

SEMESTER V

COURSE TITLE: INTERNET OF THINGS

COURSE CODE : 05ACAIO17551

CREDITS: 04

UNIT I - INTRODUCTION TO IOT

Defining IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT. Communication models & APIs. Machine to Machine, Difference between IoT and M2M, Software define Network. Wireless medium access issues, MAC protocol survey.

UNIT II - IOT DEPLOYMENT AND DEVELOPMENT CHANGES

Survey routing protocols, Sensor deployment & Node discovery., Data aggregation & dissemination Design challenges, Development challenges, Security challenges, Other challenges. Home automation, Industry applications, Surveillance application - Other IoT applications.

UNIT III - BACK-END APPLICATION DESIGNING

Apache for handling HTTP Requests, PHP & MySQL for data processing, MongoDB Object Type Database. HTML, CSS & jQuery for UI Designing, JSON lib for data processing, Security & Privacy during development. Application Development for mobile Platforms Overview of Android / IOS App Development tools. IoT applications in home, infrastructures, buildings, security, Industries, Home appliances, other IoT electronic equipment. Sensors and sensor Node and interfacing using any Embedded target boards.

UNIT IV - INTRODUCTION TO PYTHON

Introduction to Python, Introduction to different IoT tools. Developing applications through IoT tools, developing sensor based application through embedded system platform. Implementing IoT concepts with python. Declaring and using Numeric data types: int, float, complex Using string data type and string operations.

SEMESTER V

COURSE TITLE: PROGRAMMING IN PYTHON

COURSE CODE : 05ACAPY 17551

CREDITS: 04

UNIT I - INTRODUCTION TO PYTHON

Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion). Illustrative problems: find minimum in a list, insert a card in a list of sorted cards, guess an integer number in a range, Towers of Hanoi. Python interpreter and interactive mode; values and types: int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments. Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

UNIT II - CONTROL FLOW, FUNCTIONS

Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-else if-else). Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion. Strings: string slices, immutability, string functions and methods, string module; Lists as arrays. Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search.

UNIT III - LISTS, TUPLES, DICTIONARIES

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters. Tuples: tuple assignment, tuple as return value. Dictionaries: operations and methods; advanced list processing – list comprehension. Illustrative programs: selection sort, insertion sort, mergesort, histogram.

UNIT IV - FILES, MODULES, PACKAGES

Files and exception: text files, reading and writing files. Format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file. File handling exceptions, modules. Packages. Illustrative programs: word count, copy file.

SEMESTER V

COURSE TITLE: MOBILE COMPUTING USING ANDROID PROGRAMMING

COURSE CODE : 05ACAMC17551

CREDITS : 04

UNIT I - INTRODUCTION

Introduction to Mobile Computing : Introduction to Mobile Computing, Mobile Software Engineering, Characteristics of Mobile Applications. Generations: Generations of Mobile Communication Technologies- Multiplexing. Spread Spectrum: -MAC Protocols-SDMA- TDMA- FDMA- CDMA. Mobile Applications-Android: Android Intents and Services, Android Development Environment

UNIT II - OVERVIEW OF ANDROID PROGRAMMING

Overview: Flavours of Android operating systems, Challenges of developing for Android. Android Studio-Overview of the development process - Java, Android Studio , Project layout in Android Studio, Target and minimum SDKs. AVD: Android Virtual Device (AVD) Monitor, Viewing logs in logcat and AVD, Android manifest file , App Architecture. Layouts, Views and Resources: Defining layouts for activities, inflating the layout, Getting user input from a view, Programmatically changing UI elements, Layout Managers, Scrolling Views, Debugging apps, Testing app, Support libraries

UNIT III - USER INTERFACE

UI Controls and Menus: Getting user input , Changing keyboards , Buttons , Dialogs and pickers , Spinners, checkboxes, and radio buttons , Gestures , Speech recognition (not done), Sensors (not done)- Menus: Options menu, contextual menus (floating and action bar), and popup menu, Adding menu items. Handling on Clicks from menus. Screen Navigation and Themes Style:Terminology, Different ways a user can navigate through an app, Action bar, Settings menu, Navigation drawer, Directed workflow (funnels), Best practices for navigation - Themes and Styles: Best practices for themes and styles, Performance benefits for themes, drawables, nine-patches. Material Design and Adapt Layout: Material design best practices. Material Design guidelines, Implementing Material Design look and feel, with compatibility with previous versions, Support library for Material Design Transitions and Animations –Creation of Adapt layouts. Localization and Testing: LTR and RTL, Automated testing of UIs, User testing UI with real users, Using the Espresso and UI Automator frameworks for testing UIs

UNIT IV - WORKING WITH DATA AND APP PUBLISHING

Data Access-Saving/Store: Internal versus external storage, Privacy, sharing, security, encryption of your data , Shared Preferences: Store private primitive data in key-value pairs, Using Content Resolvers to access data. Data Load and Display: Using loaders to asynchronously load data into an activity or fragment, Benefits of Loaders. Polish and Publish Android App: Permissions, Libraries, Widgets, Publishing Android App, Making and publishing APKs, Beta test your app, Publish your app to Google Play.

SEMESTER V
COURSE TITLE: CYBER SECURITY AND ETHICAL HACKING

COURSE CODE : 05ACACE17552

CREDITS: 04

UNIT I - INTRODUCTION TO CYBERCRIME

Definition and Origins of the World – Cybercrime and Information Security. Classification of Cybercrimes – Legal Perspectives – Indian Perspective. Cybercrime and the Indian ITA 2000, A Global Perspective on Cybercrimes ,Cybercrime Era.

UNIT II - CYBER OFFENCES, TOOLS, METHODS AND MOBILITY

Cybercrime: Categories and Attacks. Mobility and Security Challenges. Organizational Security Policies. Cybercrime: Tools and Methods. Attackson Wireless Networks

UNIT III - CYBERCRIMES AND CYBER SECURITY

Need for Cyber Laws. Indian IT Act. Cyber Law and Technology. Cyber Forensics. Forensics Auditing.

UNIT IV - CYBERCRIME AND ETHICAL HACKING

Introduction to Ethical Hacking. Intellectual Property in the Cyberspace. Ethical Dimension of Cybercrimes.Sociology of Cybercriminals. Information Warfare, Real-Life Examples

SEMESTER V

COURSE TITLE: ENTERPRISE RESOURCE PLANNING

COURSE CODE : 05ACACC17552

CREDITS : 04

UNIT I - ERP OVERVIEW

Introduction, Business Function and Business Processes, Integrated Management Information. Business modeling ,Integrated Data Model, Common ERP Myths. The Future of ERP packages. Risks and Benefits Of ERP

UNIT II - ERP AND RELATED TECHNOLOGIES

Cybercrime: Categories and Attacks. Mobility and Security Challenges. Organizational Security Policies. Cybercrime: Tools and Methods. Attackson Wireless Networks

UNIT III - ERP MARKETPLACE AND FUNCTIONAL MODULES AND IMPLEMENTATION

The changing ERP market, Functional Modules of ERP software. Integration of ERP,SCM and CRM. Basics, Technological, Operational, Business Reasons for ERP implementation. ERP Implementation Life Cycle, Objectives, Phases

UNIT IV - ERP TRANSITION STRATEGIES & ERP PROJECT TEAMS

Transition Strategies, Big Bang Strategy . Organization of the Implementation team. Hybrid Transition strategy - Pro & Cons of In-house Implementation ,vendors, consultants, ERP Future Directions: New Markets, New Channels, Faster Implementation Methodologies, Application Platforms, New Business Segments, Web Enabling & Snapshot.

SEMESTER V

COURSE TITLE: ARTIFICIAL INTELLIGENCE

COURSE CODE : 05ACAAI17552

CREDITS: 04

UNIT I - INTRODUCTION TO AI

Definition, AI Applications, AI Representation. Properties of internal representation. Heuristic search techniques – Best first search, mean and end analysis. A* and AO* Algorithm, Game Playing, Minimize Search procedure. Alpha beta cutoffs – Waiting for Quiescence, Secondary Search

UNIT II - KNOWLEDGE REPRESENTATION USING PREDICATE LOGIC

Predicate calculus, Predicate and augments, ISA hierarchy, frame notation, resolution, Natural deduction. Knowledge representation using non monotonic logic – TMS, statistical and probabilistic reasoning. Fuzzy Logic- structure knowledge representation – Semantic net. Frames – Script, TMS Classifications - Conceptual dependency.

UNIT III - PLANNING OF AI

Block world, strips, Implementation using goal stack, Nonlinear planning with goal stacks, Hierarchical planning. List commitment strategy – Perception – Action, Robot Architecture – Vision, Texture and Images. Representing and recognizing scenes, waltz algorithm, constraint determination – Trihedral and non-trihedral figures labeling. Learning as induction matching algorithms – Failure driver learning, learning in general problem solving – Concept learning. Qualitative analysis only – neural net architecture and applications.

UNIT IV - NATURAL LANGUAGE PROCESSING AND UNDERSTANDING

Syntactic – semantic analysis – RTN, ATN, understanding sentences. Bayesian, maximum a posteriori, and minimum description length frameworks. Parameter estimation, sufficient statistics, decision trees, neural networks, support vector machines, Bayesian networks, bag of words classifiers, N-gram models; Markov and Hidden Markov models, probabilistic relational models, association rules, nearest neighbor classifiers, locally weighted regression, ensemble classifiers. Computational learning theory, mistake bound analysis, sample complexity analysis, VC dimension, Occam learning, accuracy and confidence boosting. Dimensionality reduction, feature selection and visualization. Clustering, mixture models, k-means clustering, hierarchical clustering, distributional clustering. Reinforcement learning; Learning from heterogeneous, distributed, data and knowledge. Selected applications in data mining, automated knowledge acquisition, pattern recognition, program synthesis, text

and language processing. Internet-based information systems, human-computer interaction, semantic web, and bioinformatics and computational biology

SEMESTER V

COURSE TITLE: EMBEDDED SYSTEMS

COURSE CODE : 05ACAES17553

CREDITS: 04

UNIT I

Embedded system introduction. Introduction to embedded system, embedded system architecture. classifications of embedded systems, challenges and design issues in embedded systems. Fundamentals of embedded processor and microcontrollers. CISC vs. RISC, fundamentals of Vonneuman/Harvard architecture. Types of microcontrollers, selection of microcontrollers.

UNIT II

Embedded Computing Introduction, Complex Systems and Microprocessor. The Embedded System Design Process, Formalisms for System Design, Design Examples. The 8051 Architecture Introduction, 8051 Micro controller Hardware. Input/Output Ports and Circuits, External Memory, Counter and Timers. Serial data Input/Output, Interrupts.

UNIT III

PIC Architecture, Introduction to PIC microcontrollers, PIC architecture. comparison of PIC with other CISC and RISC based systems and microprocessors. memory mapping, assembly language, programming, addressing modes. instruction set.

UNIT IV

Real – Time Operating Systems Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment, Basic Design Using a Real-Time Operating System Principles. Semaphores and Queues, Hard Real, Time Scheduling Considerations, Saving Memory and Power, An example RTOS like UC-OS

SEMESTER V

COURSE TITLE: DISTRIBUTED COMPUTING AND LINUX ADMINISTRATION

COURSE CODE : 05ACADC17553

CREDITS: 04

UNIT I

Administrative concepts: Multi user concepts, Multitasking concepts, Administrative interfaces, Directory structure. *Setup* Procedures: Installing the console terminal, installation, Powering up, the super user, Maintaining the super user login, setting data/time, setting the time zone, setting system names, using administrative logins, startup and shut down managing user logins. Display defaults user environment, changing default user environment, default profile files, adding user, user add options, user passwords, blocking user access, Hard delete of a user, adding a group, deleting a group, setting up terminal and picture. Maintenance tasks, communicating with users, checking the system, security, summary

UNIT II

Managing information storage. Storage media and UNIX file system, managing storage media. UNIX system directory structure, managing disk space, backup and restore, backup plan backup example, backup strategy. Managing system services. Service access family, process scheduling parameters display scheduler parameter summary

UNIT III

Process: The ps command, how to kill a process, parent and child processes. Process scheduling: the at command, the batch command, daemons, the cronfacility, the crontab, command. Process Priorities: The nice command, the sleep command, the wait command, ps command options. Signals and semaphores: the nohup command, Zombie process. Real- time Process: priority classes of processes, setting the priority of a process, executing a process with a priority class, time quanta for real-time processes, displaying the priority classes of processes, displaying the priority classes of processes, displaying the priority classes and limits.

UNIT IV

Introduction to distributed computing models; Clock synchronization; Message Ordering and Group Communication; Termination Detection Algorithms; Reasoning with Knowledge; Distributed Mutual Exclusion Algorithms and Distributed Shared Memory.

SEMESTER V
COURSE TITLE: CLOUD COMPUTING & VIRTUALIZATION

COURSE CODE : 05ACAER17553

CREDITS: 04

UNIT I:

Introduction- Objectives, From collaborative to the Cloud – A short history Client – Server Computing, Peer-to-Peer Computing, Distributed Computing, Collaborative Computing, Cloud Computing, Functioning of Cloud Computing, Cloud Architecture, Cloud Storage, Cloud Services, Industrial Applications. Business Values, Introduction-Objectives, Service Modeling, Infrastructure Services , Platform Services, Software Services - Software as service modes- Massively scaled software as a service- Scale of Economy, Management and Administration. Inside Cloud Computing- Introduction- Objectives, Feeling Sensational about Organization, Making Strategy Decisions- Governance Issues- Monitoring Business Processes- IT Cost Management

UNIT II:

Cloud Service Administration- Service Level Agreements and Monitoring- Support Services- Accounting Services, Resource Management- IT Security- Performance Management- Provisioning- Service Management, Untangling Software Dependencies. Cloud Computing Technology- Introduction-Objectives, Clients – Mobile – Thin – Thick, Security - Data Linkage - Offloading Work - Logging - Forensics - Development – Auditing. Network- Basic Public Internet- The Accelerated Internet- Optimised Internet Overlay- Site-to-Site VPN- Cloud Providers- Cloud Consumers - Pipe Size- Redundancy, Services- Identity- Integration- Mapping- Payments- Search.

UNIT III:

Accessing the Cloud- Introduction-Objectives, Platforms- Web Application Framework- Web Hosting Services- Proprietary Methods, Web Applications- API's in Cloud Computing, Browsers for Cloud Computing- Internet Explorer- Mozilla Firefox- Safari-Chrome. Data Management- Introduction- Objectives, Data Security- Data Location- Data Control- Securing data for transport, Scalability and Cloud Services- Large Scale Data Processing- Databases and Data Stores- Data Archival. Information Storage in Cloud Computing- Introduction- Objectives, Storage as a Service, Storage Providers- Amazon Simple Storage Service- Nirvanix- Google BigtableDatastore- MobileMe- Live Mesh, Storage Security, Merits and Demerits of Storage. Discovery of Private and Hybrid Clouds- Introduction- Objectives, Need for Privacy- Defining a private cloud- Public, Private, and Hybrid Clouds – A Comparison

UNIT IV:

Examining the Economics of the private cloud- Assessing capital expenditures- Vendor Private Cloud Offerings, The Up Key Vendors- Service Oriented- Systems Integrators- Technology Enablers. Cloud Computing Standards- Introduction- Objectives, Best Practices and Standards, Practical Issues- Interoperability- Portability- Integration- Security, Standards Organizations and Groups- Cloud Security Alliance- Distributed Management Task Force (DMTF)- National Institute of Standards and Technology (NIST)- Open Cloud Consortium (OCC)- Open Grid Forum (OGF)- Object Management Group (OMG)- Storage Networking Industry Association (SNIA)- Cloud Computing Interoperability Forum (CCIF)- Vertical Groups. Desktop and Device Management- Introduction- Objectives, Desktop Virtualization- Across Industries- Client Desktops, Desktop placement in the cloud- Merits- Desktop as a Service (DaaS), Desktop Management- Watching the four areas- Asset Management. Cloud Governance- Introduction- objectives, IT Governance, Deciding the Governor, Risk Assessment of running the cloud- Understanding possible risks- Performance monitoring and measurement- Measurement Methods, Working of Governance- Establishment of the Governance Body- IT Service Performance – Monitoring and Measuring- Cataloging control and Compliance Data, Migrating to cloud

SEMESTER V
COURSE TITLE: DATA MINING & BUSINESS INTELLIGENCE

COURSE CODE : 05ASECO17532

CREDITS: 04

UNIT I

Introduction to Data Mining -What is data mining? Related technologies - Machine Learning, DBMS, OLAP, Statistics, Data Mining Goals, Stages of the Data Mining Process, Data Mining Techniques, Knowledge, Representation Methods, Applications. Data Warehouse and OLAP, Data Warehouse and DBMS, Multidimensional data model, OLAP operations. Data preprocessing -Data cleaning, Data transformation, Data reduction, Discretization and generating concept hierarchies.

UNIT II

Data mining knowledge representation - Task relevant data, Background knowledge, Interestingness measures, Representing input data and output knowledge, Visualization techniques. Attribute-oriented analysis -Attribute generalization, Attribute relevance, Class comparison, Statistical measures. Data mining algorithms: Association rules Frequent Itemset Generation, Rule Generation, Compact Representation of Frequent Itemsets, Alternative methods for generating Frequent Item sets, FP Growth Algorithm, Evaluation of Association Patterns

UNIT III

Classification -1 :Basics, General approach to solve classification problem, Decision Trees. Rule Based Classifiers, Nearest Neighbor Classifiers. Classification 2 – Bayesian Classifiers, Estimating Predictive accuracy of classification methods. Improving accuracy of classification methods, Evaluation criteria for classification methods, Multiclass Problem.

UNIT IV

Clustering Techniques: Overview, Features of cluster analysis, Types of Data and Computing Distance. Types of Cluster Analysis Methods, Partitional Methods, Hierarchical Methods, Density Based Methods, Quality and Validity of Cluster Analysis, Data Mining Tools. Web Mining: Introduction, Web content mining, Text Mining, UnstructuredText, Text clustering, Mining Spatial and Temporal Databases