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.

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

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total
CET-1402	Concrete Technology	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. 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

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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:** Type of soils, Bearing capacity, Soil stabilization and improvement of bearing capacity, Settlement and safe limits, Spread foundations, Wall footings, Grillage, Foundations well foundation, Causes of failure and remedial measures, Under reamed piles, Foundation on shrinkable soils, Black cotton soil, Timbering for trenches, Dewatering of foundations, Damp proof courses, Repairs techniques for foundations.	**14**
IV	**Masonry and Walls:** Brick masonry, Bonds, stone masonry, Casting and laying, Masonry construction, Brick cavity walls, Code provisions regarding load bearing and non load bearing walls, Common defects in construction and their effect on strength and performance of walls, Designed brick masonry, Precast stone masonry block, Hollow concrete block, Plastering and pointing, White and color washing, Distempering, Dampness and its protection.	**14**

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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

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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.

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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).

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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**

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

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

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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.

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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.

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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