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
With effect from Academic Year 2015-16

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

I SEMESTER

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<th>Syllabus Ref. No.</th>
<th>Subject</th>
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<td>Information Security</td>
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<td>MC 312</td>
<td>Middleware Technologies</td>
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<td>MC 313</td>
<td>Object Oriented System Development</td>
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<td>Software Testing</td>
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<td>MC 363</td>
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<td>MC 372</td>
<td>Cloud Computing</td>
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<td>Information Retrieval Systems</td>
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<td>Programming Lab-OOSD</td>
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<td>Programming Lab-MWT</td>
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L: Lecture, T: Tutorial, D: Drawing, P: Practical
With effect from Academic Year 2015-16

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

II SEMESTER

<table>
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<th>Sl No.</th>
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</table>

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

Unit-II
Legal, Ethical and Professional Issues: Law and ethics in information security, Ethics and information Security.

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:

Suggested Reading:
MC 312

With effect from Academic Year 2015-16

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

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 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:


Essential Reading


MC 313
With effect from Academic Year 2015-16

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

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

Unit – IV
Unit – V

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

Text Books:


Suggested Reading:


SOFTWARE TESTING

Instruction
Duration of Main Examination
Main Examination
Internal Examination
Assignment
Credits

4L periods per week
3 Hours.
75 Marks
20 Marks
5 Marks
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

Unit-III

Unit-IV

Unit-V
Text Books:


Suggested Reading:


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.
4. Capable to develop mobile applications.

Pre Requisites:

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

Unit- I

Unit- II
Broadcast systems: Cyclic representation of data, Digital audio Broadcasting, Digital video Broadcasting, Convergence of Broadcasting and mobile communication.

Unit- III

Unit- IV
Unit-V
Introduction to Android and IOS, Mobile Applications: PhoneGap, Monotouch, Mono and Derby

Text Books:


Suggested Reading:


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

Unit – III

Unit – IV
Unit – V

Text Books:


Suggested Reading:


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

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

Unit III
Risk Management, Resource Allocation, Monitoring & Control.

Unit-IV

Unit –V
Text Books:


Suggested Reading:


### CLOUD COMPUTING

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<td>Assignment</td>
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<td>Credits</td>
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**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**

**UNIT - II**

**UNIT - III**

**UNIT - IV**

UNIT - V

Text Book:

Suggested Reading:
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:


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

UNIT-III
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.


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


Text Books:


Suggested Reading:


MC 316

With effect from Academic Year 2015-16

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:


Suggested Reading:


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

Text Book:


Suggested Reading:


MC 318

With effect from Academic Year 2015-16

SEMINAR

Instruction: 3 Periods per week
Sessional: 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 discussion
3. Submit a report on the seminar topic with a list of reference and slide used

Seminars are to be scheduled from the 3rd 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

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<th>6 Periods per week</th>
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<tr>
<td>Sessional</td>
<td>50 Marks</td>
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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\textsuperscript{nd} 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 Vive-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 3 Periods per week
Sessional 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.