

With effect from Academic Year 2015-16

**Syllabus of M.C.A. III YEAR**  
**OF**  
**THREE YEAR PG COURSE**  
**IN**  
**MASTER OF COMPUTER APPLICATIONS**



**DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS**  
**CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (Autonomous)**  
**Hyderabad – 500 75**

**SCHEME OF INSTRUCTION AND EXAMINATION**  
**M.C.A. III YEAR**  
**MASTER OF COMPUTER APPLICATIONS**

**I SEMESTER**

S No.	Syllabus Ref. No.	Subject	Scheme of Instruction		Scheme of Examination			Credits
			Periods per week		Duration in hrs	Maximum Marks	Sessionals	
			L/T	D/P		Semester End Exam		
<b>THEORY</b>								
1.	MC 311	Information Security	4	-	3	75	25	3
2.	MC 312	Middleware Technologies	4	-	3	75	25	3
3.	MC 313	Object Oriented System Development	4	-	3	75	25	3
<b>Elective – II (Any One)</b>								
4.	MC 361	Software Testing	4	-	3	75	25	3
	MC 362	Mobile Computing	4	-	3	75	25	3
	MC 363	Multimedia	4	-	3	75	25	3
<b>Elective–III (Any One)</b>								
5.	MC 371	Software Project Management	4	-	3	75	25	3
	MC 372	Cloud Computing	4	-	3	75	25	3
	MC 373	Information Retrieval Systems	4	-	3	75	25	3
<b>PRACTICALS</b>								
6.	MC 316	Programming Lab-OOSD	-	3	3	50	25	2
7.	MC 317	Programming Lab-MWT	-	3	3	50	25	2
8.			-	3	3	50	25	2
	MC 318	Seminar	-	3	3	50	25	2
<b>TOTAL</b>			<b>20</b>	<b>9</b>	<b>-</b>	<b>525</b>	<b>200</b>	<b>21</b>

L: Lecture, T: Tutorial, D: Drawing, P: Practical

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**SCHEME OF INSTRUCTION AND EXAMINATION  
M.CA. III YEAR  
MASTER OF COMPUTER APPLICATIONS**

**II SEMESTER**

Sl No.	Syllabus Ref. No.	Subject	Scheme of Instruction		Scheme of Examination			
			Periods per week		Duration in hrs	Maximum Marks	Sessionals	Credits
			L/T	D/P		Semester End Exam		
1.	MC 901	Project Work	-	6	3	Grade	50	16
2.	MC 322	Project Seminar	-	3	3	--	25	2
	<b>TOTAL</b>		-	9	-	---	75	18

L: Lecture, T: Tutorial, D: Drawing, P: Practical

❖ Projects are evaluated with Viva Voce examination and the following grades are awarded:

**Excellent/Very Good/Good/Satisfactory/ Not Satisfactory**

In case of Not Satisfactory, the candidates have to read the project and submit at the time of next semester examination.

**INFORMATION SECURITY**

Instruction	4L periods per week
Duration of Main Examination	3 Hours
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

**Course Objectives:**

1. To gain the knowledge of SDLC and the need for Security.
2. To gain the knowledge of Legal, Ethical professional issues.
3. To gain the knowledge of Firewalls and VPNS & Cryptographic Algorithms.

**Course Outcomes:**

1. Students would have gained knowledge of SDLC and requirement of Information Security.
2. Students would have gained knowledge of Legal, Ethical Professional Issues.
3. Students would have gained knowledge of Firewalls and VPNS, knowledge of Cryptographic Algorithms.

**Pre Requisites:**

1. Students should have knowledge of Computer Networks and Data Communications.

**Unit-I**

**Introduction:** History, Critical characteristics of information, Components of an information system, securing the components, The SDLC, The security SDLC. Security Professionals and the organization. Need for Security: Business needs, Threats, Attacks- secure software development.

**Unit-II**

**Legal, Ethical and Professional Issues:** Law and ethics in information security, Ethics and information Security.

**Security Analysis:** Risk Management, Identifying and assessing risk, Controlling Risk.

**Planning for Security:** Security policy, Standards and practices, Design of Security Architecture.

**Unit-III**

**Security Technology:** Firewalls and VPNs: Physical design Firewalls, Protecting remote connections.

Intrusion detection and other security tools: Intrusion detection and prevention systems, Scanning and analysis tools.

#### **Unit-IV**

**Cryptography:** Foundations of cryptology, Cipher methods, Cryptographic Algorithms (Symmetric Key-DES,IDEA, and AES) and public key cryptography (Public key Encryptions-RSA), Cryptographic tools, Protocols for secure communications, Attacks on cryptosystems.

#### **Unit- V**

**Message Digest:** Message Digest (MD-5, SHA), Digital signatures.

**SSL and SET:** SSL and SET protocols, Internet transactions using both SSL and SET.

#### **Text Books:**

1. Michel E Withman and Herbert J Mattord, “Principles and Practices of Information Security”, Cengage Learning, 2009 (Unit-I to III).
2. William Stallings, “Cryptography and Network Security”, Pearson Education, 2000.  
(Unit-III, IV and V)

#### **Suggested Reading:**

1. Thomas R Peltier, Justin Peltier, John Blackley, “Information Security Fundamentals”, Auerbach Publications, 2010
2. Behrouz A. Forouzan, "Cryptography and Network Security", Tata McGraw Hill, 2007.

**MIDDLEWARE TECHNOLOGIES**

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

**Course Objectives:**

1. To understand the fundamentals of Web Services.
2. To make a study of basics EJB types of EJB and applications.
3. To impart knowledge in CORBA and COM.
4. To learn a latest framework .NET.

**Course Outcomes:**

1. Understand the basic concepts of the various Web services
2. Acquire the knowledge of EJB and its types.
3. Understanding the differences between CORBA and COM
4. Acquire the knowledge about different .NET framework and its programming

**Pre Requisites:**

1. A knowledge on Distributed Systems is required.
2. A knowledge on Java Programming language is required.
3. A knowledge on Java Script and VB Script is required.
4. A knowledge on Web programming is required.

**Unit – I**

**Client/Server Concepts:** Client/Server, File Server, Database server, Group server, Object Server, Web server, Middleware – General middleware –Service specific middleware. Client/Server Building blocks – RPC – Messaging – Peer- to- Peer. Web Services – SOA, SOAP, WSDL, REST Services.

**Unit – II**

**EJB Architecture:** EJB – EJB Architecture – Overview of EJB software architecture –View of EJB – Conversion – Building and Deploying EJBs – Role in EJB.

**Unit – III**

**EJB Applications:** EJB Session Beans – EJB entity beans – EJB Clients – EJB Deployment Building an application with EJB.

## **Unit – IV**

Introduction to .NET, Overview of .NET applications, .NET Framework – CTS – CLS – CLR – Managed execution, Runtime environment. Understanding assemblers, .NET security.

**Introduction Microsoft Visual C# and Visual Studio.NET** : Welcome to C# , Working with variables, operators, and expressions; writing methods and applying scope, using decision statements, using iteration statements, managing errors and exceptions.

## **Unit -V**

**Understanding the C# Language** : Creating and managing classes and objects, understanding values and references, creating value types with enumerations and structures, using arrays and collections, understanding parameter arrays, working with inheritance, using garbage collection and resource management.

**Working with Windows Applications**: Introducing windows forms, working with menus, performing validation, using complex controls, using the MDI, Windows and dialog boxes, creating GUI Components.

### **Text Books:**

1. Robert Orfali, Dan Harkey and Jeri Edwards, “The Essential Client / Server Survival Guide”, Galgotia Publications Pvt.Ltd, 2002 (Unit 1).
2. Tom Valesky, “Enterprise Java Beans”, Pearson Education, 2002 (Unit 2 & 3).
3. John Sharp, Job Jagger, “Microsoft Visual C#.NET step by step”, Prentice hall of India Private Ltd, 2003. (Unit 4 & 5)

### **Essential Reading**

1. Jeffrey R. Shapiro, “The Complete Reference Visual Basic.NET”, TMH, 2002.
2. Burton Harvey, Simon Robinson, Julian Templemanm, Karli Watson, “ C# Programming ”, 3<sup>rd</sup> Indian Reprint, Shroff Publishers & Distributors Pvt. Ltd, 2001.

**OBJECT ORIENTED SYSTEM DEVELOPMENT**

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

**Course Objectives:**

1. To understand the basic building blocks of UML.
2. To learn about the structural and Dynamic modeling.
3. Understanding the concepts of Architectural modeling.
4. To understand the concept and structure of USDP.

**Course Outcomes:**

1. Students would have gained the knowledge of how to model the object oriented applications through UML.
2. Students would have gained the knowledge of Structural and Behavioral modeling
3. Student would have gained the theoretical knowledge of Forward and Reverse Engineering.

**Pre Requisites:**

1. Students should have the knowledge of Software Engineering Principles and the stages of Software Development Life Cycle and the Traditional models.

**Unit – I**

**UML Introduction:** Why we model, introducing the UML, Building blocks of UML.

**Basic Behavioral Modeling:** Use Cases, Use Case Diagrams,

**Structural Modeling:** Classes, Class Diagrams, Relationships, Common Mechanism, Advanced Structural Modeling, Object Diagrams

**Unit – II**

**Dynamic modeling:** Interactions, Interaction Diagrams, Events and signals, State Machines, Processes and Threads, Time and Space, State Chart Diagrams, Activity Diagrams.

**Unit – III**

**Architectural Modeling:** Interfaces, Packages, Instances, Components, Component Diagrams, Design Patterns and Frame works, Deployment diagrams, Systems and models,

**Unit – IV**

**Unified Software Development Process:** The Unified Process, The Four Ps, Use-Case- Driven Process, Architecture – Centric Process, Iterative and Incremental Process.



## **Unit – V**

**Core Workflows:** Requirements Capture, Capturing Requirements as Use Cases, Analysis Model, Design Model, Implementation Model and Test Model.

### **Text Books:**

1. Grady Booch, James Rumbaugh, Ivor Jacobson, “The Unified Modeling Language – User Guide”, 2<sup>nd</sup> Edition, Pearson Education, India, 2007.
2. Ivor Jacobson, Grady Booch, James Rumbaugh, “The Unified Software Development Process”, Pearson Education, India, 2008.

### **Suggested Reading:**

1. Grady Booch, Robert A. Maksimchuk and Three more, “ Object Oriented Analysis and Design with Applications”, 3<sup>rd</sup> Edition, Pearson Education, 1991.
2. Craig Larman, “Applying UML and Patterns: An Introduction to Object Oriented Analysis and Design and Iterative Development”, 3<sup>rd</sup> Edition, Pearson Education, 2008.
3. Ali Bahrami, “Object Oriented System Development”, Irwin/Mc Graw Hill, 1999.

**SOFTWARE TESTING**

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

**Course Objectives:**

1. To understand the basic concepts of Testing.
2. To learn about the Functional and Integration Testing.
3. Understanding the concepts Object Oriented and Millennium Testing.

**Course Outcomes:**

1. Students would have gained the knowledge of Functional and Integration Testing.
2. Students would have gained the knowledge of Object Oriented Testing, Millennium Testing.
3. Students should have gained the knowledge testing tools which are to be applied for various applications.

**Pre Requisites:**

1. Students should have the knowledge of Software Engineering Principles and the basic knowledge of Testing Approaches and Strategies.

**Unit-I**

**Introduction to Software Testing** Concepts, White Box Approach, Basis Path Testing, Cyclomatic Complexity, Independent paths, D-D Graphs, Dataflow Testing,

**Unit-II**

**Functional Testing:** Boundary Value Testing, Equivalence Class Testing, Decision Table-Based Testing, Retrospective on Functional Testing.

**Unit-III**

**Integration and System Testing:** Levels of Testing, Unit testing, Integration Testing, System Testing, Interaction Testing.

**Unit-IV**

**Object-Oriented Testing:** Issues in Object-Oriented Testing, Class Testing, GUI Testing, Object-Oriented System Testing.

**Unit-V**

**Millennium Testing:** Exploratory Testing, Model-Based Testing, Test-Driven Development, All Pairs Testing, Software Testing Excellence.

**Text Books:**

1. Paul C. Jorgensen, “Software Testing: A Craftsman’s Approach”, 3<sup>rd</sup> Edition, CRC Press, 2007.
2. Roger S. Pressman “Software Engineering”, 7<sup>th</sup> Edition, Pearson Education.

**Suggested Reading:**

1. Boris Beizer, “Software Testing Techniques”, 2<sup>nd</sup> Edition, Dreamtech, 2013.
2. M.G. Limaye, “Software Testing: Principles – Techniques and Tools”, 1<sup>st</sup> Edition, Tata Mc. Hill, 2009
3. Mauro Pezze, Michal Young, “Software Testing and Analysis: Process, Principles and Techniques”, Wiley India Pvt. Ltd.

**MOBILE COMPUTING**

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

**Course Objectives:**

1. To understand the basic concepts of Data Communications.
2. To learn about the telecommunications and broadcasting systems.
3. Understanding the concepts of Wireless LANs.
4. Learn the features of different mobile OS and Mobile Applications.

**Course Outcomes:**

1. Good Knowledge on Data Communications.
2. Understanding the Implementation of telecommunications and broadcasting systems.
3. Awareness of Wireless Transmissions and Protocols.
4. Capable to develop mobile applications.

**Pre Requisites:**

1. Students should have knowledge of Computer Networks and Data Communications.

**Unit- I**

Introduction and applications of mobile computing, Wireless transmission: Frequencies, Signals, Antennas, Signal Propagation, Multiplexing, Modulation, Spread spectrum, Cellular systems. Medium Access Control, SDMA, FDMA, TDMA, CDMA, Comparisons.

**Unit- II**

**Telecommunication system:** GSM, DECT, TDMA, TETRA, UMTS & IMT-2000.

**Satellite systems:** Applications, Basics, routing, localization, Handover.

**Broadcast systems:** Cyclic representation of data, Digital audio Broad casting, Digital video Broadcasting, Convergence of Broadcasting and mobile communication.

**Unit- III**

Wireless LAN: Infrared Vs Radio Transmission, Infrastructure and Ad hoc Networks, IEEE 802.11, HIPERLAN, Bluetooth.

**Unit- IV**

Mobile IP, Dynamic Host Configuration Protocol, Mobile Adhoc Networks, Mobile Transport Layer, Traditional TCP, Classical TCP improvements, TCP over 2.5/3G Wireless Networks, Performance Enhancing Proxies.

**Unit- V**

File systems, WWW, Wireless Application Protocol.

Introduction to Android and IOS, Mobile Applications: PhoneGap, Monotouch, Mono and Derby

**Text Books:**

1. Jochen M.Schiller, “Mobile Communications”, 2<sup>nd</sup> Edition, Pearson Education, India 2003. (Unit I – V)(Unit-V: Chapter 10: File systems, WWW, WAP).
2. Jeff McWheter, Scott Gowell, “Professional Mobile Application Development”, Wiley India Pvt. Ltd. – 2013 (Unit – V: Chapter 6, 7, 11 and 12).

**Suggested Reading:**

1. Dharma P. Agarwal, Qing An Zeng, “Introduction to wireless and Mobile systems”, 2<sup>nd</sup> Edition, Thomas India, 2007.
2. Frank Adelstien, Sandeep K.S.Gupta, “Fundamentals of Mobile and Pervasive Computing”, Tata McGraw Hill, 2005.
3. Ivan Stojmenovic, “Handbook of Wireless and Mobile Computing”, Wiley India, 2006

**MULTIMEDIA**

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

**Course Objectives:**

1. To impart the knowledge of Multimedia concepts.
2. To elaborate the elements and techniques of Multimedia to the students.
3. To make the students verse with the global applications of Multimedia in various domains.

**Course outcomes:**

1. Students would have learned the knowledge of the concepts of Multimedia
2. Students would have learned the knowledge of different Multimedia tools.
3. Students would have learned the application of Multimedia Techniques, which are to be applied in various domains of computer applications.

**Pre Requisites:**

1. A basic knowledge of File Systems, Digital Electronics is required.

**Unit – I**

**Multimedia and Digital Representation:** Characteristics of Multimedia Presentation, Multiple Media, Hardware and Software Requirements, Steps for Creating a Multimedia Presentation, Digital Representation, Relation between Sampling and Bit Depth.

**Unit – II**

**Visual Display Systems – Text – Image:** Video Adapter Card, Liquid Crystal Display (LCD), Plasma Display Panel (PDP), Text Compression, File Formats, Image Types, Basic Steps for Image Processing, Image Processing Software.

**Unit – III**

**Graphs and Audio :** Advantages of Graphs, Uses of Graphs, Components of Graphics Systems, Clipping Algorithms, 3D Graphics, Audio Mixer, Musical Instrument Digital Interface (MIDI), Audio File Formats.

**Unit – IV**

**Video and Compression :** Types of Animation, Computer Assisted Animation, 3D Animation, Special Effects, Lossy / Perceptual Compression Techniques, JPEG Image Coding Standard, MPEG Image Coding Standard, MPEG-2 Video, MPEG-4, MPEG-7.

## **Unit – V**

**Multimedia Architecture and Application Development** : Multimedia Architecture, Hardware Support, Real time Protocols, Streaming Techniques, Multimedia Database Systems (MMDBS), Software Life Cycle Overview, Virtual Reality, Virtual Reality Modeling Language (VRML).

### **Text Books:**

1. Ranjan Parekh, “Principles of Multimedia”, 12<sup>th</sup> Edition, Tata Mc Graw Hill, 2012

### **Suggested Reading:**

1. James E. Shuman, “Multimedia in Action”, Cengage India Pvt. Ltd., 1998.
2. John F Koegel Boford, “Multimedia Systems”, 3rd Edition, Pearson Education.

**SOFTWARE PROJECT MANAGEMENT**

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

**Course Objectives:**

1. To introduce software project management and to describe its distinctive characteristics.
2. To discuss project planning and the planning process.
3. To show how graphical schedule representations are used by project management.
4. To discuss the notion of risks and the risk management process.

**Course outcomes:**

1. A basic knowledge of software project management principles
2. The ability to come up with a project schedule and assign resources
3. Choose an appropriate project development methodology (e.g. Waterfall, Spiral..) and identify project risks, monitor and track project deadlines.
4. The capability to work in a team environment and be aware of different modes of communications

**Pre Requisites:**

1. Students should have concepts of Software Engineering.

**Unit I**

Introduction to Software Project Management, Project Evaluation and Programme Management, An Overview of Project Planning.

**Unit II**

Selection of an Appropriate Project Approach, Software Effort Estimation, Activity Planning.

**Unit III**

Risk Management, Resource Allocation, Monitoring & Control.

**Unit-IV**

Managing Contracts, Managing People in Software Environments, Working in Teams.

**Unit –V**

Software Quality, ISO, An Overview of PRINCE 2.



**Text Books:**

1. Bob Hughes and Mike Cotterell, "Software Project Management", 5<sup>th</sup> Edition, Tata McGraw Hill, 2010.

**Suggested Reading:**

1. Walker Rayce, "Software Project Management: A Unified Framework", Addison Wesley, 1998.
2. Watts S. Humphrey, "Managing Software Process", Addison – Wesley Pearson Education, 1998.

**CLOUD COMPUTING**

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

**Course Objectives:**

1. To understand the fundamentals of Cloud Computing
2. To make a study of basics Virtual Machines and virtualization
3. To understand the architecture of cloud computing and impart knowledge in Cloud Security
4. To learn a Cloud Programming and Software Environments

**Course Outcomes:**

1. Understand the basic concepts of the cloud computing.
2. Understand the virtual machines and virtualization.
3. Understanding the Cloud computing through Case studies.
4. Gaining the importance of security in Cloud.
5. Learning Cloud supporting languages.

**Pre Requisites:**

1. This course assumes a sound background in operating systems and computer architecture. All students should be proficient in a programming language such as C# or Java or python as used on an operating system like Windows or Linux.

**UNIT - I**

The Evolution of Cloud Computing: Hardware Evolution, Internet Software Evolution, Server Virtualization. Web Services Delivered from the Cloud : Communication-as-a-Service (CaaS),Infrastructure-as-a-Service (IaaS), Monitoring-as-a-Service (MaaS),Platform-as-a-Service (PaaS),Software-as-a-Service (SaaS).

**UNIT - II**

Building Cloud Networks : The Evolution from the MSP Model to Cloud Computing and Software-as-a-Service, The Cloud Data Center, Collaboration, Service-Oriented Architectures as a Step Toward Cloud Computing, Basic Approach to a Data Center-Based SOA,The Role of Open Source Software in Data Centers, Where Open Source Software Is Used.

**UNIT - III**

Virtualization Practicum, Federation, Presence, Identity, and Privacy inthe Cloud : Federation in the Cloud, Presence in the Cloud,Privacy and Its Relation to Cloud-Based Information Systems.

**UNIT - IV**

Security in the Cloud: Cloud Security Challenges, Software-as-a-Service Security, Is Security-as-a-Service the New MSSP.

#### **UNIT - V**

Common Standards in Cloud Computing : The Open Cloud Consortium, The Distributed Management Task Force, Standards for Application Developers, Standards for Messaging, Standards for Security. End-User Access to Cloud Computing : YouTube API Overview ,Zimbr, Facebook,Zoho, DimDim Collaboration

#### **Text Book:**

1. John W. Rittinghouse, James F. Ransome, "Cloud Computing: Implementation, Management and Security", CRC Press 2009.

#### **Suggested Reading:**

1. Kai Hwang. Geoffrey C.Fox, Jack J. Dongarra, "Distributed and Cloud Computing From Parallel Processing to the Internet of Things", Elsevier, 2012.
2. Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, "Cloud Computing: Principles and Paradigms (Wiley Series on Parallel and Distributed Computing)", Wiley Publishing, 2011
3. Raluca Ada Popa, Catherine M.S. Redfield, Nickolai Zeldovich, and Hari Balakrishnan, "CryptDB: Protecting Confidentiality with encrypted Query Processing" 23rd ACM Symposium on Operating Systems Principles (SOSP 2011), Cascais, Portugal October 2011.

**INFORMATION RETRIEVAL SYSTEMS**

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

**Course Objectives:**

1. This course shall be useful to gain knowledge on Information Storage and Processing.
2. The course will establish the knowledge of Retrieval and Performance of Information Retrieval Systems.

**Course Outcomes:**

1. To know the capabilities of IR Systems.
2. To understand the Design and Implementation of IR Systems.
3. To evaluate the performance of an IR Systems.
4. To extract relevant information from large collections.

**Pre Requisites:**

1. Knowledge required on File Systems, DBMS and Data Structures.

**UNIT-I**

**Introduction to Information Retrieval Systems:** Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data warehouses.

**Information Retrieval System Capabilities:** Search capabilities, Browse capabilities, miscellaneous capabilities.

**UNIT-II**

**Cataloging and Indexing:** Objectives of Indexing, Indexing Process, Automatic Indexing, Information Extraction.

**Data Structures:** Introduction to Data Structures, Stemming Algorithms, Inverted File Structure, N-gram Data Structures, PAT data Structure, Signature File Structure, Hypertext Data Structure.

**UNIT-III**

**Automatic Indexing:** Classes of Automatic Indexing, Statistical Indexing, Natural Language, Concept Indexing, Hypertext Linkages.

**Document and Term Clustering:** Introduction to Clustering, Thesaurus generation, Item Clustering, Hierarchy of Clusters.

**User Search Techniques:** Search statements and binding, Similarity measures and ranking, Relevance feedback. Selective dissemination of information search, weighted searches of Boolean systems, Searching the Internet and hypertext.

#### **UNIT-IV**

**Information Visualization:** Introduction to Information Visualization, Cognition and Perception, Information Visualization Technologies.

**Text Search Algorithms:** Introduction to Text Search Algorithms, Software Text Search Algorithms, Hardware Text Search Systems.

#### **UNIT –V**

**Multimedia Information Retrieval:** Spoken Language Audio Retrieval, Non–Speech Audio Retrieval, Graph Retrieval, Imagery Retrieval, Video Retrieval.

**Information System Evaluation:** Introduction to Information System Evaluation, Measures used in System Evaluations, Measurement Examples – TREC results.

#### **Text Books:**

1. Kowalski, Gerald Mark T Maybury, “Information Storage and Retrieval Systems: Theory and Implementation”, Springer International Edition, Kluwer Academic Publishers, 2000

#### **Suggested Reading:**

1. Ricardo Baeza-Yates, Berthier Ribeiro – Neto, “Modern Information Retrieval”, Pearson Education, 1999.
2. David A Grossman and Ophir Frieder, “Information Retrieval : Algorithms and Heuristics”, 2<sup>nd</sup> Edition, Springer International Edition, 2004.
3. William B Frakes, Ricardo Baeza – Yates, “Information Retrieval Data Structures and Algorithms”, Pearson Education, 1992.

**PROGRAMMING LAB - OOSD**

Instruction	3 Periods per week
Duration of Main Examination	3 Hours
Main Examination	50 Marks
Sessional	25 Marks
Credits	2

**Course Objectives:**

1. To understand the basic operations of case tool (Rational Rose)
2. To know about the representation of Structural and Dynamic modeling
3. Understanding the concepts of Architectural modeling and its representation.

**Course Outcomes:**

1. Students would have gained the practical knowledge of structural modeling of Object Oriented Applications through UML.
2. Students would have gained the practical knowledge of dynamic modeling of Object Oriented Applications through UML.
3. Students would have gained the practical knowledge of Forward and Reverse Engineering.

**Pre Requisites:**

1. Students should have the knowledge of Software Diagrams like DFD's and ER Diagrams.

The students have to implement the following UML modellings on a selected case study by forming themselves into teams in the LAB.

They should use an appropriate case tool like Rational Rose.

- Use case modeling
- Structural modeling
- Behavioral modeling
- Architectural modeling

The outcome of each case study should consists of

1. Use case Diagram
2. Class Diagram
3. Object Diagram
4. Sequence Diagram
5. Collaboration Diagram
6. State chart Diagram
7. Activity Diagram
8. Component Diagram
9. Deployment Diagram

The students should finally submit a technical report on their case study in IEEE format.

**Text Books:**

1. Ivor Jacobson, Grady Booch, James Rumbaugh, “The Unified Software Development Process”, Pearson Education, India, 2008.
2. Curtis HK T Sang, Clarence SW Lau, Ying K. Leung, “Object-Oriented Technology: from Diagram to Code with Visual Paradigm for UML” 1<sup>st</sup> Edition, McGraw-Hill Science/Engineering/Math, 2005.

**Suggested Reading:**

1. Grady Booch, James Rumbaugh, Ivor Jacobson, “The Unified Modeling Language – User Guide”, 2<sup>nd</sup> Edition, Pearson Education, India, 2007.
2. Grady Booch, Robert A. Maksimchuk and Three more, “ Object Oriented Analysis and Design with Applications”, 3<sup>rd</sup> Edition, Pearson Education, 1991.
3. Craig Larman, “Applying UML and Patterns: An Introduction to Object Oriented Analysis and Design and Iterative Development”, 3<sup>rd</sup> Edition, Pearson Education, 2008.

**MC 317**

**With effect from the academic year 2015-16**

**PROGRAMMING LAB - MWT**

Instruction	3 Periods per week
Duration of Main Examination	3 Hours
Main Examination	50 Marks
Sessional	25 Marks
Credits	2

**Course Objectives:**

1. To understand the remote method invocation.
2. To gain knowledge in Java Beans and Enterprise java beans
3. To gain knowledge in .NET programming using C# programming language.

**Course Outcomes:**

1. To practice web service programs through ejbs
2. To practice computer applications through C# programming language.

**Pre Requisites:**

1. A strong knowledge on Computer programming is required.
2. A knowledge on Java Script and VB Script is required
3. Knowledge on Web programming is required.

1. Create a Distributed name Server (like DNS) RMI.
2. Create a Java Bean to draw various graphical shapes and display it using or without using BDK.
3. Develop an enterprise Java Bean for student Information System.
4. Develop an enterprise Java Bean for Library operations.
5. Create and invoke Web Services.
6. Develop an application for converting the currency values using .NET.
7. Develop an application for browsing CD catalogue using .NET.
8. Develop a Student Information System Forms using .NET and store data into database.
9. Develop a Library Information System Forms using .NET and store data into database.
10. Implement a Sample Inventory Management System using .NET and store data into database.

**Text Book:**

1. Robert Orfali, Dan Harkey and Jeri Edwards, "The Essential Client / Server Survival Guide", Galgotia Publications Pvt. Ltd, 2002.

**Suggested Reading:**

1. Tom Valesky, "Enterprise Java Beans", Pearson Education, 2002.
2. John Sharp, Job Jagger, "Microsoft Visual C#.NET step by step", Prentice hall of India Private Ltd, 2003.



**MC 318**

**With effect from Academic Year 2015-16**

**SEMINAR**

Instruction  
Sessional

3 Periods per week  
25 Marks

Oral presentation is an important aspect of technical and objective of the seminar is to prepare the student for a systematic and independent study of the state of the art topics in a broad area of thread specifications

Seminar topics may be chosen by the students with advice from the faculty members . Students are to be exposed to the following aspects of the seminar presentation.

- Literature Survey
- Organization of the material
- Presentation of PPTs
- Technical writing

**Each student is required to:**

1. Submit one page synopsis before the seminar talk for display on the notice board
2. Give a 15 minutes presentation through OHP, PC, Slide projector followed by a 5 minutes discussions
3. Submit a report on the seminar topic with a list of reference and slided used

Seminars are to be scheduled from the 3<sup>rd</sup> week to the last week of semester and any change in schedule should be discouraged.

For award of Sessional marks students are to be judged by at least two faculty members on the basis of an oral and written presentation as well as their involvement in the discussion.

**PROJECT WORK**

Instruction	6 Periods per week
University Examination	Viva-Voce
University Examination	Grade
Sessional	50 Marks

Sixth Semester of the MCA course is exclusively meant for project work. Project has to be carried out by each student individually in a period of 15 weeks of duration. Students should submit a synopsis at the end of 2<sup>nd</sup> week in consultation with the Project Guide. The synopsis should consist of definition of the problem, scope of the problem and plan of action. After completion of eight weeks students are required to present a Project Seminar on the topic covering the aspects of analysis, design and implementation of the project work.

At the end of the semester the students are required to present themselves for a University Viva-voce examination in which each student will be awarded with a grade.

A committee consisting of two faculty members of the respective college along with a guide will evaluate the project and award internal marks.

**PROJECT SEMINAR**

Instruction  
Sessional

3 Periods per week  
25 Marks

**Each student will be required to:**

1. Submit one page of synopsis on the project work for display on notice board.
2. Give a 20 minutes presentation followed by 10 minutes discussion.
3. Submit a technical write-up on the project.

At least two teachers will be associated with the Project Seminar to evaluate students for the award of sessional marks which will be on the basis of performance in all the 3 items stated above.

The project seminar presentation should include the following components of the project:

- Problem definition and specification.
- Literature survey, familiarity with research journals.
- Broad knowledge of available techniques to solve a particular problem.
- Planning of the work, preparation of bar(activity) charts
- Presentation-oral and written.