Rajiv Gandhi Proudhyogiki Vishwavidyalaya, Bhopal
Computer Application (MCA- Dual Degree) V Semester

Subject Code	Subject Name	Periods per week			Credits	Maximum Marks (Theory Slot)			Maximum Marks (Practical Slot)		Total Marks
		L	T	P		End Sem. Marks	Test (Two)	Assign. /Quiz	End Semester Practical/Viva	Practical Record /Assign./Quiz/ Presentation	
MCA DD -501	Object Oriented Programming in C++	5		-	5	70	20	10	-	-	100

MCADD-501 Object Oriented Programming in C++

UNIT-I

C++ basics, loops and decisions, structures and functions, object and classes, object arrays, constructor and destructor functions.

UNIT-II

Operator and function overloading, pointers, pointers to base and derived classes inheritance, public and private inheritance, multiple inheritance.

UNIT-III

Polymorphism, virtual functions, abstract base classes and pure virtual function, friend function, early and late binding.

UNIT-IV

C++ I/O system, formatted I/O, creating insertors and extractors, file I/O basis, creating disk files and file manipulations using seekg(), seekp(), tellg() and tellp() functions, exception handling: try, catch and throw.

UNIT-V

UML concepts, object-oriented paradigm and visual modeling, UML diagrams, UML specifications, object model, object oriented design, identifying classes and object, object diagrams.

BOOKS

1. Lafore R. “Object Oriented Programming in C++”, Galgotia Pub.
2. Lee “UML & C++ a practical guide to Object Oriented Development 2 ed, Pearson.
3. Schildt “C++ the complete reference 4ed, 2003.
4. Hans Erit Eriksson “UML 2 toolkit” Wiley.
5. Balagurusawmy “Object Orienter Programming with C++”.
6. B.G., Boach “Object Oriented Analysis & Design with Applications”, Addision Wesly.
7. S. Parate “C++ Programming”, BPB.
8. Boggs “Mastering UML” BPB Publications.

Note : Paper is to be set unit wise with internal choice.

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MCA DD -502	Principles of Programming Language	5		-	5	70	20	10	-	-	100

UNIT I

Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming, Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments. Issues in Language Translation: Syntax, Semantics, Stages, analysis and synthesis, Parse Tree, CFG and BNF grammar.

UNIT II

Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation issues related to these types, Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. Sequence control with Expressions, Conditional Statements, Loops, Exception handling.

UNIT III

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic subprograms, design issues for functions overloaded operators, co routines.

UNIT IV

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, Static and StackBased Storage management, heap based storage management. Garbage Collection, Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C++ threads.

UNIT V

Exception handling, Exceptions, exception Propagation, Exception handler in C++ and Java, Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming. Functional Programming Languages: Introduction, fundamentals. Introduction to 4GL.

BOOKS

1. Sebesta,"Concept of programming Language", Pearson Edu.
2. Louden, "Programming Languages: Principles & Practices" , Cengage Learning
3. Tucker, " Programming Languages: Principles and paradigms ", Tata McGraw –Hill
4. Terrance W Pratt, "Programming Languages: Design and Implementation" Pearson Edu.

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MCA DD -503	Advanced Web Designing	5		-	5	70	20	10	-	-	100

MCADD-503 Advance Web Desuigning

UNIT I

BASICS OF HTML: Html tags, entities, links, frames, Text Alignment and Lists, Text Formatting, Fonts Control, head, meta, Email Links and link within a Page, Creating a Table, rules of web designing, Creating HTML Forms, page design, home page layout, Design concepts, Create a Web page with Graphics, Custom Backgrounds and Colors, Creating Animated Graphics, scripts, attributes, events, URL encode.

UNIT II

CASCADING STYLE SHEET: CSS, Defining Style with HTML Tags, Features of Style Sheet, Style Properties, Style Classes, External Style Sheet, Creating style sheet, working with block elements and objects, working with list and table, CSS advance.

UNIT III

JAVASCRIPT : Introduction to JavaScript: Writing First Java Script, External JavaScript, Variables: Rules for variable names, Declaring the variable, Assign a value to a variable, Scope of variable, Using Operators, Control Statements, JavaScript loops, JavaScript Functions: Defining a Function, Returning value from function, User define function. JavaScript Frameworks.

UNIT IV

PHP BASICS: Origin and Uses of PHP – Overview of PHP – General Syntactic Characteristics – Primitives, Operators and Expressions – Output Statement – Control Statements – Arrays
Built-in Functions – User-defined Functions- Regular Expression – Validating Data Entry – Form Handling – Cookies – Session Tracking

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UNIT V

MySQL : Getting Started with MySQL – Basic Data Types –Database and Table Creation – Performing Operations on Table Data – Running Calculations on Table Data – Grouping the
Data – Functions in MySQL - Database Access with PHP and MySQL. Eclipse, an Integrated
Development Environment.

Books:

1. HTML: The complete reference – Thomas A. Powel.
2. HTML Examples – Norman Smith, Edward.
3. Ivan Bayross, Sharanam Shah, MySQL 5 for Professionals, Shroff Publishers, Edition 2007.
4. JavaScript Bible – Danny Goodman.
5. Dave W & others, Beginning PHP 5, Wiley-dreamtech, Edition 2004
6. Steven M Schafer, HTML, CSS, JavaScript, Perl, Python, & PHP, Wiley-Dreamtech, Edition 2005

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MCA DD -504	Computer Graphics	5		-	5	70	20	10	-	-	100

MCADD-504 Computer Graphics

UNIT-I

Computer Graphics : definition, classification & Applications, Development of Hardware & Software for Computer Graphics. Display devices, Hard copy devices. Interactive Input devices, display processor, Line drawing; various algorithms and their comparison, circle generation- Bresenham's mid point circle drawing algorithm, mid point ellipse drawing algorithm.

UNIT-II

Attributes of output primitives, line style, color and intensity, Area filling algorithms, Scan line algorithm, boundary fill flood fill algorithm, Antialiasing techniques. Two dimensional transformations; translation, scaling, rotation, reflection sheering, composite transformation, transformation commands, character generation.

UNIT-III

Viewing coordinates, Window, view port, clipping, Window to view port transformation, line clipping algorithm; Cohen Sutherland, polygon clipping; Sutherland hodgman algorithm, 3D clipping : Normalized view volumes, view port clipping, clipping in homogeneous coordinates

UNIT-IV

3-D Viewing: Three-dimensional concepts, 3D display techniques, 3D representation polygon & curved surfaces. Design of curves & surfaces- Bezier's Method, B-spline methods, 3D transformation transition, scaling, composite transformation rotation about arbitrary axis, projections: Parallel & Perspective,

UNIT-V

Hidden surface and line removal; back face removal, depth buffer and scan line methods. Illumination model: Light sources, diffuse reflection specular reflection, reflected light, intensity levels, surface shading; phong shading ground shading, color models like RGB, YIQ, CMY, HSV etc.

BOOKS

1. D.Hearn and M.P. Baker "Computer Graphics" (2nd ed), PHI.
2. S. Harrington – "Computer Graphics - a Programming approach" (2nd ed) McGrawhill.
3. New Mann & Sprovl- "Principles of interactive computer graphics" (2nd ed) McGrawhill.
4. Roger S. David "Procedural Elements for Computer Graphics", McGraw Hill.
5. Roger S David "Mathematical Elements for Computer Graphics", McGraw Hill.
6. Foley & Vandan "Computer Graphics Principles & Practice in "C" "Addision Wesly.

Note : Paper is to be set unit wise with internal choice.

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MCA DD -505	SoftwareEngineering	5		-	5	70	20	10	-	-	100

MCADD-505 Software Engineering

UNIT-I

Software Engineering Paradigms : Software Characteristics, Software myths, Software Applications, Software Engineering Definitions, Various Software Process Models, Process iteration, Process activities, The Rational Unified Process, Computer-aided software engineering

UNIT-II

Project Management, Management activities, Project planning, Project scheduling, Risk management Software Requirements, Functional and non-functional requirements, User requirements, System requirements, Interface specification, software requirement document Requirements Engineering Processes, Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management

UNIT-III

System Models, Critical Systems Specification, Risk-driven specification, Safety specification, Security specification, Software reliability specification
Software Metrics and Measures — Process Metrics, Project metrics, Software Project Planning, Empirical, Putnam, COCOMO. Risk Identification and Projection: RMMM, Project Scheduling and Tracking.

UNIT-IV

Application Architectures — Data processing systems, Transaction processing systems, Event processing systems, Language processing systems,
User Interface Design — Design issues, The user interface design process, User analysis, User interface prototyping, Interface evaluation
Rapid Software Development — Agile methods, Extreme programming, Rapid application development, Software prototyping.
Software Reuse — Design patterns, Generator-based reuse, Application frameworks, Application system reuse, Software Evolution
Verification and validation,— Planning verification and validation, Software inspections,Automated static analysis, Verification and formal methods.

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UNIT-V

Software Testing — System testing, Component testing, Test case design, Test automation. Software Cost Estimation — Software productivity, Estimation techniques, Algorithmic cost modeling, Project duration and staffing.

Quality Management — Process and product quality, Quality assurance and standards, Quality planning, Quality control, Software measurement and metrics

Process Improvement — Process and product quality improvement, Process classification,

Process measurement — Process analysis and modeling, Process change, The CMMI process improvement framework.

Text/References:

1. Software Engineering, Pressman, TMH
2. Software engineering, Ian Sommerville, 8th
3. Software Engineering Fundamentals, Ali Behforooz, Hudson, Oxford