical equipment's like, Any one machine tool, Pump ,Air compressor, Internal combustion engine, Boiler, Electrical motors, Types of faults in machine tools and their general causes.	**14**
V	**Periodic and Preventive Maintenance**: Periodic inspection-concept and need, Degreasing, Cleaning and repairing schemes, Overhauling of mechanical components, Overhauling of electrical motor, Common troubles and remedies of electric motor, Repair complexities and its use, Definition, need, Steps and advantages of preventive maintenance, Steps/procedure for periodic and preventive maintenance of, Machine tools, Pumps, Air compressors, schedule of preventive maintenance of mechanical and electrical equipment, Advantages of preventive maintenance, Repair cycle, concept and importance.	**14**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –III**

Text Book/References Books/ Websites:

1. Maintenance Engineering Handbook; Higgins & Morrow; Da Information Services.
2. Maintenance Engineering; H. P. Garg; S. Chand and Company.
3. Pump-hydraulic Compressors; Audels; Mcgrew Hill Publication.
4. Foundation Engineering Handbook; Winterkorn; Hans; Chapman & Hall London

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTUP13102	Waste to Energy	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should be able to apply the knowledge about the operations of waste to energy plants.
	2. Apply the knowledge in planning and operations of waste to energy plants.
	3. Able to analyze the various aspects of waste to energy management systems.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction to Energy from Waste:** Classification of waste – agro based, Forest residues, Domestic waste, Industrial waste (hazardous and non-hazardous), Characterization of waste for energy utilization, Conversion devices – Incinerators, Gasifiers, digestors ,Waste production in different sectors i.e. domestic, Industrial, Agriculture, Postconsumer waste etc. Waste Selection criteria.	**14**
II	**Technologies for Waste to Energy Biochemical Conversion** – Energy production from organic waste through anaerobic digestion and fermentation, Thermo-chemical conversion – combustion, Incineration and heat recovery, Pyrolysis, Gasification, Plasma Arc Technology.	**14**
III	**Waste to Energy Options**: Landfill gas, Collection and recovery, Refuse Derived Fuel (RDF) – fluff, Briquettes, Pellets, Alternate Fuel Resource (AFR) – production and use in cement plants, Thermal power plants and industrial boilers, Conversion of wastes to fuel resources for other useful energy applications, Energy from plastic wastes – non-recyclable plastic wastes for energy recovery, Energy recovery from wastes and optimization of its use, Benchmarking and standardization.	**14**
IV	**Centralized and Decentralized Waste to Energy Plants**: Collection, Segregation, transportation and storage requirements, Location and Siting of waste to energy, Plant,. Industry specific applications – In-house use – sugar, Distillery, Pharmaceuticals, Pulp and paper, Refinery and petrochemical industry and any other industry, Centralized and decentralized energy production, Distribution and use, Comparison of centralized and decentralized systems and its operations.	**14**
V	**Waste To Energy & Environmental Implications**: Environmental standards for waste to energy plant operations and gas clean-up, Savings on non-renewable fuel resources, Carbon Credits, Carbon foot calculations and carbon credits transfer mechanisms, Energy analysis, Global best practices in waste to energy production and use, Indian scenario on waste to energy production distribution and use in India, Role of the Government in promoting 'Waste to Energy'.	**14**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –III**

Text Book/References Books/ Websites:

1. Industrial and Urban Waste Management in India; TERI Press.
2. Banwari Lal and Patwardhan; Wealth from Waste: Trends and Technologies; TERI Press.
3. S.N Mukhopadhyay; Fundamentals of waste and Environmental Engineering; TERI Press.
4. www.envfor.nic.in www.cpcb.nic.in
5. www.eai.in/ref/ae/wte/typ/clas/india_industrial_wastes.html
6. www.teriin.org/projects/green/pdf/National-Waste.pdf

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTUP13103	Cost Management of Engineering Projects	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Students should be able to perform and evaluate present worth, future worth and annual worth and more economic alternatives.
	2. Able to carry out and evaluate benefit/cost, life cycle and break-even analyses on one or more economic alternatives.

Unit	Contents (Theory)	Marks Weightage
I	Introduction and overview of the strategic cost management process cost concepts in decision-making, Relevant cost, Differential cost, Incremental cost and opportunity cost, Objectives of a costing system, Inventory valuation, Creation of a database for operational control, Provision of data for decision-making.	**14**
II	Project: meaning, Different types, Why to manage, Cost overruns centers, Various stages of project execution, Conception to commissioning, Project execution as conglomeration of technical and nontechnical activities, Detailed engineering activities, Pre project execution main clearances and documents project team, Role of each member, Importance project site, Data required with significance, Project contracts, Types and contents, Project execution project cost control, Bar charts and network diagram.	**14**
III	Project commissioning, Mechanical and process cost behavior and profit planning marginal Costing, Distinction between marginal costing and absorption costing, Break-even analysis, Cost-volume-Profit Analysis, Various decision-making problems, Standard costing and variance analysis.	**14**
IV	Pricing strategies. Pareto analysis. Target costing, life cycle costing, Costing of service sector Just-in-time approach, Material requirement planning, Enterprise resource planning, Total quality management and theory of constraints Activity-based cost management, Bench marking, Balanced score card and value-chain analysis, Budgetary control, Flexible budgets, Performance budgets, Zero-based budgets, Measurement of divisional profitability pricing decisions including transfer pricing.	**14**
V	Quantitative techniques for cost management, linear programming, PERT/CPM, Transportation problems, Assignment problems, Simulation, learning curve theory.	**14**

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –III**

Text Book/References Books/ Websites:

1. Cost Accounting A Managerial Emphasis; Prentice Hall of India; New Delhi.
2. Charles T. Horngren and George Foster; Advanced Management Accounting .
3. Robert S Kaplan Anthony A. Alkinson; Management & Cost Accounting.
4. Ashish K. Bhattacharya; Principles & Practices of Cost Accounting A. H. Wheeler publisher.
5. N.D. Vohra; Quantitative Techniques in Management; Tata McGraw Hill Book Co. Ltd.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTUP13201	Urban Renewal	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should be able to know surveys for renewal and sources of data.
	2. Student should be able to know problems and prospects of renewal in Indian cities.
	3. Student should be able to know policies for urban renewal.

Unit	Contents (Theory)	Marks Weightage
I	Definition of urban renewal, Surveys for renewal and sources of data, Methods of analysis.	**14**
II	Problems and prospects of renewal in Indian cities, Urban renewal a comparative study.	**14**
III	Policies for urban renewal, Legislation for renewal.	**14**
IV	Methodology for urban renewal, Alternative strategies for urban renewal.	**14**
V	Preparation of plans, Implementation, Costing and phasing Case study and report writing.	**14**

Text Book/References Books/ Websites:

1. Gehl, J. Gemzoe, L ;Compendium in town renewal and urban planning.; Nova Publisher.
3. Chris Couch, Chries Fraser; Urban Regeneration in Europe; Oxford.
3. Edward Ng. Earthscan ;Designing high-density cities; Routledge.
4. JNURM, Govt of India

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTUP13202	Water Resource Management	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know need for management of water resources.
	2. Student should able to know organized harnessing of water.
	3. Student should able to know areas, desert areas, special economic zones, port city.

Unit	Contents (Theory)	Marks Weightage
I	Need for management of water resources, International hydrological programme by UNESCO as a basis of water resource management.	**14**
II	Organized harnessing of water- dams, Hydro electric projects- their merits and demerits and short and long term impact on resource availability.	**14**
III	Special areas under consideration would include formal and functional regions (Hill areas, Coastal areas, Desert areas, Special economic zones, Port city, Aerotropolis, Medi-city, and knowledge city etc.)	**14**
IV	Urban 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**
V	Case studies of various topologies of special area development plans in Indian and international context	**14**

Text Book/References Books/ Websites:

1. A Handbook for Integrated Water Resources Management in Basins; Global Water Partnership.
2. Letitia A Obeney; Water Supply Engineering ; Khanna Publisher.
3. Ashu Jain & Narendra Shukla; Water Resources Management in India; Pointer Publishers.
4. Sarah Luck; Water Resource Management; Syrawood Publishing House.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
MTUP13203	Techniques of Analysis & Population Studies	3	1	-	(70)	(30)	Min: 40 (D Grade)	(Nil)	(Nil)	(Nil)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 15	Assignment/Quiz/Attendance - Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance- Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Student should able to know collection and presentation of data.
	2. Student should able to know significance of averaging and variation.
	3. Student should able to know significance of study of correlation. types of correlation.

Unit	Contents (Theory)	Marks Weightage
I	**Collection And Presentation of Data:** Introduction of statistics, Statistical data and method of analysis types of data, Designing questionnaire, Tabulation and representation of data, Line diagram, Pie diagram, Frequency distribution, Histogram, Radar diagram.	**14**
II	**Measures of Central Tendency and Variances:** Significance of averaging and variation, Calculation of mean median and mode for ungrouped and grouped data, Merits and limitations, Variance and standard deviation of ungrouped and grouped data, Lorenz curve, Skewness, Moments and kurtosis.	**14**
III	**Correlation Analysis:** Significance of study of correlation, Types of correlation, Karl pearson's coefficient of correlation, Properties of correlation coefficient, Rank correlation, Partial and multiple correlation.	**14**
IV	**Recasting and Time Series Analysis:** Requirement and methods of forecasting system, Types of time series data, Method of trend analysis, Semi-average, Moving-average and method of least square, Analysis and measurement of seasonal and cyclical variations, Introduction to non-linear rends.	**14**
V	**Population Pyramid:** Types and Properties, Human Sex Ratio, Dependency Ratio, Components of Population Growth: Birth and Mortality Rate, Age composition, Migration, Population forecasting method using statistical theories.	**14**

Text Book/References Books/ Websites:

1. Urban Planning: use of critical path Method / WORD
2. Asis Kumar Chattopadhyay; Demography: Techniques & Analysis; Viva books.
3. Petit; Population studies and Development from Theory to field work; Springer.

Suggested List of Laboratory Experiments :- (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Master of Technology** **Specialization:** Urban Planning **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total (300)
MTUP1303	Pre-Dissertation	-	-	6	(Nil)	(Nil)	(Nil)	(200)	(100)	Min: 120 (D Grade)

Duration of Theory (Externals): 3 Hours

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

Pre-Requisite	Knowledge of concerned discipline of Engineering.
Course Outcome	1. Identify literature and problem identification of research.
	2. Apply engineering principles through efficient handling of project.
	3. Identify appropriate techniques to analyze complex engineering problems.

Unit	Contents (Theory)	Marks Weightage
I	**Pre- Dissertation:** Students are required to select a topic of their interest in the third semester and prepare a dissertation on it. Mid semester presentation will include identification of the problem based on the literature review on the topic referring to latest literature available. End semester presentation should be done along with the report on identification of topic for the work and the methodology adopted involving scientific research, collection and analysis of data, determining solutions and must bring out individuals contribution. The student must submit a synopsis at the end of the semester for the approval from the research Approval committee in the specified format and submitted to the university for further Approval and give the power point presentation of the same for Evaluation/Approval.	**300**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- (Expandable): Nil