B. Tech.

(CSE)

Scheme and Syllabus

Department of Computer Science

AKS University

July 2021

B. Tech. (CSE)

SEMESTER 7

S.NO.	PAPER CODE	NAME OF PAPER	HOURS PER WEEK			TOTAL CREDIT
		THEORY	**LECTURE**	**TUTORIAL**	**PRACTICAL**	
1	12CA702	JAVA PROGRAMMING	4	1	0	5
2	12CA703	**ELECTIVE IV** CLOUD COMPUTING DISTRIBUTED OPERATING SYSTEM WIRELESS AND MOBILE COMMUNICATION Applied Cloud Computing (CC)- TCS iON	4	0	0	4
3	12CA704	ENTREPRENEURSHIP DEVELOPMENT	**3**	**1**	**0**	**4**
4		CURRENT TRENDS AND TECHNOLOGIES	**4**	**1**	**0**	**5**
		LABORATORY				
1	12CA751	JAVA PROGRAMMING – LAB	0	0	2	1
2		CURRENT TRENDS AND TECHNOLOGIES-LAB	0	0	2	1
3	12CA752	MAJOR PROJECT-I LAB	0	0	4	2
		TOTAL CONTACT HOURS/CREDIT	**15**	**3**	**8**	**22**

SUBJECT NAME: JAVA PROGRAMMING

Unit – 1

Overview of Java: History and Evolution of Java, Java Byte Code, JDK, JRE, and JVM (Java Virtual Machine) Difference between Java and C++, Java Program Structure, Implementing Java program, Java Tokens, Data types, Variables, Constants, Primitive and Non-primitive Data Type, Type conversion and Casting, Operators, Static Keyword.

Unit – 2

Control Statements: Selection statements, Iteration Statements, Jump statements.

Methods: Methods overview, Call by value, Call by reference, Recursion.

Arrays: One dimensional, two dimensional, multidimensional.

Object-Oriented Programming: Class, Objects, Constructors, Method Overloading, Method Overriding, Inheritance, Final, Super, this keyword, Abstract method and Classes, Visibility Control, String, String Clasess.

Unit – 3

Interfaces: Introduction, Defining Interfaces, Implementing Interfaces.

Packages: Java API Packages, Adding classes to package.

Exception Handling: Exception classes in Java, Type of errors, Compile time errors, run time errors, try and catch.

Unit – 4

Multithreading: Basic idea of multithreaded programming, the life cycle of a thread, Creating thread with the thread class and runnable interface, Thread synchronization, Thread scheduling.

IO package: Inputstreams, Outputstreams, Objectserialization, Deserialization.

Collection: Collection, Collection Classes

Unit – 5

GUI-Introduction to AWT programming, Layout and component managers, Event handling, Applet class, Applet life-cycle, passing parameters embedding in HTML

AWT- Overview of AWT, AWT Components, Menu and Dialogs, Layout Manager.

Advance Java: Introduction to Spring and Hibernate, JDBC.

Reference Book:

1. E. Balagurusamy, Fundamental of Java programming.
2. Herbert Scheldt, The Complete Reference for Java, TMH publication

CLOUD COMPUTING

Objectives: The objective and goal of this course is to provide students fundamental demonstration Cloud Computing which is one of the immersing trends in the field of Computer Science and Engineering.

Unit-1

Introduction to Cloud Computing: Definition, Characteristics, Components, Cloud provider, SAAS, PAAS, IAAS and Others, Organizational scenarios of clouds, Administering & Monitoring cloud services, benefits and limitations, Deploy application over cloud, Comparison among SAAS, PAAS, IAAS, Cloud computing platforms: Infrastructure as service: Amazon EC2,Platform as Service: Google App Engine, Microsoft Azure, Utility Computing, Elastic Computing.

Unit-2

Introduction to Cloud Technologies: Study of Hypervisors, Compare SOAP and REST, Web-services, AJAX and mashups-Web services: SOAP and REST, SOAP versus REST, AJAX: asynchronous 'rich' interfaces, Mashups: user interface services Virtualization Technology: Virtual machine technology, virtualization applications in enterprises, Pitfalls of virtualization, Multitenant software: Multi-entity support, Multi-schema approach, Multi-tenancy using cloud data stores, Data access control for enterprise applications.

Unit-3

Data in the Cloud: Relational databases Cloud file systems: GFS and HDFS, BigTable, HBase and Dynamo. Map-Reduce and extensions: Parallel computing, The map-Reduce model, Parallel efficiency of Map-Reduce, Relational operations using Map-Reduce, Enterprise batch processing using Map-Reduce, Introduction to cloud development, Example/Application of Map-reduce, Features and comparisons among GFS, HDFS etc, Map-Reduce Model.

Unit-4

Administrating the Clouds: Cloud Management Products, Emerging Cloud Management Standards, Securing the Cloud, Securing Data, Establishing Identity and Presence.

Unit-5

Issues in Cloud Computing: Implementing real time application over cloud platform, Issues in Intercloud environments, Quality of Service (QOS) Issues in Cloud, Dependability, data migration, streaming in Cloud, QoS monitoring in a Cloud computing environment, Cloud Middleware. Mobile Cloud Computing. Inter Cloud issues. A grid of clouds, Sky computing, Load Balancing, Resource Optimization, Resource Dynamic Reconfiguration, Monitoring in Cloud.

Text Books:

1. Rajkumar Buyya, Christian Vecchiola, and S. Thamarai Selvi, “Mastering Cloud Computing”, McGraw Hill Education Pvt Ltd.

Reference Books:

2. Gautam Shroff, “Enterprise Cloud Computing”, Cambridge University Press.

DISTRIBUTED OPERATING SYSTEM (ELECTIVE -1)

Objective: This course is taught to students to aware about the computing in distributed system and how it operates.

Unit-1
Introduction: Distributed Computing System Models, Advantages of Distributed Systems, Distributed Operating Systems, Issues in Designing Distributed Operating Systems.
Message Passing: Introduction, Features of Message Passing, Issues in IPC by Message Passing, Synchronization, Failure Handling, Group Communication.

Unit-2
Remote Procedure Calls: The RPC Model, Transparency of RPC, Implementation of RPC Mechanism, STUB Generation, RPC Messages, Communication Protocol.
Distributed Shared Memory: Distributed Shared Memory Systems (DSM), DSM – Design and Implementation Issues, Granularity – Block Size, Structure of Shared Memory Space in a DSM System, Memory Coherence (Consistency) Models.

Unit-3
Synchronization: Clock Synchronization, Clock Synchronization Algorithms, Distributed Algorithms, Event Ordering, Mutual Exclusion, Deadlock, Election Algorithms.
Resource Management: Introduction and Features of a Good Global Scheduling Algorithm, Task Assignment Approach, Load – Balancing Approach, Load – Sharing Approach.

Unit-4
Process Management: Introduction, Process Migration, Threads.
Distributed File Systems: Key Challenges, File Services, File Access Semantics, Stateful Versus Stateless Servers, Replication, Caching.
Distributed Deadlock Detection- Introduction, Issues, Deadlock Handling Strategies.

Unit-5
Naming: Desirable Features of a Good Naming System, System Oriented Names, Object – Locating Mechanisms, Human – Oriented Names, Name Caches, Naming and Security.
Security in DS: Design Principles, Authentication, Access Control, Digital Signatures.
Case Study for Students - Java RMI, Sun Network File System, Ceph, Google Case Study.

Reference Books:

1. Distributed Operating System by William Stalling.
2. Distributed Operating Systems Concepts and Design, Pradeep K. Sinha, PHI.
3. Distributed Systems: Concepts and Design by George Coulouris, Jean Dollimore, Tim Kindberg, Pearson 3. Distributed Operating Systems by Andrew S Tanenbaum, Pearson.
4. Distributed Computing by Sunita Mahajan & Seema Shah OXFORD.
5. Distributed Systems: Principles and Paradigms by Andrew S Tanenbaum, Maarten Van Steen, PHI.

WIRELESS AND MOBILE COMMUNICATION

UNIT-1

WIRELESS NETWORK OVERVIEW: Wireless Network, Wireless Network Architecture, Wireless Switching Technology, Wireless Communication Problem, Wireless Network Reference Model, Wireless Networking Issues & Standards, WLANs (Wireless LANs), IEEE 802.11 standard.

UNIT-2

MOBILE COMPUTING: Mobile Computing Architecture, Mobile Computing Applications, Mobile Devices, Mobile System Networks, Mobility Management, Cellular Overview: Cellular networks, Cellular concept, Location Management, Handoffs, Foliage loss.

UNIT-3

GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS (GSM): Mobile Services, System Architecture, Mobility management, Network signaling. GPRS: GPRS System, Architecture, UMTS: UMTS System Architecture.

Wireless Application Protocol (WAP): The Mobile Internet standard, WAP Gateway and Protocols, Wireless Mark-up Languages (WML), Wireless Local Loop (WLL): Introduction to WLL Architecture, Wireless Local Loop Technologies.

UNIT-4

MOBILE NETWORK LAYER: Mobile IP: Goals, Assumptions, Entities and Terminology, IP Packet Delivery, Agent Discovery, Registration, Tunneling and Encapsulation, Optimizations, Dynamic Host Configuration Protocol (DHCP).

UNIT-5

MOBILE TRANSPORT LAYER: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast Retransmit /Fast Recovery, Transmission/Time-out Freezing, Selective Retransmission, Transaction oriented TCP, TCP over 2.5G/3G Wireless Networks, Mobile ad-hoc networks (MANET), introduction to 4G.

Introduction to Mobile Operating Systems: Palm OS, Windows CE, Embedded Linux, J2ME, Android, Blackberry operating system, Symbian.

TEXT BOOKS:

1. Jochen Schiller, “Mobile Communications”, Pearson Education, Second Edition, 2008.
2. P.K. Patra and S.K. Dash, “Mobile Computing”, Scitech Publications, Second Edition 2011.
3. Rajib Mall, P. K. Pattanaik, “Fundamentals of Mobile Computing”, PHI, First Edition, 2012.

REFERENCE BOOKS:

1. Raj Kamal, “Mobile Computing”, Oxford University Press.
2. Mobile Computing: Ashok K. Talukdar, Roopa R. Yavagal, Tata McGraw Hill.

ENTREPRENEURSHIP DEVELOPMENT

UNIT 1

Introduction Entrepreneurship, and Theories of Entrepreneurship: Theory of Achievement Motivation, Theory of Entrepreneur as a risk taker, Theory of Creative destruction; Entrepreneurship Categories: by chance, need, choice, force; Myths, challenges and process of Entrepreneurship, Definition of Startups and types of Internet based startups.

UNIT 2

Difference between Scientist, Entrepreneur, and Manager; Characteristics of Entrepreneur; Entrepreneurial Mindset and its enablers, difference between idea and opportunity, Link between creativity and innovation, character of creative climate with cases of world most creative companies, types of innovation, link between technology and innovation.

UNIT 3

Opportunity Analysis: Opportunity sighting: Market Driven, People Driven; Opportunity Evaluation Process, Approaches to ideation, Ideation techniques, Idea to Opportunity Mapping. Business Model – Functions and Factors of Business Model

UNIT 4

Introduction to Pitching, types of pitch, Aspects of funds, types of capital, concept of break-even, sources of funds, types and nature of investors, understanding of the three financial statements: profit and loss account, balance sheet, cash flow statement, Introduction to Business Plan its types and different sections.

UNIT 5

Collaboration: Why Collaborate, types and approaches of collaboration; Networking: Why Network: places of networking, stages of networking, good networking practices; Distinction between data, information, intelligence and knowledge, Components of Knowledge; Intellectual Property: Its life cycle, its types and IP Rights

Text Book:

Entrepreneurship Theory and Practice by Raj Shankar, ISBN: 978-81-8209-269-3

CURRENT TRENDS AND TECHNOLOGIES

Unit-I

IoT: Defining IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models & APIs. Challenges in IoT, Domain specific applications of IoT, Overview of Arduino platform, Raspberry Pi (RPi).

Case Study: Open source IoT platform, Amazon IoT cloud

Unit-II

Android: History and Evolution, Introduction to Smartphone Features, Installing the SDK, Creating Android Emulator, Installing Eclipse. Installing Android development tools. Android Life cycle. Android applications structure, Android controls, Option Menu. Database (SQLite database). Creation of .apk file.

Unit-III

AngularJS: Introduction to AngularJS, AngularJS MVC Architecture, First app in AngularJS, Data Binding Expressions: Numbers, Strings, Objects and Arrays, AngularJS Scopes, AngularJS Events, AngularJS Controls, AngularJS Form Validation. TypeScript, Architect development of Angular Framework, Single page Application, MySQL CRUD Operation, Integration.

Unit-IV

Python: Introduction, Data types and Operators, Python Statements and Conditionals, Functions, Strings, Object oriented programming with Python, Errors and Exception Handling, File handing, Regular expression, Modules and Package. MySQL Database Access in Python.

Unit-V

Search Engine Optimization: Search Engines and Basics, Popular Search Engines, Crawlers/Spiders/robots, Visibility on Search Engines.

Keyword research and analysis: Keyword, Keyword Density, Various types of Keywords, Keyword Proximity

Case study: Google Analytics

Books:

1. Search Engine Optimization Bible, Second Edition**,** by Jerri L. Ledford, Publisher: John Wiley & Sons
2. Search Engine Optimization (SEO) Secrets, Book by Danny Dover and Erik Dafforn
6. Pro AngularJS -By Adam Freeman
7. AngularJS Web Application Development Cookbook - By Matt Frisbie
8. AngularJS Programming by Example - By Agus Kurniawan
9. Angular JS: Up and Running - O'Riley Media