



“ A” Re-accredited By NAAC

(2014) with CGPA-3.16

Revised Syllabus For

M.C.A. Part-III

(Sem. – V and VI)

Syllabus to be implemented from June 2015-16 onwards.

SEM-V

Course Code	Title of the Course	Credits	Teaching Scheme(h/w)		Evaluation Scheme (Marks)		
			L	P	CIE	SE	Total
CS1511	Compiler Construction	4	4	-	20	80	100
CS1512	Web Technology	4	4	-	20	80	100
CS1513	Python Programming	4	4		20	80	100
CS1514	Elective-III 1. Mobile Application Development 2. Cryptography and Network Security 3. Distributed Computing	4	4	-	20	80	100
CS1531	Computer Graphics and Digital Image Processing (CBCS)	4	4	-	20	80	100
CS1516	Web Technology Lab	4		12	20	80	100
CS1517	Python and Graphics Lab	4		12	20	80	100
CS1518	Project and Viva				20	80	100
Total		28	20	24	160	640	800

SEM-VI

Course Code	Title of the course	Credits	Teaching Scheme(h/w)		Evaluation Scheme (Marks)		
			L	P	CIE	SE	Total
CS1611	Research/Industrial Project	10	---	----	100	150	250
Total		10	---	----	100	150	250

Compiler Construction(CS1511)

UNIT-I

(15 hrs)

Introduction to Compiler and Design of Lexical Analyzer Compiler Basics, Issues in Compilation, Phases of Compilation: the Analysis – Synthesis Model, Compiler Construction Tools. Designing a Lexical Analyzer: Role of Lexical Analysis, Input Buffering, Specification of Tokens, Recognition of Tokens, Finite automata, Conversion from regular expression to NFA, Deterministic finite automata, Conversion from NFA to DFA, Minimization of DFA, Creating Lexical Analyzer with LEX.

UNIT-II

(15 hrs)

Design of Syntax Analyzer Role of Syntax Analyzer, Classification of parsers, **Top-Down Parsing:** Introduction, Problems in top-down parsing, Recursive Parsing, Problems in Recursive Procedures, Predictive Parsing, Error Handling in Predictive Parsers, **Bottom Up Parsing:** Shift Reduce Parser, Actions of shift reduce parser, Construction of parse tree, Operator Precedence Parsing, Components of operator precedence parsers, Parsing action, Construction of operator precedence parsers, Error reporting and recovery in operator precedence Parsers, Advantages and disadvantages of operator precedence Parsing. LR Parsing: Simple LR parser, LR(1) parser, LALR parser.

UNIT-III

(15 hrs)

Intermediate Code Generation and Code Optimization Need For Intermediate Code Generation, Intermediate Forms: Polish Notation, Quadruples, Triples, Indirect Triples & Bloks. Code Optimization: Introduction, need for code optimization, Classification of code optimization techniques: Optimization techniques that work on machine code, Optimization techniques that work on intermediate forms of source code i.e. Optimization with in Basic Blocks: Folding, Redundant operation elimination, Optimization with in Loop: Strength Reduction, Dead code elimination, Moving operation within block out of block.

UNIT-IV

(15 hrs)

Symbol Table Organization Introduction, Methods of organizing a symbol table: Unsorted, sorted symbol tables, binary search, hashing, its advantages, disadvantages, Collision, collision resolution techniques: Rehashing, Chaining.

BOOKS:

1. Aho A.V., R. Sethi and J.D. Ullman, “Compiler Principle, Techniques and Tools”, Addison Wesley.
2. Barret, Couch, “Compiler Construction Theory and Practice”, Computer Science series, Asian Student Edition.
3. Dhamdhare D.M, “Compiler Construction Principle and Practice”, McMillan India.
4. Gres D., “Compiler Construction for Digital Computer”, Wiley.
5. David Galles, Modern Compiler Design, Pearson Education, 2009.

Web Technology (CS1512)

UNIT -I

(15hrs)

Introduction: .NET framework and its architecture, CLR, JIT, CTS, Metadata, .NET Revolution, Characteristics of C#, Programming structure of C#, scope of variables, boxing & unboxing, Nullable Data types, Conditional statements, Arrays, Loops, Procedures and functions, Exception handling, Windows form controls, containers, Data Controls, Dialog Controls, sample application development, Deployment of C# application

UNIT -II

(15hrs)

ASP.NET: Page Life Cycle, Standard controls, Data Controls, Sample Application Development, Web services, Server side Validation Controls, Language Integrated Queries (LINQ) **Working with DataBases :** Working with ADO.NET, Data Binding using DataBound Control, Working With GridView Control, Working With DetailsView Control, Working With FormView Control, Working With Repeater , Connected architecture, Disconnected architecture. **Microsoft SQL Server:** Creation of Table, Views, Stored Procedures

UNIT -III

(15hrs)

ASP.Net State Management: Server side State management, Client Side state management. **Caching in ASP.NET:** Page caching, data caching, fragment caching **AJAX:** Introduction to AJAX, Calendar Extender, Always Visible Control Extender, Confirm Button Extender, Filtered text Box extender, Password Strength, Drag Panel Extender

UNIT -IV

(15hrs)

JavaScript: Introduction to JavaScript, JavaScript Identifiers, Operators, Control and looping structure, Functions, Arrays, Math functions, printing, events, cookies, objects, error handling, validations, animations, multimedia, Debugging, Image Map, Browsers.

Reference Books:

1. HTML : the complete reference by Thomas A. Powell
2. HTML, DHTML, JavaScript, Perl and CGI by Ivan Bayross

3. Microsoft Visual C# 2013 - Microsoft Press, by John Sharp
4. Professional ASP.NET 2.0 – Wrox Publication.
5. ASP.NET 2.0 (Black Book) – Dreamtech Press
6. Jesse Liberty, “Programming C#”, 4th Edition, O’Reilly Media
7. Mario Szpuszta, Matthew MacDonald, “Pro ASP.NET 4 in C# 2010: Includes Silverlight 2”, Apress, Third Edition
8. A Beginners Guide, ASP.NET 3.5 by William B. Senders

Python Programming (CS1513)

Unit-I

(15 hrs)

Installing Python, Simple program using Python, Expressions and Values, Variables and Computer Memory, error detection, Multiple line statements, Designing and using functions, functions provided by Python, Tracing function calls in memory model, omitting return statement. Working with Text: Creating Strings of Characters, Using Special Characters in Strings, Creating a Multiline String , Printing Information, Getting Information from the Keyboard

Unit-II

(15 hrs)

A Boolean Type , Choosing Statements to Execute, Nested If Statements , Remembering the Results of a Boolean Expression Evaluation , A Modular Approach to Program Organization, Importing Modules , Defining Your Own Modules, Testing Code Semi automatically Grouping Functions Using Methods: Modules, Classes, and Methods , Calling Methods the Object-Oriented Way, Exploring String Methods, Underscores.

Unit-III

(15hrs)

Storing Collections of Data Using Lists: Storing and Accessing Data in Lists, Modifying Lists, Operations on Lists , Slicing Lists , Aliasing, List Methods , Working with a List of Lists.Repeating Code Using Loops: Processing Items in a List, Processing Characters in Strings, Looping Over a Range of Numbers, Processing Lists Using Indices , Nesting Loops in Loops, Looping Until a Condition Is Reached, Repetition Based on User Input, Controlling Loops Using Break and Continue Reading and Writing Files: Kinds of files, Opening a File , Techniques for Reading Files, Files over the Internet, Writing Files, Writing Algorithms That Use the File-Reading Techniques, Multiline Records

Unit-IV

(15hrs)

Storing Data Using Other Collection Types: Storing Data Using Sets, Storing Data Using Tuples, Storing Data Using Dictionaries, Inverting a Dictionary, Using the In Operator on Tuples, Sets, and Dictionaries, Comparing Collections, A Collection of New Information Object-Oriented

Programming : Understanding a Problem Domain , Function “Instance,” Class Object, and Class Book , Writing a Method in Class Book, Plugging into Python Syntax: More Special Methods ,Creating Graphical User interface: Building a Basic GUI, Models, Views, and Controllers, Customizing the Visual Style Introducing few more Widgets, Object-Oriented GUIs, Keeping the Concepts from Being a GUI Mess

References:

1. Practical Programming: An introduction to Computer Science Using Python, second edition, Paul Gries, Jennifer Campbell, Jason Montojo, The Pragmatic Bookshelf.
2. Python for Informatics: Exploring Information, Charles Severance
3. Learning Python, Fourth Edition, Mark Lutz, O’Reilly publication
4. Introduction to Python for Computational Science and Engineering (A beginner’s guide), Hans Fangohr,

Mobile Application Development (CS1514)

UNIT –I

(15 hrs)

Introduction What is mobile Application Programming, Different Platforms, Operating systems ,Architecture and working of Android, iOS and Windows phone 8 operating system Comparison of Android, iOS and Windows phone 8 **Android:**History Behind Android Development , What is Android? Pre-requisites to learn Android , **Android Architecture:** Overview of Android Stack Android Features , Introduction to OS layers **Android Stack:** Linux Kernel , Libraries Android Runtime , Application Framework , Dalvik VM **Installing Android Machine** Configuring Android Stack ,Creating Eclipse Environment, Integrating Android with Eclipse IDE . Exploring Eclipse IDE.

UNIT-II

(15hrs)

Android Components and Activities Creating Android Project, Debugging Application through DDMS. setting up environment AVD Creation ,Executing Project on Android Screen.

Android Components : Activities , Services , Broadcast Receivers , Content Providers, **Hello World App** Creating your first project , The manifest file , Layout resource , Running your app on Emulator **Building UI with Activities:** Activities , Views, layouts and Common UI components, Creating UI through code and XML , Activity lifecycle , Intents , Communicating data among Activities

UNIT -III

(15 hrs)

Advanced UI Selection components (ListView, Spinner), Adapters, Custom Adapters , Complex UI components ,Building UI for performance , Menus , Creating custom and compound Views **Notifications:** Toast, Custom Toast, Dialogs , Status bar Notifications, **Styles And Themes:** Creating and Applying simple Style , Inheriting built-in Style and User defined style , Using Styles as themes **Resources and Assets:** Android Resource , Using resources in XML and code ,Localization ,Handling Runtime configuration changes **Intent, Intent Filters.**

UNIT -IV

(15 hrs)

Data Storage and SQLite:Android File System, IntroducingSQLite, SQLiteOpenHelper and creating a database, Opening and closing a database , Working with cursors Inserts, updates, and deletes .

References:

1. Professional Android 4 Application Development Reto Meier Wrox
2. Android Application Development: Programming with the Google SDK 2009 by Rick Rogers, John Lombardo, Zigurd Mednieks, G. Blake Meike

Cryptography and Network Security (CS1514)

UNIT 1

(15)

Introduction to concept of security : Need, Principles, Policy, Types of attacks, Basic Network security terminology .Types of Cryptography: Stream Ciphers and Block Ciphers ,Algorithm Types and modes ,Computer based symmetric (Electronic code book, Cipher block chaining, Cipher feedback, Output Feedback) Computer based

Symmetric Key Cryptographic Algorithms (Data Encryption Standard and variations, International Data Encryption Algorithm , RC5, Blowfish) .

UNIT 2

(15)

Number Theory : Prime number, Fermat's Theorem, Euler's Theorem, Modular arithmetic, Discrete Logarithms, Quadratic Residues, Chinese remainder theorem, Primality testing
Asymmetric Key Cryptography (Public Key Cryptography) Diffie Hellman Key exchange algorithm, RSA algorithm, One way hash function, Digital Signature , MD5, Secure hash algorithm, Digital Certificates .

UNIT 3

(15)

Network Security :Introduction to network security, revision of TCP/IP,IP datagram format, Virtual private networks , IP Security , IPsec protocol, Internet Key exchange protocol, Authentication header, Encapsulating Security Payload .Web Security: Socket layer, Secure hypertext transfer protocol, Secure electronic transaction, Pretty Good Privacy,S/MIME.

UNIT 4

(15)

Authentication: User Authentication , Password based authentication, Certificate based authentication, Biometric authentication, Kerberos, Ticket granting approach, Authentication Model, Kerberos and Public key cryptography, Applications of Kerberos, X.509 authentication service. **Firewalls:** Introduction, Packet Filters, Application level gateways, Circuit level gateways, Firewall architecture, Benefits and limitations of Firewall, access control mechanism.

References:

- 1) Cryptography and Network Security,Atul Kahate, McGraw Hill
- 2) William Stallings, W.,Cryptography and Network Security: Principles and Practice, 3 rd ed., Prentice Hall PTR.,2003.
- 3) Cryptography and Information Systems By V.K. Pachghare,PHI
- 4) Introduction to Computer Security By Matt Bishop and Sathynarayana ,Pearson Education.
- 5) Applied Cryptography protocols, Algorithms and Source Code in c By Bruce Schneier ,Wiley India.

Distributed Computing (CS1514)

UNIT-I

(15hrs)

Introduction of Distributed Computing and Synchronization History of Distributed Computing; Forms of computing: Monolithic, Micro, distributed, parallel, Co-operative; Distributed System Models; Issues in designing DS. Synchronization in Distributed Computing: Introduction; Clock Synchronization: Physical clock, Clock synchronization algorithms, use of synchronized clock; Logical clocks: event ordering, implementation of logical clocks, Lamport's Timestamps, Vector Timestamps; global state; Mutual Exclusion: Centralized algorithms, distributed algorithms, token ring algorithm; Election algorithms: bully algorithm, ring algorithm

UNIT -II

(15hrs)

Interprocess Communication: Event synchronization, Timeout and Threading, Deadlock and timeouts, Data Encoding, Request Response Protocols, Event diagram, sequence diagram, Connection-oriented /connectionless IPC, Evolution of paradigms for IPC.

UNIT-III

(15hrs)

Distributed Computing paradigms and System Management Paradigms and Abstraction, an Example Application, Paradigms for Distributed Applications, Trade-Offs Paradigms and Abstraction, an Example Application, Paradigms for Distributed Applications, Trade -Offs. Distributed System Management: Resource management, Task management approach, Load balancing approach, Load sharing approach, Process Management, Process migration

UNIT-IV

(15hrs)

Naming in Distributed Systems and Security Overview, Features, Basic concepts, System oriented names, Object locating mechanisms, Issues in designing human oriented names, Name caches, Naming and security, DNS Security in distributed Systems: Introduction, Cryptography, Secure Channels, Access Control, Security Management

Reference Books:

1. M.L. Liu, " Distributed Computing: Principles and Applications ", Pearson.
2. Sunita Mahajan, Seema Shah " Distributed Computing " Oxford Publications
3. P.K. sinha , " Distributed Operating Systems Concepts and design", PHI.

Computer Graphics and Digital Image Processing(CS1531)

Unit-I

(15 hrs)

a) Introduction to Computer Graphics: Advantages, application and classification of computer graphics, Input/output devices : Trackball, Joysticks, Data Glove, Digitizers, Light pen, Touch panels, Image scanners, Printers and plotters. b) Logical Input Devices: Locator, Stroke, String, Valuator, Choice and Pick. c) Video Display Devices: Refresh Cathode-Ray Tubes, Raster-Scan Displays, Random-Scan Displays, Color CRT Monitors, Direct-View Storage Tubes, Flat Panel Displays and Liquid crystal monitors, d) Raster-Scan Systems: Video Controller, Raster-Scan Display Processor, Random-Scan Systems.

Unit-II

(15hrs)

a) Line, Circle, Ellipse and Curve generation algorithm, b) Polygon filling algorithm c) Windowing and clipping : Window to Viewport transformation, line clipping and polygon clipping, B) 2D and 3D transformations : a) 2D basic transformation, other transformation, composite transformation, matrix representation and homogeneous transformation, b) 3D concepts : Display models, parallel and perspective projections c) 3D basic transformation, other transformation & composite transformation.

Unit-III

(15 hrs)

Chromatic and achromatic light, properties of light, color lookup tables, Color models : XYZ, RGB, CMY, HSV, HLS, B) Curve generation: a) Bezier curve, properties of Bezier curve, Cubic Bezier Curve, b) B-Spline curves : i) Uniform, Periodic B Spline, ii) Cubic, periodic Bspline, iii) Open, uniform B- Spline iv) Non-uniform B-spline, c) Beta-Spline : Beta spline continuity conditions, cubic periodic beta spline, matrix Representation, d) Introduction to fractal (Koch and Hilberts curve) e) Basic illumination models: Ambient light, diffuse reflection, specular reflection and its Phong model, shadows and transparency, ray tracing, displaying continuous tone images, halftone pattern and Dithering techniques, aliasing and antialiasing

Unit-IV

(15 hrs)

a) Phong rendering methods: Constant intensity shading, Gouroud shading, Phong and Fast Phong shading b) Visible surface detection methods : Classification of visible surface detection algorithm, Back-face detection, depth-buffer method, A-buffer method and Painter's algorithm c) Introduction to Digital Image Processing & Applications: What is an Image? Digital Image Processing. Examples of Use of Digital Image Processing, Fundamental Steps in Digital Image Processing, Components of an Image Processing System. Basic Relationship Between Pixels & Sampling and Quantization: Elements of Visual Perception. Image Sensing and Acquisition. Image Sampling and Quantization. Some Basic Relationships Between Pixels. Linear and Nonlinear Operations. Digital image enhancement, contrast stretching, Histogram Equalization, smoothing and median Filtering

Reference Books :

1. Computer Graphics --- Donald Hearn and M Pauline Baker, Pearson Education, 2nd Edition.
2. Computer Graphics --- F. S. Hill J R
3. Principles of interactive Computer Graphics --- Newmann Sproul
4. Fundamentals of interactive Computer Graphics --- Foley J D & van Dam
5. Theory and problems of Computer Graphics --- Plastock & Kelly
6. Computer Graphics --- A.P.Godase
7. Computer Graphics : a programming approach -- Steven Harrington
8. Mathematical Elements for Computer Graphics, D. F. Rogers and J. A. Adams, 2nd Edition, McGraw-Hill International Edition.
9. Digital Image Processing, Gonzalez & Woods, Pearson Education, Second edition.
10. Fundamentals of Digital Image Processing, Anil K Jain, PHI