



## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

### Course Structure for Information Technology B. Tech Course (2013-14)

#### IV - I Semester

S.No	Course code	Subject	Theory	T	P	Credits
1.	13A05605	Software Testing Methodologies	3	1	-	3
2.	13A05709	Advanced Computer Architecture	3	1	-	3
3.	13A05703	Mobile Application Development	3	1	-	3
4.	13A52702	Management Science	3	1	-	3
5.	13A05704 13A12701 13A12702	<b>Choice Based Credit Courses-2</b> ( Department specific) 1. Human Computer Interaction 2. Internet of Things 3. Scripting Languages	3	1	-	3
6.	13A05708 13A05701 13A12703	<b>Choice Based Credit Courses-3</b> (Department specific) 1. Information Retrieval Systems 2. Software Architecture & Design Patterns 3. Middle Ware Technologies (MWT)	3	1	-	3
7.	13A12704	Software Testing Laboratory	-		4	2
8.	13A05711	Mobile Application Development Laboratory	-		4	2
<b>Total</b>			<b>18</b>	<b>06</b>	<b>08</b>	<b>22</b>

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech. IV - I sem (I.T)

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## (13A05605) SOFTWARE TESTING METHODOLOGIES

### *Course Objective:*

- Basic software debugging methods.
- Various testing methodologies.
- The procedure for designing test cases.
- The significance of software testing

### **Learning Outcome:**

- Understand the basic testing procedures.
- Generating test cases and test suites.
- Test the applications manually and by automation using different testing methods.

### **UNIT I**

**Introduction:** Purpose of Testing, Dichotomies, Model for Testing, Consequences of Bugs, Taxonomy of Bugs.

**Flow graphs and Path testing:** Basics Concepts of Path Testing, Predicates, Path Predicates and Achievable Paths, Path Sensitizing, Path Instrumentation, Application of Path Testing.

### **UNIT II**

**Transaction Flow Testing:** Transaction Flows, Transaction Flow Testing Techniques.

**Dataflow testing:** Basics of Dataflow Testing, Strategies in Dataflow Testing, Application of Dataflow Testing.

### **UNIT III**

**Domain Testing:** Domains and Paths, Nice & Ugly Domains, Domain testing, Domains and Interfaces Testing, Domain and Interface Testing, Domains and Testability.

### **UNIT IV**

**Paths, Path products and Regular expressions:** Path Products & Path Expression, Reduction Procedure, Applications, Regular Expressions & Flow Anomaly Detection.

**Logic Based Testing:** Overview, Decision Tables, Path Expressions, KV Charts, and Specifications.

### **UNIT V:**

**State, State Graphs and Transition Testing:** State Graphs, Good & Bad State Graphs, State Testing, Testability Tips.

**Graph Matrices and Application:** Motivational Overview, Matrix of Graph, Relations, Power of a Matrix, Node Reduction Algorithm, Building Tools. (Student should be given an exposure to a tool like JMeter or Win-runner).

### **Text Books :**

1. Software testing techniques – Boris Beizer, Dreamtech, second edition.
2. Software Testing- Yogesh Singh, Cambridge

**Reference Books :**

1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing, 3rd edition, P.C. Jorgensen, Aurbach Publications (Dist.by SPD).
3. Software Testing, N.Chauhan, Oxford University Press.
4. Introduction to Software Testing, P.Ammann&J.Offutt, Cambridge Univ.Press.
5. Effective methods of Software Testing, Perry, John Wiley, 2nd Edition, 1999.
6. Software Testing Concepts and Tools, P.Nageswara Rao, dreamtech Press.

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## (13A05709) ADVANCED COMPUTER ARCHITECTURE

### Course Objective:

- Discuss the concept of parallel processing and the relationship between parallelism and performance
- Understand the organization of computer structures that can be electronically configured and reconfigured
- Discuss the performance advantages that multithreading can offer along with the factors that make it difficult to derive maximum benefits from this approach

### Learning Outcome:

- Realize Parallelism and Parallel architectures
- Ability to use Instruction Level Parallelism
- Ability to use Thread level parallelism

### UNIT I

Evolution of Computer Architecture, System Attributes to performance; Shared Memory Multiprocessors, Distributed Memory Multiprocessors, A Taxonomy of MIMD Computers; architecture of Vector Super computers, operational model of SIMD computer, PRAM models and PRAM variants.

Conditions of Parallelism- data and resource dependencies, hardware and software parallelism, Program partitioning and Scheduling- grain sizes and latency, grain packing and scheduling, static multi processor scheduling, Program flow mechanisms- control flow vs data flow, demand driven mechanisms, comparison of flow mechanisms, System interconnect architectures- network properties and routing, static and dynamic connection networks

### UNIT II

Principles of scalable performances- performance metrics and measures- parallelism profile in programs, mean performance, efficiency, utilization and quality, benchmarks and performance measures, characteristics of parallel processing applications, Speed up performance laws- Amdahl's law, Gustafson's law, memory bounded speed up model, Scalability metrics and goals,

Bus systems- back plane bus specification, Addressing and Timing protocols, Arbitration, transaction and interrupt, IEEE future bus standard requirement set, Shared memory organizations- Interleaved memory organization, band width and fault tolerance, memory allocation schemes, Atomicity and event ordering

### UNIT III

Linear Pipeline Processors- asynchronous and synchronous models, clocking and timing control, speedup, efficiency, and throughput, Non linear pipeline processors- reservation and latency analysis, collision free scheduling, pipeline schedule optimization, Instruction pipe line design- instruction execution phases, mechanisms for instruction pipelining, dynamic instruction scheduling, branch handling techniques, static arithmetic pipelines.

Hierarchical bus system, cross bar switch and multiport memory, multistage and combining networks, multistage and combining networks, The cache coherence problem, message passing mechanism- message routing schemes, deadlock virtual channels, flow control strategies, multicast routing algorithms

### UNIT IV

Vector processing principles- vector instruction types, vector access memory schemes, early super computers, Multi vector multiprocessors- performance directed design rules, architecture of Cray and MPP, Compound vector operations, vector loops and chaining, SIMD computer organizations

## **UNIT V**

Latency-hiding techniques- shared virtual memory, prefetching techniques, distributed coherent caches, scalable coherence interface, relaxed memory consistency, principles of multithreading and context switching policies,

MPD architecture, The Tera multiprocessor system, Data flow computer architecture

### ***Text Books :***

1. *Kai Hwang & Naresh Jotwani, "Advanced Computer Architecture- Parallelism, Scalability, Programmability" Second Edition, Mc Graw Hill Publishing*

### ***Reference Books :***

1. *Hennesy Patterson, "Computer Architecture- A Quantitative Approach" Fifth Edition, Elsevier*
2. *Kai Hwang, "Advanced Computer Architecture- Parallelism, Scalability, Programmability", TMH.*
3. *Computer Architecture, Concepts and Evolutions, Garrit A Blaauw, PEA*

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## (13A05703) MOBILE APPLICATION DEVELOPMENT

### **Course Objective:**

- To introduce the Android technology and its application.
- Design & program real working education based mobile application projects.
- Become familiar with common mobile application technologies and platforms; open files, save files, create and program original material, integrate separate files into a mobile application project, create and edit audio sound effects & music.

### **Learning Outcome:**

At the end of the course students will be assessed to determine whether they are able to

- Describe the limitations and challenges of working in a mobile and wireless environment as well as the commercial and research opportunities presented by these technologies
- Describe and apply the different types of application models/architectures used to develop mobile software applications
- Describe the components and structure of a mobile development frameworks (Android SDK and Eclipse Android Development Tools (ADT)) and learn how and when to apply the different components to develop a working system
- Describe and apply software patterns for the development of the application models described above
- Describe and work within the capabilities and limitations of a range of mobile computing devices
- Design, implement and deploy mobile applications using an appropriate software development environment

### **UNIT I**

**J2ME Overview:** Java 2 Micro Edition and the World of Java, Inside J2ME, J2ME and Wireless Devices. Small computing Technology: Wireless Technology, Radio Data Networks, Microwave Technology, Mobile Radio Networks, Messaging, Personal Digital Assistants.

**J2ME Architecture and Development Environment:** J2ME Architecture, Small Computing Device Requirements, Run – Time Environment, MIDlet programming, Java Language for J2ME, J2ME Software Development Kits, Hello World J2ME Style, Multiple MIDlets in a MIDlet Suite, J2ME wireless Toolkit.

### **UNIT II**

**J2ME Best Practices and Patterns:** The Reality of Working in a J2ME World, Best Practices, **Commands, Items, and Event Processing:** J2ME User Interfaces, Display Class, The Palm OS Emulator, Command Class, Item Class, Exception Handling.

**High – Level Display:** Screens, Screen Class, Alert Class, Form Class, Item Class, List Class, Text Box Class, Ticker Class.

### **UNIT III**

**Low Level Display:** The Canvas, User Interactions, Graphics, Clipping Regions, Animation. **Record Management System:** Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records, Searching Records, Record Listener.

### **UNIT IV**

**JDBC Objects:** The Concept of JDBC, JDBC Driver Types, JDBC Packages. Overview of the JDBC process, Database Connection, Statement Objects, Result Set, Transaction Processing, Metadata, Data Types, Exceptions.

**JDBC and Embedded SQL:** Model programs, Tables, Indexing, Inserting Data into Tables, Selecting Data from a Table, Updating Tables, Deleting Data from a table.

**Introduction Android Programming:** What is Android, Activities, Linking Activities Using Intents, Fragments, Calling Built – in Applications using Intents, Displaying Notifications

## **UNIT V**

**Android User Interface:** Understanding the Components of a Screen, Adapting to Display Orientation, Managing Changes to Screen Orientation, Utilizing the Action Bar, Listening for UI Notifications.

**Designing User Interface with Views:** Basic Views, Picker Views, Using List Views to Display Long Lists.

### ***Text Books :***

1. *J2ME: The Complete Reference*, James Keogh, TMH.
2. *Beginning Android 4 Application Development*, Wei-Meng Lee, Wiley India

### ***Reference Books :***

1. *Enterprise J2ME: Developing Mobile Java Applications*, Michael Juntao Yuan, Pearson Education, 2004.
2. *Android Application Development for Java programming* by James C. Sheusi, Cengage Learning
3. *Android A Programmers Guide* by Jerome DiMargio, TMH.

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**B.Tech. IV - I sem (I.T)**

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## **(13A52702) MANAGEMENT SCIENCE**

### **Course Objective:**

*The objectives of this course are to equip the student the fundamental knowledge of Management Science and its application to effective management of human resources, materials and operations of an organization. It also aims to expose the students about the latest and contemporary developments in the field of management.*

### **Learning outcome:**

*This course enables the student to know the principles and applications of management knowledge and exposure to the latest developments in the field. This helps to take effective and efficient managerial decisions on physical and human resources of an organization. Besides, the knowledge of Management Science facilitates for his/her personal and professional development.*

## **UNIT I**

### **INTRODUCTION TO MANAGEMENT**

Definition of Management- Function of Management- Management as a Science and Art-Management as a Profession- Universality of Management- Henri Faylo's Administrative Theory –Elton Mayo's Human Relations Movement- Systems theory – Contingency theory- Monetary and non-monetary incentives to motivate work teams- Leadership –Definition- Qualities of successful leaders- Different leadership styles.

## **UNIT II**

### **ORGANIZATION DESIGN AND STRUCTURE**

Organization design and structure- Principles—Types of organization structure-Mechanic and Organic Structures- Line organization- Line & Staff organization- Functional Organization – Matrix organization structures- merits and demerits- Departmentation and Decentralization-Power and Authority- Delegation of authority-Principles for effective delegation of authority.

## **UNIT III**

### **HUMAN RESOURCE AND MATERIALS MANAGEMENT**

Concept of HRM-functions – Human Resource Planning-Job Analysis-Recruitment and Selection- Training and Development- Performance appraisal –methods- Wage and Salary Administration- Grievances handling Procedure-Material Management- Need for Inventory control- Economic order quantity- ABC analysis- Management of purchase, stores and stores records.-Marketing Management – Concept- Channels of distribution- Marketing mix and product mix.

## **UNIT IV**

### **MANAGEMENT OF OPERATIONS & PROJECT MANAGEMENT**

Nature of organizational control- Marketing control- HR control- effective control systems- Operations Management- Essentials of operations management- Trends in operational management- Designing operation system for effective management of an organization-Project Management –Network Analysis- PERT and CPM-Project crashing (Simple problems)

## **UNIT V**

### **CONTEMPORARY MANAGEMENT ISSUES**

Strategic Management-Concept- Mission-Vision-Core values-Setting objectives-Corporate planning – Environmental scanning-SWOT analysis- Steps in strategy formulation & implementation- Management



Information System (MIS)- Enterprise Resource Planning (ERP)-Just-in-Time (JIT)- Total Quality Management (TQM) – Supply Chain Management-Six Sigma-Business Process Outsourcing (BPO).

**Text Books:**

1. *Stoner, Freeman, Gilbert, Management, Pearson, Six Edition 2008*
2. *Aryasri: Management Science, Fourth Edition TMH, 2012.*

**Reference Books:**

1. *Vijay Kumar & Apparo, Introduction to Management Science, Cengage, 2011.*
2. *Kotler Philip & Keller Kevin Lane: Marketing Management, 14<sup>th</sup> Edition, Pearson, 2012.*
3. *Aswathappa, Human Resource Management, Himalaya, 2012.*
4. *Kanishka Bedi, Production and Operations Management, Oxford University Press, 2011.*
5. *Schermerhorn, Capling, Poole & Wiesner: Management, Wiley, 2012.*
6. *Joseph M Putti, Management Principles, Mc Millan Publishers, 2012.*

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## (13A05704) HUMAN COMPUTER INTERACTION (CBCC-II)

### *Course Objective:*

- *Gain an overview of Human-Computer Interaction (HCI), with an understanding of user interface design.*
- *Become familiar with the vocabulary associated with sensory and cognitive systems as relevant to task performance by humans*
- *Be able to apply models from cognitive psychology to predicting user performance in various human-computer interaction tasks and recognize the limits of human performance as they apply to computer operation*
- *Be familiar with a variety of both conventional and non-traditional user interface paradigms*

### *Learning Outcome:*

*At the end of the course students will be assessed to determine whether they are able to*

- *Find innovative ways of interacting with computers*
- *Help the disabled by designing non-traditional ways of interacting*
- *Use cognitive psychology in the design of devices for interaction*

### UNIT I

**Introduction: Importance of user Interface:** Definition, Importance of Good Design, Benefits of Good Design, A Brief History of Screen Design.

**The Graphical User Interface :** Popularity of Graphics, the Concept of Direct Manipulation, Graphical System, Characteristics,

**Web User –** Interface Popularity, Characteristics- Principles of User Interface.

### UNIT II

**Design process –** Understanding how people interact with computers, importance of human characteristics human consideration, Human interaction speeds, and understanding business functions.

**Screen Designing:** Design goals – Screen meaning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design

### UNIT III

**System menus:** Structures of Menus, Functions of Menus, Content of Menus, Kinds of Graphical menus

**Windows:** Window characteristics, Components of a window, Window presentation styles, Types of windows, Window management

### UNIT IV

**Controls:** Characteristics of device based controls, Selecting the proper device based controls, Operable controls, Text Entry/Read-only controls, Selection controls, Combination Entry/selection controls, Selecting the proper controls

### UNIT V

**Graphics:** Icons, Multimedia, Colour-what is it, Colour uses, Colour and Human vision, Choosing colours

**Testing:** The purpose and importance of usability testing, Scope of testing, Prototypes, Kinds of Tests, Developing and conducting the test

**Text Books :**

1. *The essential guide to user interface design, Wilbert O Galitz, 2<sup>nd</sup> edition, 2013, Wiley.*

**Reference Books :**

1. *Designing the user interface, 3rd Edition Ben Shneidermann, Pearson Education Asia.*
2. *Human –Computer Interaction, D.R.Olsen, Cengage Learning.*
3. *Human – Computer Interaction, I.Scott Mackenzie, Elsevier Publishers.*
4. *Interaction Design, Prece, Rogers, Sharps, Wiley Dreamtech.*
5. *User Interface Design, Soren Lauesen, Pearson Education.*
6. *Human –Computer Interaction, Smith - Atakan, Cengage Learning*

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**B.Tech. IV - I sem (I.T)**

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**(13A12701) INTERNET OF THINGS**

**(CBCC-II)**

**Course objectives:**

- Students will be explored to the interconnection and integration of the physical world and the cyber space. They are also able to design & develop IOT Devices.

**Course Outcomes:**

- Able to understand the application areas of IOT
- Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks
- Able to understand building blocks of Internet of Things and characteristics.

**UNIT I: Introduction to Internet of Things**

Introduction, Physical Design of IoT, Logical Design of IoT, IoT Enabling Technologies.

**Domain Specific IoTs**

Introduction, Home Automation, cities, Environment, Retail, Agriculture, Industry, Health & Lifestyle.

**UNIT II:**

**IoT and M2M**

Introduction, M2M, Difference between IoT and M2M, SDN and NFV for IoT.

**IoT System Management with NETCONF-YANG**

Need for IoT Systems Management, Simple Network Management Protocol (SNMP), Network Operator requirements, NETCONF, YANG, IoT System Management with NETCONF-YANG.

**UNIT III: Developing Internet of Things**

Introduction, IoT Design Methodology, Case Study on IoT System for Weather Monitoring.

**Case Studies Illustrating IoT Design:**

Introduction, Home Automation, Cities, Environment, Agriculture, Productivity Applications.

**UNIT IV**

**Advanced Topics:**

Introduction, Apache Hadoop, Using Hadoop Map Reduce for Batch Data Analysis.

**IEEE 802.15.4:**

The IEEE 802 committee family of protocols, The physical layer, The Media Access control layer, Uses of 802.15.4, The Future of 802.15.4: 802.15.4e and 802.15.4g.

**UNIT V:****ZigBee:**

Development of the standard, ZigBee Architecture, Association, The ZigBee network layer, The ZigBee APS Layer, The ZigBee Devices Object (ZDO) and the ZigBee Device Profile (ZDP), Zigbee Security, The ZigBee Cluster Library (ZCL), ZigBee Applications profiles, The ZigBee Gateway Specifications for network devices.

**TEXT BOOKS:**

1. Internet of Things a Hands-on Approach by Arshdeep Bahga and Vijay Madisetti. University Press
2. The Internet of Things key applications and protocols by Oliver Hersent, David Boswarthick and Omar elloumi, Wiley Student Edition.

**REFERENCE BOOKS:**

1. Internet of Things: Architecture, Design Principles and Applications by Raj Kamal MCGraw Hill Edition.

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## (13A12702) SCRIPTING LANGUAGES

(CBCC-II)

### Course Objectives:

The primary objective of the course is to learn web programming by designing and developing a web based project and also learn basic User Interface Principles.

### Learning Objectives:

- Learn to validate the above mock up pages by a client side script (Javascript).
- Learn to create, insert, retrieve, update data in Database using JDBC.
- Learn to work with web servers like Tomcat.
- Learn the game execution by using JSP's, AJAX.
- Learn heuristic based UI principles
- Learn the basics of PHP programming language.

### OUTCOMES:

At the end of the course, the student should be able to:

- Ability to solve real time problems using PHP
- Ability to create dynamic web pages using the PHP scripting language and a MySQL database.

### Unit-1

**Essential PHP:** Enter PHP, Getting PHP, Creating your Development Environment, Creating and running first PHP page, Mixing HTML and PHP, Printing some Text, Using PHP “here” documents, command-line PHP, comments, variables, storing data, Interpolating Strings, creating variables and constants and data types.

**Operators and flow controls:** PHP's Math Operators, working with the assignment operator, Increment and decrement values, String operators, Bitwise, Execution operator, Operator precedence, If statement, comparison operator, logical operators, else, elif, ternary, switch, for, while, do-while loops, foreach, terminating, skipping iterations.

**Strings and Arrays:** String Functions, Converting to and from Strings, Formatting Text Strings, Arrays, Array PHP Functions, Sorting Arrays, handling Multi dimensional arrays, splitting and merging arrays.

### Unit-2

**Creating Functions:** Creating in Functions in PHP, Passing Functions some data, Passing Arrays to functions, Passing by reference, default arguments, returning data from functions, returning arrays and lists, variable scope in php, accessing global data, static variables, conditional functions, nesting functions, creating include files, returning errors from functions.

**Reading data in web Pages:** Setting up web pages to communicate with PHP, Handling of Text fields, Text areas, Check boxes, Radio buttons, List boxes, Password controls, Hidden controls, Image Maps, File Uploads, buttons.

**PHP browser Handling Power:** Using PHP's Server Variables, HTTP Headers, User's browser type, Redirecting browsers with HTTP Headers, Dumping a form's data all at once, Handling form data with custom arrays, putting all it into the page, performing data validation, checking entered data, requiring numbers and text, Persisting user data, client side data validation, handling html tags in user input.

### Unit-3

**Object Oriented Programming:** Creation of class and Objects, setting access to Properties and methods, Using constructors to Initialize Objects, using Destructors to clean up after objects, Inheritance, Method Overriding, overloading, autoloading classes .

**Advanced Object Oriented Programming:** Creating Static Methods, static members and Inheritance, abstract classes, interfaces, Supporting Object Iteration, Comparing Objects, creating class constants, final key word, cloning objects.

**Working with Database:** what is database?, Essential sql, creating MySql database, creating table, Accessing the database in php, Updating, Inserting, deleting, sorting data.

**Sessions, Cookies, and FTP:** Setting cookie and reading cookie, setting cookie expiration, deleting cookies, Working with FTP, Downloading and Uploading and deleting files with FTP, creating and removing directories with FTP, Sending E-mail, sending advanced email, adding attachments to the email, sorting data.

### Unit-4

**Introduction to PYTHON:** Getting Started with Python Programming, Detecting and correcting Syntax errors.

**Software Development, data types, and Expressions:** Software Development Process, case study: Income tax calculator, Strings, Assignments, and comments, Numeric data types and character sets, Expressions, Using functions and modules, Control statements.

**Design with Functions:** Functions as abstraction Mechanism, Problem solving with top-down design, recursive function, File system, Managing a program's namespace, Higher Order Functions.

### Unit-5

**String and Text Files:** Accessing characters and substrings in strings, data encryption, strings and number Systems, String Methods, Text Files, Case Study : Text Analysis.

**List and Dictionaries:** List, Defining simple Functions, case study: generating sentences, dictionaries, case study: nondirective psychology.

**Design with classes:** Getting inside objects and classes, case study: Playing the game of craps, data modelling examples, Structuring classes with Inheritance and Polymorphism.

### Text Books:

1. The Complete Reference PHP by Steven Holzner, M H HILL Education, Indian Edition, 2008.
2. Fundamentals of PYTHON By Kenneth A. and Lambert and B.L Juneja, Cengage Learning, 2012.

### Reference Books:

1. Core Python application and programming by Wesley J.Chun, Pearson, 3<sup>rd</sup> edition .

2.Introduction to computing and programming in python by Mark. J. Guzdial and Barbara Ericson, Pearson, 4<sup>th</sup> edition.



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**B.Tech. IV - I sem (I.T)**

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**(13A05708) INFORMATION RETRIEVAL SYSTEMS  
(CBCC-III)**

**Course Objective:**

- *To learn the different models for information storage and retrieval*
- *To learn about the various retrieval utilities*
- *To understand indexing and querying in information retrieval systems*
- *To expose the students to the notions of structured and semi structured data*
- *To learn about web search*

**Learning Outcome:**

*At the end of the course students will be assessed to determine whether they are able to*

- *store and retrieve textual documents using appropriate models*
- *use the various retrieval utilities for improving search*
- *do indexing and compressing documents to improve space and time efficiency*
- *formulate SQL like queries for unstructured data*

**UNIT I**

**Introduction to Information Retrieval**

**Retrieval Strategies:** Vector space model, Probabilistic retrieval strategies: Simple term weights, Non binary independence model, Language Models

**UNIT II**

**Retrieval Utilities:** Relevance feedback, Clustering, N-grams, Regression analysis, Thesauri.

**UNIT III**

**Retrieval Utilities:** Semantic networks, Parsing.

**Cross-Language Information Retrieval:** Introduction, Crossing the language barrier.

**UNIT IV**

**Efficiency:** Inverted index, Query processing, Signature files, Duplicate document detection

**UNIT V**

**Integrating Structured Data and Text:** A Historical progression, Information retrieval as a relational application, Semi-structured search using a relational schema.

**Distributed Information Retrieval:** A Theoretical model of distributed retrieval, Web search.

**Text Books :**

1. *Information Retrieval – Algorithms and Heuristics, David A. Grossman, Ophir Frieder, 2<sup>nd</sup> Edition, 2012, Springer, (Distributed by Universities Press)*

**Reference Books :**

1. *Modern Information Retrieval Systems, Yates, Pearson Education*
2. *Information Storage and Retrieval Systems, Gerald J Kowalski, Mark T Maybury, Springer, 2000*
3. *Mining the Web : Discovering Knowledge from Hypertext Data, Soumen Chakrabarti Morgan-Kaufmann Publishers, 2002*
4. *An Introduction to Information Retrieval, Christopher D. Manning, Prabhakar Raghavan, Hinrich Schütze, , Cambridge University Press, Cambridge, England, 2009*

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

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## (13A05701) SOFTWARE ARCHITECTURE & DESIGN PATTERNS (CBCC-III)

### *Course Objective:*

- *To understand interrelationships, principles and guidelines governing architecture and evolution over time.*
- *To understand various architectural styles of software systems.*
- *To understand design patterns and their underlying object oriented concepts.*
- *To understand implementation of design patterns and providing solutions to real world software design problems.*
- *To understand patterns with each other and understanding the consequences of combining patterns on the overall quality of a system*

### *Learning Outcome:*

- *Know concepts, principles, techniques, and methods for design, analysis, and maintenance of software architectures*
- *Know the underlying object oriented principles of design patterns.*
- *Understand the context in which the pattern can be applied*
- *Understand how the application of a pattern affects the system quality and its tradeoffs*

### **UNIT I**

**Introduction:** What is Software Architecture? An Engineering Discipline for Software, The Status of Software Architecture.

**Architectural Styles:** Architectural Styles, Pipes and Filters, Data Abstraction and Object-Oriented Organization, Event-Based, Implicit Invocation, Layered Systems, Repositories, Interpreters, Process Control, Other Familiar Architectures, Heterogeneous Architectures.

**Shared Information Systems:** Shared Information Systems, Database Integration, Integration in Software Development Environments, Architectural Structures for Shared Information Systems.

### **UNIT II**

**Introduction:** What Is a Design Pattern? Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

**Creational Patterns:** Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

### **UNIT III**

**Structural Pattern Part-I:** Adapter, Bridge, Composite.

**Structural Pattern Part-II:** Decorator, Facade, Flyweight, Proxy.

### **UNIT IV**

**Behavioral Patterns Part-I:** Chain of Responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer.

### **UNIT V**

**Behavioral Patterns Part-II:** State, Strategy, Template Method, Visitor, Discussion of Behavioral Patterns.

**A Case Study (Designing a Document Editor):** Design Problems, Document Structure, Formatting, Embellishing the User Interface, Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations, Spelling Checking and Hyphenation.

**Text Books :**

1. *Design Patterns* By Erich Gamma, Pearson Education
2. *Software Architecture: Perspective on an Emerging Discipline* By Mary Shaw, David Garlan, PHI.

**Reference Books :**

1. *Software Architecture in Practice* by Len Bass, Paul Clements, Rick Kazman, Third Edition, Pearson Education.
2. *Head First Design Patterns* By Eric Freeman-Oreilly-spd.
3. *Design Patterns Explained* By Alan Shalloway, Pearson Education.
4. *Pattern Oriented Software Architecture*, F.Buschmann&others, John Wiley & Sons
5. *Pattern"s in JAVA Vol-I* By Mark Grand, Wiley DreamTech.
6. *Pattern"s in JAVA Vol-II* By Mark Grand, Wiley DreamTech.
7. *JAVA Enterprise Design Patterns Vol-III* By Mark Grand, Wiley DreamTech

B.Tech. IV - I sem (I.T)

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(13A12703) MIDDLE WARE TECHNOLOGIES

(CBCC-III)

### Course Objectives

- Learn the Distributed Computing environment
- Study CORBA and DCOM technologies
- Understand features of JAVA Beans

### Course Outcomes

- Create Distributed objects
- Write reusable software code

### Unit-I

**Introduction:** Evolution of distributed systems, The arrival of distributed objects, Methods of distribution, Issues in design of distributed object systems, Multi-tier architecture, Component concepts, Component-based software development.

**CORBA:** Object management architecture (OMA), CORBA Architecture, OMG CORBA IDL, CORBA object life cycle, Invocation life cycle, Performance Considerations.

### Unit-II

**CORBA Services:** Object location services, CORBA messaging service, CORBA security, Transaction service in CORBA, CORBA persistency service, Load Balancing Mechanisms in CORBA, Fault-tolerant CORBA, CORBA-based scheduling service, Licensing service.

### Unit-III

**Other CORBA Object Models:** Real time CORBA, Minimum CORBA, CORBA component models, Distributed Component Model: Microsoft distributed commerce architecture, Evolution of DCOM, OLE, Active X, Microsoft DCOM, Active X Template Library, COM IDL, Error handling in COM.

### Unit-IV

**CORBA-continued:** COM Interfaces, COM Threading Models, Marshalling.

**DCOM Services:** Persistence, Security, Microsoft transaction service, Clustering in DCOM, Messaging queuing.

## **UNIT-V**

**Enterprise Java Beans:** Introduction, EJB Architecture, Types of enterprise beans, Life cycle of beans, Steps in developing an EJB, Difference between EJB 2.0 and 3.0.

**Other Distributed Object Models:** Java RMI, Java Beans, CORBA Component Model, Comparison of Distributed Object Technologies, Model Driven Architecture, .Net Architecture, Interoperability between distributed object models.

### **Text Books:**

1. “Distributed Component Architecture”, G. Sudha Sadasivam, Wiley India, Edition, 2011, Wiley.
2. “Client Server Survival Guide”, Orfali, Harkey, Edwards, 3<sup>rd</sup> Edition, 2011, Wiley India Edition.

### **References**

1. “IT Architectures and Middleware: Strategies for Building Large, Integrated Systems”, Chris Britton and Peter Bye, Addison-Wesley professional
2. “The Complete Book of Middleware” Judith M. Myerson, Auerbach publications
3. “CISSP All-in-One Exam Guide”, 6<sup>th</sup> Edition, Shon Harris, McGrawHill
4. “Client/Server Programming with Java and CORBA”, 2<sup>nd</sup> Edition, Robert Orfali and Dan Harkey, Wiley

**Course Objectives:**

To learn to use the following (or Similar) automated testing tools to automate testing:

- Win Runner/QTP for functional testing.
- Load Runner for Load/Stress testing.
- Test Director for test management.
- JUnit, HTMLUnit, CPPUnit.
- To study state-of-art tools for software testing and Middleware technologies

**Course Outcomes:**

- Test the software applications using standard tools available in the market

**Sample problems on testing:**

1. Write programs in 'C' Language to demonstrate the working of the following constructs:  
i) do...while ii) while....do iii) if...else iv) switch v) for
2. "A program written in 'C' language for Matrix Multiplication fails" Introspect the causes for its failure and write down the possible reasons for its failure.
3. Take any system (e.g. ATM system) and study its system specifications and report the various bugs.
4. Write the test cases for any known application (e.g. Banking application)
5. Create a test plan document for any application (e.g. Library Management System)
6. Study of any testing tool (e.g. Win runner)
7. Study of any web testing tool (e.g. Selenium)
8. Study of any bug tracking tool (e.g. Bugzilla, bugbit)
9. Study of any test management tool (e.g. Test Director)
10. Study of any open source-testing tool (e.g. Test Link)
11. Take a mini project (e.g. University admission, Placement Portal) and execute it. During the Life cycle of the mini project create the various testing documents\* and final test report document.

**Additional problems on testing:**

1. Test the following using JUnit and CPPUnit:  
i) Sorting problems ii) Searching problems iii) Finding gcd of two integers iv) Finding factorial of a number.
2. Test web based forms using HTMLUnit.
3. Test database stored procedures using SQLUnit.

(Use sufficient number of test cases in solving above Problems)

\*Note: To create the various testing related documents refer to the text “Effective Software Testing Methodologies by William E. Perry”

### **REFERENCE BOOKS:**

1. Software Testing Concepts and Tools,P.Nageswara Rao,dreamtech press.
2. Software Testing Tools,Dr.K.V.K.K.Prasad,dreamtech Press.
3. Software Testing with Visual Studio Team System 2008, S.Subashini, N.Satheesh kumar,SPD.
4. Learning UML 2.0,Russ Miles and Kim Hamilton,O'Reilly,SPD.
5. Mastering UML with Rational Rose,W.Boggs&M.Boggs,Wiley India.

**B.Tech. IV - I sem (I.T)**

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**(13A05711) MOBILE APPLICATION DEVELOPMENT LABORATORY**

**Common to CSE & IT**

**OBJECTIVES:**

**The student should be made to:**

- Know the components and structure of mobile application development frameworks for Android and windows OS based mobiles.
- Understand how to work with various mobile application development frameworks.
- Learn the basic and important design concepts and issues of development of mobile applications.
- Understand the capabilities and limitations of mobile devices.

**OUTCOMES:**

**At the end of the course, the student should be able to:**

- Design and implement various mobile applications using emulators.
- Deploy applications to hand-held devices

**LIST OF EXPERIMENTS:**

1. Develop an application that uses GUI components, Font and Colours
2. Develop an application that uses Layout Managers and event listeners.
3. Develop a native calculator application.
4. Write an application that draws basic graphical primitives on the screen.
5. Develop an application that makes use of database.
6. Develop an application that makes use of RSS Feed.
7. Implement an application that implements Multi threading
8. Develop a native application that uses GPS location information.
9. Implement an application that writes data to the SD card.
10. Implement an application that creates an alert upon receiving a message.
11. Write a mobile application that creates alarm clock