RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Civil Engineering, VII-Semester

Open Elective CE 703(A) Internet of Things

Course Objectives (CEO):
The course provides basic knowledge of how to connect various devices through Internet and control them remotely. It will provide methods for different types of networking and data storage.The course aims at providing communication overview and protocols for safe and secure data access and transfer and maintain confidentiality and integrity.

Unit 1:Introduction: Definition, Characteristics of IOT, IOT Conceptual framework, IOT Architectural view, Physical design of IOT, Logical design of IOT, Application of IOT.

Unit 2: Machine-to-machine (M2M), SDN (software defined networking) and NFV(network function virtualization) for IOT, data storage in IOT, IOT Cloud Based Services.

Unit 3: Design Principles for Web Connectivity: Web Communication Protocols for connected devices, Message Communication Protocols for connected devices, MQTT, CoAP, SOAP, REST, HTTP Restful and Web Sockets.
Internet Connectivity Principles: Internet Connectivity, Internet based communication, IP addressing in IOT, Media Access control.

Unit 4: Sensor Technology , Participatory Sensing, Industrial IOT and Automotive IOT , Actuator, Sensor data Communication Protocols ,Radio Frequency Identification Technology, Wireless Sensor Network Technology.

Unit 5:IOT Design methodology: Specification -Requirement, process, model, service, functional & operational view.IOT Privacy and security solutions, Raspberry Pi &arduino devices.IOT Case studies: smart city streetlights control & monitoring.

Reference Book:

1. Rajkamal,"Internet of Things", Tata McGraw Hill publication
2. Vijay Madisetti and ArshdeepBahga, "Internet of things(A-Hand-on-Approach)" 1st Edition ,Universal Press
3. Charless Bell "MySQL for the Internet of things",Apresspublicatons.
4. Francis dacosta "Rethinking the Internet otthings:A scalable Approach to connecting everything", 1st edition, Apresspublications .
5. HakimaChaouchi "The Internet of Things: Connecting Objects", Wiley publication.
6. Donald Norris"The Internet of Things: Do-It-Yourself at Home Projects for Arduino,Raspberry Pi and BeagleBone Black", McGraw Hill publication.

Course Outcomes (COs): After completion of the course the students should be able to

1. Understand in depth about Internet of things**.**
2. Establish secure communication for his network for his devices connected in IOT.
3. Store his data securely on cloud and access it when required
4. Design web based application using various internet protocols and services
5. Use sensor technology and RFID and wireless networking for maintaining privacy and security concern in smart city and housing environmental considerations.

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Civil Engineering, VII-Semester

Open Elective CE 703(B) Project Management

Course Objectives:

The objectives of this course are :

1. To make them understand the concepts of Project Management for planning, resource utilization to execution of projects.
2. To make them understand the feasibility analysis in Project Management, earned value, risk and time estimation.
3. To enable them to comprehend the fundamentals of Project life cycle, Costing and Budgeting.
4. Make them capable to analyze, apply and appreciate contemporary project management tools and project proposal, documentation and team management.

UNIT 1
Project Management Concepts &Initiating

Project Attributes , Balancing Project Constraints, Project Life Cycle
Project Management Process, Stakeholder Engagement , Global Project Management , Benefits .Project Identification, Project Selection

UNIT 2 Developing Project Proposals
Building Relationships with Customers and Partners, Pre-RFP/Proposal Marketing
Decision to Develop a Proposal &techniques ,Proposal Preparation & Contents
Pricing Considerations , Contracts

UNIT 3 Planning Schedule, & Resource Utilization-Its Performance , and Controlling the Project
Project Objective ,scope, Plan for Quality , Create W.B.S, Assign Responsibility, Activities & sequencing ,Estimate Activity Resources &Durations ,Develop Project Schedule , Project Control Process ,Resource-Constrained Planning ,leveling, scheduling
Project Management Information Systems

Unit 4 Determining Costs, Budget, and Earned Value & Risks
Estimate Activity Costs Determine Project Budget , Determine Actual Cost
Determine Value of Work Performed Analyze Cost Performance , Control Costs ,Manage Cash Flow, Identify Risks, Assess Risks ,Monitor Risks

Unit 5 The Project Team &Project Manager & Documentations& project Management structures
Acquiring the Project Team, Project Team Development,Project Kickoff Meeting
Project Manager Responsibilities, Project Manager Skills ,Developing Project Manager Competence ,Delegation &Managing Changes,
Functional Organizational Structure ,Matrix Organizational Structure
Advantages and Disadvantages of Organizational Structures

Course Outcomes:

On completion of this course, the students will be able to:

1. Understand project characteristics and various stages of a project.
2. Understand the conceptual clarity about project organization and feasibility analyses – Market, Technical, Financial and Economic.
3. Analyze the learning and understand techniques for Project planning, scheduling and Execution Control.
4. Apply the risk management plan and analyse the role of stakeholders.
5. Understand the contract management, Project Procurement and productivity.
6. Understand the Documentation and Control are practiced in the industry

References:

1. Contemporary Project Management, 4E by Timothy J. Kloppenborg | Vittal S. Anantatmula | Kathryn Wells Cengage Learning India
2. Project Management: The Managerial Process, 6E by Clifford F. Gray, Erik W. Larson, Gautam V. Desai McGraw Hill
3. Project Management, 1E by Pradeep Pai. Pearson
4. Project Management: A Systems Approach to Planning, Scheduling, and Controlling, 12th Edition by Harold Kerzner. Wiley
5. Project Management A practical guide to planning and managing Projects by Stephen Hartley. Taylor & Francis

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New Scheme Based On AICTE Flexible Curricula

Civil Engineering, VII-Semester

Open Elective CE 703(C) Integrated Waste Management

(L-T-P: 3-0-0, Credit: 3)

Course Objectives:

O1: To Aware about the problems associated with Municipal solid waste(MSW) and their effective management.
O2: To understand the components of Integrated solid waste management system.
O3: To learn about recycling, reuse and reduce, recover of solid wastes and Transfer station.
O4: To examine the operation of a resource recovery facility, waste-to-energy strategies.
O5: To study the design and operation of a municipal solid waste composting and land-filling.

UNIT I: INTRODUCTION OF SOLID WASTES

Definition of solid waste, garbage, rubbish-Sources and Types of solid wastes. Characteristics of Solid Wastes: Physical, chemical and biological characteristics- Problems occur due to improper disposal of solid wastes.

UNIT II: INTEGRATED SOLID WASTE MANAGEMENT

Definition- Reduction, reuse, recycling and recovery principles of waste management- Functional elements of integrated solid Waste management- Waste generation and handling at Source-Collection of solid wastes- Collection methods and services- guidelines for collection route layout.

UNIT III: INTRODUCTION OF TRANSFER STATION

Transfer Station-Processing and segregation of the solid waste- various methods of material segregation. Importance of Transfer Stations. Site selection of transfer stations.

UNIT IV: PROCESSING AND TRANSFORMATION OF SOLID WASTES

Composting: definition-methods of composting-advantages of composting, Incineration: definition-methods of incineration-advantages and disadvantages of incineration.

UNIT V: DISPOSAL OF SOLID WASTE

Volume reduction, Open dumping, land filling techniques. Landfills: Classification-Design and Operation of landfills, Land Farming, Deep well injection.

Course Outcomes:

After studying this course, students will be able to:

CO1: Review the components of solid waste management system as per need of particular locality, town or city.
CO2: Be aware of the significance of recycling, reuse and reduction and recovery of solid wastes.
CO3: Develop an insight into the collection, transfer, and transport of municipal solid waste.
CO4: Understand the importance and operation of a resource recovery facilities like waste-to-energy Technologies-Biochemical and thermochemical.
CO5: Understand the design and operation of a municipal solid waste composting and landfilling.

Text Books:

1. George Tchobanoglous, Hilary Theisen and Samuel A Vigil, Integrated Solid Waste management, Tata McGraw Hill
2. Ramachandra T.V., Management of Municipal Solid Waste, 2009; by The Energy and Resource Institute, TERI
3. Sasikumar, K, Gopi Krishna, Sanoop, Solid Waste Management; 2009, PHI.

Reference Books:

1. Manual on Solid Waste Management, prepared by The Central Public Health and Environmental Engineering Organization(CPHEEO), India
2. MSW Management Rules 2016, Govt. of India, available online at CPCB website

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Civil Engineering, VII-Semester

Open Elective CE 703(D) Building Services

UNIT I -

Importance of building services, types of services required in building complexes. Planning of services, organization structure of services role and administrative functions of supervisors, classification of building as per NBC. Water supply & distributions in high rise buildings, house connections system of water supply, water supply fixtures & appliances, swimming pool water treatment, algae control in swimming pool.

UNIT II – Lift & Escalator

Anatomy of lift provision in lift, classification of lift, types of lifts, types of operation of lifts. lift codes & rules, traffic analysis and selection of lift, types of lift control, structural provisions of lift and buildings, fire safety provisions in lifts, work done and lift installation by owner, details of information to be given to lift supplier, Accidents in lifts and safety precautions, escalators, working mechanism, Travelators,

UNIT III – Fire-Fighting

Fire growth and behavior, classification of fire, fire triangle classification of building according to fire, classification of structural components, modes of fire, fire- extinguishers and their types of suitability, types of portable fire extinguishers, fire hydrants and their location, Carbon Di-oxide storing system , provisions in building from fire safety (IS 1641), Hydrants installation , fire lift , fire escapes, service duet escape route , fire detection systems their type and applications fire alarm systems, types and their working fire control systems.

UNIT IV – Acoustics and sound insulation and HVAC system

Noise, sources & their effects, Charactereristics sound; Acoustical defects, Noise in building, Planning Noise rating Curve, Reverberation time, materials for acoustical treatment, requirement for good acoustics, general principles of caustics design, Acoustical design of auditorium, studio, open air theatre, Sound insulation of walls, ceiling floors.

Natural ventilation, Types of Ventilation systems, Types of air conditioning, principles of control air conditioning, system of air conditioning essentials of air conditioning system, Thermal insulation of walls & ceiling, methods of thermal insulation.

UNIT V – Miscellaneous Services

Building Security & access Control (Biometrics, voice recognition, Iris detector, smart card, Vascular pattern, fingerprint, contactless system etc), Design of car parking system, car park management Strategy , services for Disabled , Rain water harvesting, solar systems, green Building Concerns, Street lighting (Campus lighting), Land scaping & Horticulture, waste collection & reuse & recycling, package STP, use of IOT in building Services management, CCTV, Surveillance, refuse collection & Transportation