PEOPLE'S UNIVERSITY, BHOPAL

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

Programme: **Master of Technology** **Specialization: Cyber Security** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)			Total
MT13101	Industrial Safety	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	Functioning of Engineering equipments and industry work culture.
Course Outcome	1. Student should 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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Programme: **Master of Technology** **Specialization: Cyber Security** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)			Total
MT13102	Waste to Energy	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	1. Student should 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

Suggested List of Laboratory Experiments (Expandable): Nil

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Programme: **Master of Technology** **Specialization: Cyber Security** **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	1. Students should able to perform and evaluate present worth, future worth and annual worth of more economic alternatives.
	2. 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**: Projec 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)

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Programme: **Master of Technology** **Specialization: Cyber Security** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)			Total
MTCY13201	Digital Cyber Crimes & Cyber Criminology	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	1. Understand the structure, mechanics and evolution of the Internet in the context of emerging crime threats and technological and other trends in cyberspace.
	2. Analyse and assess the impact of cybercrime on government, businesses, individuals and society.

Unit	Contents (Theory)	Marks Weightage
I	**Computer and Cyber Forensic Basics-** Introduction to Computers, Computer History, Software, Hardware, Classification, Computer Input-Output Devices, Windows, DOS Prompt Commands, Basic Computer Terminology, Internet, Networking, Computer Storage, Cell Phone / Mobile Forensics, Computer Ethics and Application Programs, Cyber Forensic Basics- Introduction to Cyber Forensics, Storage Fundamentals, File System Concepts, Data Recovery, Operating System Software and Basic Terminology.	**14**
II	**Data and Evidence Recovery-** Introduction to Deleted File Recovery, Formatted Partition Recovery, Data Recovery Tools, Data Recovery Procedures and Ethics, Preserve and safely handle original media, Document a "Chain of Custody", Complete time line analysis of computer files based on file creation, file modification and file access, Recover Internet Usage Data, Recover Swap Files/Temporary Files/Cache Files, Introduction to Encase Forensic Edition, Forensic Tool Kit (FTK) etc, Use computer forensics software tools to cross validate findings in computer evidence-related cases.	**14**
III	**Cyber Crimes and Cyber Laws- I**ntroduction to IT laws & Cyber Crimes – Internet, Hacking, Cracking, Viruses, Virus Attacks, Pornography, Software Piracy, Intellectual property, Legal System of Information Technology, Social Engineering, Mail Bombs, Bug Exploits, and Cyber Security etc.	**14**
IV	**Cyber Forensics Investigation-** Introduction to Cyber Forensic Investigation, Investigation Tools, eDiscovery, Digital Evidence Collection, Evidence Preservation, E-Mail Investigation, E-Mail Tracking, IP Tracking, E-Mail Recovery, Encryption and Decryption methods, Search and Seizure of Computers, Recovering deleted evidences, Password Cracking.	**14**
V	**Cyber Security-** Introduction to Cyber Security, Implementing Hardware Based Security, Software Based Firewalls, Security Standards, Assessing Threat Levels, Forming an Incident Response Team, Reporting Cyber crime, Operating System Attacks, Application Attacks, Reverse Engineering & Cracking Techniques and Financial Frauds. Mobile transport and application layer protocol - Review of traditional TCP, fast retransmit/fast recovery, transmission/timeout freezing, file systems, WWW, WAP.	**14**

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Programme: **Master of Technology** **Specialization: Cyber Security** **Semester –III**

Text Book/References Books/ Websites:

1. Debby Russell and Sr. G.T Gangemi;Computer Security Basics (Paperback);2nd Edition, O' Reilly Media, 2006.
2. Thomas R. Peltier; Information Security policies and procedures: A Practitioner's Reference; 2nd Edition Prentice Hall, 2004.
3. Kenneth J. Knapp; Cyber Security and Global Information Assurance: Threat Analysis and Response Solutions; IGI Global, 2009.
4. Thomas R Peltier, Justin Peltier and John blackley; Information Security Fundamentals; 2nd Edition, Prentice Hall, 1996
5. Jonathan Rosenoer; Cyber law: the Law of the Internet; Springer-verlag, 1997.

Suggested List of Laboratory Experiments (Expandable): Nil

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Programme: **Master of Technology** **Specialization: Cyber Security** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
MTCY13202	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.	**14**
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: Cyber Security** **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)-

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Suggested List of Laboratory Experiments (Expandable): Nil

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Programme: **Master of Technology** **Specialization: Cyber Security** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)			Total
MTCY13203	Biometric 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: 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	To provide students with understanding of biometrics, biometric equipment and standards applied to security

Unit	Contents (Theory)	Marks Weightage
I	**Biometrics- Introduction-** benefits of biometrics over traditional authentication systems – benefits of biometrics in identification systems-selecting a biometric for a system – Applications – Key biometric terms and processes - biometric matching methods -Accuracy in biometric systems	**14**
II	**Physiological Biometric Technologies**: Fingerprints - Technical description –characteristics - Competing technologies - strengths – weaknesses – deployment - Facial scan – Technical description - characteristics - weaknesses-deployment - Iris scan - Technical description – characteristics - strengths – weaknesses – deployment - Retina vascular pattern – Technical description – characteristics - strengths – weaknesses –deployment - Hand scan – Technical description-characteristics - strengths – weaknesses deployment – DNA biometrics.	**14**
III	**Behavioral Biometric Technologies**: Handprint Biometrics - DNA Biometrics - signature and handwriting technology - Technical description – classification - keyboard / keystroke dynamics - Voice – data acquisition - feature extraction - characteristics - strengths – weaknesses deployment.	**14**
IV	**Multi biometrics**: Multi biometrics and multi factor biometrics - two-factor authentication with passwords - tickets and tokens – executive decision - implementation plan	**14**
V	**Case studies on Physiological**: Behavioral and multifactor biometrics in identification systems.	**14**

Text Book/References Books/ Websites:

1. Samir Nanavathi, Michel Thieme, and Raj Nanavathi; Biometrics -Identity verification in a network;Wiley Eastern, 2002.
2. John Chirillo and Scott Blaul; Implementing Biometric Security; Wiley Eastern Publications, 2005.
3. John Berger;Biometrics for Network Security; Prentice Hall, 2004.

Suggested List of Laboratory Experiments (Expandable): Nil