

MANGALORE UNIVERSITY

Revised Syllabi of

**Credit Based Semester System
(2012-2013 onwards)**

Bachelor of Science Degree Course

OPTIONAL SUBJECT: COMPUTER SCIENCE

MANGALORE UNIVERSITY

B.Sc Computer Science Course Pattern and Scheme of Examinations

I Semester B.Sc - Computer Science

Paper Code	Subject Title	Hrs. per week	Duration of Exams	Marks	Marks and Credit		
		Theory /Practical.	Theory/ Practical.	I.A	Exam	Total	Credits
CS101	Digital Fundamentals	04	03	20	80	100	2
CS102	Digital Logic & MS Office Lab	03	03	10	40	50	1
Total		07		30	120	150	3

II Semester B.Sc - Computer Science

Paper Code	Subject Title	Hrs. per week	Duration of Exams	Marks	Marks and Credit		
		Theory /Practical.	Theory/ Practical.	I.A	Exam	Total	Credits
CS151:	Programming in C	04	03	20	80	100	2
CS152:	C Programming Lab	03	03	10	40	50	1
Total		07		30	120	150	3

III Semester B.Sc - Computer Science

Paper Code	Subject Title	Hrs. per week	Duration of Exams	Marks	Marks and Credit		
		Theory /Practical.	Theory/ Practical.	I.A	Exam	Total	Credits
CS 201:	C++ and Data Structures	04	03	20	80	100	2
CS 202:	C++ and Data Structure Lab	03	03	10	40	50	1
Total		07		30	120	150	3

IV Semester B.Sc - Computer Science

Paper Code	Subject Title	Hrs. per week	Duration of Exams	Marks	Marks and Credit		
		Theory /Practical.	Theory/ Practical.	I.A	Exam	Total	Credits
CS251	Operating System & Linux	04	03	20	80	100	2
CS252	OS & Linux Lab	03	03	10	40	50	1
Total		07		30	120	150	3

MANGALORE UNIVERSITY

B.Sc Computer Science Course Pattern and Scheme of Examinations

V Semester B.Sc - Computer Science

Paper Code	Subject Title	Hrs. per week	Duration of Exams	Marks	Marks and Credit		
		Theory /Practical.	Theory/ Practical.	I.A	Exam	Total	Credits
CS301	Microprocessor Architecture and 8086 Programming	03	03	20	80	100	2
CS302	Elective Stream-I: E1.1, E1.2	03	03	20	80	100	2
CS303	8086 MP Programming Lab	04	04	20	80	100	2
	Oracle Lab / Computer Graphics Lab						
Total		10		60	240	300	6

CS 302: Elective Stream-I: E1.1, E1.2

E1.1: Database Concepts and Oracle

E1.2: Computer Graphics and Multimedia

VI Semester B.Sc - Computer Science

Paper Code	Subject Title	Hrs. per week	Duration of Exams	Marks	Marks and Credit		
		Theory /Practical.	Theory/ Practical.	I.A	Exam	Total	Credits
CS351	Visual Basic .NET Programming	03	03	20	80	100	2
CS352	Elective Stream-II: E2.1 E2.2	03	03	20	80	100	2
CS353	Visual Basic.NET Lab	02	04	20	80	100	2
	Web Designing Lab/ Java Programming Lab	02					
Total		10		60	240	300	6

CS352: Elective Stream-II: E2.1, E2.2

E2.1 : Computer Networks and Web Design

E2.2 : Java Programming

Total Marks :1200

Total number of Credits: 24

MANGALORE UNIVERSITY**B.Sc Computer Science Course Pattern and Scheme of Examinations****I Semester B.Sc - Computer Science**

Paper Code	Subject Title	Hrs. per week	Duration of Exams	Marks	Marks and Credit		
		Theory /Practical.	Theory/ Practical.	I.A	Exam	Total	Credits
CS101	Digital Fundamentals	04	03	20	80	100	2
CS102	Digital Logic & MS Office Lab	03	03	10	40	50	1
Total		07		30	120	150	3

PAPER-I	CS101: Digital Fundamentals	48 hours
Theory/Week: 4 Hrs Credits: 2		I.A: 20 Exam: 80
	UNIT-I	12 Hrs.
<p>Introduction to Computer Systems: Introduction, Characteristics of Computers, Evolution of Computers, Generations of Computers, Classification of Computers, Computer System, Application of Computers Number systems: Decimal, Binary, Octal, Hexadecimal, number system conversion, signed numbers, arithmetic operations with signed numbers, 1's and 2's complements of binary numbers, BCD numbers, Binary codes, and parity codes, Digital System applications. Logic gates: Basic gates- AND, OR and NOT gates, Universal Gates- NOR and XOR gates, EX-OR gate, EX-NOR gate.</p>		
	UNIT-II	12 Hrs.
<p>Boolean Algebra and Logic implications: Boolean operators and expression, Laws and rules of Boolean algebra, DeMorgan's Theorem, Boolean analysis of logic circuits, Simplification using Boolean algebra, Standard forms of Boolean expressions, Boolean expressions and truth tables, the Karnaugh Map, Karnaugh's map SOP minimization, Karnaugh's map POS minimization. Combinational Logic Analysis: Basic combinational logic circuits, combinational logic implementation, Universal property of NAND gate, NOR gates, combinational logic using NAND and NOR gates. Functions of Combinational logic: Basic adders, parallel binary adders, comparator, comparators, decoders, encoders, code convertors, Multiplexers, Demultiplexers.</p>		
	UNIT-III	12 Hrs.
<p>Latches and Flip flops: Latches, Edge trigger flip-flop, Flip Flop Operating characteristics. Counters: Asynchronous counters, Synchronous Counters, Up/Down Synchronous Counters, Design of synchronous Counters, Cascaded Counters, Counter Decoding;</p>		
	UNIT-IV	12 Hrs.
<p>Shift Registers: Basic shift register operations, serial in/serial out, serial in/parallel out, parallel in/serial out, parallel in/ parallel out shift registers, Bidirectional shift registers and shift registers counters; Memory and Storage: Memory basics, Random Access Memory, Read Only Memory, Programmable Read Only Memory (PROM), Flash Memory, Memory expansion, special types of memory, Magnetic and optical storage.</p>		
<p>Text Books:</p> <ol style="list-style-type: none"> ITL Education Solution Limited, Introduction to Information Technology, Pearson Education, 2012 (Chapter 1). Thomas L Floyd, Digital Fundamentals, 10th Edition, Pearson, 2011. 		
<p>Reference books:</p> <ol style="list-style-type: none"> Peter Norton, Introduction to Computers, 7th edition, Tata McGraw Hill Publication, 2011 M. Morris Mano, Digital Logic and Computer Design, PHI publication. 		

Practical-I	CS102 : Digital Logic and MS Office Lab	36 hours
Practical/Week: 3 Hrs Credits: 1	Experiments on Digital logic and exercises in the MS-Office package	I.A: 10 Exam: 40

MANGALORE UNIVERSITY**B.Sc Computer Science Course Pattern and Scheme of Examinations****II Semester B.Sc - Computer Science**

Paper Code	Subject Title	Hrs. per week	Duration of Exams	Marks	Marks and Credit		
		Theory /Practical.	Theory/ Practical.	I.A	Exam	Total	Credits
CS151:	Programming in C	04	03	20	80	100	2
CS152:	C Programming Lab	03	03	10	40	50	1
Total		07		30	120	150	3

PAPER-I	CS151: PROGRAMMING IN C	48 hours
Theory/Week: 4 Hrs Credits: 2		I.A: 20 Exam: 80
	UNIT-I	12 Hrs.
<p>Problem Solving using computers, Introduction to flow charts, algorithms, Overview of C Program, Importance of C-Program, Basic structure of a C-program, Execution Style of C-Program. Constants, Variables & Data types: Features of C language, Character set, C token, Keywords & identifiers, Constants, Variables, data types, Declaration of variables, assigning values to variables, defining symbolic constants. Operators and Expression: Arithmetic, Relational, logical, assignment, increment & decrement, conditional, bit wise & special operators, evaluation of expressions, Precedence of arithmetic operators, type conversions in expressions, operator precedence & Associativity, built in mathematical functions. Managing Input and Output operations: Reading & writing a character, Formatted input and output.</p>		
	UNIT-II	12 Hrs.
<p>Decision Making and Branching: Decision making with if statement, simple if statement, the if else statement, nesting of if ... else statements, the else if ladder, the switch statement, the ?: operator, the go to statement. Decision making and looping: The while statement, the do statement, for statement, exit, break, jumps in loops. Arrays: Declaration, initialization & access of one dimensional & two dimensional arrays. Programs using one and two dimensional arrays. : Adding multiplying, transposing matrices, sorting and searching arrays.</p>		
	UNIT-III	12 Hrs.
<p>Handling of character strings: Declaring & initializing string variables, reading strings from terminal, writing strings to screen, Arithmetic operations on characters, putting strings together, comparison of two strings, string handling functions, table of strings. User defined functions: Need for user defined functions, Declaring, defining and calling C functions return values & their types, Categories of functions: With/without arguments, with/without return values, recursion, functions with arrays, the scope, visibility & lifetime of variables.</p>		
	UNIT-IV	12 Hrs.
<p>Structures and union: Structure definition, giving values to members, structure initialization, comparison of structure variables, arrays of structures, arrays within structures, structures within structures, structures & functions, unions, size of structures, bit fields. Pointers: Understanding pointers, accessing the address of a variable, declaring & initializing pointers, accessing a variable through its pointer, pointer expression, pointer increments & scale factor, pointers & arrays, Passing pointer variables as function arguments. The Preprocessor: Macro substitution, file inclusion, compiler control directives, command line arguments & illustrative programs. File Management in C: Introduction, defining and opening a file, closing a file, I/O operations on files, error handling during I/O operations.</p>		
<p>Text Book: E. Balagurusamy, Programming in ANSI C, 5th Edition, Tata McGraw Hill.</p>		
<p>Reference Books:</p> <ol style="list-style-type: none"> 1. K.R. Venugopal and Sudeep R Prasad, Programming with C, 4th Edition, Tata McGraw-Hill Education. 2. Yashavant P. Kanetkar, Let Us C, 10th Edition, Tata McGraw Hill, 2010. 		

Practical-II	CS152 : C Programming Lab	36 hours
Practical/Week: 3 Hrs Credits: 1	Programming exercises in C	I.A: 10 Exam: 40

MANGALORE UNIVERSITY**B.Sc Computer Science Course Pattern and Scheme of Examinations****III Semester B.Sc - Computer Science**

Paper Code	Subject Title	Hrs. per week	Duration of Exams	Marks	Marks and Credit		
		Theory /Practical.	Theory/ Practical.	I.A	Exam	Total	Credits
CS 201:	C++ and Data Structures	04	03	20	80	100	2
CS 202:	C++ and Data Structure Lab	03	03	10	40	50	1
Total		07		30	120	150	3

PAPER-III	CS201: C++ and Data Structures	48 hours
Theory/Week: 4 Hrs Credits: 2		I.A: 20 Exam: 80
	UNIT-I	12 Hrs.
<p>Input and Output statements: cin, cout, manipulator functions endl, hex, dec, oct, setbase, setw, setfill, setprecision, ends, ws, flush. Functions in C++: main function, Prototyping, call and return by reference, inline functions, default arguments, const arguments, function overloading. Classes and objects: structures, specifying a class, creating objects, accessing class members, defining member functions, making outside functions inline, nesting of member functions, private member functions, arrays with in a class, memory allocation for objects, static data members, static member functions, arrays of objects, objects as function arguments, friends functions, returning objects, const member functions, pointers to members.</p>		
	UNIT-II	12 Hrs.
<p>Constructors and Destructors: Parameterized constructors, multiple constructors, constructors with default arguments, dynamic initialization of objects, copy constructor, dynamic constructors, constructing 2 dimensional arrays, destructors. Operator overloading: defining, overloading unary and binary operators, overloading binary operators using friend functions, manipulation of strings using operator overloading, type conversions – basic to class, class to basic, one class to another class. Inheritance: Defining a derived class, single inheritance, protected members, multilevel inheritance, multiple inheritance. Pointers, virtual functions, polymorphisms: Pointers to objects, this pointer, pointers to derived classes, virtual functions.</p>		
	UNIT-III	12 Hrs.
<p>Introduction to Data structures: Arrays in C Stacks: Definitions, representation of Stacks, Examples - infix, postfix and prefix, Algorithms, Queues and List: The Queues and its sequential representation, Linked Lists, lists in C</p>		
	UNIT-IV	12 Hrs.
<p>Circular list, stack as circular list, queue as a circular list, doubly linked list. Trees- Binary Trees, Binary Tree Representation, Representing List as Binary Trees, Trees and their applications. Sorting: Bubble sort, Quick Sort, Simple insertion sort. Searching: Sequential Search, Binary search.</p>		
<p>Text Books:</p> <ol style="list-style-type: none"> 1. E Balagurusamy, Object Oriented Programming with C++, 4th Edition, Tata McGraw Hill publisher, 2008. 2. Yedidyah Langsam, Moshe J, Augenstein and Aaron M, Tenenbaum, Data Structures Using C and C++, 2nd edition, PHI Publication.(1.2, Chap. 2, 4.1, 4.2, 4.3, 4.5, 5.1, 5.2, 5.4, 5.5 and Chap. 6) 		
<p>Reference books:</p> <ol style="list-style-type: none"> 1. D.Ravichandran, Data Structures with C++, Tata McGraw Hill Publisher, 2009. 2. Jean Paul & Paul G Sorenson, An Introduction to Data Structures with Applications, 2nd edition, Tata McGraw Hill publisher. 		

Practical-III	CS202: C++ and Data Structure Lab	36 hours
Practical/Week: 3 Hrs Credits: 1	Programming exercises in C++ and Data structures	I.A: 10 Exam: 40

MANGALORE UNIVERSITY**B.Sc Computer Science Course Pattern and Scheme of Examinations****IV Semester B.Sc - Computer Science**

Paper Code	Subject Title	Hrs. per week	Duration of Exams	Marks	Marks and Credit		
		Theory /Practical.	Theory/ Practical.	I.A	Exam	Total	Credits
CS251	Operating System & Linux	04	03	20	80	100	2
CS252	OS & Linux Lab	03	03	10	40	50	1
Total		07		30	120	150	3

PAPER-III	CS251: OPERATING SYSTEM & LINUX	48 hours
Theory/Week: 4 Hrs Credits: 2		I.A: 20 Exam: 80
	UNIT-I	12 Hrs.
<p>Introduction: Operating system, Mainframe systems, Desktop Systems, Multi processor Systems, Distributed Systems, Cluster systems, Real Time Systems, Hand held Systems, Future Migration, Computing Environment. Operating System Structures: System Components, Operating System Services, Systems Calls, System Structures. Process Management: Process concept, Process Scheduling, Operations on process, Cooperative Process, Inter process Communication. Threads: Over view, Multithreading Models.</p>		
	UNIT-II	12 Hrs.
<p>CPU Scheduling: Basic concepts, Scheduling criteria, Scheduling algorithms, multiple processor scheduling. Process Synchronization: Background, The critical section Problems, Synchronization, Semaphore, Classic problems synchronization hardware, Critical region Monitor, Semaphore. Deadlocks: System model, dead lock characterization, Methods for handling deadlocks, Dead lock prevention, Dead lock avoidance, Deadlock detection.</p>		
	UNIT-III	12 Hrs.
<p>Memory Management: Background, Swapping, contiguous Memory allocations, Paging, segmentation, segmentation with paging, Virtual Memory: Background, demand paging, process creation, page replacement, allocation of frames and thrashing. File Management: File concept, Access methods, Directory structure, File system Mounting, File sharing, Protection.</p>		
	UNIT-IV	12 Hrs.
<p>UNIX: An introduction, Features of Unix, Unix system organization, Unix file system Linux: An introduction, reason for its popularity, Linux file system, login and logout. Linux commands: Command format, Directory oriented command, wild card characters, File oriented commands, File Access Permissions, Process oriented commands, Background processing, Communication oriented commands, General purpose commands, Pipe and Filters related commands, vi editor, Shell programming, System administration.</p>		
<p>Text Books:</p> <ol style="list-style-type: none"> 1. Silberschartz, Galvin and Gagne, Operating Systems Concepts, 6th/ 7th Edition, John Wiley & sons, Pvt. Ltd. Chapters (1,3,4,5,6,7,8,9,10,11), 2. B Mohamed Ibrahim, Linux: A Practical Approach, Firewall Media, 2009 		
<p>Reference Books:</p> <ol style="list-style-type: none"> 1. Kay A. Robbins and Steven Robbins, Unix Systems Programming, Communication, Concurrency and Threads, LPE, Pearson Education publisher, 2004. 2. Colin Ritchie, Operating Systems in incorporating Unix and Windows, 4th Edition, BPB. 3. Richard Petersen, Linux: The Complete Reference, 6th Edition, Tata McGraw Hill Publisher 		

Practical-IV	CS252: OS and Linux LAB	36 hours
Practical/Week: 3 Hrs Credits:1	Implementation of OS concepts using C++ and shell scripts in Linux	I A: 10 Exam: 40

MANGALORE UNIVERSITY**B.Sc Computer Science Course Pattern and Scheme of Examinations****V Semester B.Sc - Computer Science**

Paper Code	Subject Title	Hrs. per week	Duration of Exams	Marks	Marks and Credit		
		Theory /Practical.	Theory/ Practical.	I.A	Exam	Total	Credits
CS301	Microprocessor Architecture and 8086 Programming	03	03	20	80	100	2
CS302	Elective Stream-I: E1.1, E1.2	03	03	20	80	100	2
CS303	8086 MP Programming Lab	04	04	20	80	100	2
	Oracle Lab / Computer Graphics Lab						
Total		10		60	240	300	6

CS 302: Elective Stream-I: E1.1, E1.2

E1.1: Database Concepts and Oracle

E1.2: Computer Graphics and Multimedia

PAPER-V	CS301: MICROPROCESSOR ARCHITECTURE AND 8086 PROGRAMMING	48 hours
Theory/Week: 3 Hrs Credits: 2		I.A: 20 Exam: 80
	UNIT- I	12 Hrs.
Basic Computer Organization and design: Instruction codes; Computer registers; Computer Instructions; Timing and Control; Instruction cycle; Memory reference instructions; I/O and Interrupt. Memory Devices and Organization: Memory Unit; Memory Hierarchy; Main Memory; Auxiliary Memory; Associative Memory; Cache Memory; Virtual Memory.		
	UNIT- II	12 Hrs.
Architecture of 8086: Microprocessors; 8086: Internal Architecture; Memory Organization; Input and Output Structure; Programmable Hardware Registers; Addressing Modes; Levels of Programming. Assembler Directives: Symbols, Variables and Constants; Data Definition and Storage Allocation Directives; Program Organization Directives; Alignment Directives; Program End Directive; Value-Returning Attribute Directives; Procedure Definition Directives; Macro Definition Directives; Data Control Directives; Branch Displacement Directives; Header File Inclusion Directives; Target Machine Code Generation Control Directives.		
	UNIT- III	12 Hrs.
80x86 Instructions: Introduction; Assembler Instruction Format; Data Transfer Instructions; Arithmetic and Logical Instructions; Branch Instructions; Processor Control Instructions; String Operation Instructions. Assembly Language Programming: Introduction; Program Segments; Procedures; Program Structure; Programming with Macros; Input-Output Structure and Programming; Program Development Tools.		
	UNIT-IV	12 Hrs.
Software Interrupts in C: Introduction; Interrupt Interface Calls – Parameters to Interface Functions, Function: int86, Function: int86x, Function: intdos, Function: intdosx, Function: intr, Function: getinterrupt; Inline Assembly Language Programming; Mixed Language Programming – Procedure Calling Conventions: C Language Conventions. Interrupts and Interrupt Service Routines: Introduction; 8086 Interrupts and Interrupt actions; How does an Interrupt Work?; Interrupts and ROM-BIOS Services, Hardware or Exception Interrupts (INT 00H,INT 01H,INT 02H only); System Calls (Software Interrupts- DOS interrupts- INT 20H INT21H only).		
Text books:		
<ol style="list-style-type: none"> 1. M. Morris Mano, Computer System Architecture, PHI Publication (For Unit I: Chapters 2-7, 5-1 to 5-10, 12-1 to 12-6). 2. K. R. Venugopal, Rajkumar, Microprocessor x 86 Programming, BPB Publications. (For Units II, III, and IV: Chapters 1.3 to 1.9, 2, 3, 4, 5, 6). 		
Reference books:		
<ol style="list-style-type: none"> 1. Yu-Cheng Liu, Glenn A. Gibson, Microcomputer Systems: The 8086/8088 Family, PHI Publication. 2. Udaya Kumar, Umashankar, Advanced Microprocessor and Assembly Language Programming, BPB Publication. 		

PAPER-VI	Elective Stream-I: CS302: E1.1: DATABASE CONCEPTS AND ORACLE	48 hours
Theory/Week: 3 Hrs Credits: 2		I.A: 20 Exam: 80
	UNIT-I	12 Hrs.
<p>Database System Concepts and Architecture, History of Database Systems, Database Systems versus File Systems. Data Abstraction, Data independence, Schemas and Instances, Data models, Database Languages, Database Users, DBA. Structure of Database Systems. The database system environment, Centralized and Client/Server Architecture for DBMSs, Classification of DBMSs, Entity types, attributes, keys, relationships, Relationship types, roles and structural constraints, Weak entity sets. Data Modeling using E-R Models.</p>		
	UNIT-II	12 Hrs.
<p>Relational model: Basic Concepts of relational data model, Relational Algebra, Basic and additional operations of relational algebra. Simple queries using relational algebra. Design theory of Relational Database: Introduction to Relational database design, Functional dependency, and Normal forms based on Primary Keys. Normal forms (1NF, 2NF, 3NF and BCNF), Armstrong Inference rules. Recovery Techniques: Recovery Concepts.</p>		
	UNIT-III	12 Hrs.
<p>Introduction to Oracle: Creation of Database: Creating, changing and dropping the tables. Integrity Constraints specification, maintaining reference integrity constraints, Data insertion, deletion and modification. Querying the database: Information retrieval using SELECT statement, Various features of SELECT statement, Aggregate functions, ORDER BY clause, Working with expressions and sub queries, Handling of multiple tables.</p>		
	UNIT-IV	12 Hrs.
<p>PL/SQL Basics: Introduction, PL/SQL execution environment, PL/SQL syntax, Block structure, Conditional statements, iterative statements, Oracle transactions. Cursors- Definition, use, declaring, opening, fetching and closing of cursor, cursor attributes implicit and explicit cursor. Functions: Definition, creation, execution and syntax of function, an application using a function. Procedures: Definition, creation, execution and syntax of procedures, an application using a procedure, deleting a procedure. Database triggers: Definition, uses, comparison with procedures, constraints, parts of triggers, types of triggers, syntax, deleting a trigger, applications using triggers. Packages: Creation and use of packages.</p>		
<p>Text Books :</p> <ol style="list-style-type: none"> 1. Silberschatz and Korth, Database System Concepts, McGraw Hill Publication. (Chapter 1). 2. Elmasri and Navathe , Fundamentals of Database Systems, Pearson Education Asia Publication, 4th edition. (Chapter 2, 3.1 to 3.7,5,6,10, 17.1 to 17.3 19.1) 3. Ivan Bayross, Commercial Application Development using Oracle D2K, BPB Publications (Chapters 1, 2, 3, 4, 5, 6) 		
<p>Reference Books :</p> <ol style="list-style-type: none"> 1. Ivan Bayross, SQL, PL/SQL The programming Language, BPB Publications 2. Scott Urman, Oracle 8 PL/SQL Programming, Tata McGraw Hill Edition 		

PAPER-VI	ELECTIVE STREAM-II: CS302: E1.2: COMPUTER GRAPHICS AND MULTIMEDIA	48 hours
Theory/Week: 3 Hrs Credits: 2		I.A: 20 Exam: 80
	UNIT-I	12 Hrs.
<p>Overview of Graphics Systems: Video Display devices, Raster-Scan Displays, Raster -Scan Systems, Random Scan Systems, Graphics Monitors and Workstations, Input Devices, Hard-Copy Devices, Graphics Software. Output Primitives: Points and Lines, Line Drawing Algorithms- DDA, Bresenham's, Loading the Frame Buffer, Line Function, Circle Generating Algorithms, Ellipse Generating Algorithms, Filled-Area primitives.</p>		
	UNIT-II	12 Hrs.
<p>Attributes of Output Primitives: Line attributes, Curve Attributes, Color and Grayscale levels, area fill attributes, Character attributes. Two Dimensional Geometric Transformations- Basic Transformations, Matrix Representations and Homogeneous Coordinates, Composite Transformations, Other Transformations, Transformations between Coordinate Systems, Affine Transformations. 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, Polygon clipping-Sutherland-Hodgeman Polygon clipping.</p>		
	UNIT-III	12 Hrs.
<p>Introduction: What is Multimedia? Definition, use of multimedia, delivering multimedia. Text: The Power of meaning, About fonts and faces, Using fonts in multimedia, Using text in multimedia, computers and text, Font editing and design tools, Hypermedia and hyper text. Images: How to create, Making still images, color, image file formats. Sound: The Power of sound, digital audio, MIDI audio, MIDI vs. Digital audio, Multimedia system Sounds, Audio File formats, Vaughan's Law of Multimedia minimums, Adding sounds to multimedia Project.</p>		
	UNIT-IV	12 Hrs.
<p>Animation: The Power of motion, Principles of animation, Animation by computer. Video: Using video, How video works and is displayed? Digital video container, obtaining video clips, Shooting and editing videos. Making multimedia: The stages of multimedia project, the needs for multimedia project, Input and output devices needed, software needed required authoring system.</p>		
<p>Text Books:</p> <ol style="list-style-type: none"> 1. Donald Hearn, M. Pauline Baker, Computer Graphics - C version, 2nd Edition, LPE Pearson.(Units - I and II) 2. Tay Vaughan, Multimedia: Making It Work, 8th Edition, Tata McGraw Hill, 2011.(Units - III and IV) 		
<p>Reference Books:</p> <ol style="list-style-type: none"> 1. Steven Harrington, Computer Graphics: A Programming Approach, McGraw Hill Education. 2. Ze-Nian Li and Mark S Drew, Fundamentals of Multimedia, PHI, 2009 3. Ralf Steinmetz and Klara Nahrstedt, Multimedia: Computing, Communication and Applications, LPE, Pearson Education 		

Practical-V	CS303: Microprocessor and Oracle Lab/ Microprocessor and Computer Graphics Lab	48 hours
Practical/Week: 4 Hrs Credits: 2	i. 8086 programs using Arithmetic and Logic Instructions; String Manipulation Operations; Keyboard / Screen Handling; Software interrupts in C. ii. Programming exercises in Oracle and Computer Graphics.(Elective Subjects)	I.A: 20 Exam: 80

MANGALORE UNIVERSITY**B.Sc Computer Science Course Pattern and Scheme of Examinations****VI Semester B.Sc - Computer Science**

Paper Code	Subject Title	Hrs. per week	Duration of Exams	Marks	Marks and Credit		
		Theory /Practical.	Theory/ Practical.	I.A	Exam	Total	Credits
CS351	Visual Basic .NET Programming	03	03	20	80	100	2
CS352	Elective Stream-II: E2.1 E2.2	03	03	20	80	100	2
CS353	Visual Basic.NET Lab	02	04	20	80	100	2
	Web Designing Lab/ Java Programming Lab	02					
Total		10		60	240	300	6

CS352: Elective Stream-II: E2.1, E2.2

E2.1 : Computer Networks and Web Design

E2.2 : Java Programming

PAPER-VII	CS351: VISUAL BASIC .NET PROGRAMMING	48 hours
Theory/Week: 3 Hrs Credits: 2		I A: 20 Exam: 80
	UNIT-I	12 Hrs.
Introduction: Introduction to .Net, .Net Architecture, Features of .Net, Advantages of .Net, .Net Base Class Library, Overview of .Net Framework, languages and the .NET Framework, The structure of a .NET Application, Compilation and Execution of a .NET Application, .Net Framework Class Library, VB .Net Enhancements. Introduction to Visual Basic.Net IDE: Creating a project, Types of project in .Net, Exploring and coding a project, Solution explorer, toolbox, properties window, Output window, Object Browser.		
	UNIT-II	12 Hrs.
Object Oriented Features: Classes and Objects, Access Specifiers: Private, Public and Protected, Building Classes, Reusability, Constructors, Destructor, Inheritance, Overloading, Overriding, Polymorphism. VB.Net Programming Language: Variables, Comments, Data Types, Working with Data Structures – Arrays, Array Lists, Enumerations, Constants, Structures; Introduction to procedures & functions, calling procedures, argument passing mechanisms, scope of variable. Control Flow Statements: Conditional statement, Loops, Nesting of Loops. Exception Handling(using : Try-catch, Multiple catch, Finally, Resume next)		
	UNIT-III	12 Hrs.
GUI Programming: Introduction to Window Applications, Using Form – Common Controls, Properties, Methods and Events. Interacting with controls – Windows Form, Textbox, Rich Text Box, Label, Button, Listbox, Combobox, Checkbox, Picture Box, Radio Button, Panel, Scroll Bar, Timer, ListView, TreeView, Toolbar, Status Bar. Progress Bar, Date time Picker, Month Calendar, Track Bar, Splitter, Link Label, Group Box, Tooltip, Menustrip, Check List Box. Dialog Controls: PageSetupDialog, PrintDialog, PrintPreview Dialog, PrintPreviewControl, PrintDocument, OpenFileDialog, SaveFileDialog, Multiple Document Interface: Creating and Using MDI applications, Creating DialogBox, Adding and removing Controls at runtime		
	UNIT-IV	12 Hrs.
Error Handling in Windows Forms: Types of Validation: Data validation, Field Level validation, Using the ErrorProvider class: Public Properties of ErrorProvider objects, Public methods of Error Provider class, Performing Data Validation in Controls, Handling Mouse Events, Handling Keyboard Events. Working With Database: Data Access with ADO.net, The ODBC architecture, OLE DB, ActiveX Data Objects (ADO), ADO Object Model, Connection Object, Recordset Object, ADO.NET Data Providers, Connected Data Access, Connecting to a SQL Server Data Provider: Using OLEDB Provider, Using Commands, Using Data Reader, Disconnected Data Sets, Data Adapters, Creating the Data Set manually, Using XML Data, Working with Database, Queries, Creating the Database, Adding, Deleting & Updating Records.		
Text Book: Steven Holzner, Visual Basic.NET Programming Black Book , Dreamtech Press		
Reference Books: 1. Bradley, Millsbaugh Julia Case, Anita, Programming in Visual Basic. NET , Tata McGraw Hill 2. Dr Garima Khadelwal, Programming with Visual Basic. NET , Prakhar Publishers Distributors 3. M Vishwanath Pai, A Book on VB.NET , 2011		

PAPER-VIII	Elective Stream-II: CS352-E2.1: COMPUTER NETWORKS AND WEB DESIGN	48 hours
Theory/Week: 3 Hrs Credits: 2		I A: 20 Exam: 80
	UNIT-I	12 Hrs.
Computer Networks:-Networking and OSI Reference Model: Networking – LANs and WANs; The OSI Reference model – Why a layered Network Model?, The seven layers of the OSI Reference Model, Peer-to-peer communication, Data Encapsulation. Topologies: Topology; Bus topology; Star topology; Extended star topology. IP Addressing: Addressing Overview; Classes of IP addresses; Subnet Addressing; Subnet Masking; Subnet Planning. The Application, Presentation, Session and Transport Layers: The Application Layer; The Presentation Layer; The Session Layer; The Transport Layer.		
	UNIT-II	12 Hrs.
HTML - Concepts of Hypertext, Versions of HTML, Elements of HTML syntax, Head & Body Sections, Building HTML documents, Inserting texts, Images, Hyperlinks, Backgrounds and Colour controls, Different HTML tags, Table layout and presentation, Use of font size & Attributes. List types and its tags, Use of Frames and Forms in web pages, ASP & HTML Forms. An Introduction to HTML 5, HTML 4 Doctype Declaration, HTML 5 is Open to Interpretation, WAI-ARIA and HTML 5, Drawing With The Canvas Element, Video On the Web, Geo Location in HTML5, Working Off-Line in HTML5, Building Forms in HTML5, Using CSS Today, Understanding CSS Transitions, Hover Crafting with CSS, Enriching Forms Using CSS3 Properties, Transforming the Message, CSS3 - In Conclusion		
	UNIT-III	12 Hrs.
Overview of Dynamic Web page: introduction & features of ASP.NET, Understanding ASP.NET Controls, Applications, Web servers, installation of IIS. Web forms, web form controls -server controls, client controls. Adding controls to a web form, Buttons, Text Box, Labels, Checkbox, Radio Buttons, List Box. Adding controls at runtime. Running a web Application, creating a multiform web project. Form Validation: Client side validation, server Side validation, Validation Controls: Required Field Comparison Range. Calendar control, Ad rotator Control, Internet Explorer Control. Overview of ADO.NET, from ADO to ADO.NET. ADO.NET architecture, Accessing Data using Data Adapters and Datasets, using Command & Data Reader, binding data to data bind Controls, displaying data in data grid. XML in .NET, XML basics, attributes, fundamental XML classes: Document, text writer, text reader. XML validations, XML in ADO.NET, The XML Data Document.		
	UNIT-IV	12 Hrs.
Web services: Introduction, State management- View state, Session state, Application state. SOAP, web service description language, building & consuming a web service. Web Application deployment. Caching. Threading Concepts, Creating Threads in .NET, managing threads, Thread Synchronization Security features of .NET, Role based security & Code access security, permissions		
Text Books :		
<ol style="list-style-type: none"> 1. Amato Vito, Cisco Systems Networking Academy: First Year Companion Guide, Techmedia Publication/BPB/Pearson Education Asia. 2. Ivan Bayross, HTML 5 and CSS 3 Made Simple, B P B Publications, 2011 3. Neha Kotecha, Sonal Mukhi, Vijay Mukhi, ASP. Net with C# The Basics, BPB Publishers, 2011 		

Reference books:

1. Behrouz Forouzan, Firouz Mosharraf, **Computer Networks**, Tata Mcgraw Hill Education Pvt Ltd, 2011
2. Kogent Learning solutions Inc, **ASP.NET 3.5, Black Book**, DreamTech Press, 2011
3. Kogent Learning Solutions Inc, **HTML5 Black Book: Covers Css3, Javascript,XML, XHTML, Ajax, PHP And JQuery** (With CD), Dreamtech press, 2011
4. Balagurusamy E, **Programming in C# : A Primer**, Tata Mcgraw Hill education private limited, 2010
5. Jon Skeet, **C# in Depth**, Dreamtech press, 2011

PAPER-VIII	Elective Stream-II: CS352: E2.2: JAVA PROGRAMMING	48 hours
Theory/Week: 3 Hrs Credits: 2		I A: 20 Exam: 80
	UNIT-I	12 Hrs.
<p>Java Fundamentals: The origins of Java, Java's contribution to the internet, The Bytecode, The Java Buzzwords, Object Oriented Programming, Structure of a simple program, The Java Keywords, Identifiers in Java, The Java Class Libraries</p> <p>Data Types and Operators: Java's Primitive Types, Literals, Variables, The Scope and Lifetime of variables, Operators- Arithmetic Operators, Increment and Decrement Operators, Relational and Logical Operators, Short-Circuit Logical Operators, The Assignment Operator, The Bitwise Operators, The Shift Operators, The ?: operator, Shorthand Assignments, Type Conversion in Assignments, Casting Incompatible Types, Operator Precedence, Expressions</p> <p>Using I/O: Byte streams and character streams, predefined streams, reading console input, reading characters, strings, writing console output.</p> <p>Control Statements: Input Characters from the Keyboard, The if statement, Nested ifs, The if..else..if Ladder, The switch statement, Nested switch statement, The for loop, The while Loop, The do..while Loop, break, continue, Nested Loops.</p>		
	UNIT-II	12 Hrs.
<p>Arrays: One-Dimensional Arrays, Multidimensional Arrays,: Two –Dimensional Arrays, Irregular Arrays, Initializing Multidimensional Arrays, Alternative Array Declaration Syntax, Assigning Array References, Using the length member, The For..Each Style for loop, Iterating Over Multidimensional Arrays, Applying the Enhanced for, Strings, Using Command-Line Arguments</p> <p>Classes, Objects and Methods: Class Fundamentals, Creating Objects, Reference Variables and Assignment, Adding Methods, Returning from a Method, Returning a Value, Using Parameters, constructors, Parameterized Constructors, Adding a Constructor, The new operator, Garbage Collection and Finalizers, The finalize() method, The this keyword, Controlling Access to Class Members, Java's Access Modifiers, , Pass Objects to Methods, Returning Objects, Method Overloading, Overloading Constructors, Recursion, Understanding static: Static Blocks, Introducing Nested and Inner Classes, Variable-Length Arguments</p> <p>Inheritance: Inheritance Basics, Member Access and Inheritance, Constructors and Inheritance, Using super to Call, Superclass Constructors, Using super to Access Superclass Members, Creating a Multilevel Hierarchy, call to the Constructors, Superclass References and Subclass Objects, Method Overriding, Overridden Methods Support Polymorphism, Use of Overridden Methods, Using Abstract Classes, Using final, The Object Class.</p>		
	UNIT-III	12 Hrs.
<p>Packages and Interfaces : Packages, Packages and Member Access, Understanding Protected members, Importing packages, Java's standard packages, Interfaces, Implementing Interfaces, Using Interface References ,Variables in Interfaces, Extending Interface.</p> <p>Exception Handling: The Exception Hierarchy, Exception Handling Fundamentals, try and catch, The Consequences of an Uncaught Exception, Using Multiple catch statements, Catching Subclass Exceptions, nested try blocks, Throwing an Exception, Rethrowing an Exception, Using finally, Using throws, Java's Built-in Exceptions, Creating Exception Subclasses.</p> <p>Multithreaded Programming : Multithreading fundamentals, The Thread Class and Runnable Interface, Creating a Thread, Creating Multiple Threads, Determining When a Thread Ends, Thread Priorities, Synchronization, Using Synchronized Methods, The synchronized Statement, Thread Communication Using notify(), wait() and notifyAll(), Suspending, Resuming, and Stopping Threads</p>		

	UNIT-IV	12 Hrs.
<p>Applets, Events, and Miscellaneous Topics: Applet Basics, Applet Organization and Essential Elements, The Applet Architecture, A Complete Applet Skeleton, Applet Initialization and Termination,, Requesting Repainting-The update() Method, Using the Status Window, Passing parameters to Applets, The Applet Class ,Event Handling The Delegation Event Model, Events, Using the Delegation Event Model, More Java Keywords.</p> <p>Using AWT controls, Layout managers and menus.</p> <p>Control Fundamentals - Labels, Buttons, CheckBoxes, CheckboxGroup, Choice Controls, Lists, Scroll Bars, TextField, TextArea.</p> <p>Layout Managers: FlowLayout, BorderLayout, GridLayout, Menu Bars and Menus</p> <p>Introducing Swing: The Origins and Design Philosophy of Swing, Components and Containers, Layout Managers, Use Jbutton, Work with JTextField, Create a JCheckBox, Work with Jlist, Use anonymous inner classes to handle events, Create a Swing applet</p>		
<p>Text Books:</p> <ol style="list-style-type: none"> 1. Herbert Schildt, Java: A Beginner's Guide, 5th Edition, Tata McGraw Hill Education Private Limited, 2011. 2. Herbert Schildt, The Complete reference Java, Seventh edition, Tata McGraw Hill Publishing Company Limited. (Chapters: 13, 24) 		
<p>Reference books:</p> <ol style="list-style-type: none"> 1. E Balagurusamy, Programming With Java: A Primer, Tata McGraw Hill Education Private Limited, 2009 2. Junaid Khateeb and Dr. G T Thampi, Computer Programming in Java, Dreamtech, 2011 		

Practical-VI	CS353: VB .NET and Web design Lab / VB.NET and JAVA Programming Lab	48 hours
Practical/Week: 4 Hrs Credits: 2	<ol style="list-style-type: none"> i. Programs implementation on the topics studied in the subjects of VB .NET and Web design(Elective Subject) ii. Programs implementation on the topics studied in the subjects of VB.NET and Java Programming.(Elective Subject) 	I A: 20 Exam: 80