MCA IV SEMESTER SYLLABUS

CS - 41. Visual Programming with VB.Net
CS - 42. Software Engineering
CS - 43. Operations Research
CS - 45. Project (VB.Net with any Database).

CS - 41. Visual Programming with VB.Net

Introducing .NET:-

The Common Language Runtime:-

.NET Language:-
C#, A C# Example, C# Types, C# Control Structure, Other C# Feature, Visual Basic, A Visual Basic Example, VB Control Structure, Other VB Feature, C++,C++/CLI, Managed C++.

Surveying the .NET Framework Class Library:-

Building Web Application: ASP.NET

Accessing Data: ADO.NET
Using .NET Framework Data Providers, Connection and Command Objects, Accessing Data with DataReader, DataSets, Accessing and Modifying a Dataset's Content, Dataset with XML-Defined Data.

Building Distributed Application:-

Text Book:-

References:
CS - 42. Software Engineering

**Introduction:** Fundamental definitions, size factors, quality and productivity factors, managerial issues.

**Planning a software project:** defining the problem, developing a solution strategy, planning the development process, planning organizational structure, other planning activities.

**The Product:** - The Evolving Role of Software, Software Characteristics, software application.


**Project management concept:** - The management Spectrum, people, product, the process.

**Software Process and Project Metrics:** - Measure, metrics, and indication. Software measurement, Size-oriented Metrics, Function oriented Metrics.

**Software Project Planning:** - Project Planning objective, software scope, Resources, software project Estimation, Decomposition technique.

**Risk Analysis and management:** - Software risk, risk identification, risk projection, risk refinement, risk migration, monitoring and management.

**Project Scheduling:** - Basic concept, Relationship between people and effort, scheduling, Software cost estimation, SW cost factors, Cost estimation techniques, staffing level, estimating maintenance cost, Timeline chart, Software requirement specification, formal specification techniques.

**Software Quality:** - Quality concepts, quality movement, software quality assurance, formal technical review.

**Analysis concept:** - Data modeling, data object attributes and relationship, cardinality and modality, Entity-relationship Diagram, Functional modeling and information flow, data flow diagram, Data dictionary.

**Design Concept:** - Software design, design process, design principle, design concept, effective modular design.

**Software Testing Techniques:** - Software testing fundamental, testing objective, principle, testability. Test case Design, white box testing, basic path testing, flow graph notation, cyclomatic complexity, deriving test cases, graph matrices, control structure testing, condition testing, data flow testing, loop testing, black box testing, Graph-Based testing, Equivalence partitioning, boundary value analysis.

**Software testing Strategy:** - verification and validation, organizing for software testing, a software strategy, unit testing, integration testing, validation testing, system testing.

**Implementation issues:** Structured coding techniques, Coding style, Documentation guidelines

**Software maintenance:** Enhancing Maintainability during Development, Managerial aspect of Software Maintenance, Configuration Management, and Source Code Matrices.

**Textbooks(s):**

T1. Fundamentals of Software Engineering, Ghezzi et.al. PHI

**Reference Book(s)**

R1. Software Engineering, Pressman, TMH | R2. Software Engineering, Fairley, TMH.
CS - 43. Operations Research

**Linear Programming Problem (LPP)**: Graphical method for 2 dimensional problems.

**Central problem of linear programming**: Various definitions - statement of basic theorems and properties. Simplex method - primal and dual, dual simplex method, sensitivity analysis. Transportation problem, Assignment problem and its solution by Hungarian method.

**Integer Programming**: Gomory cutting plane methods.

**Queuing theory**: Characteristics of queuing systems - steady state, M/M/1, M/M/1/k, M/M/C queuing models.

**Replacement theory**: Replacement of items that fail Group replacement and individual replacement.

**Inventory theory**: Costs involved in inventory problems - single item deterministic models- economic lot size models without shortage and with shortages having production rate - infinite and finite.

**PERT and CPM**: Arrow networks, time estimates, latest allowable occurrence time and slack, artificial path, probability of meeting schedule date of completion of project. Calculations on CPM networks.

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**Textbook(s):**
- T1. Mustafi ‘Operation Research’ New Age

**Reference Book(s)**
- R1. Operations Research, Gupta Malik,
- R2. Operations Research, Shaum Series, TMH
**CS-44. Computer Graphics & Programming with World Wide Web.**

*Group-A*

**Computer Graphics:**

**A Survey of Computer Graphics:**

**Overview of Graphics Systems:**

**Output Primitives:**

**Attributes of Output Primitives:**
Line Attributes, Curve Attributes, Color and Grayscale Levels, Area-Fill Attributes, Character Attributes, Bundled Attributes, Inquiry Functions, Antialiasing.

**Two-Dimensional Geometric Transformations:**

**Two-Dimensional Viewing:**
The Viewing Pipeline, Viewing Coordinate Reference Frame, Window-to-Viewport Coordinate Transformation, Two-Dimensional Viewing Function, Clipping Operations, Point Clipping, Line Clipping, Polygon Clipping, Curve Clipping, Text Clipping, Exterior Clipping.

**Structures and Hierarchical Modeling:**

**Graphical User Interfaces and Interactive Input Methods:**

**Three-Dimensional Concepts:**
Three-Dimensional Display Methods, Three-Dimensional Graphics Packages.

**Three-Dimensional Object Representations:**
Polygon Surfaces, Curved Lines and Surfaces, Quadric Surfaces, Super quadrics, Blobby Objects, Spline Representations, Cubic Spline Interpolation, Bezier Curves and Surfaces, B-Spline Curves and Surfaces, Beta-Splines, Rational Splines, Conversion Between Spline Representations, Displaying Spline Curves and Surfaces, Sweep Representations, Constructive Solid-Geometry Methods, Octrees, BSP Trees, Fractal-Geometry Methods, Shape Grammar and Other Procedural Methods, Particle Systems, Physically Based Modeling, Visualization of Data Sets.

**Three-Dimensional Geometric and Modeling Transformations:**
Translation, Rotation, Scaling, Other Transformations, Composite Transformations, Three-Dimensional Transformation Functions, Modeling and Coordinate Transformations.
Three-Dimensional Viewing:
Viewing Pipeline, Viewing Coordinates Projections, View Volumes and General Projection Transformations, Clipping, Hardware Implementations, Three-Dimensional Viewing Functions.

Visible-Surface Detection Methods:

Illumination Models and Surface-Rendering Methods:
Light Sources, Basic Illumination Methods, Displaying Light Intensities, Halftone Patterns and Dithering Techniques, Polygon-Rendering Methods, Ray-Tracing Methods, Radiosity Lighting Model, Environment Mapping, Adding Surface Detail.

Color Models and Color Application:

Computer Animation:
Design of Animation Sequences, General Computer-Animation Functions, Raster Animations, Computer-Animation Languages, Key-Frame Systems, Motion Specifications.

Textbook(s):
T1: Computer Graphics C Version, Hearn, Pearson Education
Fundamentals

Introduction to XHTML:-
Origins and Evolution of HTML and XHTML, Basic Syntax, Standard XHTML Document Structure, Basic Text Markup, Images, Hypertext Links, Lists, Tables, Forms, Frames, Syntactic Differences between HTML and XHTML

Cascading Style Sheets:-
Levels of Style Sheets, Style Specification Formats, Selector Forms, Property Value Forms, Font Properties, List Properties, Color, Alignment of Text, The Box Model, Background Images, The <span> and <div> tags

The Basics of Java Script:-

Java Script and HTML Documents:-

Dynamic Documents with Java Script:-
Element Positioning, Moving Elements, Element Visibility, Changing Colors and Fonts, Dynamic Content, Stacking Elements, Locating the Mouse Cursor, Reacting to a Mouse Click, Slow Movement of Elements, Dragging and Dropping Elements.

Java Applets:-

Introduction to XML:-

The Basics of Perl:-
Using Perl for CGI Programming:
The Common Gateway Interface, CGI Linkage, Query String Format, the CGI.pm Module, A Survey Example, Cookies.

Servlets and Java Server Pages:
Overview of Servlets, Servlet Details, a Survey Example, Storing Information on Clients Java Server Pages.

Introduction to PHP:
Origins and uses of PHP, Overview of PHP, General Syntactic Characteristics, Primitives, Operations, and Expressions, Output, Control Statements, Arrays, Functions, Pattern Matching, Form Handling, Files, Cookies, Session Tracking.

Introduction to ASP.NET:
Overview of the .NET Framework, Introduction to C#, Introduction to ASP.NET, ASP.NET Controls, Web Services.

Database Access through the web:
Relational Database, An Introduction to the Structured Query Language, Architectures for Database Access, The MySQL Database System, Database Access with Perl and MySQL, Database Access with PHP and MySQL, Database Access with JDBC and MySQL.

Text Book: - Programming the World Wide Web by Robert W. Sebesta – Pearson Education
Reference: - Internet and World Wide Web by Deitel - Pearson Education
Web Technology by Jhonson - PE
Web Technology and Design by Xavier – New Age

CS - 45. Project (VB.Net with any Database).

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