

**Structure for
M. Sc. (IT & CA)
Master of Science (Information Technology & Computer Application)**



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Saurashtra University
Department of Computer Science
CBCS structure for M. Sc. (IT & CA)

M. Sc. (IT & CA)

Master of Science (IT & CA) : Two years (four semesters) full time course

Total credits for the course : 96

Semester	Credits
Semester – 1	24
Semester – 2	24
Semester – 3	24
Semester – 4	24
Total credits	96

Semester – 1

Sr. No.	Subject Code	Title of the course	Course Credits	No. of Hrs. per week	Weightage for internal exam	Weightage for semester end examination	Total marks	Duration of semester end examination in hrs.
1	CMY1001	Object Oriented programming Using Visual C ++	4	4	30	70	100	3
2	CMY1002	O.S. and Network management	4	4	30	70	100	3
3	CMY1003	RDBMS & Advanced Database Administration	4	4	30	70	100	3
4	PMY1004	Practical – 1	6	9	-	100	100	3
5	JMY1005	Project – 1	6	9	-	100	100	3
		Total	24	30	90	410	500	

Semester – II

Sr. No.	Subject Code	Title of the course	Course Credits	No. of Hrs. per week	Weightage for internal exam	Weightage for semester end examination	Total marks	Duration of semester end examination in hrs.
1	CMY2001	Web Programming – 1	4	4	30	70	100	3
2	CMY2002	Linux admin. & Linux Networking	4	4	30	70	100	3
3	Elective – 1		4	4	30	70	100	3
	EMY2013	.Net Framework and C#						
	EMY2023	Core Java						
	EMY2033	Funda. of Graphics and Multimedia						
	EMY2043	Networking Fundamentals						
4	PMY2004	Practical – 2	6	9	-	100	100	3
5	JMY2005	Project – 2	6	9	-	100	100	3
		Total	24	30	90	410	500	

Semester – III

Sr. No.	Subject Code	Title of the course	Course Credits	No. of Hrs. per week	Weightage for internal exam	Weightage for semester end examination	Total marks	Duration of semester end examination in hrs.
1	CMY3001	Web programming – 2	4	4	30	70	100	3
2	CMY3002	Advanced Software engineering	4	4	30	70	100	3
3	Elective – 2		4	4	30	70	100	3
	EMY3013	Programming with ASP.NET						
	EMY3023	Advanced Java programming in J2EE						
	EMY3033	Multimedia animation and prog. using FLASH						
	EMY3043	High performance computing clusture service computing						
4	PMY3004	Practical – 3	6	9	-	100	100	3
5	JMY3005	Project – 3	6	9	-	100	100	3
		Total	24	30	90	410	500	

Semester – IV

Sr. No.	Subject Code	Title of the course	Course Credits	No. of Hrs. per week	Weightage for internal exam	Weightage for semester end examination	Total marks	Duration of semester end examination in hrs.
1	JMY4001	Industrial project	24	-	-	300	300	3
		Total	24	-	-	300	300	

Coding for M. SC. (IT & CA) subjects

CMY	Core MSc (IT & CA) subject
PMY	Practical of MSc (IT & CA)
EMY	Elective MSc (IT & CA) subject
JMY	Project for MSc (IT & CA)

Semester – I
CMY1001: Object Oriented Programming Using Visual C++

- (1) Introduction to OOP
- (2) Basic OOP concepts & Applications
- (3) Introduction of VC++
- (4) Controls usages in Application
- (5) Mouse and Keyboard integration
- (6) Dialog based Application
- (7) Message Handling mechanism
- (8) Multiple dialog handling
- (9) Documents, views, and the single document interface
- (10) Scroll views, HTML views, and other view types
- (11) Menu environment
- (12) Test and fonts handling
- (13) Incorporating graphics, drawing and bitmaps
- (14) Device context and GDI Objects
- (15) Single document interface application
- (16) Multiple documents and multiple views
- (17) C Archive and C File classes
- (18) Database handling using ODBC
- (19) Database handling using DAO
- (20) Database handling using OLEDB
- (21) Error Detection and Exception Handling
- (22) Toolbars, Status Bars, and Rebars
- (23) Serialization
- (24) Creating DLLs (COM) using ATL & App Wizard
- (25) ActiveX Controls integration in VC++ application
- (26) Creating ActiveX controls

Reference:

- (1) Mastering VC++, BPB Publication
- (2) Practical VC++, PHI Publication
- (3) VC++ Unleashed, Techmedia Publication
- (4) Programming VC++, Microsoft press publication

Semester – I
CMY1002: O.S. and Network management

- (1) Overview of Operating System Tasks
Operating system types, OS functions, GUI/Non GUI operating system, Comparison of various OS
- (2) Essentials of Network Operating System
Understanding Requirements of NOS, Understanding different file systems (NTFS,VFS, NFS etc), Installation and configuration of Windows 2003 server
- (3) Working with Windows 2003 server
Essential commands and utilities, Administration tools, adding/removing O.S. Components, Managing file systems
- (4) Understanding Network
Establishing LAN. Dial up and wire less network, VPN, Connectivity with Other computers and devices like cell phone, iPod, Webcam, Sharing managing other users and components of network, DNS configuration with Active Directory (overview, understanding deployment, administration), IIS configuration, Overview, Running Web application, FTP service configuration, mail service configuration
- (5) Communication Protocols
Peer – To – Peer Processes, network addressing (Physical Address, Internet Address, Port Address), Network Address Classification - Recognizing Classes, NETID & HOSTID, Classes & Blocks, Network Addresses, Special Addresses, Sub-netting, Super-netting, Classless Addressing, Process To Process Communication, Port Addresses, Socket Addresses
- (6) Socket Interface
Socket Definitions, Address Transformation, Byte Manipulation Functions, Socket System Calls, Socket Addresses, Connectionless – Connection, Oriented C/S Interface

Reference Books

- (1) Learning Windows Server 2003 – O’Reilly
- (2) Windows 2003 Server – Microsoft Certification Books
- (3) Unix network programming W. R. Stevens PHI
- (4) TCP/IP protocol Suite Forouzan TMH

Semester – I
CMY1003: RDBMS & Advanced Database Administration

- (1) Introduction to RDBMS
- (2) Basic RDBMS Concepts
- (3) Database Administration with SQL Server

- (4) Introduction SQL Server
Overview of SQL Server 2000, features, components, relational database engine, replication, DTS, analysis Services, English Query, SQL server Meta Data Services, Database Architecture, Relational Database Engine Architecture, Administration Architecture

- (5) SQL Server Programming Tools
SQL query analyzer, overview of Transact-SQL, Transact-SQL syntax elements, identifiers, variables, functions, Data types, expressions, control-of-flow language elements, batches, stored procedures and triggers, transact- SQL scripts

- (6) SQL Server Database
Components of a SQL server database, files and filegroups, transaction logs, environment, SQL server installation, security, creating and managing a SQL server database, data types system-supplied data types, user-defined data types, column data types, creating and managing tables, creating tables in a SQL server, database, and managing tables in a SQL server database

- (7) Data Integrity
Enforcing Data integrity, types of data integrity, PRIMARY KEY Constraints, UNIQUE Constraints, FOREIGN KEY Constraints, CHECK Constraints. Adding.

- (8) Accessing and Modifying Data
SELECT, INTO, FORM Clause, WHERE, GROUP BY HAVING And ORDER BY Clause, using joins to retrieve Data defining subqueries, inserting modifying, deleting data into a SQL Server Database

- (9) Managing and Manipulating Data
Importing and Exporting Data, using the bcp utility and the BULK, INSERT Statement. Introduction to cursors, fetching and scrolling, controlling cursor behavior, cursor locking

- (10) Implementing Views, stored Procedures, Triggers
Creating, executing, modifying, and deleting stored Procedures, Parameters and variables, RETURN statement and Error Handling, Nesting Procedures. Cursors, creating and Managing Triggers, viewing, dropping, and disabling triggers, inserted and deleted pseudo tables, trigger syntax, system commands, and

functions, creating, modifying, and deleting views, viewing data through views. Modifying data. Index architecture, index creation and Administration, choosing to index, index performance.

- (11) SQL Server Transactions and Locks
Transaction and locking architecture, managing SQL server transactions managing SQLserver locking configuring transaction properties
- (12) SQL Server 2000 Security, Server Monitoring and Tuning
Overview of SQL Server 2000security, designing a database security plan. Database security implementation and Administration, SQL monitoring databases with SQL profiler, index tuning and Database Partitioning

Database Administration with ORACLE

- (13) Managing the Database
Parameter File:INIT.ORA, The oracle SID, crating a new database, startup and shutdown, the data dictionary, Redo Logs, Control Files, Trace and Alert Files, database Modes
- (14) Managing Disk Space
Oracle blocks in the database files, ROWID, Storage clause, Rollback segments Tablespaces, temporary segments, analyzing storage, estimating storage for a table.
- (15) Managing Users
User Analysis, minimum, maximum level of Access the User, constraints, user authentication methods, password, operating system authentication, user configuration setup, profiles, default table space, temporary table space Resource management, using profiles, defining profiles, creating modifying deleting profiles, using the default profile, quotas, enforcing tablespace quotas, assigning unlimited tablespace quotas, user database accounts creating, deleting user accounts, changing user passwords, working with INIT.ORA parameters, special account considerations, setting up a generic database administrator, setting up a generic applications administrator
- (16) Backup and Recovery
Importance of Backups, Redo Logs, Archive Logs, Requirements for Backups, Control Files, Database files, Redo Log Files, Types of Backups, control file Backups Operating system copy mirrored control files, backing up control files (online) Backup to trace, Redo Log file Backups, Mirrored Online Redo Logs, adding members, dropping Redo Log groups, dropping members from Redo Log Groups, shutting down the instance, steps in performing backup, alternative backup methods, tablespace offline copy, export, types of database failure tablespace, control file, Redo Logs Archive Logs, recovery methods, full database

- recovery, time-based recovery Cancel-based recovery, sample database backup scripts
- (17) Database Tuning
Applications tuning database tuning. Operating system tuning, performance tools
Viewing SGA and parameter settings, tuning database SGA, database Block size
Database buffer cache, shared pool size, rollback segment contention, Redo Log
contention, checkpoints, Database objects, tables and indexes.
 - (18) Database Security
Authentication, password Authentication, Privileged Accounts, Access Rights
Defined system privileges, grants to PUBLIC, Protected Object Ownership
Schema Capacity planning requirements, defining database roles, system privilege
roles Database auditing

Reference Books

- (1) Oracle Complete Reference
- (2) Oracle unleashed
- (3) Sql Server 2000, Microsoft Press

Semester – I
PMY1004: Practical – 1

- (1) CMY1001: Object Oriented Programming Using Visual C++ - 50 marks
- (2) CMY1003: RDBMS & Advanced Database Administration - 50 marks

Semester – I
JMY1005: Project – 1

Semester – II

CMY2001: Web Programming – 1

- (1) Writing Client Side Scripts
Introduction to JavaScript, Writing JavaScript into HTML, Data Types and Literal, Type Casting, Creating Variable, Incorporating Variables in a Javascript, Javascript Array, Operators and Expressions in Javascript, Special Operators, Constructor, Condition Checking, Endless Loop, Functions in Javascript, User Define Function, Dialog Boxes, The Javascript Document Object Model, Built in objects in javascript, Form used By a website, Cookies

- (2) Writing server side script
Introduction to PHP, how PHP works, The PHP .ini File, Basic PHP syntax : PHP tags, PHP statements and whitespace comments, PHP functions, Variable types, variable names (identifiers, type strength, variable scope, super, globals, constants, variable – testing and manipulation functions), First PHP script, PHP operators, Creating Dynamic pages: Single Quotes Vs. Double Quotes, Passing variables on the URL, passing variables via the Query String, Flow Control, Arrays.

PHP and HTML Forms, HTML Forms, how HTML Forms work, processing form input

String Manipulation, Formatting Strings, /Concatenation, String Manipulation Functions, Examples of string functions, working with string manipulation functions, magic quotes

Reusing Code and Writing Functions, including files, require, require_once, auto_prepend_file and auto_append_file, user functions, defining and calling functions, default values, variable scope, by reference vs.. by value, form processing code organization, code organization, conclusion

Managing Data, querying a database, inserting, updating deleting, searching records mysql functions.

Regular expressions, Regular Expression Syntax, Start and End (^\$), Number of occurrences (? +*{}), Common Characters (.\d\D\w\W\s\S), Grouping ([]), Negation (^), Subpatterns(), Alternatives(), Escape Character (\), Form validation functions with regular expressions

Session Control and /Cookies, Sessions, Configuring Sessions, Session Functions, Cookies, Authentication with Session Control.

Sending Email with PHP, mail(), shortcomings of mail(), PHPMailer, Sending a password by Email

File System Management, Opening a file, fopen(), Reading from a file, fgets(), writing to a file, fwrite(), writing to a file, file locking, flock(), uploading files via an HTML form, getting file information, more file functions, directory functions getting a directory listing, creating a resume management page.

Reference Books

- (1) Beginning JavaScript 2nd Edition – Wrox
- (2) Beginning PHP5, Apache, Mysql Web Development – Wrox
- (3) PHP Bible, 2nd Edition :Tim Converse, Joyce Park
- (4) PHP manual

Semester – II
CMY2002: Linux administration & Linux Networking

- (1) Linux Basics & Shell Programming
 - (1.1) Introduction to linux shell
 - (1.2) Introduction to shell commands & Practice
 - (1.3) Introduction to Text Editors – vi, pico
 - (1.4) Linux file system navigation
 - (1.5) Printing with linux
 - (1.6) Using shell commands & scripts
 - (1.7) Introduction to the process
 - (1.8) Decision control statements
 - (1.9) Looping statements
 - (1.10) The sh command
 - (1.11) Export exporting shell variables
 - (1.12) The command
 - (1.13) Shell functions
 - (1.14) exec statement
 - (1.15) eval: Evaluating Twice
 - (1.16) Introduction to X window system
 - (1.17) Introduction to Hard Link& Soft Link

- (2) Linux system administration
 - (2.1) Root: The system administrator's Login
 - (2.2) Disk Management
 - (2.3) fdisk L command overview
 - (2.4) Handling DOS diskettes
 - (2.5) File system mounting

- (3) Linux System configuration
 - (3.1) System environment
 - (3.2) Add & remove software packages with package manager
 - (3.3) Configuring a modem & fax service
 - (3.4) Configuration of internet service
 - (3.5) E-mail service
 - (3.6) Configuration of FTP server
 - (3.7) Telnet & Internet Relay chat

- (4) Linux Networking
 - (4.1) Networking Environment
 - (4.2) Basic network client services
 - (4.3) Basic concepts of DNS
 - (4.4) Configuration of DNS
 - (4.5) Basic concepts of DHCP
 - (4.6) DHCP-Server/client setup
 - (4.7) NFS – Network file system

- (4.8) NIS – Network information system
 - (4.9) Apache Web server
 - (4.10) Samba server
 - (4.11) Mail server
 - (4.12) Proxy server
 - (4.13) Working with GUI tools
- (5) Linux Advanced Administration
- (5.1) Advanced samba administration
 - (5.2) Clustering on linux
 - (5.3) Concurrent versions system
 - (5.4) Dynamic DNS
 - (5.5) Introduction to Kernel Concepts
 - (5.6) RPM Management
 - (5.7) MySQL & PHP on linux

Reference books:

- (1) Using Linux, Ball, Que PHI
- (2) Linux complete, sybex BPB
- (3) UNIX – Concepts & Application, Sumitabh Das, BPB
- (4) Professional PHP, Wrox

Semester – II
(Elective – 1)
EMY2013: .NET Framework and C#

- (1) MS .Net Introduction, features, advantages
 - (1.1) Ms. Net framework and architecture
 - (1.2) Ms. Net platform
 - (1.3) Microsoft .Net and Windows DNA, Microsoft .Net architecture Hierarchy
 - (1.4) Features of the .Net platform
 - (1.5) Multilanguage development, platform and processor independence
 - (1.6) Automatic memory management, easy deployment, distributed architecture, interoperability with unmanaged code security performance and scalability
 - (1.7) components of the .Net architecture
 - (1.8) MS .Net runtime, managed/unmanaged code, intermediate language
 - (1.9) Common type systems, MS.net base class library (BCL), assemblies Metadata, assemblies and modules, assembly cache, reflection, just in Time compilation, garbage collection

- (2) MS .Net Programming with C#
 - (2.1) Introduction to C# .Net language
 - (2.2) Creating your first C# program
 - (2.3) Compiling and executing, defining a class, declaring the main() method
 - (2.4) Organizing libraries with Namespaces, using the “using” keyword, adding comments
 - (2.5) introducing data types
 - (2.6) value types (Primitive Data types) and reference types, boxing and unboxing, types and aliases, casting between types, common language specification (CLS)
 - (2.7) Operators
 - (2.8) Operator Precedence and Associativity
 - (2.9) Classes and Structure
 - (2.10) Defining classes, creating object, class members, access modifiers. The main method, constructors, constants vs. Read-only fields, Inheritance. Defining Structs in C#
 - (2.11) Methods
 - (2.12) Value and reference parameters, method overloading, variable method parameters, virtual methods, static methods
 - (2.13) Properties, arrays, and indexers
 - (2.14) Properties as smart fields
 - (2.15) Arrays (Single-Dimensional Array, multidimensional arrays jagged arrays)
 - (2.16) Accessing lists with indexers
 - (2.17) Attributes
 - (2.18) Introducing attributes, defining attributes (class Attributes, method Attributes, field attributes), Attribute parameters, the attribute Usage

attribute, single-use and multiuse attributes, specifying inheritance attribute rules attribute identifiers, predefined attributes (obsoleteattribute, CLSCompliant attribute, DllImport and structLayout attributes, assembly attributes), context attributes

- (2.19) Interfaces
- (2.20) Declaring interfaces, implementing interfaces, explicit interface member name qualification, interfaces and inheritance, combining interfaces
- (2.21) Using Delegates and Events
 - (2.21.1) Delegates: single cast, multicast, Events
- (2.22) Explaining control structures
 - Using the if statement, using the if-else statement. Using the switch case statement, using the for statement, using the while statement, using the do while statement, using the break statement, using the continue statement, using the return statement, using the goto statement
- (2.23) Using Exception Handling
 - Using the try Block, using the catch block, using the finally block, using the throw statement
- (2.24) Understanding inheritance, polymorphism
- (2.25) File I/O with streams
 - Stream classes (filestream, streamreader and streamwriter, string readers and writers, file system classes (directory and directoryinfo, file and fileinfo, parsing paths), nonconsole use of streams (openfile dialog, reading web pages), serialization (Binaryformatter, soapformatter, xmlserializer, implementing iserializable))
- (2.26) Multithreading
 - Getting started with threads, managing thread lifetimes, destroying threads, scheduling threads, communicating data to a thread
- (3) Windows form and Controls
 - (3.1) General Controls
 - Label, text box, button, list box, combo box, check box, radio button picture box, date time picker progress bar, timer. Status strip, user defined controls
 - (3.2) Containers
 - Group box, panel, split container, tab control, tab layout panel, flow layout panel
 - (3.3) Menu and Tools Bars
 - (3.4) Menu strip, context menu strip, status strip, tool strip
 - (3.5) Dialogs
 - Color dialog, folder browser dialog, font dialog, open file dialog, save file dialog
- (4) Report
 - (4.1) Different type of reports
 - (4.2) Standard, cross-tab, mail label
 - (4.3) Report sections

- (4.4) Report header, report footer, page header, report footer, details, group header, group footer
- (4.5) Using report in application
- (4.6) Report objects formatting
- (4.7) Page setup
- (4.8) Record filtering
- (4.9) Formula
- (4.10) Special fields
- (4.11) Summary
- (4.12) Sub report

Reference Books

- (1) Inside C# by Tom Archer, MS Press
- (2) visual Studio .Net Programming Black Book –dreamtech press
- (3) Beginning C#, Wrox publication
- (4) professional crystal reports for visual studio .Net 2nd edition by David Mcamis, wrox
- (5) crystal reports 10: the complete reference by George Peck, MGH

Semester – II
(Elective – 1)
EMY2023: Core Java

- (1) Introduction
 - (1.1) Introduction – what is java, importance of java, java implementation application of java
 - (1.2) java buzzwords (simple, secure, portable, object-oriented, robust multithreaded, architecture – natural, interpreted, high performance, distributed dynamic)
 - (1.3) object oriented programming
 - (1.4) three OOP principals (encapsulation, inheritance, polymorphism)
 - (1.5) sample program & compilation
 - (1.6) using block of code
 - (1.7) lexical issues (White space, identifiers, literals, comments, separators, keyword)
 - (1.8) java class library

- (2) Data type, operators, control structures
 - (2.1) variables, constants, declaration, literals, scope of variable, type casting
 - (2.2) arithmetic operators, relational operators, logical operators, assignment operators, increment –decrement operators, conditional operators, bit wise operators, interface of operators, dot operators
 - (2.3) if-else, statement, loops (while, do-while, for break, goto, continue return) switch statement, operator
 - (2.4) array –declaration, creation, initialization, length
 - (2.5) two-dimensional arrays
 - (2.6) string-string arrays, string methods, stringbuffer class

- (3) introduction of classes, objects and methods
 - (3.1) What is class, object & method
 - (3.2) defining class, adding variables, adding methods, creating objects
 - (3.3) constructors THIS key word, garbage collection, finalize() method
 - (3.4) accessing class members, methods overloading static members, nesting of methods
 - (3.5) vectors and wrapper classes
 - (3.6) inheritance, subclasses, subclass constructor, multiple inheritance, hierarchical inheritance overriding methods
 - (3.7) final variables and methods, final classes, finalizer methods, abstract methods and classes
 - (3.8) visibility control – public access, friendly access, protected access, private protected access, rules of thumb
 - (3.9) method overloading, object as parameters, argument passing, returning objects, recursion, access control, static, final
 - (3.10) Nested & inner classes
 - (3.11) String class

- (3.12) Command-Line arguments
- (4) Inheritance
 - (4.1) Inheritance, Member access, super class
 - (4.2) creating multilevel Hierarchy
 - (4.3) Method over loading & overriding
 - (4.4) Abstract class, method
 - (4.5) Using final to prevent overriding & overloading
 - (4.6) The object class
- (5) Packages and Interfaces
 - (5.1) Defining packages, understanding CLASSPATH
 - (5.2) Access protection
 - (5.3) importing packages
 - (5.4) defining interfaces
- (6) exception handling
 - (6.1) exception types
 - (6.2) uncaught exceptions
 - (6.3) multiple catch clauses
 - (6.4) nested try statements
 - (6.5) throw
 - (6.6) throws
 - (6.7) finally
 - (6.8) java's built-in exceptions
 - (6.9) creating your own exception subclasses
- (7) Multithreaded programming
 - (7.1) creating threads, run()method, new thread, thread class, stopping & blocking threads
 - (7.2) life cycle of thread- newborn, runnable, running, blocked, dead, waiting sleeping, suspended, blocked
 - (7.3) using thread methods, thread exceptions, thread priority, synchronization
 - (7.4) implementing the Runnable interface
- (8) Applet
 - (8.1) what is an applel
 - (8.2) applet lifecycle
 - (8.3) applet class
 - (8.4) applet context class
 - (8.5) passing parameters to applet
 - (8.6) use of java .awt graphics class and its various methods in an applet
- (9) Event Handling
 - (9.1) Event delegation model or event class hierarchy

- (9.2) all classes and interfaces of event delegation model, programmes related to event handling covering all types of events

- (10) I/O files in java
 - (10.1) Concept of streams, difference between characterstreams and bytestreams
 - (10.2) characterstreams (reader, writer, bufferedreader, inputstreamreader, filereader, bufferwriter, outputstreamreader, filewriter, printwriter)
 - (10.3) Bytestreams (inputstream, fileinputstream, filterinputstream, bufferedinputstream, datainputstream, outputstream, fileoutputstream, filteroutputstream, bufferedoutputstream, dataoutputstream, printstream)
 - (10.4) Other classes (randomaccessfile, stream tokenizer, file)

- (11) Graphical user interface
 - (11.1) Layout managers (flowlayout, borderlayout, cardlayout, gridbaglayout, gridlayout)
 - (11.2) AWT controls (labels, buttons, canvases, checkboxes, checkboxgroup, choices, textfields, textareas, lists, scrollbars, panels, windows, frames, menus, menubars)

- (12) Java Swing
Working with JFrame, JApplet, JPanel, Jtextfield, JPasswordField, JButton, Jcheckbox, Jradiobutton, Jlist, Jscrollpane, Jcombobox, Jmenu, Jmenubar, JMenuitem, JpopupMenu, JTree, JTable

Reference Books

- (1) SCJP Sun certified programmer for Java 5 study guide (Exam 310-055) by Katherine sierra and Bert Bates
- (2) Java: the CR, 7th Edition by Schildt, Herbert, TMH publication

Semester – II
(Elective – 1)

EMY2033: Fundamental of Graphics and Multimedia

- (1) **Application of Computer Graphics**
Computer-aided design, presentation graphics, computer art entertainment, education and training, visualization, image processing graphical user interfaces
- (2) **Overview of Graphics systems**
Videodisplay devices, refresh cathode-ray tubes, raster-scan displays random-scan displays, color CRT monitors, direct-view storage tubes flat-panel displays, three-dimensional viewing devices, stereoscopic and virtual-reality, systems raster-scan systems, input devices keyboards, mouse, trackball and spaceball, joysticks, data glove digitizers, image scanners, touch panels, light pens, voice systems.
- (3) **Two-Dimensional Geometric Transformation**
Basic transformations, translation, rotation, scaling, matrix representations, and homogeneous, coordinates, composite transformations, translations, rotations, scalings, general pivot point rotation, general fixed-point scaling general scaling directions concatenation properties, general, composite transformations, and computational efficiency, other transformations, reflection shear
- (4) **TWO DIMENSIONAL VIEWING**
The viewing pipeline, viewing coordinate reference frame, window-to-viewport coordinate, transformation, two-dimensional viewing functions clipping operations, point clipping, line clipping, cohen-sutherland line clipping, liang-barsky line clipping, nicholl line clipping polygon clipping, Sutherland-hodgeman polygon clipping
- (5) **Three-Dimensional Concepts**
Three-Dimensional display methods, parallel projection, perspective projection depth cueing, visible line and surface, identification, surface rendering exploded and cutaway views, three-dimensional and stereoscopic view.
- (6) **Three-Dimensional Object Representations.**
Polygon surfaces, polygon tables, curved lines and surfaces, quadric surfaces, sphere, ellipsoid, torus, superquadrics, superellipse superellipsoid, blobby objects, spline representations, interpolation and approximation, splines, parametric continuity, conditions, spline specifications, Bezier curves and surfaces, Bezier curves, properties of Bezier curves, B-Spline curves and surface, B-spline curves
- (7) **Three-Dimensional Geometric and Modeling Transformations**
Translation, rotation, coordinate-Axes Rotations, General Three-dimensional rotations, scaling, other transformations, reflections, shears, composite transformations

- (8) illumination models and surface-rendering methods
Light sources, basic illumination models, ambient light, diffuse reflection, specular reflection and the Phong model, combined diffuse and specular, reflections with multiple light sources, intensity, attenuation, color considerations, transparency, shadows, displaying light intensities, assigning intensity levels, gamma correction and video, lookup tables, displaying continuous-tone, images, Ray-tracing methods, basic ray-tracing algorithm
- (9) Video
Digitizing video, video standards, video compression techniques, digital video editing and post-production, streamed video and video conferencing
- (10) Animation
Captured animation and image sequences, 'digital cel' and sprite animation, key frame animation, 2D animation
- (11) Sound
The nature of sound, digitizing sound, processing sound, compression formats, MIDI, combining sound and picture
- (12) Distributed multimedia system
Introduction to DMS, main features of DMS, resources management of DMS, networking multimedia operating system, distributed multimedia servers, distributed multimedia application
- (13) Multimedia Data Compression
Data compression terminology, a classification of data compression terminology, data compression technology, compression standards

Reference Books

- (1) Digital Multimedia, 2nd edition by Dr. Nigel Chapman, Jenny by Wiley publication
- (2) Computer graphics by Donald Hearn and M. Pauline Baker – Pearson Education

Semester – II
(Elective – 1)
EMY2043: Networking fundamentals

- (1) The development of Network computing
The mainframe environment, the PC revolution. The development of local area, network(LANs), Cooperative Networking, peer-to-peer networking client/server networking, master/slave networking. The development of wide area networks (WANs), intranets, internet overview. The internet and extranets
- (2) Physical Networks – Components, Standards and Structure
Basic physical network components network adapter cards, network card configuration, coaxial, cabling, types of coaxial cabling: Thinnet (10 Base2) cabling, Thinnet connectors and terminators, Thicknet (10 Base5) cabling coaxial cabling considerations, Twisted Pair Ethernet cabling, Twisted pair connectors, cable categories, fibre optic cabling structured cabling, remote connectivity, modems leased lines, public switched telephone networks (PSTNs). Integrated services data network – ISDN, integrated services digital network (ISDN) terminal adapters, comparison of ISDN and PSTN, Network interface Layer, LAN Technologies, Ethernet, Ethernet Implementations, Ethernet frame formats, Ethernet limitations, faster Ethernet standards, token ring FDDI, FDDI Fault Tolerance, CDDI, other LAN technologies, wide area network technologies –introduction, point-to-point, Tunnelling protocol (PPTP). The X.25 Model, frame Relay operatio, Asynchronous Transfer mode (ATM). The need for routing, intermediate nodes, routing vs Bridging, Layer 3 Protocols, Metrics, Network, infrastructure, LAN interconnections, Repeaters, Hubs, switched Hubs, bridges, transparent bridging, problems with transparent bridging – loops, spanning tree algorithm, transparent bridge network after running STA, Source Route Bridging, Routers, Brouters, Gateways
- (3) Networking Protocols
The need for network standards, international organization for standadisation (ISO), the OSI 7-layer reference model, protocol data unit (PDU), service access point (SAP), the physical Layer, the Data Link Layer -1. the data link layer -2, the network layer, the network layer and packet routing, the transport layer, the session layer, the presentation layer, the application layer, network protocols, the TCP/IP protocol suite, comparison of TCP/IP and OSI, Novell NetWare protocols, AppleTalk protocols, NetBIOS extended user interface (NetBEUI)
- (4) Internet Protocol (TCP/IP) Suite
Introduction, the history of TCP/IP, TCP/IP standards, architecture, architecture-continued, comparison with OSI architecture. Network interface layer, internet layer, internet control message protocol (ICMP), Internet group management protocol (IGMP), internet protocol (IP), Transport Layer, User Datagram protocol (UDP), TCP/IP for windows 2000 – new features, IP addressing, IP addressing, classes of IP address, subnet masks, subnet masks – continued, subnetting,

supernetting, dynamic v/s manual configuration of TCP/IP hosts, dynamic configuration DHCP Mechanisms, IP lease renewal, DHCP implementation, name to address resolution, name resolution, local name resolution text files problems with static host name resolution, NetBIOS names, NetBIOS name discovery methods, primary and secondary WINS servers, NetBIOS name discovery methods, primary and secondary WINS Servers, NetBIOS name release. Name resolution by broadcast, Microsoft name resolution methods. TCP/IP node types, the LMHOSTS file, Windows internet naming service 9WINS0, WINS name registration, renewal and release WINS implementation introduction to the domain name system, domain name system (DNS) DNS name space, zones of authority, DNS name server roles, DNS name resolution, IP address Resolution, integration of Active Directory and DNS configuring an Active Directory Integrated Zone. Configuring the dynamic update service for DNS, Testing and troubleshooting the DNS server service

Reference Books

- (1) Principles of Network and system Administration – Wiley
- (2) Computer Networks and Internets – Douglas E. Comer

Semester – II
PMY2004: Practical – 2

- | | | |
|-----|--|------------|
| (1) | CMY2001: Web Programming – 1 | : 40 marks |
| (2) | CMY2002: Linux admin. & Linux Networking | : 20 marks |
| (3) | (Elective – 1) | : 40 marks |

Semester – II
JMY2005: Project – 2

Semester – III
CMY3001: Web programming – 2

- (1) **Advanced PHP**
PHP XML Support, Simple XML Objects, executing X path Queries, DOM Interoperability, Using X path, Installing and Configuring LIBXSL, Applying server side XSL Transformations, Using XML in N-Tier Architecture, Mixing PHP Objects and XML

PHP Web Services, Web service Technology Stack, SOAP Soup, Web services with PHP, Installing NuSOAP, Building a SOAP SERVER, Consuming a Web service, Generating WSDL Dynamically, Understanding Generated WSDL, WSDL and SOAP Proxies

Ajax with PHP, Ajax overview, Ajax Technology Stack, Ajax Implementations, Installing and configuring HTML Ajax Pear Module, Ajax Server, Ajax Client Smarty templates, Smarty overview, installing and configuring smarty Pear Module, Setting up a Template, passing data to the template, smarty for template, designers, smarty for programmers, smarty in N-Tier Architecture

- (2) **ASP**
ASP Introduction, Global.asa file, Asp Server Side Scripting, ASP Functions

ASP Object: Application Object (Collection Reference, Methods Reference, Events Reference),ObjectContext Object (Collection Reference, Methods Reference, Events Reference), Request Object (Properties Reference, Collection Reference, Method Reference), Response Object (Properties Reference, Collection Reference), Server Object (Properties Reference, Method Reference), Session Object (Properties Reference, Collection Reference, Method Reference, Events Reference),

The ADO Recordset Object (Properties Reference, Collection Reference, Method Reference, Events Reference)

ASP Components (ASP ADRotator, ASP BrowserCap, ASP ContentLinking, ASP ContentRotator)

ASP and AJAX, Ajax Introduction, Ajax ASP

Reference Books

- (1) Beginning Ajax – Wrox
- (2) PHP Bible, 2nd Edition :Tim Converse, Joyce Park
- (3) Beginning PHP5, Apache, Mysql Web Development – Wrox
- (4) XML Bible – Wiley
- (5) O'Reilly-ASP In.A.Nutshell-2ndEdition - O'Reilly

Semester – III
CMY3002: Advanced Software Engineering

- (1) Object Oriented Concept And Principles
 - (1.1) Object Oriented Paradigm
 - (1.2) Object Oriented Concepts
 - (1.3) Identifying the elements of an object model
 - (1.4) Management of Object Oriented software projects

- (2) Object Oriented Analysis
 - (2.1) Object Oriented Analysis Concepts
 - (2.2) Domain Analysis
 - (2.3) Generic components of Object Oriented analysis model
 - (2.4) Object Oriented analysis process
 - (2.5) Object Relationship model
 - (2.6) Object behavior model

- (3) Object Oriented Design
 - (3.1) Design of Object Oriented System
 - (3.2) The System Design Process
 - (3.3) Object Design Process
 - (3.4) Design Patterns
 - (3.5) Object Oriented Programming

- (4) Object Oriented Testing
 - (4.1) Broadening the view of Testing
 - (4.2) Testing Object Oriented Analysis and Object Oriented Design Models
 - (4.3) Object Oriented Testing Strategies
 - (4.4) Test case design for Object Oriented Software
 - (4.5) Testing methods applicable at the class level
 - (4.6) Interclass test case design

- (5) Technical metrics for Object Oriented Systems
 - (5.1) The intent of Object Oriented Metrics
 - (5.2) The distinguishing Characteristics of Object Oriented Metrics
 - (5.3) Metrics for Object Oriented Design Model
 - (5.4) Class Oriented Metrics
 - (5.5) Operation Oriented Metrics
 - (5.6) Metrics for Object Oriented testing
 - (5.7) Metrics for Object Oriented Projects

- (6) Clean Room Software Engineering
 - (6.1) The clean room approach
 - (6.2) Functional specification
 - (6.3) Clean room specification
 - (6.4) Clean room design

- (6.5) Clean room testing
- (7) Component Base Software Engineering
 - (7.1) Engineering of component based systems
 - (7.2) The component based software engineering process
 - (7.3) Domain engineering
 - (7.4) Component based development
 - (7.5) Classifying and Retrieving Components
- (8) Case studies of all above Books

Reference Books

- (6) Software Engineerin, A practicenor's approach Roger S. Pressman
- (7) Object Oriented Analysis and Design, Gooch

Semester – III
(Elective – 2)
EMY3013: Programming with ASP.NET

- (1) Building ASP.NET Pages
 - (1.1) ASP.NET and the .NET Framework
 - (1.2) Introducing ASP.NET Controls
 - (1.3) Adding Application logic to an ASP.NET Page
 - (1.4) The structure of an ASP.NET Page

- (2) Building Forms with Web Server Controls
 - (2.1) Building Smart Forms
 - (2.2) Controlling Page Navigation
 - (2.3) Applying Formatting to Controls

- (3) Performing Form Validations with validation controls
 - (3.1) Using client side validation
 - (3.2) Requiring fields: The RequiredFieldValidator control
 - (3.3) Validating expressions: The RegularExpressionValidator Control
 - (3.4) Comparing Values: The CompareValidator Control
 - (3.5) Checking for a Range of values: The RangeValidator Control
 - (3.6) Summarizing Errors: The ValidationSummary Control
 - (3.7) Performing Custom Validation: The CustomValidator Control Disabling Validation

- (4) Advanced Control Programming
 - (4.1) Working with View State
 - (4.2) Displaying and Hiding Content
 - (4.3) Using Rich Controls

- (5) Introduction to ADO.NET
 - (5.1) An Overview of ADO.NET
 - (5.2) Performing Common Database Tasks
 - (5.3) Improving Database Performance
 - (5.4) Advanced Database Topics

- (6) Binding Data to Web Controls
 - (6.1) Overview of Data Binding
 - (6.2) Building a Server Control to a Data Source
 - (6.3) Creating Master/Detail Forms
 - (6.4) Data Binding without Data Binding Expressions

- (7) Using the DataList and DataGrid Controls
 - (7.1) Overview of the DataList and DataGrid controls
 - (7.2) Using the DataList Control
 - (7.3) Using the DataGrid Control

- (8) Working with DataSets
 - (8.1) Understanding DataSets

- (8.2) Understanding DataTables
- (8.3) Understanding DataViews
- (8.4) Using DataSets with ASP.NET Pages

- (9) Working with XML
 - (9.1) Overview of the XML
 - (9.2) Classes Using XML with DataSets
 - (9.3) Transforming XML with XSL Stylesheets
 - (9.4) Using the ASP.NET XML Control Using the XslTransform Class Using Strongly Typed DataSets

- (10) Using ADO.NET to Create a Search Page
 - (10.1) Using SQL Server Full Text Search
 - (10.2) Using the Microsoft Indexing Service

- (11) Creating ASP.NET Applications
 - (11.1) Overview of ASP.NET Applications
 - (11.2) Using Application State
 - (11.3) Using the Web.config File
 - (11.4) Using HTTP Handler and Modules-

- (12) Tracking User Sessions
 - (12.1) Using Browser Cookies
 - (12.2) Using Session State
 - (12.3) Using Cookieless Sessions

- (13) Caching ASP.NET Applications
 - (13.1) Using Page Output Caching
 - (13.2) Using Page Fragment Caching
 - (13.3) Using Page Data Caching

- (14) Application Tracing and Error Handling
 - (14.1) Responding to Errors
 - (14.2) Tracing and Monitoring Your Application
 - (14.3) Logging Events
 - (14.4) Using the Debugger

Reference Books

- (1) ASP.NET UNLEASHED, Stephen Walther Pearson Edition
- (2) ASP.NET BLACK BOOK

Semester – III
(Elective – 2)
EMY3023: Advanced Java programming in J2EE

- (1) Introducing J2EE
 - (1.1) J2EE Introduction
 - (1.2) J2EE Platform Technologies At a Glance
 - (1.3) Sun Java Application Server

- (2) Installation Of J2EE
 - (2.1) Downloading J2EE
 - (2.2) Installing J2EE
 - (2.3) Uninstalling J2EE

- (3) Introduction To Web Application
 - (3.1) Web Application Architecture
 - (3.2) Collecting data
 - (3.3) Sending the web server request
 - (3.4) Executing server side program/script
 - (3.5) Developing Server Applications

- (4) Java Servlets
 - (4.1) Servlet Introduction
 - (4.2) Architecture of a Servlet
 - (4.3) Servlet API
 - (4.4) Servlet Life Cycle
 - (4.5) Servlet in Web Application
 - (4.6) Compiling and Building Servlet Application
 - (4.7) Deploying Web Application
 - (4.8) Undeploying Web Application
 - (4.9) Cookies in Servlet: Types of Cookies, Advantages of Cookies, Creating Cookies using Servlet

- (5) Sessions
 - (5.1) Life cycle of HttpSession
 - (5.2) Methods of Session Tracking
 - (5.3) Session API for creating, deleting and managing sessions

- (6) JDBC
 - (6.1) JDBC Introduction
 - (6.2) JDBC Architecture
 - (6.3) Types of JDBC Drivers
 - (6.4) JDBC API and Objects
 - (6.5) Database Connection Statement PreparedStatement, CallableStatement
 - (6.6) Connecting with Databases
 - (6.6.1) MySQL

- (6.6.2) Access
- (6.6.3) Oracle
- (6.6.4) Performing Database Operations

- (7) Java Server Pages
 - (7.1) Introduction
 - (7.2) JSP vs. Servlet J
 - (7.3) SP Architecture J
 - (7.4) SP Lifecycle
 - (7.5) JSP Elements: Directive Elements, Scripting Elements, Action
 - (7.6) Elements JSP Implicit Objects
 - (7.6.1) Request
 - (7.6.2) Response
 - (7.6.3) Out
 - (7.6.4) Session
 - (7.6.5) Application
 - (7.6.6) Config
 - (7.6.7) PageContext
 - (7.6.8) Page
 - (7.6.9) Exception
 - (7.7) JSP Scope
 - (7.7.1) Application Scope
 - (7.7.2) Session Scope
 - (7.7.3) Request Scope
 - (7.7.4) Page Scope

- (8) Enterprise Java Beans
 - (8.1) Enterprise Bean Architecture
 - (8.2) Benefits of Enterprise Bean
 - (8.3) Types of Enterprise Bean
 - (8.3.1) Session Beans
 - (8.3.2) Entity Beans
 - (8.3.3) Message Driven Beans

- (9) Working with Session Beans
 - (9.1) Stateless Session Beans
 - (9.2) Stateful Session Beans
 - (9.3) Demo Application for Session Beans

- (10) Working with Message Driven Beans
 - (10.1) Use of Message Driven Beans
 - (10.2) Demo Application for Message Driven Bean

- (11) Working with Entity Beans
 - (11.1) Java Persistence
 - (11.2) Entity Class

- (11.3) Persistent Fields and Properties
- (11.4) Demo Application for Entity Beans

Reference Books

- (1) Java Server Programming For Professionals, Ivan Bayross, Sharanam Shah, Shroff publication
- (2) Java Server Programming Black Book, Dreamtech Publications

Semester – III
(Elective – 2)

EMY3033: Multimedia animation and programming using FLASH

- (1) Basic Introduction of Animation and script programming
 - (1.1) Create still or animated text on your Web page.
 - (1.2) Use Flash tools to create your own graphics for your Web page or to import graphics.
 - (1.3) Animate graphics and make objects appear and disappear by using the transparency feature.
 - (1.4) Create Web page buttons that not only lead your viewers wherever you want them to go but also change shape or color at the same time.
 - (1.5) Add sound or video to your movie.
 - (1.6) Create menus that viewers can use to navigate your site.

- (2) Getting Start with Flash
 - (2.1) Flash Menus, panel and toolbar.
 - (2.2) The Timeline window
 - (2.3) The Use of Flash Help window.
 - (2.4) Creating drawings
 - (2.5) Making graphics move (Animation - I)
 - (2.6) Publishing your first animation on Web browser
 - (2.7) Setting the Stage, adding metadata, Library, Using Template

- (3) Animation on objects and text
 - (3.1) Selecting and Manipulating objects (moving, copying, and deleting)
 - (3.2) Use of Motion and shape tweening effect
 - (3.3) Reshaping shapes, Working with fills, Transferring properties to objects (scaling, rotating, skewing, and flipping)
 - (3.4) Combining, Grouping and ungrouping, Breaking apart objects
 - (3.5) Creating, editing, and formatting text using text effects, Hyper linking text,
 - (3.6) Creating input and dynamic text

- (4) Layer Effects, Symbols
 - (4.1) Creating layers
 - (4.2) Modifying layers
 - (4.3) Using guide layers
 - (4.4) Creating holes with mask layers
 - (4.5) Types of symbols
 - (4.6) Making symbols
 - (4.7) Creating instances
 - (4.8) Buttons and Scripting
 - (4.9) Making simple buttons
 - (4.10) Testing your buttons
 - (4.11) Adding sound, movie clip to button

- (4.12) The Timeline window effects
 - (4.12.1) Animation frame by frame
 - (4.12.2) Adding labels and comments
 - (4.12.3) Reversing animation
 - (4.12.4) Using onion skins
 - (4.12.5) Breaking movie into scene
- (4.13) Adding action to timeline
- (4.14) Controls through script on Buttons
 - (4.14.1) Add a button that acts on text input (interactive control)
 - (4.14.2) Using Behavior, Action Events
 - (4.14.3) Browser/Network action commands
 - (4.14.4) Built in Methods, External Scripting
- (5) Development of small application of Publishing Web Application using Flash

Reference Books:

- (1) Flash 8 Bible, IDG Book India Reinhardt, Robert
- (2) Macromedia Flash 8 for Dummies, Wiley Publishing Gurdy Leete and Ellen Finkelstien
- (3) Flash 4: Magic, TechMedia Darnell Rick

Semester – III
(Elective – 2)

EMY3043: High performance computing cluster service computing

- (1) High Performance Computing
 - (1.1) The Demand for High Performance Computing
 - (1.2) Parallel Processing -An introduction
 - (1.3) Classification of computer architecture by Flynn
 - (1.4) Shared memory multiprocessing architecture model
 - (1.5) Distributed memory multiprocessing and its important
 - (1.6) Parallelism in Sequential Machines
 - (1.7) Abstract Model of Parallel Computer
 - (1.8) Architectural Features of Messages - Passing Multi computers
 - (1.9) Basics of Message-passing Programming
 - (1.10) Pipelined Computations
 - (1.11) Synchronous Computations
 - (1.12) Algorithms and Applications
 - (1.13) Parallel Programming Languages
 - (1.14) Scalar vs. Vector pipelining
 - (1.15) Architecture of PVM
- (2) Cluster Server Computing
 - (2.1) Introduction to Clusters
 - (2.2) Definition, Distinctions and Initial Comparisons
 - (2.3) Symmetric Multiprocessors
 - (2.4) Basic Programming Models and Issues
 - (2.5) Commercial Programming Models
 - (2.6) Cluster Design and Networking concepts
 - (2.7) Cluster Installation and Administration Issues
 - (2.8) Comparisons of Different Open Source Architectures
 - (2.9) Advantages of Cluster Server

Books

- (1) Introduction to Parallel Processing M. Sasikumar, PHI
- (2) Building your own cluster O'reilly
- (3) Parallel Programming
- (4) Prentice Hall, Barry Wilkinson and Michael Alien

Semester – III
PMY3004: Practical – 3

- | | | |
|-----|------------------------------|------------|
| (1) | CMY3001: Web Programming – 2 | : 50 marks |
| (2) | (Elective – 1) | : 50 marks |

Semester – III
JMY3005: Project – 3

Semester – IV
JMY4001: Industrial Project