KAKATIYA UNIVERSITY, WARANGAL

DEPARTMENT OF COMPUTER SCIENCE

MCA COURSE STRUCTURE WITH EFFECT FROM 2013-14

MCA II YEAR I SEMESTER:

Paper No	Paper Title / Subject	Workload Per week (Theory : Lab)	MARKS		
			Internal	External	Total
MCA211	Database Management Systems	T (4)	20	80	100
MCA212	Data Communication and Networks	T (4)	20	80	100
MCA213	Software Engineering	T (4)	20	80	100
MCA214	Principles and Practices of Management	T (4)	20	80	100
MCA215	.NET Programming	T (4)	20	80	100
MCA216	Database Management Systems Laboratory	L (4)	--	50	50
MCA217	Software Engineering Laboratory	L (4)	--	50	50
MCA218	.NET Programming Laboratory	L (4)	--	50	50
					650

MCA211	DATABASE MANAGEMENT SYSTEMS	DBMS
WORK LOAD: 4 PPW	INTERNAL MARKS: 20	EXTERNAL MARKS: 80

U N I T – I

FUNDAMENTALS OF DATABASE CONCEPTS: Database and Database Users: Characteristics of the Database Approach – Advantages of Using the DBMS Approach – A Brief History of Database Applications. Database System Concepts and Architecture: Data Models, Schemas, and Instances – Three Schema Architecture and Data Independence – Database Languages and Interfaces – The Database System Environment – Centralized and Client/Server Architectures for DBMSs – Classification of Database Management Systems. Data Modeling Using the Entity Relationship Model: Using High-Level Conceptual Data Models for Database Design – An Example Database Application – Entity Types, Entity Sets, Attributes, and Keys – Relationship Types, Relationship Sets, Roles, and Structural Constraints – Weak Entity Types – ER Diagrams, naming Conventions, and Design Issues. (Chapters 1 to 3)

U N I T – II

FUNDEAMENTALS OF RELATIONAL MODEL: The Relational Data Model and Relational Database Constraints: Relational Model Concepts – Relational Model Constraints and Relational Database Schemas. The Relational Algebra and Relational Calculus: Unary Relational Operations: SELECT and PROJECT – Relational Algebra Operations from Set Theory – Binary Relational Operations: JOIN and DIVISION – Additional Relational Operation – The Tuple Relational Calculus – The Domain Relational Calculus. Relational Database Design Using ER to Relational Mapping. (Chapters 5.1, 5.2, 6, 7.1)

U N I T – III

RELATIONAL DATABASE DESIGN: Functional Dependencies and Normalization for Relational Databases: Informal Design Guidelines for Relation Schemas – Functional Dependencies – Normal Forms Based on Primary Keys – General Definitions of Second and Third Normal Forms – Boyce-Codd Normal Form. Relational Database Design Algorithms and Further Dependencies: Properties of Relational Decompositions – Algorithms for Relational Database Schema Design – Join Dependencies and Fifth Normal Form. (Chapters 10 and 11)

U N I T – IV

FUNCTIONS OF DBMS: Introduction to Transaction Processing Concepts and Theory: Introduction to Transaction Processing – Transaction and System Concepts – Desirable Properties of Transactions – characterizing Schedules Based on Recoverability – Characterizing schedules Based on Serializability. Concurrency Control Techniques: Two-Phase Locking Techniques for Concurrency Control – Concurrency Control Based on Timestamp Ordering. Database Recovery Techniques: Recovery Concepts – Recovery Techniques Based on Deferred Update – Recovery Techniques Based on Immediate Update – Shadow paging. (Chapters 17.1 to 17.5, 18.1, 18.2, 19.1 to 19.4)

TEXT BOOKS

1. FUNDAMENTALS OF DATABASE SYSTEMS BY – RAMEZ ELMASRI SHAMKANT B. NAVATHE V EDITION (PEARSON)

REFERENCE BOOKS

1. DATABASE SYSTEM CONCEPTS (IV EDITION) BY - SILBER SCHATZ, KORTH G. SUDARSHAN (TMH)
2. DATABASE MANAGEMENT SYSTEMS BY - ALEXI'S LEON AND MATHEWS LEON (LION VIKAS -2002)
3. DATABASE MANAGEMENT SYSTEMS (II EDITION) - GERALD. V. POST
4. A FIRST COURSE IN DATABASE SYSTEMS - ULLMAN, WINDON (PEARSON)

MCA212	DATA COMMUNICATION AND NETWORKING	DCN
WORK LOAD: 4 PPW	INTERNAL MARKS: 20	EXTERNAL MARKS: 80

UNIT I

BASIC CONCEPTS: Line Configuration –Topology –Transmission Modes – Categories of Networks. THE OSI LAYERS– TCP/IP Protocol suite. TRANSMISSION OF DIGITAL DATA: INTERFACES AND MODEMS: Digital Data Transmission –DTE-DCE INTERFACE– Other interface– MODEMS– 56K Modems –Cable Modems. MULTIPLEXING: Many to One Downloading, Uploading/ One to Many – Frequency-Division Multiplexing(FDM) – wave Division Multiplexing(WDM) – Time Division Multiplexing(TDM) – Inverse Multiplexing – Multiplexing Application – Digital Subscriber Line(DSL) –FTTC in the Telephone Network, FTTC in the cable TV Network. (Chapter 2, 3, 6 & 8)

UNIT II

ERROR DETECTION AND CORRECTION: Types of Errors –Redundancy – Vertical Redundancy check(VRC) – Longitudinal Redundancy Check(LRC) – Cyclic Redundancy Check(CRC) – Checksum – Error Correction – DATA LINK CONTROL: Line Discipline –Flow Control –Error Control. LOCAL AREA NETWORK: Project 802 – Ethernet – Other Ethernet Networks –Token Bus – Token Ring -FDDI. SWITCHING: Circuit Switching – Packet Switching – Message Switching. (Chapter 9, 10, 12 and 14)

UNIT III

INTEGRATED SERVICES DIGITAL NETWORK (ISDN): Services –History – subscriber Access to the ISDN – The ISDN Layers – Broadband ISDN – Future of ISDN. X.25: X.25 Layers – Other Protocols related to X.25. NETWORKING AND INTERNETWORKING DEVICES: Repeaters – Bridges – Routers – Gateways – Other Devices –Routing algorithms – Distance Vector Routing – Link State Routing. (Chapter 16, 17 and 21)

UNIT IV

TRANSPORT LAYER: Duties of Transport Layer – Connection — The OSI Transport Protocol.
UPPER OSI LAYERS: Session layer – Presentation Layer – Application Layer.
TCP/IP PROTOCOL SUITE: Overview of TCP/IP – Network Layer – Addressing –Subnetting –Other Protocols In the Network Layer –Transport Layer. (Chapter 22, 23 and 24)

TEXT BOOK:

1. DATA COMMUNICATIONS AND NETWORKING BY BEHROUZ A. FOROUZAN (TATA McGraw Hill)

REFERENCE BOOKS

1. BUSINESS DATA COMMUNICATION & NETWORKS By - FITZ GERALD (John Wiley)
2. DATA & COMPUTER COMMUNICATIONS – W STALLINGS (PEARSON, PHI)
3. COMPUTER COMMUNICATIONS & NETWORKING TOPOLOGIES – MA GALLO, V.M. HANCOCK (THOMSON)
4. DATA COMMUNICATION & COMPUTER NETWORKS – R. AGARWAL, BB TIWARI (VIKAS)
5. COMPUTER NETWORKS – AS TANENBAUM (PHI)
6. COMPUTER NETWORKS – BLACK (PHI)
7. UNDER STANDING COMMUNICATIONS & NETWORKS – WA SHAY (THOMSON)
8. COMPUTER NETWORKING A TOP-DOWN APPROACH FEATURING THE INTERNET BY – JAMES F. KUROSE AND KEITH W. ROSS (PEARSON)

MCA213	SOFTWARE ENGINEERING	SE
WORK LOAD: 4 PPW	INTERNAL MARKS: 20	EXTERNAL MARKS: 80

U N I T - I

INTRODUCTION TO SOFTWARE ENGINEERING: The Evolving Role of Software - Software - The Changing Nature of Software - Software myths. A GENERIC VIEW OF PROCESS: Software Engineering-A Layered technology - A Process frame work - The capability Maturity Model Integration (CMMI) - Process Patterns - Process Assessment - Personal and Team Process Models - process Technology - Product and Process MODELS: Prescriptive Models - The waterfall Model - Incremental Process Models - Evolutionary Process Models - Specialized Process Models - The Unified Process. (Chapters1,2,3)

UNIT- II

SOFTWARE ENGINEERING PRACTICE: Software engineering Practice - Communication Practice - Planning Practices - Modeling Practices - Construction Practice - deployment SYSTEM ENGINEERING: Compute-Based systems - The System Engineering Hierarchy - Business Process Engineering: An Overview - Product Engineering:An Overview - System Modeling. REQUIRMENT ENGINEERING: A Bridge to Design and Construction - Requirements Engineering Tasks - Initiating the Requirements Engineering Process - Eliciting Requirements - Developing Use - Cases - Building the analysis Model - Negotiating Requirements - Validating Requirements. BUILDING THE ANALYSIS MODEL: Requirements Analysis - Analysis Modeling Approaches – Data Modeling Concepts - Object-oriented Analysis- Scenario-Based Modeling- Flow-Oriented Modeling - Class-Based Modeling - Creating a Behavioral Model. (Chapters 5, 6, 7 AND 8)

UNIT - III

DESIGN ENGINEERING: Design within the Context of Software Engineering - design Process and Design Quality - Design Concepts - The Design Model - Pattern-Based Software Design.
CREATING AN ARCHITECTURAL DESIGN: Software Architecture - Data Design - Architectural Styles and Patterns - Architectural Design - Assessing Alternative Architectural Designs - Mapping Data Flow into Software Architecture. MODELING COMPONENT-LEVEL DESIGN: What is a Component? - Designing Class-Based Component-Level Design - Object Constraint Language - designing Conventional Components. (Chapters 9, 10 and 11)

UNIT - IV

PERFORMING USER INTERFACE DESIGN: The Golden Rules - User Interface Analysis and Design - Interface Analysis - Interface Design Steps - Design Evaluation. RISK MANAGEMENT: Reactive vs. Proactive Risk Strategies - Software Risks - Risk Identification - Risk Projection - Risk Refinement - Risk Mitigation, Monitoring, and Management - The RMMM Plan. QUALITY MANAGEMENT: Quality Concepts - Software Quality Assurance - Software Reviews - Formal Technical Reviews - Formal Approaches to SQA - Statistical Software Quality Assurance - Software Reliability - The ISO 9000 Quality Standards - The SQA Plan. (Chapters 12, 25 and 26)

TEXT BOOK:

1. SOFTWARE ENGINEERING BY R.S. PRESSMAN (Mc. Graw Hill Sixth Edition)

REFERENCE BOOKS:

1. SOFTWARE ENGINEERING BY GHEZZI (PHI)
2. SOFTWARE ENGINEERING FUNDAMENTALS BY BEHFOROOZ AND HUDSON OXFORDUNIVERSITY PRESS
3. SOFTWARE ENGINEERING BY FAIRLEY (Mc.Graw Hill)

MCA214	PRINCIPLES AND PRACTICES OF MANAGEMENT	PPM
WORK LOAD: 4 PPW	INTERNAL MARKS: 20	EXTERNAL MARKS: 80

UNIT – I

MANAGEMENT: Meaning - Nature - Significance of Management Principles of Management - Approaches to Management, Development of Management Thought, Management Process and Skills, Managers and Environment, Social Responsibilities of Management. PLANNING: Concept, Characteristics - Importance and Limitations Steps in Planning Process - Strategic Planning - Decision Making.

UNIT – II

ORGANISING: Concept - Importance - Steps in Organizing Process Base and Problems of Departmentation - Delegation of Authority - Centralization and Decentralization - Line and Staff Relations - Span of Management.

UNIT – III

DIRECTING: Nature and Importance - Communication - Concept Elements - Process - Patterns of Communication - Barriers to Communication. MOTIVATION: Nature and Significance - Types of Motivation, Determinants of Motivation - A Brief Discussion on Theories of Motivation (MASLOW's Theory, McCLLELAND FNEED THEORY, THEORY X AND THEORY Y).LEADERSHIP: Concept - Importance - Leadership Styles - Autocratic, Democratic and Free Rein.

UNIT – IV

STAFFING: Concept - Human Resource Planning - A Brief Description of Recruitment - Selection - Training and Appraisal Methods Controlling: Meaning - Importance - Steps in Control Process - Problems of Controlling - A Brief Description of Control Techniques. COORDINATION: Need for Coordination - Approaches to Effective Coordination - Techniques of Coordination.

TEXT BOOKS

PRINCIPLES AND PRACTICE OF MANAGEMENT BY L.M. PRASAD.

REFERENCE BOOKS

1. MANAGEMENT, JAMES A.F. STONER AND CHARLES WANKEL
2. MANAGEMENT, KOONTZ HAROLD AND O'DONNEL CYRIL
3. ORGANISATION AND MANAGEMENT, LOUIS ALLEN
4. MANAGEMENT - TASKS AND RESPONSIBILITIES, PETER F DRUCKER

MCA215	.NET PROGRAMMING	.NET
WORK LOAD: 4 PPW	INTERNAL MARKS: 20	EXTERNAL MARKS: 80

U N I T - I

INTRODUCTION TO .NET FRAMEWORK: .NET Overview - Behind Microsoft .NET- The .NET Platform - .NET Framework Design Goals -.NET Framework. - The Common Language Runtime - CLR Environment and Executables – Metadata - JIT Compilation - Automatic Memory Management - Assemblies and Manifests - Intermediate Language (IL) - The CTS and CLS - CLR Execution.
FUNDAMENTALS OF VISUAL BASIC- Introduction to Visual Basic .NET, Windows forms, Control Classes, Different Types of Boxes, Labels, Buttons, Panels and Exception handling. Windows Forms applications and GDI+ - Windows Forms custom control creation. Different types of Bars, Menus, and Views. (Chapters 1 to 7)

U N I T - II

CONSOLE PROGRAMMING:
VISUAL BASIC.NET: Visual Basic .NET- Modules- variables- error handling- Arrays, lists - collections – Files- directories- streams - Object serialization - Regular expressions – Threading
OBJECT ORIENTED PROGRAMMING: Classes and objects constructors and destructors, inheritance, modifiers, Interfaces, Polymorphism, late Binding, Graphics handling and File handling. (Chapters 8 to 13)

U N I T - III

ASP.NET: Introduction - Working in ASP.NET -Controls - Working with web forms, Web forms and HTML, The Web control class, Web Forms and Boxes, Web Forms and Buttons, Validation Controls, Ad Rotators, Web Forms and HTML controls. Session & Cookies – Caching - Authentication & Authorization - Web User Controls - Working with Web Config file - Implementing Security - Crystal Reports - Creating Setup and Deployment. (Chapters 14 to 19)

U N I T - IV

APPLICATION DEVELOPMENT USING ADO .NET: Features of ADO.NET. Architecture of ADO.NET – ADO.NET providers –Accessing Data bases Using ADO.NET- Connection opening and closing– Command object – Data Adapter – Dataset – Data Tables - Controlling table views with Data Views and Data Relation Objects- Data-binding in Windows Forms and Web Forms. Data base access in Web Applications. Creating user Controls, Web user Controls, and Multithreading creating Windows services, Web Services and Deploying applications. (Chapters 20 to 25)

TEXT BOOK

1. VB.NET PROGRAMMING (BLACK BOOK) BY STEVEN HOLZNER (Dreamtech- 2003)
2. .NET Framework Essentials, Third Edition, Thuan L.Thai, Hoang Lam Publisher: O'Reilly. 2003

REFERENCE BOOKS

1. VB.NET PROGRAMMING BY T. GADDIS (Dreamtech)
2. Microsoft Visual Basic. Net step by step By Halverson (PHI)
3. OOP with Microsoft Visual Basic.Net By Reynolds Hacrtte (PHI)

MCA216	DATABASE MANAGEMENT SYSTEM Laboratory	DBMSL
WORK LOAD: 4 PPW	ASSIGNMENTS ASSESSMENT	EXTERNAL MARKS: 50

NOTE:

- All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.
- Faculty must take care about PG standard programs it should be minimum 45 – 50.
- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.
- External Viva-voce is compulsory.

MCA217	SOFTWARE ENGINERING Laboratory	STL
WORK LOAD: 4 PPW	ASSIGNMENTS ASSESSMENT	EXTERNAL MARKS: 50

SOFTWARE TESTING – Introduction, purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs. Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture, Software Development Life Cycle. Basic Structural Modeling: Classes, Relationships, Class & Object Diagrams. Interactions, Interaction diagrams, Use cases, Use case Diagrams, Activity Diagrams, Component, Deployment, Component diagrams and Deployment diagrams; Caste Study on Unified Library Application(ULA).

To learn and use the testing tools to carry out the functional testing, load/stress testing and use the following (or similar) automated testing tools to automate testing:

a) Win Runner/QTP for functional testing.
b) Load Runner for Load/Stress testing.
c) Test Director for test management.

List of Sample Programs /Experiments

1. The student should take up the case study of Unified Library Application (ULA) which is mentioned in the theory, and Model it in different views i.e Use case view, logical view, component view, Deployment view, Database design, forward and Reverse Engineering, and Generation of documentation of the project.

2. Student has to take up another case study of his/her own interest and do the same what ever mentioned in first problem. Some of the ideas regarding case studies are given in reference books which were mentioned and it would be referred for some new idea.

REFERENCE BOOKS:

1. Software Testing Tools – Dr.K.V.K.K.Prasad, Dreamtech

2. Software Testing Concepts and Tools, P.Nageswara Rao, Dreamtech Press.

3. Grady Booch, James Rumbaugh, Ivan Jacobson : The Unified Modeling Language User Guide, Pearson Education 2nd Edition

MCA218	.NET PROGRAMMING Laboratory	.NETL
WORK LOAD: 4 PPW	**ASSIGNMENTS ASSESSMENT**	**EXTERNAL MARKS: 50**

NOTE:

- All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.
- Faculty must take care about PG standard programs it should be minimum 45 – 50.
- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.
- External Viva-voce is compulsory.