Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Computer Science and Business Systems
(Applicable from the academic session 2020-2021)

Semester-VII

Introduction to IoT
Code: PEC-CSBS701A
Credit: 3

Course Outcome(s):

This course will help students understand basic principles and concepts of Internet-of-Things use cases, applications, architecture and technologies. Students will get an overview of an end to end IoT system encompassing the edge, cloud and application tiers. This course will build upon the foundations created in the pre-requisite courses and will equip the students to architect a complete IoT application on their own. The lab exercises will consist of hands-on experiments that will lead to building an IoT application end-to-end. Some of the specialized topics will be covered via student seminars where students are expected to research and present their findings in a seminar format.

Topics to Be Covered:

UNIT – I

Introduction to IoT and Use cases: Understanding basic concepts of IoT, Consumer IoT vs Industrial Internet, Fundamental building blocks, Use Cases of IoT in various industry domains,

UNIT – II

Architecture: IoT reference architectures, Industrial Internet Reference Architecture, Edge Computing, IoT Gateways, Data Ingestion and Data Processing Pipelines, Data Stream Processing

UNIT – III

Sensors and Industrial Systems: Introduction to sensors and transducers, integrating sensors to sensor processing boards, introduction to industrial data acquisition systems, industrial control systems and their functions

UNIT – IV

Networking and Communication for IoT: Recap of OSI 7 layer architecture and mapping to IoT architecture, Introduction to proximity networking technologies (ZigBee, Bluetooth, Serial Communication), Industrial network protocols (Modbus, CANbus), Communicating with cloud applications (web services, REST, TCP/IP and UDP/IP sockets, MQTT, WebSockets, protocols. Message encoding (JSON, Protocol Buffers)

UNIT – V

IoT Data Processing and Storage: Time Series Data and their characteristics, time series databases, basic time series analytics, data summarization and sketching, dealing with noisy and missing data, anomaly and outlier detection,

IoT Seminars:

Selected topics in IoT should be handled via student seminars. Recommended that students form a group do research on at least one of the following topics and present it through seminars. They are expected to do a literature survey of the topic and present their survey paper to the class. The suggested topics are –

a) IoT Applications

- Smart Cities
- Connected Vehicles and Telematics
- Smart Grids
- Smart Homes

b) IoT data visualization

c) Survey of cloud based IoT platforms

d) Low power wide area networks for IoT

e) IoT device management

f) Survey of chips, embedded modules and development boards for IoT devices

g) Embedded and real-time operating systems for IoT

h) IoT Security

- Security risks in IoT
- Securing IoT endpoint devices and secure communication protocols for IoT
- Security and Privacy of IoT data

HUMAN RESOURCE MANAGEMENT
Code: HSMC-CSBS702
Credit: 2

Course Outcomes On completion of this course, the students will be able

CO1: To develop the understanding of the concept of human resource management and to understand its relevance in organizations.
CO2: To develop necessary skill set for application of various HR issues.
CO3: To analyse the strategic issues and strategies required to select and develop manpower resources.
CO4: To integrate the knowledge of HR concepts to take correct business decisions.

MODULE I

1. Human Resource Management: Meaning, Scope, objectives, and functions of HRM , HR as a Factor of Competitive Advantage, Structure of HR Department, , Line and staff responsibility of HR Managers, Environmental factors influencing HRM (2L)

2. Human Resource Planning: definition, objective, process of HRP. Supply and Demand Forecasting techniques, Manpower Inventory, Career Planning& Development, Succession Planning, Rightsizing, Restructuring. Human Resource Information System (HRIS) (6L)

3. Recruitment and Selection: Process, Sources, Methods of selection, Interviewing Methods, Skills and Errors. (4L)

4. Human Resource Development: Definition, objective, process of HRD, Assessment of HRD Needs, HRD Methods: Training and Non-Training, Training Process; Designing, Implementation and Evaluation of Training Programmes, Induction Training. Developing Managerial Skills for: team management, collaboration, interaction across business functions, presentation , Negotiation, and Networking (6L)

5. Performance Appraisal Systems : Purpose, Methods, Appraisal instruments, 360 degree Appraisal, HR Score Card, Errors in appraisal, Potential Appraisal, Appraisal Interview. (4L)

MODULE –II

6. Compensation Management : Concepts, Components; System of Wage Payment, job evaluation, wage/ salary fixation, incentives, bonus, ESOPs, Fringe Benefits, Retirement Benefits. Compensation Plans (4L)

7. Industrial Relations in India: Parties; Management and Trade Unions, Industrial Disputes: Trends, Collective Bargaining, Settlement Machineries, Role of Government, Labour Policy in India. (4L)

8. Workers' Participation in Management: Concept, Practices and Prospects in India, Quality Circles and other Small Group Activities. (2L)

9. Discipline Management: Misconduct, Disciplinary action, Domestic Enquiry, Grievance Handling (4L)

10. Strategic HRM: Meaning, Strategic HRM vs Traditional HRM, SHRM Process, barriers to SHRM. Nature of e-HRM, e-Recruitment & Selection, e-Performance Management, e-Learning (4L)

Suggested Readings:

1. Agarwala T. - Strategic Human Resource Management, OUP
2. Aswathappa, K. - Human Resource Management, Tata McGraw Hill
3. Jyothi P. & Venkatesh, D.N. - Human Resource Management, OUP
4. Ramaswamy, E.A. - Managing Human Resources, OUP
5. Saiyadain, M.S - Human Resource Management : Tata McGraw Hill
6. Mondal Sabari & Goswami Amal - Human Resource Management: Vrinda Publications

FINANCIAL & COST ACCOUNTING
Code: HSMC-CSBS701
Credit: 2

Course Outcome(s):

This course will help students

• To create an awareness about the importance and usefulness of the accounting concepts and their managerial implications

• To develop an understanding of the financial statements and the underlying principles and learn to interpret financial statements

• To create awareness about cost accounting, different types of costing and cost management

Topics to Be Covered:

UNIT – I Accounting Concept: Introduction, Techniques and Conventions, Financial Statements- Understanding & Interpreting Financial Statements

UNIT – II Accounting Process: • Book Keeping and Record Maintenance • Fundamental Principles and Double Entry • Journal, Ledger, Trial Balance, Balance Sheet, Final Accounts • Cash Book and Subsidiary Books • Rectification of Errors

UNIT – III Financial Statements: Form and Contents of Financial Statements, Analyzing and Interpreting Financial Statements, Accounting Standards. Class Discussion: Corporate Accounting Fraud- A Case Study of Satyam

UNIT – IV Cash Flow and Fund Flow Techniques: Introduction, How to prepare, Difference between them

Programming in Matlab
Code: PCC-CSBS791
Credit: 2

Introduction

Why Matlab?, History, Its strengths, Competitors, Starting MATLAB, Using MATLAB as a calculator, Quitting MATLAB

Basics

Familiar with MATLAB windows, Basic Operations, MATLAB-Data types, Rules about variable names, Predefined variables

Programming-I

Vector, Matrix, Array Addressing, Built-in functions, Mathematical Operations, Dealing with strings (Array of characters), Array of array (cell) concept

Programming-II

Script file, Input commands, Output commands, Structure of function file, Inline functions, Feval command, Comparison between script file and function file

Conditional statements and Loop

Relational and Logical Operators, If-else statements, Switch-case statements, For loop, While loop, Special commands (Break and continue), Import data from large database, Export data to own file or database

2D Plotting

In-built functions for plotting, Multiple plotting with special graphics, Curve fitting, Interpolation, Basic fitting interface

3D Plotting

Use of meshgrid function, Mesh plot, Surface plot, Plots with special graphics