PEOPLE'S UNIVERSITY, BHOPAL

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

Programme: **Master of Technology** **Specialization: Computer Science and Engineering** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
MT13101	Industrial Safety	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	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**

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

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

Programme: **Master of Technology** **Specialization: Computer Science and Engineering** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
MT13102	Waste to Energy	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 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' plants. 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: Computer Science and Engineering** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)			Total
MT13103	Cost Management of Engineering Projects	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	Nil
Course Outcome	4. Students should able to perform and evaluate present worth, future worth and annual worth of more economic alternatives.
	5. Able to carry out and evaluate benefit/cost, life cycle and Break Even analysis 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**

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: Computer Science and Engineering** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
MTCS13201	Python Programming	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 acquire programming skills in core Python.
	2. To acquire Object Oriented Skills in Python 3.
	3. To develop the skill of designing Graphical user Interfaces in Python
	4. To develop the ability to write database applications in Python

Unit	Contents (Theory)	Marks Weightage
I	**An Introduction to Python**: A Brief History of Python, Python Versions, Installing Python, Environment Variables, Executing Python from the Command Line, IDLE, Editing Python Files, Python Documentation, Help, Dynamic Types, Python Reserved Words, Naming Conventions, Python Basic Syntax, Comments, String Values, String Methods, The format Method, String Operators, Numeric Data Types, Conversion Functions, Simple Output/Input, The % Method, The print Function, Indenting Requirements, The if Statement, Relational and Logical Operators, Bit Wise Operators, The while Loop, break and continue, The for Loop.	**14**
II	**Python Collections**: Functions, Modules: Lists, Tuples , Sets, Dictionaries, Sorting Dictionaries, Copying Collections. Defining Your Own Functions ,Parameters, Function Documentation, Keyword and Optional Parameters, Passing Collections to a Function, Variable Number of Arguments, Scope, Passing Functions to a Function, map, filter, Mapping Functions in a Dictionary, Lambda, Inner Functions, Closures. Modules, Standard Modules - sys, math, time, The dir Function.	**14**
III	**Exceptions, I/O, Classes in Python Regular Expressions:** Errors, Runtime Errors, The Exception Model, Exception Hierarchy, Handling Multiple Exceptions, raise & assert. Data Streams, Creating Your Own Data Streams ,Access Modes, Writing Data to a File, Reading Data From a File, Additional File Methods, Using Pipes as Data Streams, Handling IO Exceptions, Working with Directories, Metadata & The pickle Module. Classes in Python, Principles of Object Orientation, Creating Classes, Instance Methods, File Organization, Special Methods, Class Variables, Inheritance, Polymorphism, Type Identification, Custom Exception Classes. Simple Character Matches, Special Characters, Character Classes, Quantifiers, The Dot Character, Greedy Matches, Grouping, Matching at Beginning or End, Match Objects, Substituting, Splitting a String, Compiling Regular Expressions, Flags.	**14**
IV	**Data Structures, Writing GUIs in Python**: List Comprehensions, Nested List Comprehensions, Dictionary Comprehensions, Dictionaries with Compound Values, Processing Lists in Parallel, Specialized Sorts, Time Functionality, Generators. Components and Events, An Example GUI, The Tk Widget, Button Widgets, Entry Widgets, Text Widgets, Check button Widgets, Radio button Widgets, List box Widgets, Frame Widgets, Menu Widgets, Top level Widgets, Dialogs.	
V	**Python and CGI Scripts**: What is CGI, HTML, HTML Forms, A Library Application, HTML Tables, The CGI Script, Rendering of the Script The OS Module & Network Programming:	**14**

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Programme: **Master of Technology** **Specialization: Computer Science and Engineering** **Semester –III**

	The Environment, creating a Process, Listing Files, Other Process Methods, File Information (Metadata), Working with Directories. Networking Fundamentals, The Client/Server Model, The socket Module, A Client Program, A Server Program, An Evaluation Client and Server, A Threaded Server.	

Text Book/References Books/ Websites:

1. Python Programming(IBM ICE Publication)
2. Hetland, MagnusLie ;Beginning Python ;A press Publication;2017
3. Zed A. Shaw ;Learn Python the Hard Way ;Pearson Education; Third Edition(2017)-

Suggested List of Laboratory Experiments (Expandable): Nil

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Programme: **Master of Technology** **Specialization: Computer Science and Engineering** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
MTCS13202	Data Mining and Ware Housing	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	Student Should have basic knowledge of Database.
Course Outcome	1. The students will be able to Store voluminous data for online processing Preprocess the data for mining applications.
	2. Design and deploy appropriate classification techniques Cluster the high dimensional data for better organization of the data.

Unit	Contents (Theory)	Marks Weightage
I	**Data Warehouse**: Evolution, Characteristics, Architecture, Components- Multi Dimensional Data Model (Data Marts, Metadata), Data Warehouse Implementation – Mapping the Data Warehouse to Multiprocessor Architecture, OLAP & OLTP. Data Mining: Motivation, Importance, Functionalities, KDD Steps in Data Mining Process, Architecture, Classification & Techniques. Type of Database.	**14**
II	**Mining Association Rules & Data Preparation :**Association Rules: Introduction, Single-Dimensional & Multilevel Mining Association Rules for Transaction Databases, Relational databases and Data Warehouses. Boolean Association Rules from Transactional Databases, Association Mining to Correlation Analysis, Constraint-Based Association Mining. Market Basket Analysis, Types of Association Rules, Methods for Classification and Prediction: Methods for Data Classification and Prediction. Data Preparation: Cleaning, Integration, Transformation, Reduction, Discretization Concept Hierarchies.	**14**
III	**Mining Primitives & Issues Regarding Classification and Prediction Mining:** Primitives: Architecture, Query Languages, Designing Graphical User Interfaces Based on Data Mining Query Language Architectures of Data Mining Systems. Classification and Prediction: Classification by Decision Tree Induction & Back propagation, Bayesian Classification, Classification Based on Concepts from Association Rule Mining, Other Classification Methods, Prediction, Classifier Accuracy.	**14**
IV	**Cluster Analysis & Concepts Description :**Clusters Analysis: Types of Data in Cluster Analysis, Major Clustering Methods, Partitioning Methods, Hierarchical Methods. Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Outlier Analysis. Concepts Description: Characterization and Comparison, Data Generalization and Summarization Based Characterization, Analytical Characterization- Analysis of Attribute Relevance, Mining Class Comparisons-Discriminating between Different Classes, Mining Descriptive Statistical Measures	**14**
V	**Mining of Multimedia Data & Applications Mining** :Complex Types of Data:	**14**

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Programme: **Master of Technology Specialization: Computer Science and Engineering Semester –III**

	Multidimensional Analysis and Descriptive Mining of Complex, Data Objects, Mining: Spatial Databases, Multimedia Databases, Time-Series and Sequence Data, Text Databases, World Wide Web. APPLICATIONS : Data Mining – Social Impacts of Data Mining – Tools – An Introduction to DB Miner – Case studies – Mining WWW – Mining Text Databases – Mining Spatial Databases.	

Text Book/References Books/ Websites:

1. Arun K.Pujari ;Data Mining Techniques; University Press.
2. W. H. Inmon, Wiley ;Building the DataWarehouse; Dreamtech India Pvt. Ltd.
3. Alex Berson, Stephen J Smith; Data Warehousing, Data Mining & OLAP ;Tata Mcgraw Hill

Suggested List of Laboratory Experiments (Expandable): Nil

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

Programme: **Master of Technology** **Specialization: Computer Science and Engineering** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
MTCS13203	Simulation and Modelling	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	Student should have basic knowledge of numerical mathematics, probability and statistics, and Programming skills.
Course Outcome	The students should be able to solve real world problems which cannot be solved strictly by mathematical approaches.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction to modeling and simulation:** Modeling and simulation Methodology, system modeling, concept of simulation, continuous and discrete time simulation. Simulation Examples Queuing systems And Communications networks General Principles -Event -driven Simulation, World Views List processing.	**14**
II	**Introduction to Queuing Theory:** Characteristics of queuing system, Poisson's formula, birth-death system, equilibrium of queuing system, analysis of M/M/1 queues. Application of queuing theory in computer system like operating systems, computer networks etc.	**14**
III	**Simulation software :** History, Selection process, Simulation in High Level Language (C, C++, Pascal, Fortran), Simulation package(Matlab/Simulink), Interpreted vs. compiled simulators, Future trends. Statistical models-Terminology and Concepts, Useful Statistical Models and Distributions.	**14**
IV	**IV No Random Number Generation:** Properties of Random Numbers, Generation of Pseudo-Random Numbers, Testing for Randomness and Pitfalls. Random Variate Generation-Inverse Transform, Direct Transform, Convolution, Accept-Reject.	**14**
V	**Verification and validation:** Design of simulation experiments, validation of experimental models, testing and analysis. Simulation languages comparison and selection, study simulation sw -SIMULA, DYNAMO, STELLA, POWERSIM.	**14**

Text Book/References Books/ Websites:

1. Gorden G; System simulation ;Prentice Hall of India
2. Seila; Simulation Modeling ; Cengage Learning
3. Law ;Simulation Modeling And Analysis;McGraw Hill Publication
4. Deo; System Simulation with Digital Computer ; PHI Publication

Suggested List of Laboratory Experiments (Expandable): Nil

PEOPLE'S UNIVERSITY, BHOPAL

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Programme: **Master of Technology** **Specialization: Computer Science and Engineering** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)			Total (300)
MTCS1303	Pre-Dissertation	-	-	6	External Nil	Internal Nil	Nil	External (200)	Internal (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
	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