# PEOPLE'S UNIVERSITY, BHOPAL

***(Applicable for Admitted from Academic Session 2022-23 onwards)***

Programme: **Master of Technology** **Specialization:** Transportation Engineering **Semester –III**

| Subject Code | Subject Title | Credit | | | Theory | | | Practical | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L | T | P | External | Internal | Total (100) | External | Internal | Total |
| MTTR3102 | 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 will be able to know about energy from waste. |
| | 2. Students will have knowledge in technologies for waste to energy biochemical conversion. |
| | 3. Student will understand various centralized and decentralized waste to energy plants. |

| 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. | 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, 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. Sunil pandey;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


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

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*Branch: Transportation Engineering*

# PEOPLE'S UNIVERSITY, BHOPAL

***(Applicable for Admitted from Academic Session 2022-23 onwards)***

Programme: **Master of Technology** **Specialization:** Transportation Engineering **Semester –III**

| Subject Code | Subject Title | Credit | | | Theory | | | Practical | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L | T | P | External | Internal | Total (100) | External | Internal | Total |
| MTTR3103 | 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** | Quantity surveying & Estimation and PERT/CPM |
| **Course Outcome** | 1. They possess the skill to solve the problem in overview of the strategic |
| | 2. Student will apply their knowledge in project commissioning. |
| | 3. The Student will have an idea of pricing strategies, quantitative techniques. |

| 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 |

**Text Book/References Books/ Websites:**


1. Charles T. Horngren; Cost Accounting A Managerial Emphasis; Prentice Hall of India; New Delhi.
2. Charles T. Horngren and George Foster; Advanced Management Accounting; FT Prentice Hall.
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**

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***(Applicable for Admitted from Academic Session 2022-23 onwards)***

Programme: **Master of Technology** **Specialization:** Transportation Engineering **Semester –III**

| Subject Code | Subject Title | Credit | | | Theory | | | Practical | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L | T | P | External | Internal | Total (100) | External | Internal | Total |
| MTTR3201 | Highway Construction Practice | 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. They possess the skill to solve different problem in landslides. |
| | 2. The Student will have an idea about hill roads construction. |
| | 3. Student will be able to understand stability of slopes. |

| Unit | Contents (Theory) | Marks Weightage |
|---|---|---|
| I | **Embankment Construction:** Formation cutting in soil and hard rock, Preparation of Sub-grade, Ground improvement, Retaining and breast walls on hill roads, Granular and stabilized, Sub–bases/bases, Water bound macadam (WBM), Wet mix macadam (WMM), Cement treated bases, Dry lean concrete (DLC). | 14 |
| II | **Bituminous Constructions:** Types of bituminous constructions, Interface treatments, Bituminous surfacing and wearing courses for roads and bridge deck slabs, Selection of wearing course under different climatic and traffic conditions, IRC specifications, Construction techniques and quality control. | 14 |
| III | **Concrete Road Construction:** Test on concrete mixes, Construction equipments, Method of construction of joints in concrete pavements, Quality control in construction of concrete pavements, Construction of continuously reinforced, Pre-stressed, | 14 |
| IV | **Steel Fibre Reinforced (SFRC) Pavements:** IRC, MORT&H, ACI Specifications, AASHTO Specifications, Recycled pavements, Non-conventional pavements, Overlay construction. | 14 |
| V | **Hill Roads Construction:** Stability of slopes, Landslides - causes and control measures, Construction of bituminous and cement concrete roads at high altitudes, Hill road drainage, Construction and maintenance problems and remedial measures. | 14 |

**Text Book/References Books/ Websites:**


1. Alberto Munguia Mireles; Highway Construction and Inspection Field book; Project Construction Management Book
2. E. B. Sanford Thompson; Concrete In Highway Construction A Text-Book For Highway Engineers And Supervisors; Nabu Press


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

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Programme: **Master of Technology** **Specialization:** Transportation Engineering **Semester –III**

| Subject Code | Subject Title | Credit | | | Theory | | | Practical | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L | T | P | External | Internal | Total (100) | External | Internal | Total |
| MTTR3202 | Intelligent Transportation Systems | 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 will able to know about automated highway systems. |
| | 2. Student will know about the importance of telecommunications in the ITS. System. |
| | 3. The student will have an idea of historical background of ITS. |

| Unit | Contents (Theory) | Marks Weightage |
|---|---|---|
| I | **Introduction to Intelligent Transportation Systems (ITS):** Definition of ITS and identification of ITS objectives, Historical background, Benefits of ITS - ITS data collection techniques, Detectors, Automatic vehicle location (AVL), Automatic vehicle identification (AVI), Geographic information systems (GIS), Video data collection. | 14 |
| II | **Telecommunications in ITS :** Importance of telecommunications in the ITS system, Information management, Traffic management centres (TMC). Vehicle - road side communication, Vehicle positioning system | 14 |
| III | **ITS Functional Areas:** Advanced traffic management systems (ATMS), Advanced traveler information systems (ATIS), Commercial vehicle operations (CVO), Advanced vehicle control systems (AVCS), Advanced public transportation systems (APTS), Advanced rural transportation systems (ARTS). | 14 |
| IV | **ITS User Needs and Services :** Travel and traffic management, Public transportation management, Electronic payment, Commercial vehicle operations, Emergency management, Advanced vehicle safety systems, Information management. | 14 |
| V | **Automated Highway Systems :** Vehicles in platoons, Integration of automated highway systems. ITS programs in the world, Overview of ITS implementations in developed countries, ITS in developing countries. | 14 |

**Text Book/References Books/ Websites:**


1. Kan Paul Chen and John Miles; ITS Hand Book 2000; Recommendations for world road association (PIARC).
2. J.M. Sussman; Perspective on ITS; Artech House Publishers; 2005.
3. National ITS Architecture Documentation; US Department of Transportation; 2007 (CD-ROM).


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

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Programme: **Master of Technology** **Specialization:** Transportation Engineering **Semester –III**

| 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) |
| MTTR3203 | Transportation Network Analysis & Optimization | 3 | 1 | - | | | | | | |

**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** | Strength of Material & Theory of Structural Engineering |
| **Course Outcome** | 1. Student will have an idea of concepts of search algorithms. |
| | 2. They will have knowledge in minimum cost network assignment. |
| | 3. Student will apply their knowledge in computer software. |

| Unit | Contents (Theory) | Marks Weightage |
|---|---|---|
| I | **Network Flows:** Applications, Definitions, Graphs, Paths, Trees, Cycles, Loops, Walk, Network representation (adjacency list and matrices) and basic network transformations, **Network Algorithms:** Complexity, Search algorithms, Strategies for designing polynomial algorithms. | 14 |
| II | **Shortest Path Algorithms:** Label setting, Dijkstra's and dial's algorithms, Optimality conditions, label correcting algorithms and optimality conditions, Detecting negative cycles,. All pair shortest path algorithms, Pre-flow push polynomial time algorithms, Capacity scaling techniques. | 14 |
| III | **Minimum Cost Network Assignment:** Optimality conditions, Cycle-cancelling algorithm, Successive shortest path algorithm, Other polynomial time variants, Network equilibrium analysis, Principles and optimisation formulations, Frank-wolfe algorithm; Special cases and variants. | 14 |
| IV | **Applications:** Applications of minimum cost, Maximum flow and shortest path algorithms to transportation and infrastructure networks, Transportation networks, Airline, Freight, Facility location, Logistics, Network design, Project scheduling, Reliability of distribution systems, Telecommunication/Power networks etc. | 14 |
| V | **Computer Software:** Principles of TRIPS, SATURN, EMME/2, CUBE, Demo versions, Case studies. | 14 |

**Text Book/References Books/ Websites:**


1. R. Ahuja, T.L. Magnanti, and J. B. Orlin; Network Flows; Theory Algorithms and Application, Prentice Hall; New Jersey; 1993.
2. M.G. Bell; Transportation Networks; Elsevier Science Publishers; 1999.


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

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***(Applicable for Admitted from Academic Session 2022-23 onwards)***

Programme: **Master of Technology** **Specialization:** Transportation Engineering **Semester –III**

| Subject Code | Subject Title | Credit | | | Theory | | | Practical | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L | T | P | External | Internal | Total | External | Internal | Total (300) |
| MTTR303 | 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. Students will have an idea of methodology adopted involving scientific research. |
| | 2. Students will apply engineering principles through efficient handling of project. |
| | 3. Students will have knowledge about 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**

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