

**Subject Code: MCA 371****Subject Name: Software Project Management****Lectures per week (hours) : 3 Lectures + 1 Tutorial****Practicals per week (hours) : 2****Internal Assessment : 50 Marks****External Assessment : 50 Marks Theory + 50 Marks Practical****Total Credits : 6****Prerequisite:** Software Engineering**Aim:**

The course is aimed to help the students understand and appreciate the importance of Software Project Management in the software life cycle and understand how to manage a software project.

**Objectives:**

- (1) To understand the concept, process and importance of software project management.
- (2) To gain knowledge of some of the CASE tools useful in project management.

<b>Unit No.</b>	<b>Topics to be Covered</b>	<b>No. of Lectures</b>	<b>Marks per Unit</b>
Unit I	<b>Introduction and Project Initiation</b> Introduction to Software Project Management – Pre sales activities – Process Based Approach – CMM – Proposals and Contracts – Requirement Specification and Management	9	12
Unit II	<b>Project Planning I</b> Process Definition and Tailoring – Process Database – Process Capability Baseline – Body of Knowledge – Process Assets – Effort Estimation – Scheduling – Quality Planning and Defect Estimation	10	12
Unit III	<b>Project Planning II</b> Risk Management – Project Management Plan – Configuration Management	6	10
Unit IV	<b>Project Execution and Termination</b> Life Cycle Execution – Peer Review – Project Monitoring and Control – Project Audits – Project Closure	11	16
	<b>Total</b>	<b>36</b>	<b>50</b>



# AHMEDABAD UNIVERSITY

## AES INSTITUTE OF COMPUTER STUDIES

### Master of Computer Applications (M.C.A.)

#### Outcomes:

Upon the completion of this course, the student will be able to:

1. Plan and execute a software projects.
2. Use some of the important CASE tools useful in software project management.

#### Reference Books:

- (1) CMM in Practice, Pankaj Jalote, Pearson Education, 1<sup>st</sup> Edition

#### Additional Reference Books:

- (1) Software Engineering – A Practitioner’s Approach, Roger Pressman, TMH, 6<sup>th</sup> Edition.
- (2) Software Project Management A Unified Framework, Walker Royce, Pearson Education, 1st Impression.
- (3) PMP Certification Excel with Ease, S Chandramouli, Pearson Education, 1st Impression.

**Subject Code:** MCA 371

**Subject Name:** Software Project Management

**Practicals per week (hours)** : 2

**Total Marks (Practical Exam)** : 50

#### Topics to be covered in Practical Sessions

Sr. No.	Topics to be Covered	No. of Practicals
1.0	<b>MS Project Theory and Demonstration</b>	06
	1.1 Introduction to MS Project	
	1.2 Demonstration of MS Project	
2.0	<b>MS Project Practical</b>	06
3.0	<b>MS Visio</b>	06
	3.1 Introduction to MS Visio	
	3.2 Class Diagram, Use Case Diagram, Sequence Diagram	
	<b>Total</b>	<b>18</b>



#### Third Year MCA :

#### Trimester VII

**Subject Code:** MCA 372      **Subject Name:** Mobile Computing

**Lectures per week (hours)** : 3 Lectures + 1 Tutorial  
**Practicals per week (hours)** : 4  
**Internal Assessment** : 50 Marks  
**External Assessment** : 50 Theory + 50 Practical Marks  
**Total Credits** : 8

**Prerequisite:** Knowledge of signals, transmission media, protocols and standards of Internet and networking, Core Java

#### Aim:

To provide the knowledge of Mobile Computing commencing with the basic understanding of mobile communication till the emerging trends and application for the same.

#### Objectives:

- (1) To understand the concept of Mobile Communication and Computing along with the mobile devices and Systems.
- (2) To understand Layers for Mobile Communication.
- (3) To understand various emerging trends in mobile technologies.
- (3) To understand Application level protocol and implementation of mobile application on J2ME and Android Platform.

Unit No.	Topics to be Covered	No. of Lectures	Marks per Unit
Unit I	<b>Mobile Computing</b> Mobile Communication: An Overview, Mobile Computing: An Overview, Application of Mobile Computing, Mobile Computing Architecture, Mobile System Networks, Overview of Mobile Devices and Mobile Operating System.	6	12
Unit II	<b>Physical Layer</b> Frequencies for radio transmission, Signals, Antennas, Signal Propagation, Multiplexing, Modulation  <b>Data Link Layer</b> Medium Access Control: Motivation for specialized MAC: hidden and exposed terminals, near and far terminals. SDMA, FDMA, TDMA, CDMA	10	13



#### Mobile Network Layer

Overview of Mobile IP, DHCP and Adhoc Networks.

#### Mobile Transport Layer Overview

Unit III	<b>Overview of IEEE Standards for Wireless Systems</b> <b>Overview of Emerging Technologies:</b> Infrared, Bluetooth, RFID, WIMAX, IPv6, 3G, ZigBee <b>GSM:</b> Mobile services, system architecture, radio interface, protocols, localization and calling, handover. Localization management, addressing, mobile QOS, security	10	13
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#### Wireless Application Layer

Wireless Application Protocol, Architecture, WAP client, WAP gateway, WAP Application server, WAP internal structure, WTA and PUSH features, wireless datagram protocol, WML and WML script.

Unit IV	<b>J2ME:</b> J2ME Architecture, Small computing device requirements, Run time environment, MIDlet Programming, JAVA Language for J2ME, J2ME Software Development Kit.	10	12
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#### Android:

Introduction, Features, Android Architecture, Applications, Application, Framework, Libraries, Android Runtime, Application Fundamentals, Application Components, Activating Components, Manifest File, Managing virtual devices, Managing projects.

<b>Total</b>		<b>36</b>	<b>50</b>
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#### Outcomes:

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

1. Familiarize with overview on mobile computing, mobile networking layers, GSM and WAP also.
2. Students will be able to develop application on CLDC J2ME and Android Platform.

#### Reference Books:

- 1) Mobile Computing, Raj kamal, Oxford University Press. 1<sup>st</sup> Edition
- 2) Mobile Computing, Asoke K Talukder, Roopa R Yavgal, TMH. 2<sup>nd</sup> Edition
- 3) Mobile Communications, Jochen Schiller, Pearson Education. 2<sup>nd</sup> Edition
- 4) J2ME: The Complete Reference, Keogh, J, Tata McGraw-Hill Publishing Company Limited. 1<sup>st</sup> Edition



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#### Reference Links:

- 1) Android: <http://developer.android.com/>
- 2) J2ME: <http://www.oracle.com/technetwork/java/javame/overview/index.html>

**Subject Code:** MCA 372      **Subject Name:** Mobile Computing

**Practicals per week (hours)** : 4

**Total Marks (Practical Exam)** : 50

#### Topics to be covered in Practical Sessions

Sr. No.	Topics to be Covered	No. of Practicals
1	J2ME CLDC based Application	12
2	Android Application	24
	<b>Total</b>	<b>36</b>



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## AES INSTITUTE OF COMPUTER STUDIES

### Master of Computer Applications (M.C.A.)

**Third Year MCA :**

**Trimester VII**

**Subject Code: MCA 373 Subject Name: Enterprise Application Development using Java EE**

**Lectures per week (hours)** : 3 Lectures + 1 Tutorial  
**Practicals per week (hours)** : 4  
**Internal Assessment** : 50 Marks  
**External Assessment** : 50 Theory + 50 Practical Marks  
**Total Credits** : 8

**Prerequisite:** Core Java

#### **Aim**

To learn and apply advanced features of Java EE platform in designing, developing and deploying N-tier enterprise applications.

#### **Objectives**

- This course focuses on developing N-tier enterprise applications using Java platform Enterprise Edition (Java EE) specification and their deployment using Java EE compliant application server.
- Develop proficiency in developing web based and enterprise applications using advanced features of the Java Programming Language like Java Servlets, Java Server Pages (JSP), MVC using Struts framework, Java Beans and Hibernate.
- Focus on applying industry standard development tools (Netbeans/Eclipse IDE), frameworks, best practices like MVC architecture using Struts framework, Java Persistence using Hibernate, component based development and the practical aspects of real-world design using the Java EE technologies.

**Prerequisites:** Core Java

#### **Course Contents:**

<b>Unit No.</b>	<b>Topics to be Covered</b>	<b>No. of Lectures</b>	<b>Marks per Unit</b>
Unit I	<b>Introduction to Enterprise Applications and Java EE</b> What is Enterprise application, features and requirements, Java EE platform overview, Java EE Application model, Distributed Multi-tier applications, Java EE components, features of component, advantage of component based development, Java EE containers, Java EE technology suite, Enterprise architecture types, Two-tier, Three-tier, N-tier, Java EE architecture, Java EE container services, types, Java EE APIs.	09	12



#### **Java EE Applications, packaging, configuration, deployment and execution**

Web applications and web components, Web application life cycle, Java EE web module and its structure, Application development steps, configuring and packaging applications, Java Archive (JAR) file, a Web Archive (WAR) file, Enterprise Archive (EAR) file, installing and configuring the Java enabled server, setting JAVA\_HOME variable, web-applications elements, creating development directory, setting your CLASSPATH, Structure of Web Applications and the Role of Deployment Descriptor (web.xml) file.

#### **Java Servlets**

Static and dynamic web pages, Overview of Servlets and JSP, HTTP protocol and request response format, advantages of Servlet over CGI, CGI and state, basic Servlet structure, Life-cycle of a Servlet, SingleThreadModel Interface, handling the client request (HTTP Get and Post requests) and reading form data, reading single values and multiple values, looking up parameter names, generating the server response, overview of Servlet API (javax.servlet and javax.servlet.http packages), HTTP Servlet Request interface and its methods.

Unit II

#### **Advanced features of Java Servlets**

12

15

Servlet/Container Communication, use of ServletConfig and ServletContext interfaces, reading servlet initialization parameters from web.xml, creating application level variables, Using RequestDispatcher, Need for session tracking, techniques to maintain state information: hidden form fields, cookies, URL rewriting and session objects, creating session object writing data and objects to session object, retrieving values from session object, invalidating session objects, using filters.

#### **Java Server Pages (JSP)**

Comparison between Servlet and JSP, Benefits of JSP, JSP translation and request, writing and deploying JSP in Java application server, Components of JSP page, JSP directories for Tomcat, Invoking Java Code with JSP Scripting elements, using JSP expressions, Implicit Objects (request, response, session, out, application), comments, Using JavaBeans Components in JSP Documents, advantages of using Java Bean, Introduction to JSF, features and advantages.



Unit III	<b>JSP Expression Language (EL)</b> Invoking EL using syntax, access to stored objects, bean properties, access to collection elements, access to request parameters, cookies and scoped variables, advantages of JSP expression language.	09	15
	<b>Integrating Servlets and JSP: The Model View Controller (MVC) Architecture</b> <ul style="list-style-type: none"><li>• Understanding the benefits of MVC</li><li>• Using RequestDispatcher to implement MVC</li><li>• Implementing JSP as view layer, Servlets as controller layer and Java Bean as model layer.</li><li>• Understanding Data Sharing Between Servlets and JSP</li><li>• Forwarding requests from servlets to JSP pages</li></ul>		
	<b>Java Persistence with Hibernate</b> Object persistence, Need for object relational mapping and problems, overview of Hibernate, Hibernate architecture and API, Hibernate Java annotations, Hibernate Configuration, Hibernate Sessions, The Hibernate Query Language (HQL), Mapping Persistent classes, one-to-one and one-to-many relationships, Entity Inheritance, Build Java applications that use Hibernate to create, retrieve, update, and delete objects, Work with Hibernate Query Language (HQL) to generate object-based SQL, Hibernate sessions and transactions		
Unit IV	<b>Struts Framework</b> The Struts Framework Basics: Understanding struts, Setting up struts, Struts flow of control, Processing requests with action objects, Handling request parameters with form beans, pre-populating and redisplaying input forms, Struts framework – i18n and layout: Using properties files, internationalizing applications, Struts framework – validating input: validating in the Action class, validating in the Form Beans, Using the automatic validation framework	06	08
	<b>Case Study on Enterprise Application Development</b> Developing a Java EE enterprise case study application utilizing all advanced features of Java EE platform, Implementing MVC architecture using Struts, Using Hibernate Persistence, Using Integrated Development Environment (IDE) tools like NetBeans/Eclipse for rapid application development (RAD).		
	<b>Total</b>	<b>36</b>	<b>50</b>



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### Master of Computer Applications (M.C.A.)

#### Outcomes:

- Sound understanding of the enterprise applications with multi tier architecture and the role of different Java EE technologies in developing real world solutions.
- Proficiency in developing server side enterprise applications using Java EE platform.
- Developing web applications using MVC architecture and encapsulating business logic of application in reusable Java Bean components.

#### Reference Books:

1. “Core Java 2, Volume 2 – Advanced Features”, Cay S Horstmann, Gary Cornell, Pearson Education, 8<sup>th</sup> Edition.
2. “Core Servlets and JavaServer Pages, Volume-1: Core Technologies”, Marty Hall and Larry Brown, Pearson Education, 2<sup>nd</sup> Edition, 2004
3. “Core Servlets and JavaServer Pages Volume-2, Advanced Technologies”, Marty Hall and Larry Brown, Pearson Education, 2<sup>nd</sup> Edition, 2008.
4. Java Persistence with Hibernate by Christian Bauer and Gavin King, Manning Publication, 2<sup>nd</sup> edition, 2007.
5. Java Server Programming Java EE 6(Black book), Kogent Solutions Inc., Wiley, 2010 Edition.

#### Additional Reference Books and Resources:

1. Java Servlet Programming, Jason Hunter, O’Reilly publication, 2<sup>nd</sup> edition.
2. “Pro J2EE 1.4”, Sue Spielman and Meeraj Kunnumpurath, Wiley Computer Publishing, 2004 edition.
3. The Java EE 6 Tutorial: Basic Concepts, 4/e, Eric Jendrock et. al., Pearson, 4<sup>th</sup> edition.
4. Java EE 6 Tutorial, Eric Jendrock, Ian Evans, Devika Gollapudi, Sun Microsystems, 2011 available in pdf and online at <http://download.oracle.com/javaee/6/tutorial/doc>.
5. Java Platform, Enterprise Edition 6 (Java EE 6) Technical Specification and API documentation available online at <http://download.oracle.com/javaee>.
6. Code Conventions for the Java Programming Language available online at <http://www.oracle.com/technetwork/java/codeconv-138413.html>
7. Hibernate Documentation and Reference Manual at <http://www.hibernate.org/docs>



**Subject Code:** MCA 373

**Subject Name:** Enterprise Application Development using Java EE

**Practical per week (hours)** : 4

**Total Marks (Practical Exam)** : 50

#### Topics to be covered in Practical Sessions

<b>Sr. No.</b>	<b>Topics to be Covered</b>	<b>No. of Practical (Hours)</b>
1.0	<p>Introduction to IDE (Integrated Development Environments) and related tools for Java like NetBeans/Eclipse, features of IDE, wizards and creating different types of application projects with IDE</p> <p><b>Introduction to Java EE platform</b> Java EE Application model, Java EE components, using Java EE containers, Using Java EE API docs.</p> <p><b>Java EE Applications, packaging, configuration, deployment and execution</b> Java EE web module and its structure, Application development steps, configuring and packaging applications, Java Archive (JAR) file, a Web Archive (WAR) file, Enterprise Archive (EAR) file, installing and configuring the Java enabled server, setting JAVA_HOME variable, web-applications elements, creating development directory, setting your CLASSPATH, Structure of Web Applications and the Role of Deployment Descriptor (web.xml) file.</p> <p><b>Java Servlets</b> Static and dynamic web pages, Life-cycle of a Servlet, SingleThreadModel Interface, handling the client request (HTTP Get and Post requests) and reading form data, reading single values and multiple values, looking up parameter names, generating the server response, overview of Servlet API (javax.servlet and javax.servlet.http packages), HTTP Servlet Request interface and its methods.</p>	09



#### 2.0 **Advanced features of Java Servlets** 12

Servlet/Container Communication, use of ServletConfig and ServletContext interfaces, reading servlet initialization parameters from web.xml, creating application level variables, Using RequestDispatcher, techniques to maintain state information: hidden form fields, cookies, URL rewriting and session objects, creating session object writing data and objects to session object, retrieving values from session object, invalidating session objects, using filters.

#### **Java Server Pages (JSP)**

JSP translation and request, writing and deploying JSP in Java application server, Components of JSP page, JSP directories for Tomcat, Invoking Java Code with JSP Scripting elements, using JSP expressions, Implicit Objects (request, response, session, out, application), comments, Using JavaBeans Components in JSP Documents, advantages of using Java Bean.

#### 3.0 **JSP Expression Language (EL)** 09

Invoking EL using syntax, access to stored objects, bean properties, access to collection elements, access to request parameters, cookies and scoped variables, advantages of JSP expression language.

#### **Integrating Servlets and JSP: The Model View Controller (MVC) Architecture**

- Understanding the benefits of MVC
- Using RequestDispatcher to implement MVC
- Implementing JSP as view layer, Servlets as controller layer and Java Bean as model layer.
- Understanding Data Sharing Between Servlets and JSP
- Forwarding requests from servlets to JSP pages

#### **Java Persistence with Hibernate**

Object persistence, Need for object relational mapping and problems, overview of Hibernate, Hibernate architecture and API, Hibernate Java annotations, Hibernate Configuration, Hibernate Sessions, The Hibernate Query Language (HQL), Mapping Persistent classes, one-to-one and one-to-many relationships, Entity Inheritance, Build Java applications that use Hibernate to create, retrieve, update, and delete objects, Work with Hibernate Query Language (HQL) to generate object-based SQL, Hibernate sessions and transactions



4.0	<b>Struts Framework</b>	06
	The Struts Framework Basics: Understanding struts, Setting up struts, Struts flow of control, Processing requests with action objects, Handling request parameters with form beans, pre-populating and redisplaying input forms, Struts framework – i18n and layout: Using properties files, internationalizing applications, Struts framework – validating input: validating in the Action class, validating in the Form Beans, Using the automatic validation framework	
	<b>Total</b>	<b>36</b>

#### Case Study on Enterprise Application

Students may develop a working prototype of enterprise application using Java EE platform as a part of practical term work. While solving regular practical term works in lab sessions, simultaneously, they have to design and develop prototype in a phased manner (in a team size of maximum 2 students). Students have to select a problem statement with features like complex business process, transactional support, reusable component based development using Java beans, web based interface, concurrent multiple user support, need for scalability and security. Developing a Java EE enterprise case study application utilizing all advanced features of Java EE platform, Implementing MVC architecture using Struts, JSP, Servlets, Java Beans, Using Hibernate Object relational mapping (ORM) or JDBC using SQL, Using Integrated Development Environment (IDE) tools like NetBeans/Eclipse for rapid application development (RAD).

**Subject Code:** MCA 374**Subject:** Compiler Construction**Lectures per week (hours)**

: 3 Lectures + 1 Tutorial

**Practicals per week (hours)**

: 4

**Internal Assessment**

: 50 Marks

**External Assessment**

: 50 Theory + 50 Practical Marks

**Total Credits**

: 8

**Prerequisite:**

- Formal notations for describing languages, including regular expressions and context-free grammars.
- Common algorithms and data structures, including tree, set, and graph representations and the algorithms that manipulate them.
- The basics of computer architecture, including how machines actually work and how to program in assembly language.
- The basics of systems programming, including how a computer's memory is organized at runtime.

**Aim:**

The goal of this course is to provide practically useful knowledge in how compilers translate programs in a high-level language into executable machine code. In addition, the course aims to give skills in using theoretical as well as concrete tools for compiler construction

**Objectives:**

- (1) To understand the overall structure of a compiler.
- (2) To know significant details of a number of important techniques commonly used.
- (3) To aware of the way in which language features raise challenges for compiler builders.

<b>Unit No.</b>	<b>Topics to be Covered</b>	<b>No. of Lectures</b>	<b>Marks per Unit</b>
Unit I	<b>Introduction to Compiling</b> Introduction to compilers – Analysis of source program – The phases of a compiler  <b>Lexical Analysis</b> The role of lexical analyzer – Input buffering – Specification of tokens – Recognition of token – Finite Automata – Regular expressions to an NFA – NFA to regular expression – Optimization of DFA based pattern matchers	8	12



Unit II	<b>Syntax analysis</b> Role of parser – Context free grammars – Writing a grammar – Top down parsing – Bottom up parsing – operator precedence parsing – LR parsers – Ambiguous grammars – Syntax directed definition.	10	14
	<b>Type checking</b> Type systems – Specification of simple type checkers – Equivalence of type expressions – Type conversion		
Unit III	<b>Run time environment</b> Source language issues – Storage organization – Storage allocations strategy – Access to non local names – Symbol table – Language facilities for dynamic storage allocation.	11	14
	<b>Intermediate code generation</b> Intermediate languages – Boolean expressions – CASE statements – Back patching - Procedure calls		
Unit IV	<b>Code Generation</b> Issues in design of a code generator – The target machine – Run time storage management – Basic block and flow graph – Peephole optimization – Generating code from basic blocks – Dynamic programming code generators algorithms – Code generator generators – Introduction to code optimization.	7	10
	<b>Total</b>	<b>36</b>	<b>50</b>

#### Outcomes:

Upon the completion of this course, the student will be able to:

- (1) Understand main technologies associated with compiling programming languages, by, lexical analysis, syntax analysis, type checking, run-time data organization and code-generation.
- (2) Familiar with the theory and practice of programming language translation.
- (3) Understand the structure and operation of a typical compiler including the role and operation of each of its components.

#### Reference Books:

- (1) Compilers: Principles, techniques and tools by Alfred V. Aho, Ravi Sethi and Jeffrey D. Ullman, Pearson Education, 2<sup>nd</sup> Edition.
- (2) Compiler Construction: Principles and Practice by Kenneth C. Louden, Thomson Publisher, 1<sup>st</sup> Edition



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#### Additional Reference Books:

- (1) Introduction to Languages and The Theory of Computation by J.C. Martin, Tata McGraw – Hill Publishing Company Ltd., 3<sup>rd</sup> Edition.
- (2) Compiler Design by Santanu Chattopadhyay, Prentise Hall of India Private Ltd. 1<sup>st</sup> Edition.

Subject Code: MCA 374

Subject Name: Compiler Construction

Practical per week (hours) : 4

Total Marks (Practical Exam) : 50

Topics to be covered in Practical Sessions

Implementation of various phases of compiler.



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## AES INSTITUTE OF COMPUTER STUDIES

### Master of Computer Applications (M.C.A.)

**Third Year MCA :**

**Trimester VII**

**Subject Code:** MCA 374    **Subject:** Data Warehousing and Data Mining

**Lectures per week (hours)** : 3 Lectures + 1 Tutorial  
**Practicals per week (hours)** : 4  
**Internal Assessment** : 50 Marks  
**External Assessment** : 50 Theory + 50 Practical Marks  
**Total Credits** : 8

**Prerequisite:** Basic Knowledge of Relational Database Management System

**Aim:**

The course is aimed to guide students to successfully gather, analyze, understand and act upon information in this new information age.

**Objectives:**

- (1) To understand the consolidation of necessary data into a single source.
- (2) To Guide for Building Decision Support Systems.
- (3) To understand the concept used the generate the hypothesis.
- (4) To familiarize students with the sophisticated statistical analysis and modeling techniques

Unit No.	Topics to be Covered	No. of Lectures	Marks per Unit
Unit I	<p><b>Introduction to Data Warehousing</b>  The Need for Data Warehousing, Difference between Operational Database Systems and Data Warehouses, Reason to have a Separate Data Warehouse</p> <p><b>A Multidimensional Data Model</b>  From Tables and Spreadsheets to Data Cubes  Stars, Snowflakes and Fact Constellations and Computation  Concept hierarchies, OLAP Operations in the Multidimensional Data Model and A Starlet Query Model for Querying Multidimensional Databases</p> <p><b>Data Warehouse Architecture</b>  Steps for the Design and Construction of Data Warehouses, A Three-Tier Data Warehouse Architecture, Data Warehouse Back-End Tools and Utilities, Metadata Repository, Types of OLAP Servers: ROLAP versus MOLAP versus HOLAP</p>	9	12



	<b>Data Warehouse Implementation</b> Efficient Computation of Data Cubes Indexing OLAP Data Efficient Processing of OLAP Queries		
Unit II	<b>Data Preprocessing</b> <b>Why preprocess the data?</b> <b>Descriptive Data Summarization</b> Measuring the Central Tendency, Dispersion of Data and Graphic Displays of Basic Descriptive Data Summaries  <b>Data Cleaning</b> Missing Values, Noisy Data and Data Cleaning as a process  <b>Data Integration and Transformation</b> <b>Data Reduction</b> Data Cube Aggregation, Attribute Subset Selection Dimensionality and Numerosity Reduction	9	13
Unit III	<b>Introduction to Data Mining</b> Importance of data mining, Data Mining – On what kind of data?  <b>Data Mining Functionalities – Types of Patterns Mined</b> Concept / Class Description: Characterization and Discrimination, Mining Frequent Patterns, Associations and Correlations, Classification and Prediction, Cluster Analysis, Outlier Analysis, Evolution Analysis  <b>Mining Association Rules in Large Databases</b> Association Rule Mining: An Overview & An Example, Basic Concepts, Apriori Algorithm, From Association Mining to Correlation Analysis	9	13
Unit IV	<b>Classification &amp; Prediction</b> An Overview of classification and prediction, Difference between Classification & Prediction.  <b>Cluster Analysis</b> An Overview, Typical Requirement of Clustering in Data Mining Overview: Outlier Analysis, Spatial Data Mining, Multimedia Data Mining, Text Mining	9	12



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## AES INSTITUTE OF COMPUTER STUDIES

### Master of Computer Applications (M.C.A.)

#### Web Mining

Introduction, Web Mining, Web Usage Mining, Web Content Mining, Web Structure Mining

#### Data Mining System Products & Research Prototypes

How to Choose a Data Mining System, Examples of Commercial Data Mining Systems

**Total** **36** **50**

#### Outcomes:

Upon the completion of this course, the student will be able to:

1. To convert the heaps of data to usable information.
2. Efficiently Build a Data Warehouse
3. To use various data mining techniques to uncover hidden patterns and relationship in organizational databases.
4. Use Association rule to find interesting associations / correlation relationships among large sets of data.

#### Reference Books:

- (1) Data Mining Concepts and Techniques, Jiawei Han and Micheline Kamber, Morgan Kaufmann Publishers, Second Edition

#### Additional Reference Books:

- (1) Data Warehousing in the real world – Sam Anahory Dennis Murray, Addison-Wesley, First Edition
- (2) Insight into Data Mining Theory and Practice by Soman, Diwakar and Ajay, PHI, First Edition
- (3) Introduction to Data Mining, Pang-Ning Tan, Michael Steinbach, Vipin kumar, Pearson

**Subject Code:** MCA 374      **Subject:** (Elective – II) Data Warehousing and Data Mining

**Practicals per week (hours)** : 4  
**Total Practical Marks** : 50

#### Topics to be covered in Practical Sessions

Sr. No.	Topics to be Covered	No. of Practical
1	Cube Generation and OLAP Operations on cube	14
2	Implementation of Data Mining techniques	22
		<b>36</b>



#### Third Year MCA :

#### Trimester VII

**Subject Code: MCA 374**

**Subject: Multimedia Systems**

<b>Lectures per week</b>	: 3 Lectures + 1 Tutorial
<b>Practical Sessions per Week</b>	: 4
<b>Internal Assessment</b>	: 50
<b>External Assessment</b>	: 50 Theory + 50 Practical
<b>Total Credit</b>	: 8

#### Prerequisite:

Basic knowledge of Computers and programming.

#### Aim:

The overall aim of this course is to develop an understanding of the concepts and skills associated with multimedia and to understand how to deal with different animation effects using multimedia tools like Adobe Photoshop and Macromedia Flash.

#### Objectives:

- (1) To understand the multimedia elements like Text, Audio, Video, Animation and Image.
- (2) To create attractive and user friendly Multimedia applications using multimedia tools such as Photoshop and Flash.
- (3) To understand the process of making Multimedia application.

<b>Unit No.</b>	<b>Topics to be Covered</b>	<b>No. of Lectures</b>	<b>Marks per Unit</b>
Unit I	<b>Introduction to Multimedia</b> Multimedia definition – Introduction of Multiple Facets of Multimedia (Text, Audio, Graphics, Animations, Video) – Use of Multimedia – Classifications of Multimedia – Multimedia Hardware and Software	8	8
Unit II	<b>Elements of Multimedia in Details</b> Text: The Power of meaning – About Font and faces – Computer and Text - Font editing and designing tools – Hypermedia and Hypertext Images: Making still images – Image file format – color Animations: Principle of animation – Animation by computer	6	10



Unit III	<b>Elements of Multimedia in Details</b> Sound: Multimedia system sounds – Digital Audio – Making MIDI audio – Audio file formats – MIDI versus Digital Audio - Adding sound to multimedia project Video: Analog display standards – Digital display standards – Digital video – video recording and tape formats	6	16
Unit IV	<b>Planning, Costing and Designing</b> Idea Analysis – Task Planning – Prototype Development Alpha and Beta development – Scheduling – Estimating – Designing the Structure – Designing the user Interface	4	16
	<b>Total</b>	<b>24</b>	<b>50</b>

#### Outcomes:

Upon the completion of this course, the student will be able to:

- (1) Understand different Multimedia elements.
- (2) Create Animated applications using Adobe Flash 8.0
- (3) Using all the tools and effects, develop a multimedia application as project work.

#### Reference Books:

- (1) Multimedia: Making It Work (7<sup>th</sup> edition) – Tay Vaughan – Tata McGraw-Hill
- (2) Multimedia Magic – S. Gokul – BPB Publications, 2<sup>nd</sup> Edition

#### Additional Reference Books:

- (1) Digital Multimedia – Chapman & Chapman – John Wiley & Sons, 3<sup>rd</sup> Edition
- (2) Principles of Multimedia – Ranjan Parekh – Tata McGraw-Hill, 1<sup>st</sup> Edition
- (3) Macromedia Flash 8 @ work – Kerman – Dorling Kindersley(India) pvt ltd



# AHMEDABAD UNIVERSITY

## AES INSTITUTE OF COMPUTER STUDIES

### Master of Computer Applications (M.C.A.)

Subject Code: MCA 374                      Subject: Multimedia Systems  
Practicals per week (hours)            : 4  
Total Marks (Practical Exam)         : 50

#### Topics to be covered in Practical Sessions

**Total Marks: 50**

<b>Sr. No.</b>	<b>Topics to be Covered</b>	<b>No. of Practicals</b>
1	<b>Introduction to Flash</b> 1.2 Understand the IDE 1.3 Tools available in Flash 8 1.4 Animation effects in flash 8 1.4.2 Tweening (Motion and Shape) 1.4.3 Motion Guide 1.4.4 Masking 1.4.5 Fade In and Zoom In effect 1.4.6 Blur effect 1.4.7 Bouncing effect 1.4.8 Ripple effect 1.4.9 Sparkling effect 1.4.10 Photo Slideshow 1.4.11 Change Image Color 1.4.12 Drop Shadow 1.4.13 Glow Effect 1.4.14 Gradients	24
2	<b>Actionscripts</b>	10
3	<b>Developing a Multimedia Application</b>	14
	<b>Total</b>	<b>48</b>



#### Third Year MCA :

#### Trimester VII

**Subject Code:** MCA 374

**Subject:** Software Quality Management

**Lectures per week (hours)** : 3 Lectures + 1 Tutorial

**Practicals per week (hours)** : 4

**Internal Assessment** : 50 Marks

**External Assessment** : 50 Marks Theory + 50 Marks Practical

**Total Credits** : 8

#### Prerequisite:

Basic concepts of Software Engineering and Software Project Management should be clear.

#### Aim:

The goal of this course is to provide practically useful knowledge in Software Quality Management. In addition, the course aims to give skills in using theoretical as well as concrete tools for software quality management.

#### Objectives:

- (1) To understand the concept of quality, its importance and its management in an organization..
- (2) To know significant details of a number of important techniques commonly used for software quality management.
- (3) To understand the importance of measurements and metrics to manage quality.
- (4) To understand various standards applicable for managing software quality and careers available in Quality Management.

Unit No.	Topics to be Covered	No. of Lectures	Marks per Unit
Unit I	<p><b>Software Quality in Business Context</b>            What is Quality? – Importance of Quality - Quality Control v/s Quality Assurance – QA at each phase of SDLC – The SQA function</p> <p><b>Managing S/W Quality in an organization</b>            The need for SQA – Quality Management System</p> <p><b>Planning for SQA</b>            SQA Plan – SQA : Organizational level initiatives</p>	9	12



Unit II	<b>Product Quality and Process Quality</b> Product Quality – Models for S/W Product Quality – Process Quality  <b>S/W Measurement and Metrics</b> Introduction – Measurement during SDLC – Defect Metrics – Classifications of metrics – Metrics implementation in projects – Benefits of metrics – Earned Value Analysis – Planning for Metrics program	9	13
Unit III	<b>Walkthroughs and Inspections</b> Introduction – Structured Walkthroughs – Inspections – Roles and responsibilities – Psychological aspects – Comparison of review techniques – inspection related checklists.  <b>Software Configuration Management</b> SCM – Why and What – SCM Activities – Standards for configuration audit functions – personnel in SCM activities – SCM pitfalls  <b>ISO 9001</b> What is ISO 900 – Its origins – How does ISO 9000 family of standards work? – Need of ISO 9000 – The Assessment Process -	9	13
Unit IV	<b>S/W CMM and other process improvement models</b> CMM and ISO – Types of CMM models – CMMI – Other models for process improvement – P-CMM  <b>Software Testing</b> Purpose of testing – difference between Testing and Inspection - Testing v/s Debugging – Testing Life Cycle – Roles and responsibilities – Test artifacts – Test plans – The V model for testing phases – Testing Techniques – Test Metrics – Test Automation and Test Tool selection – Test Process Improvement Framework – Human issues and challenges in testing – Testing careers and certification  <b>Careers in Quality</b> Introduction – Some important people issues – Roles for Quality Professionals – Quality Certifications	9	12
	<b>Total</b>	<b>36</b>	<b>50</b>



# AHMEDABAD UNIVERSITY

## AES INSTITUTE OF COMPUTER STUDIES

### Master of Computer Applications (M.C.A.)

#### Outcomes:

Upon completion of this course, the student will be able to:

- (1) Understand the meaning of quality of software, its importance in an organization and how to manage the quality.
- (2) Appreciate the importance of measurement and metrics in managing quality.
- (3) Understand the importance of various quality standards, their pros and cons.
- (4) Appreciate the various career opportunities in SQA and decide whether it is one of the options they would like to pursue.

#### Reference Books:

- (1) Software Quality Assurance – Principles and Practice by Nina Godbole, Narosa Publication, 1st Edition.

#### Additional Reference Books:

- (1) Metrics and Models in Software Quality Engineering by S H Kan, Pearson Education, 1<sup>st</sup> Edition.
- (2) Software Quality : Producing Practical, Consistent Software By Ben-Menachem, M;Marliss, G S, Thomson Learning 1<sup>st</sup> Edition.
- (3) ISO 9001:2000 For Software Organizations By Kishore, S;Naik, R , Tata Mcgraw-Hill Publishing Company Ltd. , 1<sup>st</sup> Edition

**Subject Code: MCA 374**

**Subject: Software Quality Management**

**Practicals per week (hours) : 4**

**Total Marks (Practical Exam) : 50**

#### Topics to be covered in Practical Sessions

**Total Marks: 50**

<b>Sr. No.</b>	<b>Topics to be Covered</b>	<b>No. of Practicals</b>
1.0	<b>Rational Unified Process</b>	9
2.0	<b>Rational RequisitePro</b>	9
3.0	<b>Rational ClearQuest , Rational ClearCase</b>	9
4.0	<b>Rational Test Manager, Rational Robot</b>	9
	<b>Total</b>	<b>36</b>