

BARATHIYAR UNIVERSITY
MCA- Enterprise Software Development and Management
Course Curriculum

**REGULATIONS AND SYLLABUS
FOR
MCA- ENTERPRISE SOFTWARE DEVELOPMENT AND MANAGEMENT**

Offered by

**BHARATHIAR UNIVERSITY, COIMBATORE
FROM 2007-2008**

Under The

**UNIVERSITY INDUSTRY INTERACTION AND
CONSULTANCY SERVICE CENTER (UIICSC)
COLLABORATIVE PROGRAMME**

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Regulations and syllabus
(Effective from Academic Year 2007 onwards)

1. Description of the course/objective of the course

The software industry is a coveted business phenomenon in India aggregating a business volume of 40 billion dollars and currently employing 13 lakhs professionals.

According to the recent NASSCOM-McKinsey report, the IT/ ITeS sector is running up an employability crisis which could dent its pre-eminence as the preferred global off-shoring destination. According to the study India will need a 2.3 million strong IT and BPO workforce by 2010 to maintain its current market share. The Software industry requires highly skilled, qualified and technically competent professionals who are productive without additional training. Supply projections indicate a potential shortfall of nearly 5 lakhs of qualified employees.

This course as been designed to blend the expertise from the software industry and the knowledge and powerful delivery mechanism of the academics to develop skilled industry acceptable professionals. The program is designed and administered in such a way the student on completion of the course becomes employable by the ultimate user industry without further grooming or training. The Program **MCA – Enterprise Software Development and Management** is a program that provides the student with the most wanted concepts skills and techniques that can make him an expert in the field of software technology.

2. Eligibility for admission

1. Candidates for admission to the **MCA – Enterprise Software Development and Management** course shall have completed a Bachelors Degree of 3 years duration in any discipline from any recognized university.

2. Candidates who have completed a Bachelors Degree of 3 years duration in any discipline from any recognized university and a Post Graduate Course in Computer Applications (PGDCA) of 1 year duration from any recognized university may be provided with a lateral entry with paper exemption directly into the 2nd year of the **MCA – Enterprise Software Development and Management** course.

In the case of Lateral Entry the candidate shall be required to undertake an examination in qualifying subjects that have not been studied by the candidate in his previous curriculum of year 1 at the previous university/college in comparison to that of the subjects being covered in this curriculum. These examinations may be undertaken by the student during his remaining period of study.

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3. Duration of the course

The duration of the course shall be for a period of three years. Examinations will be conducted at the end of every year for the respective subjects.

4. Course of Study

The course of study shall contain the subjects as defined in section - 6.

Candidates will be required to undergo learning in theory, practical, project development and workshop subjects in the institution. Candidates will be exposed to real time projects / environments of the company and will develop practical / Projects related to the company's project / product and services during the entire course of study.

5. Examination

The student will be undergoing a continuous assessment through out his period of study. The evaluation will consists of CIA, External examination, Viva - voce, for each subject based on the specific requirement of the respective subject and is detailed in section -6.

5(A). Evaluation systems and question papers

There will be four methods of evaluation

- a. Continuous Internal Assessment (CIA) will be conducted by the institution.
- b. The External examination will be conducted by the university at the end of the year for subjects mentioned.
- c. Project evaluation – will consists of two components viva – voce and Project evaluation. Will be jointly conducted by the institution and the university.
- d. Workshop Assessment: will be conducted by the institution.

a) Continuous Internal Assessment:

Further the Continuous Internal Assessment will be conducted for all subjects and scaled to 40%

100 Marks is divided as follows

Tests	:	50 Marks
Quiz (Objective tests)	:	20 Marks
Constructive Class Participation (CCP)	:	10 Marks
Assignments	:	10 Marks
Seminars (Each person seminar per year)	:	10 Marks

Total : 100 Marks (Scaled to 40%)

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b) External Examination:

The External examination shall be conducted by the university for 100 marks and will be converted to 60% of total marks. The pattern of question papers will be as follows

Section A. Objective type with no choice – 40%
40 questions 8 from each unit

Section B. Short answer questions of either or type - 40%
4 questions – 2 from each unit

Section C. Essay type questions of either or type - 20%
2 questions – 1 from each unit

Total : 100 Marks (Scaled to 60%)

c) Project evaluation:

Each project development contains CIA 40% and end evaluation of 60%.

Continuous Internal Assessment 40 %

The end evaluation will contain two components

Viva – voce 30 %

End evaluation 30 %

Total : 100 Marks

d) Workshop evaluation :

Workshop will be awarded 100% marks through continuation assessment by the institution and there will not be any external examination.

Workshop continuous assessment : 100 %

Total : 100 Marks

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7. Requirements to appear for the external examination

A candidate will be permitted to appear for the university examination of any year if he / she secures not less than 90% of attendance in the number of instructional days / practical at industry during the calendar year, failing which he/ she should redo that course of study.

8. Medium of instruction and Examination

The medium of instruction and examination for the all the papers shall be in English.

9. Passing requirements

- a. A candidate shall be declared to have passed the examination in a subject if he / she secured not less than 40% in the university examination and 40% both internal and external examination (overall).
- b. A candidate who successfully completes the course and passes the examinations prescribed in all the subjects of study shall be declared to have been qualified for the **Master of Computer Applications - Enterprise Software Development and Management**
- c. If a candidate does not complete the course successfully within a period of 6 years from the date of his / her joining he / she will not be eligible to receive the Master of Computer Applications - Enterprise Software Development and Management

10. Classification of Successful Candidates

- a. All candidates securing not less than 75% of the aggregate marks shall be declared to have passed in FIRST CLASS with DISTINCTION provided they have passed the examination in every subject without failure in anytime within the course of study.
- b. All the candidates securing not less than 60% of the aggregate marks shall be declared to have passed in FIRST CLASS provided they have passed the examination in every subject
- c. Other successful candidates shall be declared to have passed the examinations in SECOND CLASS

11. Conferment of the Degree

Candidates shall be eligible for conferment of the Degree, if he / she has undergone the prescribed course of study for a period of three years in an institution approved by the university and also has passed the examinations as have been prescribed.

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Year	Course Code	Course Title	Examination Marks			Total Marks
			Internal Marks	External Marks / Viva Voce	Project Marks	
Year 1	MCA07101	Fundamentals of IT, Operating Systems & PC Software	40	60	NA	100
	MCA07102	Maths – Discrete Mathematics	40	60	NA	100
	MCA07103	Operating Systems	40	60	NA	100
	MCA07104	Accounting and Financial Management	40	60	NA	100
	MCA07105	Communication, soft skills, PDP	100	NA	NA	100
	MCA07106	Principles of Programming languages & Programming in C	40	60	NA	100
	MCA07107	Object Oriented Analysis Design, UML, OOP and C++	40	60	NA	100
	MCA07108	Microprocessors & Assembly language	40	60	NA	100
	MCA07109	Computer Networks and O/S administration	40	60	NA	100
	MCA07110	Project – System side, embedded systems using C and C++	40	30	30	100
Year 2	MCA07201	Operations Research	40	60	NA	100
	MCA07202	Computer System Organization and Architecture	40	60	NA	100
	MCA07203	Computer Algorithms	40	60	NA	100
	MCA07204	Software engineering	40	60	NA	100
	MCA07205	Data Warehousing and Data Mining	40	60	NA	100
	MCA07206	Project Development - RDBMS with distributed database	40	30	30	100
	MCA07207	Project Development -Data structures and Logic Building	40	30	30	100
	MCA07208	Web Technologies – Java / J2EE platform	40	60	NA	100
	MCA07209	Project development using Client/Server Technology	40	30	30	100
	MCA07210	Project development in Web/Enterprise technology - Java / J2EE	40	30	30	100
Year 3	MCA07301	Software Project Management & Quality Assurance	40	60	NA	100
	MCA07302	Project in Graphics and multimedia	40	30	30	100
	MCA07303	Project development in Wireless application development	40	30	30	100
	MCA07304	Project development in current technologies	40	30	30	100
	MCA07305	Project in software testing	40	30	30	100
	MCA07306	Web Technologies – .Net platform	40	60	NA	100
	MCA07307	Project development using .Net	40	30	30	100
	MCA07308	Communication, Softskills, PDP	100	NA	NA	100
	MCA07309	PROJECT WORK	40	30	30	100

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6. Scheme of examinations ... continued

NOTES

CIA - Continuous Internal Assessment

NA - Not Applicable

Evaluation for all project papers will be as follows.

Final evaluation will consist of two components 1) viva voce and 2) project work

1. viva voce to be conducted on completion of the Project jointly by university and the institution .

2. Project evaluation to be done on completion of the project jointly by the university and the institution

based on final output of the software project and the record work submitted

12. Syllabus

The detailed syllabus for the course is as follows

Year 1

MCA07101 Fundamentals of IT, Operating Systems & PC Software
MCA07102 Discrete Mathematics
MCA07103 Operating Systems
MCA07104 Accounting and Financial Management
MCA07105 Communication, soft skills, PDP
MCA07106 Principles of Programming languages & Programming in C
MCA07107 Object Oriented Analysis Design, UML, OOP and C++
MCA07108 Microprocessors, Assembly language
MCA07109 Computer Networks and O/S administration
MCA07110 Project Development – Systems side, embedded systems using C and C++

Year 2

MCA07201 Operations Research
MCA07202 Computer System Organization and Architecture
MCA07203 Computer Algorithms
MCA07204 Software engineering
MCA07205 Data Warehousing and Data Mining
MCA07206 Project Development - RDBMS with distributed database
MCA07207 Project Development -Data structures and Logic Building
MCA07208 Web Technologies – Java / J2EE platform
MCA07209 Project development - Client/Server Technology.
MCA07210 Project development in Java / J2EE

Year 3

MCA07301 Software Project Management & Quality Assurance
MCA07302 Project development in Graphics and multimedia
MCA07303 Project development in Wireless application development
MCA07304 Project development in current technologies
MCA07305 Project in software testing
MCA07306 Web Technologies – .Net platform
MCA07307 Project development in .Net
MCA07308 Communication, soft skills, PDP
MCA07309 PROJECT WORK

Course Code: MCA07101

Course Title: Fundamentals of IT, Operating Systems & PC Software

Course Objective

This course will introduce the students to computers, hardware and software. It will deal with operating systems networks, internet and office automation techniques. The student will have a strong foundation in the field of computers.

UNIT I INTRODUCTION TO COMPUTERS

Introduction to computers – Areas of application – Advantages of computers - Computer hardware basics – Understanding computer Memory and Operating system – working with desktop – Creating directories – text files – searching the file – CUI and GUI systems

UNIT II WORD PROCESSOR

Introduction to word processor – creating a document – Editing a document – Formatting Text and paragraphs – Section Breaks and Page breaks – header and footer – customization – printing the document – print , page alignments – cut , copy & paste – modifying font – aligning text – indenting paragraphs and modifying line spacing – inserting numbers and bullets – viewing document – working with tables – inserting images – save and protect document – merge document

UNIT III SPREAD SHEET

Creating worksheets and workbooks – working with numbers – modifying worksheet layout – print from worksheets – formatting the text – selecting multiple cells – writing formula – copying formulae in cells – edit formulae – formatting cell – working with cell size – inserting and deleting rows/columns – moving and copying cells – transferring data between worksheet/workbook – creating references – using functions – data management – relative references absolute references – creating a range – using statistical functions – previewing the worksheet – managing different views – save and protect spreadsheet – sorting – filtering

UNIT IV PRESENTATION

Creating blank presentation – creating a presentation using auto content wizard – using templates –different views of slides – modifying the impact of slides – print handouts and notes – drawing on slides – customizing a presentation – working with graphs – insert objects and graphics – insert animation – working with background and fill pattern

UNIT V INTERNET BASICS

Application areas of internet – World Wide Web – File transfer protocol – Email – requirements for an internet connection – surfing the net – understanding chat – Searching and search engine – web 2.0 basics – Forums – Blogs

TEXT BOOK

1. Courseware to be provided by the institution

Course Code: MCA07102

Course Title: Discrete Mathematics

Course Objective:

Since the advent of electronic computers, Discrete Mathematics has become one of the most important theoretical courses for a Master's level program in Computer Science and Applications. Topics from Discrete Mathematics provide tools for analysis and design of computer hardware and computer software. Also topics like Propositional Calculus provide the foundation for imbedding logical reasoning in computer science.

Syllabi

UNIT I - BOOLEAN ALGEBRA AND LOGIC CIRCUITS

Boolean Algebras, Boolean Expression, Logic Circuits, Boolean Functions, Statements-Truth Tables-connectives-Normal forms-Predicate Calculus-Inference theory for statement calculus and Predicate Calculus.

UNIT II - COMBINATORICS

Multiplication and Addition Principles, Permutations – Notations, Circular Permutations, Permutations of Objects and Necessarily Distinct, Combinations-Review of Permutation and combination-Mathematical Induction-Pigeon hole principle-Principle of inclusion and exclusion-Generating function-Recurrence relations- Euler's Totient Function, Application to onto maps, Application to Probability

UNIT III - GROUPS

Semi groups-Monoids-groups-permutation group-Conssets-Lagranges theorem-Group homomorphism-Kernal-Rings and Fields (definitions and Examples only).

UNIT IV LATTICES

Partial ordering- Posets-Hasse diagram-Lattices-Properties of Lattices-Sub Lattices-Special Lattices-BooleanAlgebra.

UNIT V GRAPHS

Introduction to Graphs-Graph terminology-Representation of Graphs-Graph Isomorphism-Connectivity-Euler and Hamilton Paths.

TEXTBOOK

1. "Discrete Mathematical Structures with Applications to Computer Science", by Tremblay J.P, and Manohar R., McGraw Hill Book Company, 1975, International Edition, 1987.

Sections: 1-2.1 to 1-2.4; 1-2.6 to 1-2.14; 1-3.1 to 1-3.5; 1-4. 1 to 1-4.3; 1-5.1 to 1-5.5; 1-6.4 and 1-6.5 for Logic. Sections: 3-1.1 to 3-2.3; 3-5.1 to 3-5.5 for Groups Rings and Fields. Sections:2-3.8 and 2-39; 4-1.1 to 4.2.2 for Lattices.

2. "Discrete and Combinatorial mathematics", Ralph P., Grimaldi, Addison-Wesley Publishing Company, Reprinted in 1985.

Sections : 1.1. to 1.3; 4.1 and 4.2.; 5.5; 8.1 to 8.3; 9.1 to 9.5; 10.1, 10.2 and 10.4 for Combinatorics.

3. "Discrete Mathematics and its Applications", Kenneth H.Rosen, McGraw Hill Book Company, 1999.

Sections: 7.1 to 7.5.

- Courseware to be provided by the institution

- **Course Code: CA07103**
Course Title: Operating Systems
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Course Objective:

The course in operating systems (OS) is designed to provide students a clear description of the concepts that underlie operating systems. It explains what operating systems are, what they do and how they are designed and constructed. It also discusses the common features of an operating system, and how it interfaces the user and computer. The student will be able to install and manage Operating System in a computer.

Syllabi

UNIT I. INTRODUCTION

Definition of OS-Mainframe System-Desktop Systems-Multi processor System-Distributed-Clustered-Real time Systems-Handheld Systems-Operating System Structure-System Components-Services-System Calls-System Programs-System Design and Implementation

UNIT II PROCESS MANAGEMENT

Concepts-Process Scheduling-Operations on Processes-Co-operating Processes-Inter Process Communication-Examples of IPC Systems – Multi threaded programming concepts – Multithreading Models – Thread Libraries – Threading issues – OS Examples – Process Scheduling – scheduling criteria – Scheduling algorithms – multiple processor scheduling – thread scheduling

UNIT III PROCESS COORDINATION

Critical Section-Peterson's Solution - Synchronization Hardware-Semaphores-Problems of Synchronization-Critical Regions – Monitors – Deadlocks – Characterization - Handling Deadlocks-Deadlock Prevention-Avoidance-Detection-Deadlock Recovery

UNIT IV MEMORY MANAGEMENT

Storage Hierarchy-Storage Management Strategies-Contiguous-Non Contiguous Storage Allocation-Single User-Fixed Partition-Variable Partition-Swapping-Virtual Memory-Basic Concepts-Multilevel Organization-Block Mapping-Paging-Segmentation-Page Replacement Methods-Locality-Working Sets

UNIT V I/O AND FILE SYSTEMS

Disk Scheduling-File Concepts-File System Structure-Access Methods-Directory Structure-Protection-Directory Implementation-Allocation Methods-Free Space Management-Case Study: Linux System

Practical session: Installation of operating systems

TEXT BOOK

1. Abraham Silberschatz, Peter baer Galvin and Greg Gagne, Operating System Concepts, Asia Student Edition, John Wiley & Sons, Inc., 2006

REFERENCES

1. Milankovic M., Operating System Concepts and Design, 2nd Edition, McGraw Hill, 1992

2. P.C.Bhatt, An Introduction to Operating Systems-Concepts and Practice, Prentice Hall Of India, 2004

3. H.M.Deitel, An Introduction to Operating Systems, 2nd Edition, Pearson Education, 2002

- Courseware to be provided by the institution

Course Code: MCA07104

Course Title: Accounting & Financial Management

Syllabi

UNIT I- ACCOUNTING

Meaning and Scope of Accounting-Principles-Concepts-Conventions-Accounting Standards-Double entry book keeping, Books of accounts, Final Accounts-Trial Balance-Trading Account-Profit and Loss Account-Balance Sheet-Accounting Ratio Analysis-Funds Flow Analysis-Cash Flow Analysis

UNIT II- COST ACCOUNTING

Meaning-Objectives-Elements of Cost-Cost Sheet-Marginal Costing and Cost Volume Profit Analysis-Break Even Analysis-Applications-Limitations-Standard Costing and Variance Analysis-Material-Labor-Overhead-Sales-Profit Variances

UNIT III- WORKING CAPITAL & BUDGETS

Budgets -Meaning-Types-Sales Budget-Production Budget-Cost of Production Budget-Flexible Budgeting-Cash Budget-Master Budget-Zero Base Budgeting- Concepts of Working Capital-Working Capital Policies-Factors affecting Working Capital-Estimation of Working Capital Requirements

UNIT IV- COMPUTERIZED ACCOUNTING

Book keeping – Double entry book keeping - Final accounts – Trial Balance – Trading Account – Profit and Loss Account – Balance Sheet – Sales – Purchase – Inventory – Invoice – Reports - Using Accounting package.

UNIT V- SYSTEM STUDY BANKING

SB Account – Current account – Deposits – Transfer - Loan – Types of Loan – Reconciliation - Back office operations – ATM – Credit card – Net Banking

TEXTBOOK

1. S.N.Maheswari, "Financial and Management Accounting", Sultan Chand & Sons, 2003
2. I.M.Pandey, "Financial Management", Vikas Publications, 4th Reprint, 2002

REFERENCES

1. S.P.Iyengar, "Cost and Management Accounting", Sultan Chand & Co,
2. I.M.Pandey, "Elements of Management Accounting" Vikas Publishing House, 1993
 - Courseware to be provided by the institution

Course Code: MCA07105

Course Title: Communication, soft skills, and PDP

Course Objective:

This course targets at preparing the student to effectively communicate and improve written and oral communication, improve listening and comprehension skills the student would understand etiquettes, improve presentation capabilities and develop an overall personality which will help him become software professional

Syllabi

- Organizational Structure
- Communication process
- Goal setting and Decision Making
- Behavior, Attitude and Etiquette
- Self-esteem and Self-confidence
- Stress Management
- Time Management
- Team Work and Leadership
- Presentation Skills
- Meetings
- Group Discussions
- Resume Building
- Interview Techniques
- Mock interview

TEXT BOOK

1. Courseware to be provided by the institution

Course Code: MCA07106

Course Title: Programming in C

Course Objective

This course teaches the basic approach to be taken while writing a program regardless of the language being used. This module also aims at teaching what an algorithm, pseudocode, flowchart is and how to go about writing algorithms that are independent of any programming language. This is an intensive introduction to C programming. At the end of the course attendees should be reasonably confident in reading and writing C programs and have a good practical understanding of advanced topics such as the use of C pointers, the relationship between pointers and arrays, as well as dynamic memory allocation and memory management. Throughout, the course will emphasize a disciplined and structured approach to C programming. Debugging and code testing techniques will also be covered extensively.

Syllabi

UNIT I – PRINCIPLES OF PROGRAMMING

Basic programming concepts- Datatype – Programming constructs – Pseudocode – Flowchart - Algorithms - The Problem Solving aspect – Top down Design – Implementation of Algorithms – Program Verification – Efficiency of Algorithms – Analysis of Algorithms

UNIT II - FUNDAMENTAL ALGORITHMS - 9

Introduction – Exchanging the values – Counting – Factorial Computation – SINE computation – Base Conversion – Factoring Methods – Array Techniques.

UNIT III - INTRODUCTION TO C LANGUAGE - 9

Overview of C – Constants, Variables and Data Types – Operators and Expressions – Managing Input/Output Operations – Formatted I/O – Decision Making - Branching – IF, Nested IF – Switch – goto - Looping- While, do, for statements.

UNIT IV - ARRAYS, FUNCTIONS, STRUCTURES AND UNIONS - 9

Arrays – dynamic and multi-dimensional arrays - Character arrays and Strings – String handling Functions - User defined Functions – Categories of Functions – Recursion - Structures and Unions – Array of Structures – Structures and Functions

UNIT V - POINTERS, FILE MANAGEMENT AND MACROs

Pointers – Declaration, Accessing a variable, character strings, pointers to functions and structures - File Management in C – Dynamic Memory allocation – Linked Lists – Preprocessors. - The MACRO pre-processor and how to use it wisely-Unions-Bit fields-Date and Time functions in the C Standard Library-Diagnostics the assert macro

TEXTBOOK

1. Courseware to be provided by the institution
2. R.G.Dromey "How to Solve it by Computer ", PHI , 1998
3. E.Balagurusamy " Programming in ANSI C " , Tata McGraw Hill, 2004

REFERENCES

1. Deitel and Deitel "C How to Program ", Addison Wesley , 2001
 2. Brian W.Kernighan & Dennis Ritchie "C Programming Language", PHI, 1990
 3. Byron.S.Gottfried "Schaum's Outline of Programming with C", 2nd Edition, 1996
- Courseware to be provided by the institution

Course Code: MCA07107

Course Title: Object Oriented Analysis and Design, UML and OOP C++

Course Objective

This course provides a solid grounding in the techniques and application of Object Oriented Analysis and Design. Attendees will learn how the use of the UML and techniques can bring real improvements to the quality and efficiency of the design process. It also teaches how to apply OOP through C++ and using C++ programming features effectively. At the end of course the attendees should be confident in solving real time problems using OOP and UML and writing code for the same in C++.

Syllabi

UNIT I : A BACKGROUND TO OBJECT ORIENTED SYSTEM

Objects as things having attributes and methods- The message passing model of object interaction - Objects as instances of some class, Relationships between objects- Hierarchies of object classes

UNIT II : UML

UML notation for describing classes and class hierarchies - UML for describing relationships between objects, Building more complex objects - composition and aggregation

UNIT III : OOAD TOOLS

Various types of Modeling of Object Oriented Systems, Data flow Diagrams, Object Modeling Technique, Design Methodologies, Jackson, Structured Development, Structured Analysis/Structured Design, Features of Object, Non Object Oriented Programming Languages, Relational Databases, Case studies.

UNIT IV CORE C++

Closer look at OO fundamentals mapped to specific C++ features: the class, access control, inheritance, overloading and polymorphism. -- Constructors and destructors introduced. Storage types. Argument passing conventions. Const. Standard library introduced; vector and string classes. Inheritance and its types

UNIT V ADVANCED C++ PROGRAMMING

Embedding objects vs. pointers to objects. Virtual member functions. Abstract base classes, inline, "this" pointer. -- Inheritance access specification, "Orthodox Canonical Form": defining the class ctor, dtor, copy ctor and assignment operator. User-defined conversions. -- Templates, Generic Programming: Function and class templates, generic programming. -- The C++ Standard Library: Stream-based I/O; Template-based container classes, generic algorithms, auto_ptr -- Design Patterns: Motivation for and introduction to Design Patterns. Implementation of design patterns in C++ -- Design and use of C++ exceptions. Multiple inheritance. Run-time type information (RTTI).

TEXT BOOK

1. Courseware to be provided by the institution

Course Code: MCA07108

Course Title: Microprocessor & Assembly language

Course Objectives

Microprocessor is an electronic device that is an inherent part of the computer which interacts with the memory, input, output and similar devices. This course is intended to introduce the student to the world of microprocessors. The study of microprocessors implies a study of variety of memory chips, input/output devices, and techniques for interfacing them to the microprocessor. This course also covers the principles of instruction set architecture and assembly language programming that translates C/C++ code to assembly language and performs simple optimizations. It explores in detail a simple hardware CPU implementation that supports a small instruction subset through which the student posses practical knowledge in computer organization.

UNIT I MICROPROCESSORS INTRODUCTION

Concepts of microprocessors – Evolution of microprocessors – Organization of microprocessors – microprocessor programming – digital logic – timing diagram conventions – Data representation – positional number system – BCD representation – negative numbers – binary decimal conversions - real number representation – binary arithmetic – other number system – character representation – micro processor instruction set

UNIT I INTRODUCTION TO 8085 MICRO PROCESSOR

Evolution of the Microprocessor - INTEL 8085- Introduction- Register Architecture - Memory Addressing - 8085 Addressing Modes -8085 Instruction Set -Timing Methods 8085 Pins and Signals -8085 Instruction Timing and Execution –Interrupts-DMA- Serial port-8085 Based System Design

UNIT II INTRODUCTION TO 8086 MICROPROCESSOR

Introduction -8086 Architecture -8086 Addressing Modes – Bus structure and timing of – 8086 - 8086 Instruction Set –Data Movement Instructions Arithmetic and Logic Instructions - Program Control Instructions – exception handling in 8086

UNIT III System Design Using 8086

Basic System concepts-Bus Cycle - Address and data bus concepts- interfacing with memories-RAM - EPROM - DRAMs - Programmed I/O : 8086-Based Microcomputer. Basics of event driven programming

UNIT V ASSEMBLY LANGUAGE PROGRAMMING THROUGH C

Port I/O - flashing LEDs - Software delays - Keypad scanning - Basic RS232 - data acquisition and control using ASCII commands sent and received via a serial port. - Basic data acquisition and sensor interfacing

TEXT BOOKS

1. Courseware to be provided by the institution
2. Mohamed Rafiqzaman "Introduction to Mdicroprocessors and Microcomputer-Based System Design" 2nd edition, CRC Press,1995.
3. Aditya P. Mathur “ Introduction to microprocessors” 3rd edition, Tata McGraw-Hill publication 1993

REFERENCES

1. Walter A.Triebel, Avtar Singh, "The 8088 and 8086 Microprocessors Programming, Interfacing, Software, Hardware and Applications", Prentice Hall of India Pvt. Ltd., 2002.
 2. Barry B.Brey, "The INTEL microprocessors 8086/8088, 80186, 80286, 80386 and 80486 Architecture, Programming and Interfacing," Prentice Hall of India, 2001.
- Courseware to be provided by the institution

Course Code: MCA07109

Course Title: Computer Networks and network OS Administration

Course Objectives

To make the learner understands modern network architectures from a design and performance perspective. This course introduces the student to the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs). It helps to clarify network terminology and also provides an opportunity to do network programming using TCP/IP.

UNIT I INTRODUCTION

Use of computer networks – Network Hardware - Example of Networks – Network fundamentals - LAN Technology – LAN Architecture – BUS/Tree – Ring – Star – Ethernet – Token Rings – Wireless - Network Software – Reference models – OSI Referential model – The seven layers - Physical layer : The theoretical basis for data communication – Guided transmission Media – Wireless Transmission – Communication satellites – The public switched Telephone network – Cable Television – Mobile telephone system

UNIT II DATA LINK LAYER

Data link layer design issues – Error detection and correction Elementary data link protocols – Sliding window protocols – Protocol verification – Example data link protocols

UNIT III NETWORK LAYER , TRANSPORT LAYER

Packet Switching – Switching and Forwarding – Bridges and LAN switches – Internetworking – Simple Internetworking – Routing. - Reliable Byte Stream (TCP) – Simple Demultiplexer (UDP) – TCP Congestion Control – Congestion Avoidance Mechanisms.

UNIT IV PRESENTATION LAYER , APPLICATION LAYER and APPLICATIONS

Presentation formatting – Data compression – Cryptographic Application layer : Network security – Simple network management protocol - Algorithms: RSA - DES — Applications – Domain Name Service – Email - SMTP – MIME – HTTP – SNMP- working with Network OS

UNIT V Network OS Administration

Laboratory sessions on creating computer networks and managing network operating system

TEXT BOOKS

1. Andrew S. Tanenbaum, "Computer Networks", Tata Mcgraw Hill, 3rd Edition, 2001
2. Larry L. Peterson & Bruce S. Davie, "Computer Networks - A systems Approach", 2nd Edition, Harcourt Asia/Morgan Kaufmann, 2000.

REFERENCES

1. James F. Kurose and Keith W. Ross, "Computer Networking - A Top Down Approach featuring the Internet", 1st Edition, Addison Wesley Publishing Company, 2001.
 2. William Stallings, "Data and Computer Communications", 5th Edition, PHI, 1997.
- Courseware to be provided by the institution

Course Code: MCA07110

Course Title: Project Development – System side, embedded systems using C and C++

Course Objective

In this course the student will learn to apply the concepts and theories learnt in the courses Principles of Programming languages & Programming in C (MCA07106) and Microprocessors & Assembly language (MCA07108) and develop system based projects.

The student will be exposed to real time projects / environments of the company and will develop practical / project related to the **company's project / product and services.**

Key Domains

Project development – System development using C & C++

- Courseware to be provided by the institution

Course Code: MCA07201

Course Title: Operations Research

Course Objectives

In today's global marketplace, organizations need to be efficient to survive. The Operations Research program will provide formal training in methods of optimization, modeling and statistics used in operations research. The main objective of this course is to help individuals assist organizations to make efficient use of their resources so as to maximize efficiency and minimize net cost.

UNIT I - LINEAR PROGRAMMING

Formulation of LPP – Graphical solutions to LPP- Simplex method – Big M method – Two-phase simplex method – Duality in linear programming: Primal & Dual problem – Dual simplex method.

UNIT II THE TRANSPORTATION PROBLEM

Introduction – Mathematical Formulation – Finding Initial basic feasible solutions – Moving towards Optimality – Unbalanced transportation problems – Degeneracy. The assignment problem: Introduction – Mathematical formulation – Hungarian assignment method – Maximization in assignment problem – Unbalanced assignment problem – Impossible assignment.

UNIT III INVENTORY CONTROL

Introduction – Costs involved in inventory – Deterministic models: EOQ models without and with shortage – Buffer stock and reorder level – Price break models – ABC analysis.

UNIT IV REPLACEMENT MODEL

Introduction – Replacement of items that deteriorates gradually: Value of money does not change with time – Value of money changes with time – Replacement of items that fails suddenly: Individual replacement – Group replacement. PERT/CPM: Introduction – Construction of network – CPM calculations – PERT calculations.

UNIT V QUEUING THEORY

Introduction – Characteristic of queuing system – Problems of single server with finite / infinite population model – Problem of multi server with finite / infinite population model (No derivation).

TEXT BOOKS

1. Kanti Swarup, P.K. Gupta, Man Mohan ,”Operation Research”, Sultan Chand & Sons,Eigth Edition,1997.
2. Hamdy A. Taha, “Operations Research – An Introduction”, Seventh Edition, Pearson Education.

REFERENCE

1. Frederick S. Hillier, Gerald J. Lieberman, “Introduction to Operations Research”, Tata McGraw Hill Pub Company Ltd., Seventh Edition.
2. P.K. Gupta, D.S Hira, “Problems in Operation Research”, S. Chand & Company Ltd.
 - Courseware to be provided by the institution

Course Code: MCA07202

Course Title: Computer System Organization and Architecture

Course Objectives

This course introduces the basic concepts of computer architectures. It starts with the structure of subsystems and covers the organization of the overall system. And it is about the basic principles and current practices of computer architectures and organizations. It makes the learner understand how computers are organized and what influences have determined the architectures of processors, memory systems, and input/output systems.

UNIT I. INTRODUCTION TO DIGITAL DESIGN

Data Representation – Number system: Binary, Decimal, Octal, Hexadecimal – Conversion from one to another – complements - Data Types – Complements – Arithmetic Operations – Representations – Fixed –Point, Floating – Point , Decimal Fixed – Point – Binary Codes- Logic Gates, Boolean Algebra, Map Simplification – Combinational Circuits: Half-Adder, Full Adder- Flip Flops - Sequential Circuits

UNIT II. DIGITAL COMPONENTS - REGISTER TRANSFER & MICRO OPERATIONS

ICs – Decoders – Multiplexers – Registers – Shift Registers – Binary Counters – Memory Unit – Register Transfer Language – Register Transfer – Bus And Memory Transfers – Arithmetic, Logic And Shift Micro Operations , Arithmetic Logic Shift Unit.

UNIT III. COMPUTER ORGANIZATION AND PROGRAMMING

Instruction Codes – Computer Registers – Computer Instructions – Timing And Control – Instruction Cycle – Memory Reference Instructions – I/O And Interrupt – Machine Language – Assembly Language – Assembler - Program Loops – Programming Arithmetic And Logic Operations – Subroutines – I/O Programming.

UNIT IV. INPUT – OUTPUT ORGANIZATION

Peripheral Devices – Input-Output Interface – Asynchronous Data Transfer – Modes Of Transfer – Priority Interrupt – DMA – IOP – Serial Communication.

UNIT V. MEMORY ORGANIZATION AND CPU

Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory – Memory Management Hardware – CPU: General Register Organization – Control Word – Stack Organization – Instruction Format – Addressing Modes – Data Transfer And Manipulation – Program Control.

TEXTBOOK

1. M.Morris Mano,"Computer System Architecture",Prentice Hall of India, 2001.

REFERENCES

1. John .p.Hayes,"Computer Architecture and Organization", Tata McGraw Hill, 1996.

2. V.C.Hamatcher,et al "Computer Organization", Tata Mcgraw Hill,1996

- Courseware to be provided by the institution

Course Code: MCA07203

Course Title: Computer Algorithms

Course Objectives:

This course is to teach algorithms for solving real problems that arise frequently in computer application, and to teach basic principles and techniques of computational complexity and to introduce the areas of NP – completeness and parallel algorithms. On completion of this course the student will have the habit of always responding to new algorithms with pragmatic and reason-why approach.

UNIT I ANALYZING ALGORITHMS AND BASIC DATA STRUCTURES

Fundamentals of algorithmic problem solving – Important problem types – Fundamentals of the analysis of algorithm efficiency – analysis frame work – Asymptotic notations – Mathematical analysis for recursive and non-recursive algorithms – ADT Specification and Design Techniques – Stacks and Queues - ADTs for Dynamic Sets

UNIT II SORTING AND SEARCHING

Insertion Sort - Divide and Conquer – Merge sort – Quick sort – Binary search – Heap Sort – Shell sort – Radix Sort – Array Doubling – Amortized Time Analysis – Red Black Trees – Hashing – DER and UF programs – Priority Queues with a Decrease Key Operation

UNIT III – GRAPH OPTIMIZATION PROBLEMS AND DYNAMIC PROGRAMMING

Graph definitions and representations – Traversing Graphs – Depth First search Directed graph and Undirected graph - Strongly connected components of a DiGraph - Greedy method – Prim's algorithm – single source shortest paths - Kruskal's algorithm – Dijkstra's algorithm.

UNIT IV BACKTRACKING, NP-HARD AND NP-COMPLETE PROBLEMS

Back tracking – N-Queens problem – Hamiltonian circuit problem – Subset sum problem – Branch and bound – Assignment problem – Knapsack problem – Traveling salesman problem. P & NP problems – NP-complete problems – Approximation algorithms for NP-hard problems – Traveling salesman problem – Knapsack problem.

UNIT V STRING MATCHING and PARALLEL ALGORITHMS

String Forward solution - Knuth-Morris-Pratt algorithm – Boyer-Moore Algorithm – Approximate String Matching – Parallelism, the PARAM and Other Models – Some Simple PARAM algorithms – Handling Write Conflicts – Merging and Sorting – Finding Connected Components

TEXT BOOKS:

1. Sara Baase, "Computer Algorithms-Introduction to Design and Analysis", Addison-Wesley Publishing Company, 1991.

REFERENCES

1. Anany Levitin "Introduction to the Design and Analysis of Algorithms" Pearson Education 2003.

2. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, "Introduction to Algorithms", Prentice Hall of India Pvt.Ltd. 1998.

3. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, "Computer Algorithms", Galgotia Publications Pvt.Ltd, 1999.

4. Donald E.Knuth, "The Art of Computer Programming", Volume 3, Second Edition, Addison_Wesley Publishing Company, 1999.

- Courseware to be provided by the institution

Course Code: MCA07204

Course Title: Software Engineering

Course Objectives:

To help students to develop skills that will enable them to construct software of high quality software that is reliable, and that is reasonably easy to understand, modify and maintain and also to foster an understanding of why these skills are important

At the end of this course the student will be able to

- Get the experience of planning, designing, and implementing a significant software system.
- The experience of working in a team and building a real world software solution
- Software engineering experience to prepare the student for the real world.

Syllabi

UNIT I. INTRODUCTION AND PROCESS MODELS

Introduction to Software Engineering - A Generic View of Process – Process Models-The Waterfall Model-Incremental Model-Evolutionary Model-Specialized Model-The Unified Process–Agile Process – Agile Models

UNIT II. REQUIREMENT ENGINEERING

Software Engineering practice - System Engineering Hierarchy – System Modeling – Requirements Engineering: Tasks- Initiating The Process-Eliciting Requirements-Developing Use Cases-Negotiating Requirements-Validating Requirements – Building the Analysis Models: Concepts

UNIT III. ANALYSIS MODEL

Requirement analysis – Analysis modeling approaches – Data modeling concepts – Object Oriented Analysis – Scenario Based Modeling – Flow Oriented Modeling – Class Based Modeling – Creating Behavioral Model

UNIT IV: DESIGN ENGINEERING

Design Concepts – Design Models – Pattern Based Design – Architectural design – Software architecture – Data design – Architectural styles and patterns – architectural design – Assessing Alternative Architectural Designs – Mapping Data Flow into a Software Architecture.

UNIT V : WEB ENGINEERING

Web engineering : attributes of web-based systems and applications – webapp engineering layers – web engineering process – Analysis for Web Apps: Requirements analysis for web apps – the analysis for webapps – the content model – the interaction model – Functional Model – Configuration Model – Relationship-Navigation Analysis – Design for Webapps : Design issues for web engineering – Interface design – aesthetic design – Content Design – Architecture Design – Navigation Design Component level design

TEXT BOOKS

1. Roger Pressman.S., "Software Engineering: A Practitioner's Approach", 6th Edition, Mcgraw Hill, 2005.

REFERENCES

1. P. Fleeger, "Software Engineering", 6th edition , Prentice Hall, 1999.
 2. Carlo Ghezzi, Mehdi Jazayari, Dino Mandrioli, "Fundamentals Of Software Engineering", Prentice Hall Of India 1991.
 3. I. Sommerville, "Software Engineering" , 5th Edition: Addison Wesley, 1996.
- Courseware to be provided by the institution

Course Code: MCA07205

Course Title: Data Warehousing and Data Mining

Course Objectives:

This course gives the student a good understanding of basic concepts, principles and techniques of data warehousing and data mining. The student will be explained to

- Concept, Structure and Major issues
- Data warehousing project management
- Apply multi-dimensional modelling techniques in designing data warehouses
- Analytical processing (OLAP) technology for decision support
- Apply data cubing techniques -- use knowledge discovery in data warehouses
- define what knowledge discovery and data mining are, recognize the key areas and issues in data mining -- develop an in-depth understanding of several data mining techniques

Syllabi

UNIT I – DATA MINING TASKS

Data mining versus knowledge discovery in Databases data mining issues-data mining matrices -social implications of data mining- data mining from a database perspective. Data mining techniques: Introduction -a statistical perspective on data mining - similarity measures - decision trees - neural networks - genetic algorithms.

UNIT II ALGORITHM CLASSIFICATIONS

Introduction -Statistical -based algorithms- distance – based algorithms -decision tree- based algorithms -neural network- based algorithms- rule based algorithms- combining techniques.

UNIT III CLUSTERING

Introduction - Similarity and Distance Measures - Outliers – Hierarchical Algorithms - Partitional Algorithms. Association rules: Introduction-large item sets-basic algorithms-parallel & distributed algorithms - comparing approaches - incremental rules advanced association rules technique- measuring the quality of rules.

UNIT IV DATA WAREHOUSING

An introduction –characteristics of a data warehouse –data marts - other aspects of data mart. Online analytical processing: Introduction - OLTP & OLAP systems – data modeling- star schema for multidimensional view - data modeling - multifact star schema or snow flake schema - OLAP TOOLS - State of the market- OLAP TOOLS and the internet.

UNIT V DEVELOPING A DATA WAREHOUSE

Why and how to build a data warehouse – data warehouse architectural *strategies* and organization issues - design consideration – data content - metadata distribution of data - tools for data warehousing –performance considerations-crucial decisions in designing a data warehouse. Applications of data warehousing and data mining in government: Introduction-national data warehouses -other areas for data warehousing and data mining.

TEXT BOOKS

- 1.Courseware to be provided by the institution.
2. Margaret H.Dunham, “Data Mining introductory and advanced topics”, Pearson education,2003.
3. C.S.R.Prabhu, “Data Warehousing – concepts, techniques, products and applications”, PHI, Second Edition.

REFERENCE BOOKS

1. Aler Berson, Stepen J. Smith, “Data warehousing, data mining, & OLAP, MCH,2001.
2. Arun K. Pujari, “Data Mining Techniques”, Universities Press(India) Pvt.Ltd.,2003.

- Courseware to be provided by the institution

Course Code: MCA07206

Course Title: MCA07206 Project Development - RDBMS with distributed database

Course Objective

The object of the course is to present the fundamental concepts of database management. This includes aspects of database design, database languages and database-system implementation. The student will be familiar with the concepts, tools and techniques to effectively design, develop, manage Relational Database Management Systems. He will be also be familiar with development of Client/Server programming using RDBMS and front end programming

The student will be exposed to real time projects / environments of the company and will develop practical / project related to the **company's project / product and services**.

Key Domains

DDL Statements – DML statements – Normalization - TCL Statements - Selection Operation – Sorting – Join Operation – Other Operations – Evaluation of Expressions – Transformation of Relational Expressions – Choice of Evaluation Plans – Transaction Concept – Transaction State – Implementation of Atomicity and Durability – Concurrent Executions Serializability – Recoverability – Implementation of Isolation – Transaction Definition in SQL

Centralized systems – Client / Server Systems – Parallel Systems – Distributed Systems – Network Types – Building Client / Server systems using JFC, JDBC and MySQL – Designing a well defined database for a real-time system – creating user interface using java swing controls – Managing connectivity using JDBC

- Courseware to be provided by the institution

Course Code: MCA07207

Course Title: Project Development - Data structures and Logic Building

Course Objective

In this course the student will learn to apply the concepts and theories learnt in the course Computer Algorithms (MCA07203) and test the algorithms using Java programs. And student will also create innovative algorithms to solve real-time scenarios using the concepts and knowledge gained in above course.

The student will be exposed to real time projects / environments of the company and will develop practical / project related to the **company's project / product and services.**

Key Domains

Sorting, searching, string matching and parallel algorithms

Backtracking, NP-hard and NP-complete problems

Graph optimization problems and dynamic programming

Simulating Traversing Graphs – Testing Depth First search Directed graph and Undirected graph - Strongly connected components of a Digraph - Greedy method – Prim's algorithm – single source shortest paths - Kruskal's algorithm – Dijkstra's algorithm.

- Courseware to be provided by the institution

Course Code: MCA07208

Course Title: Web Technologies – Java / J2EE specialization

Course Objective

Java is a programming language popularly used to build programs that can work on the Internet. This course enables the attendees to develop platform independent and device independent software using java platform. It also helps him to create stand-alone, network based and web based java applications.

J2EE is a collection of technologies specifically meant to aid development of enterprise class software applications. This course will help the attendees to develop robust, high performance, easy to maintain and secure applications. This course highlights best practices for J2EE application development.

Syllabi

UNIT I WEB – APPLICATION DESIGNING

Internet basics – web site, ISP, Web Server, Browser, Hosting, IP Address, e-Mail, Search Engines, web 2.0 technologies -- Developing web site using HTML --- Applying styles to HTML pages - CSS (Cascading Style Sheet) -- Dynamic Pages – using DHTML -- Client side validation through Java Script -- Designing Interactive Web Pages using Java Script -- Using Web authoring tool – MS Front Page -- Mastering XML - Designing graphics rich pages using Flash

UNIT II CORE JAVA PROGRAMMING

Fundamentals of Java-J2SE – Util package -- Implementing OOP features in JAVA -- I/O Streams, File handling, --Exception Handling -- Multi Threading -- Applets, Controls, Garbage Collection

UNIT III Client/Server Application Development using JAVA

JAVA-JDBC – Drivers- Architecture – Components – Statements – Resultset – Metadata – SQL with applets -- Stand alone GUI development – JFC – Swing components – Look and Feel

UNIT IV ADVANCED JAVA PROGRAMMING

UDP programming - Socket Programming – Using URL – Protocol handlers – Applet – Applet Communication --- Distributed computing using RMI – Java Distributed object Model – RMI packages – RMI Implementation

UNIT V WEB & ENTERPRISE APPLICATION DEVELOPMENT

Web Programming using JSP and Servlet - JSP tags, use bean, forward actions -- Managing Stateless HTTP through Session tracking techniques - Advanced Programming skills – Servlet with JDBC – JDBC Connection Pooling -- J2EE Beans – EJB- Stateful/Stateless Session bean, Entity Bean , CMP, BMP --- JMS

TEXT BOOK

1. Courseware to be provided by the institution

Course Code: MCA07209

Course Title: Project development in Client / Server Technology

Course Objective

In this course the student will learn to apply the RDBMS concepts and theories learnt in the course RDBMS concepts and Client / Server Technology (MCA07206) and Client / Server application development concepts he had studied in the course Web Technologies – Java / J2EE (MCA07208). And he student will also develop projects using the concepts and knowledge gained in above two courses.

The student will be exposed to real time projects / environments of the company and will develop practical / project related to the **company's project / product and services.**

Key Domains

Designing an enterprise level Database, should use ER Diagram, Normalization techniques, Performance tuning, SQL queries , Stored procedures , packages, triggers. Designing graphical user interface based front end screens using JFC components – Database connectivity

Project development - Client / Server Technology.

- Courseware to be provided by the institution

Course Code: MCA07210

Course Title: Project development in Web/Enterprise Technology Java / J2EE

Course Objective

In this course the student will learn to apply the web and enterprise application development concepts learnt the course MCA07208 – Web Technologies – Java / J2EE. And he student will also develop projects using the concepts and knowledge gained in above two courses.

The student will be exposed to real time projects / environments of the company and will develop practical / project related to the **company's project / product and services.**

Key Domains

Designing a static web site using HTML, CSS, JavaScript using web authoring tool – Developing applets – static and dynamic graphics through Flash – Developing XML pages , applying CSS , XSLT as styles for XML pages – Processing the data in XML form using DOM and SAX Parsers – Using XML as intermediate storage – Designing a LAN based chat application – Creating a fully functional web2.0 application - Implementing Personalization, Localization and Internationalization

Project in Enterprise application development.

- Courseware to be provided by the institution

Course Code: MCA07301

Course Title: Software Project Management and Quality Assurance

Course Objective

The course focuses on presenting a comprehensive overview of the requirements for effective project management and Quality Assurance Function. Project management is all about the management techniques required to plan, organize, monitor, and control software projects. Software management includes management of people, process and problems. This course provides insights techniques such as software metrics, cost effort duration estimates, risk-impact management, task, project scheduling etc. The quality management aspect of the course provides the student with an understanding of Quality management, techniques, ISO, TQM & CMM standards.

Syllabi

UNIT I PROJECT LIFE CYCLE

Introduction-Idea Generation-Prototype Development Phase- Alpha Phase-Beta Phase-Protection Phase-Maintenance And Obsolescence Phase. Project Life Cycle Models - The Waterfall Model-The Prototype Model-The Rapid Application Development Model-The Spiral Model and its Variants. Metrics: Introduction-The Metrics roadmap-A Typical Metrics Strategy-What Should You Measure-Set Targets and Track Them-Understanding and Trying to Minimize Variability-Act On Data-People and Organizational Issues In Metrics Programmes-Common Pitfalls To Watch Out For In Metrics Programs-Metrics Implementation Checklists And Tools.

UNIT II SOFTWARE CONFIGURATION MANAGEMENT

Introduction-basic definitions and terminology-the process and activities of software configuration audit-software configuration management in geographically distributed teams-metrics in software configuration management-software configuration management tools and automation. Software quality assurance: how do you define quality-why is quality important in software-quality control and quality assurance-cost and benefits of quality-software quality analyst's function-some popular misconceptions about the SQA's role-software quality assurance tools-organizational structures-profile of a successful SQA-measures of SQA success-pitfalls to watch out for in the SQA's role. Risk management: introduction-what is risk management and why is it important-risk management cycle-risk identification: common tools and techniques-risk quantification-risk monitoring –risk mitigation-risks and mitigation in the context of global project –teams-some practical techniques in risk management – metrics in risk management.

UNIT III SOFTWARE REQUIREMENTS GATHERING

Inputs and start criteria for requirements gathering- dimensions of requirements gathering – steps to be followed during requirements gathering-outputs and quality records from the requirements phase-skills sets required during the requirements phase- differences for a shrink-wrapped software – challenges during the requirements management phase- metrics for the requirement phase. Estimation: what is estimation-when and why is estimation done – the three phases of estimation – estimation methodology- formal models for size

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estimationtranslation effort estimated into schedule estimates-common challenges during estimation-metricres for the estimation processes.

UNIT IV DESIGN AND DEVELOPMENT PHASES

Some difference in our chosen approach – salient features of design – evolving an architecture / blueprint- design for reusabilitytechnology choices / constraints- design to standards – design for portability – user interfaces issues - design for testability-design for diagnosability-design for maintainability-design for installability-inter- operability design-challenges during design and development phases- skills sets for design and development metricres for design and development phases. Project management in the testing phase: Introduction- what is testing- what are the activities that make up testing – test scheduling and types of tests- people issues in testing – management structures for testing in global teams-metricres for testing phase.

UNIT V QUALITY ASSURANCE

Quality: Requirements – The SEI CMM - Guidelines - Challenges - Quality Function Deployment - Building the Software Quality Assurance - Plan - Software Configuration Management: Principles - Requirements - Planning and Organizing - Tools - Benefits - Legal Issues in Software – ISO, TQM , CMM standards - Case Study.

TEXT BOOK

1. Courseware to be provided by the institution
2. Gobalswamy Ramesh, “Managing Global Software Projects”,Tata McGraw Hill Publishing Company,2003.

REFERENCE BOOKS

1. S.A Kelkar, “Software Project Management – A Concise Study”,PHI ,2003.
2. Milk Cotterel , Bob Hughes, “Software Project Management “ , Inclination / Thomas Computer Press, 1995.
3. Derrel Ince, H. Sharp And M. Woodman, “Introduction To Software Project Management And Quality Assurance” ,Tata McGraw Hill,1995.
4. Stephen H Kan, “Metricres And Models In Software Quality Engineering “, Pearson Education Asia , Second Edition.

- Courseware to be provided by the institution

Course Code: MCA07302

Course Title: Project Development - Graphics and multimedia

Course Objective

Computer Graphics offers a very powerful tool to simulate environments and situations in the virtual domains. Computer Graphics is a very appealing field of study. In this course the student will learn to write programs that create and manipulate pictures rather than strings of text and numbers. Since human eye-brain system is highly attuned to recognizing visual pattern, Computer Graphics is used in diverse areas as engineering, medicine, business, industry, art, entertainment, advertisement, education, training etc. The main objective of the course is to expose the students for building a virtual environment and situation using computer graphics, animation and multimedia.

The student will be exposed to real time projects / environments of the company and will develop practical / project related to the **company's project / product and services.**

Key Domains

Overview of Graphics System

2D TRANSFORMATIONS :

3D TRANSFORMATIONS :

MULTIMEDIA SYSTEMS :

- Courseware to be provided by the institution

Course Code: MCA07303

Course Title: Project Development in Wireless Application development

Course Objectives

The purpose of this course is to prepare students with skills and knowledge of Wireless Internet programming in WAP page development and Java-Based Wireless applications. This course focuses on how to plan, design, and develop WAP pages and acquire creative skills in design, layout, and interactivity of WAP pages. And it also integrates varied wireless technologies such as MMS, SMS, ring tones, and etc. The student will understand current and emerging technology in Wireless technology, and develop simple wireless applications.

The student will be exposed to real time projects / environments of the company and will develop practical / project related to the **company's project / product and services.**

Key Domains

WAP (Wireless Application Protocol). - Mobile hardware devices. - Wireless networks.- Messaging services – Controlling application flow through SMS- wireless programming languages - WAP site publishing and management:

Upload and download files, directories, and sites between an Wireless WAP server and a local computer using FTP. - Move, delete, and rename files and directories on the local computer and remote Web servers. - Investigate commercial Web hosting services. Multimedia Explore media tools such as MMS and ring tones.

- Courseware to be provided by the institution

Course Code: MCA07304

Course Title: Project development in current technology

Objective

The IT field undergoes rapid development and continuous change with reference software, technology and tools. There is a continuous evolution of newer technologies which become prominent in this field with very less notice. Generally the software industry harnesses these technologies immediately to keep them abreast in the market and retain their competitiveness. In this course the student will learn the technologies that provides them insight and knowledge that become current as of the date. This course will help them become employable in the software industry at a later date. This course will cover theory and practical sessions which shall formatted at later date.

The student will be exposed to real time projects / environments of the company and will develop practical / project related to the **company's project / product and services.**

- Courseware to be provided by the institution

Course Code: MCA07305

Course Title: Project in Software Testing

Course Objective

Software testing is to uncover errors that were made inadvertently as it was designed and constructed. Testing is a set of activities that can be planned in advance and conducted systematically. A strategy for software testing is developed by the project manager, software engineers, and testing specialists. In this course the student will learn strategy for software testing, black box testing, white box testing and preparing test specification documents.

The student will be exposed to real time projects / environments of the company and will develop practical / project related to the **company's project / product and services.**

Key Domains

TESTING STRATEGIES: Organizing for software testing – Test strategies for conventional software – Test strategies for Object Oriented Software – Validation Testing – System Testing – The art of Debugging

White box testing and black box testing object oriented testing methods - Test case design implications of Object Oriented Concepts – Applicability of conventional Test Case Design Methods – Fault-Based Testing – Test cases and class hierarchy – Scenario based testing – Testing surface structure and deep structure Testing web application

- Courseware to be provided by the institution

Course Code: MCA07306

Course Title: Web Technologies – .Net platform

Course objectives:

Software applications can be stand-alone or distributed. The .Net platform forms the base of applications that are language independent, and can be run from different .NET compatible devices. In this course the student will learn the concepts and technologies to develop stand-alone , distributed and enterprise wide applications using .NET framework SDK which includes C#, VB.net, ADO.net, ASP.net

Syllabi

UNIT I: OVERVIEW OF THE MICROSOFT .NET FRAMEWORK

Overview of the Microsoft .NET Framework - Overview of Namespaces - Writing a .NET Application - Compiling and Running a .NET Application-Creating simple console applications in C#

Strings, Arrays, and Collections - Strings - Terminology – Collections - .NET Framework Arrays - .NET Framework Collections - Parsing, formatting, manipulating, and comparing strings

Memory and resource Management: Memory Management Basics - Non-Memory Resource Management - Implicit Resource Management - Explicit Resource Management

Data Streams and Files: Streams - Readers and Writers - Basic File I/O Stream objects to read and write bytes to backing stores, such as strings and files. – BinaryReader – BinaryWriter – StreamReader – StreamWriter – StringReader – StringWriter – Directory – DirectoryInfo

UNIT II: WORKING WITH COMPONENTS

An Introduction to Key .NET Framework Development Technologies - Creating a Simple .NET Framework Component - Creating a Simple Console Client - Creating a VB.NET client application - Creating an ASP.NET Client - Creating a .NET Framework component in C# - Implementing structured exception handling - Creating .NET Framework console application that calls component - Creating an ASP.NET page that uses the previously developed .NET Framework component to create an ASP.NET application.

UNIT III: DEPLOYMENT AND VERSIONING

Introduction to Application Deployment - Application Deployment Scenarios - Packaging and deploying simple and componentized applications - Creating strong-named assemblies - Installing and removing assemblies from the global assembly cache. -Configuring applications to control binding based on assembly location and version data.

An Introduction to the Common Type System - Elements of the Common Type System - Object-Oriented Characteristics

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Working with Types - System.Object Class Functionality -Specialized Constructors - Type Operations - Interfaces - Managing External Types - Explaining the features that are available to work with unmanaged types, such as COM types.

UNIT IV : DELEGATES AND EVENTS

Delegates - Multicast Delegates - Events - When to Use Delegates, Events, and Interfaces - Using the delegate class to create type-safe callback functions and event-handling methods. - Using the event keyword to simplify and improve the implementation of a class that raises events. - Implementing events that conform to the .NET Framework guidelines.

UNIT V: WEB APPLICATION DEVELOPMENT

Internet Application Scenarios - The WebRequest and WebResponse Model - Application Protocols - Handling Errors - Security - Best Practices - Using the basic request/response model to send and receive data over the Internet. -

Serialization : Serialization Scenarios - Serialization Attributes - Object Graph - Serialization Process - Serialization Example - Deserialization Example - Custom Serialization - Custom Serialization Example - Security Issues - Writing an application that serializes and deserializes an object graph by using either a binary or Simple Object Access Protocol (SOAP) XML format. – Web application development using ASP.NET - Writing and configuring distributed applications that use .NET Remoting. - Creating an XML Web service by using Visual Studio .NET and ASP.NET. - Consuming an XML Web service by using the Web Services Description Language tool (WSDL.exe).

TEXT BOOK

1. Courseware to be provided by the institution

Course Code: MCA07307

Course Title: Project development in .NET

Course Objective

In this course the student will learn to apply the .NET framework and SDK Programming learnt in the course Web Technologies – .NET Platform (MCA07306). And the student will also develop projects using the concepts and knowledge gained in above course.

The student will be exposed to real time projects with the company and will develop practical / project related to the **company's project / product and services.**

Key Domains

Developing Client / Server Application using VB.net, ADO.net and MS SQL Server –
Creating Reusable components in C# and VB.net – Creating a fully functional web application using .NET – Implementing Personalization, Localization and Internationalization

Project development – Enterprise wide application development

- Courseware to be provided by the institution

Course Code: MCA07308

Course Title: Communication, soft skills, and PDP

Course Objective:

This course targets at preparing the student to effectively communicate and improve written and oral communication, improve listening and comprehension skills the student would understand etiquettes, improve presentation capabilities and develop an overall personality which will help him become software professional

Syllabi

- Organizational Structure
- Communication process
- Goal setting and Decision Making
- Behavior, Attitude and Etiquette
- Self-esteem and Self-confidence
- Stress Management
- Time Management
- Team Work and Leadership
- Presentation Skills
- Meetings
- Group Discussions
- Resume Building
- Interview Techniques
- Mock interview

TEXT BOOK

1. Courseware to be provided by the institution

Course Code: MCA07309

Course Title: PROJECT WORK

Course Objective

The student will undertake a project work using one or combination of the concepts theories and techniques learnt over the period of three years.