

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 Min 40 (D Grade)	External Nil	Internal Nil	Total Nil
CET-17101	Traffic Engineering	3	1	-						

Duration of Theory (Externals): 3 Hours

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

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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 Flow Theory; TMH.

Suggested List of Laboratory Experiments: - Nil

Approved from Academic Council

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total 100 Min 40 (D Grade)	External Nil	Internal Nil	Total Nil
CET-17102	Cost Effective and Eco friendly Construction	3	1	-						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab 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: Precast R.C plank & joists roof, Precast channel roof, Precast I-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

School of Research and Technology

Department: Civil Engineering

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total 100 Min 40 (D Grade)	External Nil	Internal Nil	Total Nil
CET-17103	Design of Hydraulic Structure	3	1	-						

Duration of Theory (Externals): 3 Hours

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

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total	External	Internal	Total
CET-1702	Design of Steel Structure-I	3	1	-	External (70)	Internal (30)	Total 100	External Nil	Internal Nil	Total Nil
							Min 40 (D Grade)			

Duration of Theory (Externals): 3 Hours

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

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total 100 Min 40 (D Grade)	External (35)	Internal (15)	Total (50) Min: 20 (D Grade)
CET-1703	Theory of Structure-II	3	1	1						

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: 15	Lab work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	Nil
Course Outcome	<ol style="list-style-type: none"> Detail analysis about the moment distribution method and kani's method. To give the knowledge of designing and analysis of plastic analysis of beams and frames. 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 multistorey 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:

- Wang C.K.; Intermediate Structural Analysis; Mcgraw Hill, New York.
- Reddy C.S.; Basic Structural Analysis; Tata Mcgraw Hill Publishing Company, New Delhi.
- Norris C.H., Wilbur J.B. And Utkys.; Elementary Structural Analysis; Mcgraw Hill International, Tokyo.
- Weaver W & Gere Jm; , Matrix Methods of Framed Structures; CBS Publishers & Distributors, Delhi.

Suggested List of Laboratory Experiments:-

- Sway in portal frame- Demonstration.
- To study the cable geometry and statics for different loading condition.
- To plot stress and strain curve for concrete. Use of mechanical and electrical strain and stress gauge.

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		L	T	P	External (70)	Internal (30)	Total 100 Min 40 (D Grade)	External (35)	Internal (15)	Total (50) Min: 20 (D Grade)
CET-1704	Environmental Engineering-II	3	1	1						

Duration of Theory (Externals): 3 Hours

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

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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

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (Nil)	Internal (Nil)	Total Nil	External (Nil)	Internal (50)	Total (50)
CET-1705	Steel Structure Lab-I	-	-	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	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.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (Nil)	Internal (Nil)	Total Nil	External (105)	Internal (45)	Total 150
CET-1706	Minor Project	-	-	3			Min: Nil			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	<ol style="list-style-type: none"> The major project work provides students an opportunity to do something on their own and under the supervision of a guide. 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	<p>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.</p> <p>The student should maintain proper documentation of different stages of project such as concept evaluation, requirement specification, objectives, work plan, analysis, design, implementation and test plan wherever applicable.</p> <p>Each student is required to prepare a project report based on the above points and present the same at the final examination with a demonstration of their project.</p>	150

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

List of experiments covered by contained from the syllabus.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (Nil)	Internal (Nil)	Total Nil Min: Nil	External (70)	Internal (30)	Total (100) Min: 40 (D Grade)
CET-1707	Industrial Training-II	-	-	2						

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	<p>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.</p> <p>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.</p> <p>Training period: Minimum of four weeks or 30 (Thirty) Days.</p> <p>Evaluation: Seventh semester</p> <p>Companies / Areas covered: Any field related to concern branch / discipline of Engineering.</p> <p>Grading: As per Scheme.</p> <p>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.</p> <p>Etiquette: Dress properly, Behave well, Portray good image as a university student, Be punctual, Observe work ethics, Concern for safety, Be professional.</p>	100

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

List of experiments covered by contained from the syllabus.