

MANGALORE



UNIVERSITY

Office of the Registrar
Mangalagangothri - 574 199

MU/ACC/CR.4/2012-13/A2

Date: 12.08.2013.

CIRCULAR

Sub: Blown up Syllabus of I & III Semester **Computer Science** subject
for B.Sc. degree programme

Ref: This office Notification of even No. dated 5.07.2012

~~~~~

In continuation to the above notification, the blown up Syllabus of I and III semester Computer Science subject for B.Sc. degree programme is hereby circulated for reference.

  
REGISTRAR

To:

- 1) The Principals of the Colleges concerned
- 2) The Registrar (Evaluation), Mangalore University.
- 3) The Chairman, UG BOS in Computer Science, Mangalore University.
- 4) The Superintendent, ACC Section, O/o the Registrar, Mangalore University.
- 5) Guard File.

| Topic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Chapter No | Sections                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>UNIT I</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                                                                                                                                                                                                                                                                                                                                |
| <p><b>Introduction to Computer Systems:</b><br/>Introduction, Characteristics of Computers, Evolution of Computers, Generations of Computers, Classification of Computers, Computer System, Application of Computers</p> <p><b>Number systems:</b><br/>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.</p> <p><b>Logic gates:</b><br/>Basic gates- AND, OR and NOT gates, Universal Gates- NOR and XOR gates, EX-OR gate, EX-NOR gate.</p>                                                                                                                                                            | 1          | BOOK 1<br>1.1, 1.1.1, 1.2, 1.3, 1.4, 1.5, 1.6                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2          | BOOK 2<br>2.1, 2.2 (No Application), 2.3, 2.4, 2.5, 2.6, 2.7, 2.8 (only conversions), 2.9 (only conversions), 2.10, 2.11 and 2.12 (Gray code, Alphanumeric codes, Error-detection codes- No CRC)                                                                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3          | 3.1, 3.2, 3.3, 3.4, 3.5, 3.6<br>(Only Logical symbols, logical expression, Truth table and operations of each gate)                                                                                                                                                                                                            |
| <b>UNIT II</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                                                                                                                                                                                                                                                                                                                                |
| <p><b>Boolean Algebra and Logic implications:</b><br/>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.</p> <p><b>Combinational Logic Analysis:</b><br/>Basic combinational logic circuits, combinational logic implementation, Universal property of NAND gate, NOR gates, combinational logic using NAND and NOR gates.</p> <p><b>Functions of Combinational logic:</b><br/>Basic adders, parallel binary adders, comparator, comparators, decoders, encoders, code convertors, Multiplexers, Demultiplexers</p> | 4          | 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 5          |                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 6          | 5.1, 5.2, 5.3, 5.4 (using dual symbols are not included)<br><br>6.1, 6.2 (only logic symbol and Truth table and operation) (adder expansion is not included), 6.4, 6.5 (The basic Binary Decoder, 4-bit Decoder, the BCD-to-Decimal Decoder), 6.6 (Only The Decimal to-BCD Encoder), 6.7, 6.8 (no examples), 6.9 (No examples) |

⑤

**Credit Based Semester System (2012-13 onwards)**  
**CS- 201: C++ and Data Structures**  
**Detailed Syllabus (presented in the Workshop held on 27-06-2013)**

**UNIT I**

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.

**UNIT-II**

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, and multiple inheritances. Pointers, virtual functions, polymorphisms: Pointers to objects, this pointer, pointers to derived classes, virtual functions.

**UNIT-III**

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.

**UNIT-IV**

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.

*Text Books:*

1. E Balagurusamy, Object Oriented Programming with C++, 4<sup>th</sup> 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, (pp 24-30, 34-36), Chap. 2.1(pp 77-83), 2.2(86-94), 2.3 (95-108), 4.1(pp174-182), 4.2(pp186-202), 4.3(pp203-215), 4.5(pp228-231, 237-238), 5.1(pp249-260), 5.2(pp261-272), 5.4(pp292-294), 5.5(pp305-318), Chap. 6(p329, pp339-348, pp365-366), Chap. 7(pp387-389,394-396).

*Reference books:*

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, 2<sup>nd</sup> edition, Tata McGraw Hill publisher.

*Experiments on Digital logic:*

( Circuit diagram : 04 Truth table : 03 Output: 03)

**Part A**

1. Prove that NAND and NOR are Universal gates by constructing NOT, AND and OR gates from them.
2. Obtain EXOR and EXNOR gates using NAND gates and verify the truth table.
3. Realise the Demorgan's theorems.
4. Construct a half adder using XOR and AND gates & verify its truth table.
5. Construct a half subtractor using XOR and NAND gates.
6. Construct a full adder & verify its truth table.
7. Realize a 2 to 1 line multiplexer using NAND gates & verify the action.
8. Realize a magnitude comparator with 2 input lines and verify its action.
9. Realise 2-bit decoder.

**Part B**

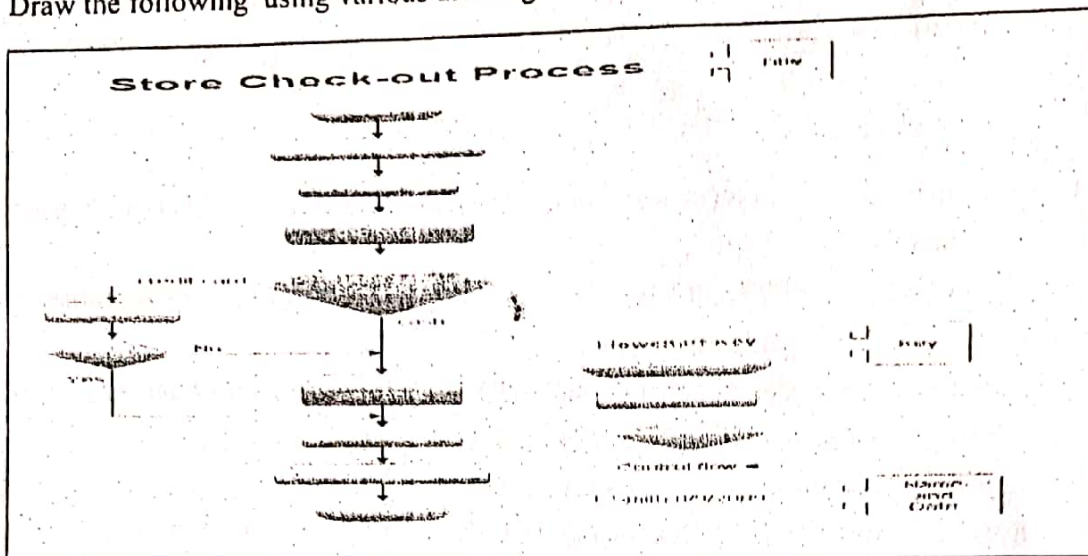
10. Realize the action of commercial JK Flip Flop.
11. Design a JK Flip Flop from D Flip Flop using sequential design procedure.
12. Construct a synchronous mod 4 counter and study its counting performance using JK Flip Flop and AND gates.
13. Realize the action of universal shift register.
14. Design and construct a 4-bit ripple up/down counter using JK Flip Flop.

*Exercises in MS-Office package*

**MS WORD Excercises ( 08 marks)**

1. Prepare a word document including following features.
  - a) Inserting picture
  - b) Bulleting and numbering
  - c) Formatting (size, bold, underline, italic, superscript, subscript, colour etc)
  - d) Border and shading,
  - e) Paragraph and line alignment
  - f) Mathematical expressions
2. Design the given paper cutting with word art, drop cap, columns, textbox, symbols, background color, header and footer.

3. Draw the following using various drawing tools.



4. Prepare a Word document with table containing Rollno; Name, Class, Marks in 3 subjects of 10 students. Calculate total marks & average. Also find the highest total marks obtained. Find the maximum and minimum marks secured in each subject.
5. Using Mail Merge in MS Word, Prepare interview call letters for 5 candidates, for teaching posts. Assume that there are 2 subjects,. Interviews should be on two different dates for the two subjects. For each candidate, timings should be different.

### MS PowerPoint Exercises (07 marks)

(Slides : 03 marks, Applying features: 04 marks)

Prepare a power point presentation with at least 5 slides and picture, chart and other contents for the following matters. Apply various transition and animations. Slides should be moved automatically as well as with mouse click..

**Exercise No. 1 :** About your college, or your city, or Any Scientist. Use pictures and charts.

**Exercise No. 2 :** A simple quiz program, or a seminar or any topic. Use diagrams. Use hyperlinks to move to another slide in the presentation (to display answer), or to open another MSWord file (to display more details for seminar).

## MS EXCEL Exercises (08 marks)

1. Prepare a worksheet containing reg.no, name, marks in 5 subjects of several students. Calculate , total average ( percentage ) and class. To pass, a student has to get 35% in each subject. If he passes, he gets distinction if percentage  $\geq 75$ , First class if  $\geq 60$  and  $< 75$ , second class if  $< 60$  and  $\geq 50$ , third class otherwise. Using custom sort , sort the data according to class :- Distinction first, First class next , and so on. Within each class, average marks should be in descending order. Also draw the Column chart showing the Roll no versus average scored. Display title, legend ,datalabels and axes labels.

*(Worksheet with formulae: 04 marks , sorting and chart : 04 marks )*

2. Prepare a work sheet to calculate electricity bill of several domestic customers. Input RR No. , name of the customer, previous meter reading , current and meter reading. The rates are as follows -

For the first 30 units -- Rs. 2.2 per unit, for the next 70 units Rs. 3.4 per unit, for the next 100 units , Rs. 4.5 per unit, for the next 100 units Rs. 5.5 per unit., and for units above 300, Rs. 6 per unit. A fixed amount of Rs. 130 is also charged. 5% tax has to be paid on the sum of bill amount & fixed amount. Use Data validation to see that current reading is more than previous reading. Arrange the records in the alphabetic order of names. Filter the records whose bill amount is more than Rs. 800.

*(Worksheet with formulae: 04 marks, validation, sorting and filtering : 04 marks )*

3. Create an excel worksheet to prepare pay bill of several employees, with the following conditions.

If basic  $\leq 5000$ , DA is 15% of basic, if basic  $> 5000$  and is  $\leq 6000$ , the DA is 10% of basic, otherwise DA is 6% of basic. If basic  $< 8000$ , HRA is 1000, otherwise it is 1500. CCA is Rs. 250 , PF is 5% of basic+DA. If basic  $> 8000$ , deduct Rs.1000 towards IT. Deduct Rs. 200 towards profession tax, if gross salary is  $\geq 10000$ , 100 otherwise. . Calculate gross and net salaries and sort according to names. Prepare individual pay slips of (at least 3) employees in another work sheet.

*(Worksheet of combined paybill 5 marks, Worksheet of individual payslips 3 marks )*

**(Note: Give proper title, column headings for each worksheet. Insert at least ten records into a worksheet. The results should take care of all the conditions mentioned in respective problems. Format numeric values appropriately wherever necessary)**

### *Scheme of Examination*

|                                                      |            |
|------------------------------------------------------|------------|
| Question 1: From Part A-Digital Combination circuits | - 10 marks |
| Question 2: From Digital sequential circuits         | - 10 marks |
| Question 3: MS POWERPOINT                            | - 07 marks |
| Question 4: MS EXCEL OR MS WORD                      | - 08 marks |
| Record                                               | - 05 marks |
| TOTAL                                                | -40 marks  |

7

**PART A : C++ Programming**

1. Write a C++ program to perform the addition of two time objects in the hours and minutes format.
2. Write a C++ program to search an element in an array using binary search method. (note: input sorted list).
3. Write a C++ program to generate first N Fibonacci numbers using constructors.
4. Write a C++ program to compute the total marks and declare the results of n students using the array of objects. Assume the class contains the data members rno, name and marks in 3 subjects.
5. Write a C++ program to calculate the volume of cube, cylinder and cuboid using function overloading.
6. Write a C++ program to initialize two strings and join them using dynamic constructors for string.
7. Write a C++ program to perform the addition, subtraction, multiplication and division operations on two complex numbers using Operator overloading by member functions.
8. Create a class Rectangle with length, breadth and area. Create another class Cuboid that inherits Rectangle and has additional members height and volume. Use single inheritance property.

**Part B : DATA STRUCTURES USING C++.**

1. Write a C++ program to implement the stack operations using arrays
2. Write a C++ program to evaluate a postfix expression
3. Write a C++ program to implement all operations on queue using arrays.
4. Write a C++ program to implement all operations on a sorted singly linked list.
5. Write a C++ program to implement a stack using linked list.
6. Write a C++ program to implement a queue using linked list.
7. Write a C++ program to perform the in order, preorder and post order traversal of a binary tree.

**Scheme of Examination**

|                                       |            |
|---------------------------------------|------------|
| Question 1:- Simple C++ exercise      | -15 marks  |
| Question 2: Data Structures using C++ | -20 marks  |
| Record                                | - 05 marks |
| Total                                 | - 40 marks |



**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        |
| <b>Total</b> |                               | <b>07</b>          |                    | <b>30</b> | <b>120</b>       | <b>150</b> | <b>3</b> |

#### 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        |
| <b>Total</b> |                   | <b>07</b>          |                    | <b>30</b> | <b>120</b>       | <b>150</b> | <b>3</b> |

#### 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        |
| <b>Total</b> |                            | <b>07</b>          |                    | <b>30</b> | <b>120</b>       | <b>150</b> | <b>3</b> |

#### 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        |
| <b>Total</b> |                          | <b>07</b>          |                    | <b>30</b> | <b>120</b>       | <b>150</b> | <b>3</b> |

## 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:<br>E1.1,<br>E1.2              | 03                 | 03                 | 20        | 80               | 100        | 2        |
| CS303        | 8086 MP Programming Lab                          | 04                 | 04                 | 20        | 80               | 100        | 2        |
|              | Oracle Lab /<br>Computer Graphics Lab            |                    |                    |           |                  |            |          |
| <b>Total</b> |                                                  | <b>10</b>          |                    | <b>60</b> | <b>240</b>       | <b>300</b> | <b>6</b> |

#### 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:<br>E2.1<br>E2.2        | 03                 | 03                 | 20        | 80               | 100        | 2        |
| CS353        | Visual Basic.NET Lab                       | 02                 | 04                 | 20        | 80               | 100        | 2        |
|              | Web Designing Lab/<br>Java Programming Lab | 02                 |                    |           |                  |            |          |
| <b>Total</b> |                                            | <b>10</b>          |                    | <b>60</b> | <b>240</b>       | <b>300</b> | <b>6</b> |

#### 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       |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                    |                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-----------------------------------|
| <b>PAPER-I</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>CS101: Digital Fundamentals</b> | <b>48 hours</b>                   |
| <b>Theory/Week: 4 Hrs</b><br><b>Credits: 2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                    | <b>I.A: 20</b><br><b>Exam: 80</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>UNIT-I</b>                      | <b>12 Hrs.</b>                    |
| <p><b>Introduction to Computer Systems:</b> Introduction, Characteristics of Computers, Evolution of Computers, Generations of Computers, Classification of Computers, Computer System, Application of Computers<br/> <b>Number systems:</b> 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. <b>Logic gates:</b> Basic gates- AND, OR and NOT gates, Universal Gates- NOR and XOR gates, EX-OR gate, EX-NOR gate.</p>                                                                                                                                                        |                                    |                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>UNIT-II</b>                     | <b>12 Hrs.</b>                    |
| <p><b>Boolean Algebra and Logic implications:</b> 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. <b>Combinational Logic Analysis:</b> Basic combinational logic circuits, combinational logic implementation, Universal property of NAND gate, NOR gates, combinational logic using NAND and NOR gates. <b>Functions of Combinational logic:</b> Basic adders, parallel binary adders, comparator, comparators, decoders, encoders, code convertors, Multiplexers, Demultiplexers.</p> |                                    |                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>UNIT-III</b>                    | <b>12 Hrs.</b>                    |
| <p><b>Latches and Flip flops:</b> Latches, Edge trigger flip-flop, Flip Flop Operating characteristics. <b>Counters:</b> Asynchronous counters, Synchronous Counters, Up/Down Synchronous Counters, Design of synchronous Counters, Cascaded Counters, Counter Decoding;</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                    |                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>UNIT-IV</b>                     | <b>12 Hrs.</b>                    |
| <p><b>Shift Registers:</b> 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; <b>Memory and Storage:</b> 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><b>Text Books:</b></p> <ol style="list-style-type: none"> <li>ITL Education Solution Limited, <b>Introduction to Information Technology</b>, Pearson Education, 2012 (Chapter 1).</li> <li>Thomas L Floyd, <b>Digital Fundamentals</b>, 10<sup>th</sup> Edition, Pearson, 2011.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                    |                                   |
| <p><b>Reference books:</b></p> <ol style="list-style-type: none"> <li>Peter Norton, <b>Introduction to Computers</b>, 7<sup>th</sup> edition, Tata McGraw Hill Publication, 2011</li> <li>M. Morris Mano, <b>Digital Logic and Computer Design</b>, PHI publication.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                    |                                   |

|                                     |                                                                     |                     |
|-------------------------------------|---------------------------------------------------------------------|---------------------|
| <b>Practical-I</b>                  | <b>CS102 : Digital Logic and MS Office Lab</b>                      | <b>36 hours</b>     |
| Practical/Week: 3 Hrs<br>Credits: 1 | Experiments on Digital logic and exercises in the MS-Office package | I.A: 10<br>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        |
| <b>Total</b> |                   | <b>07</b>          |                    | <b>30</b> | <b>120</b>       | <b>150</b> | <b>3</b> |

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



|                                     |                                  |                     |
|-------------------------------------|----------------------------------|---------------------|
| <b>Practical-II</b>                 | <b>CS152 : C Programming Lab</b> | <b>36 hours</b>     |
| Practical/Week: 3 Hrs<br>Credits: 1 | Programming exercises in C       | I.A: 10<br>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        |
| <b>Total</b> |                            | <b>07</b>          |                    | <b>30</b> | <b>120</b>       | <b>150</b> | <b>3</b> |

| PAPER-III                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | CS201: C++ and Data Structures | 48 hours            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------|
| Theory/Week: 4 Hrs<br>Credits: 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                | I.A: 20<br>Exam: 80 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>UNIT-I</b>                  | <b>12 Hrs.</b>      |
| <p><b>Input and Output statements:</b> cin, cout, manipulator functions endl, hex, dec, oct, setbase, setw, setfill, setprecision, ends, ws, flush. <b>Functions in C++:</b> main function, Prototyping, call and return by reference, inline functions, default arguments, const arguments, function overloading. <b>Classes and objects:</b> 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>                     |                                |                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>UNIT-II</b>                 | <b>12 Hrs.</b>      |
| <p><b>Constructors and Destructors:</b> Parameterized constructors, multiple constructors, constructors with default arguments, dynamic initialization of objects, copy constructor, dynamic constructors, constructing 2 dimensional arrays, destructors. <b>Operator overloading:</b> 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. <b>Inheritance:</b> Defining a derived class, single inheritance, protected members, multilevel inheritance, multiple inheritance. <b>Pointers, virtual functions, polymorphisms:</b> Pointers to objects, this pointer, pointers to derived classes, virtual functions.</p> |                                |                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>UNIT-III</b>                | <b>12 Hrs.</b>      |
| <p><b>Introduction to Data structures:</b> Arrays in C <b>Stacks:</b> Definitions, representation of Stacks, Examples - infix, postfix and prefix, Algorithms, <b>Queues and List:</b> The Queues and its sequential representation, Linked Lists, lists in C</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                |                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>UNIT-IV</b>                 | <b>12 Hrs.</b>      |
| <p><b>Circular list,</b> stack as circular list, queue as a circular list, doubly linked list. <b>Trees-</b> Binary Trees, Binary Tree Representation, Representing List as Binary Trees, Trees and their applications. <b>Sorting:</b> Bubble sort, Quick Sort, Simple insertion sort. <b>Searching:</b> Sequential Search, Binary search.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                |                     |
| <p><b>Text Books:</b></p> <ol style="list-style-type: none"> <li>1. E Balagurusamy, <b>Object Oriented Programming with C++</b>, 4<sup>th</sup> Edition, Tata McGraw Hill publisher, 2008.</li> <li>2. Yedidyah Langsam, Moshe J, Augenstein and Aaron M, Tenenbaum, <b>Data Structures Using C and C++</b>, 2<sup>nd</sup> 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)</li> </ol>                                                                                                                                                                                                                                                                                                                                                                             |                                |                     |
| <p><b>Reference books:</b></p> <ol style="list-style-type: none"> <li>1. D.Ravichandran, <b>Data Structures with C++</b>, Tata McGraw Hill Publisher, 2009.</li> <li>2. Jean Paul &amp; Paul G Sorenson, <b>An Introduction to Data Structures with Applications</b>, 2<sup>nd</sup> edition, Tata McGraw Hill publisher.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                |                     |

|                                     |                                                  |                     |
|-------------------------------------|--------------------------------------------------|---------------------|
| <b>Practical-III</b>                | <b>CS202: C++ and Data Structure Lab</b>         | <b>36 hours</b>     |
| Practical/Week: 3 Hrs<br>Credits: 1 | Programming exercises in C++ and Data structures | I.A: 10<br>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        |
| <b>Total</b> |                          | <b>07</b>          |                    | <b>30</b> | <b>120</b>       | <b>150</b> | <b>3</b> |

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

|                                    |                                                                    |                     |
|------------------------------------|--------------------------------------------------------------------|---------------------|
| <b>Practical-IV</b>                | <b>CS252: OS and Linux LAB</b>                                     | <b>36 hours</b>     |
| Practical/Week: 3 Hrs<br>Credits:1 | Implementation of OS concepts using C++ and shell scripts in Linux | I A: 10<br>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:<br>E1.1,<br>E1.2              | 03                 | 03                 | 20        | 80               | 100        | 2        |
| CS303        | 8086 MP Programming Lab                          | 04                 | 04                 | 20        | 80               | 100        | 2        |
|              | Oracle Lab /<br>Computer Graphics Lab            |                    |                    |           |                  |            |          |
| <b>Total</b> |                                                  | <b>10</b>          |                    | <b>60</b> | <b>240</b>       | <b>300</b> | <b>6</b> |

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

E1.1: Database Concepts and Oracle

E1.2: Computer Graphics and Multimedia



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                |                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------|
| <b>PAPER-V</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>CS301: MICROPROCESSOR ARCHITECTURE AND 8086 PROGRAMMING</b> | <b>48 hours</b>                   |
| <b>Theory/Week: 3 Hrs</b><br><b>Credits: 2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                | <b>I.A: 20</b><br><b>Exam: 80</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>UNIT- I</b>                                                 | <b>12 Hrs.</b>                    |
| <b>Basic Computer Organization and design:</b> Instruction codes; Computer registers; Computer Instructions; Timing and Control; Instruction cycle; Memory reference instructions; I/O and Interrupt. <b>Memory Devices and Organization:</b> Memory Unit; Memory Hierarchy; Main Memory; Auxiliary Memory; Associative Memory; Cache Memory; Virtual Memory.                                                                                                                                                                                                                                                                                                           |                                                                |                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>UNIT- II</b>                                                | <b>12 Hrs.</b>                    |
| <b>Architecture of 8086:</b> Microprocessors; 8086: Internal Architecture; Memory Organization; Input and Output Structure; Programmable Hardware Registers; Addressing Modes; Levels of Programming. <b>Assembler Directives:</b> 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.                 |                                                                |                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>UNIT- III</b>                                               | <b>12 Hrs.</b>                    |
| <b>80x86 Instructions:</b> Introduction; Assembler Instruction Format; Data Transfer Instructions; Arithmetic and Logical Instructions; Branch Instructions; Processor Control Instructions; String Operation Instructions. <b>Assembly Language Programming:</b> Introduction; Program Segments; Procedures; Program Structure; Programming with Macros; Input-Output Structure and Programming; Program Development Tools.                                                                                                                                                                                                                                            |                                                                |                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>UNIT-IV</b>                                                 | <b>12 Hrs.</b>                    |
| <b>Software Interrupts in C:</b> 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. <b>Interrupts and Interrupt Service Routines:</b> 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). |                                                                |                                   |
| <b>Text books:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                |                                   |
| 1. M. Morris Mano, <b>Computer System Architecture</b> , PHI Publication (For Unit I: Chapters 2-7, 5-1 to 5-10, 12-1 to 12-6).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                |                                   |
| 2. K. R. Venugopal, Rajkumar, <b>Microprocessor x 86 Programming</b> , BPB Publications. (For Units II, III, and IV: Chapters 1.3 to 1.9, 2, 3, 4, 5, 6).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                |                                   |
| <b>Reference books:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                |                                   |
| 1. Yu-Cheng Liu, Glenn A. Gibson, <b>Microcomputer Systems: The 8086/8088 Family</b> , PHI Publication.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                |                                   |
| 2. Udaya Kumar, Umashankar, <b>Advanced Microprocessor and Assembly Language Programming</b> , BPB Publication.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                |                                   |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                         |                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------|
| <b>PAPER-VI</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Elective Stream-I:<br/>CS302: E1.1: DATABASE CONCEPTS AND ORACLE</b> | <b>48 hours</b>             |
| <b>Theory/Week: 3 Hrs<br/>Credits: 2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                         | <b>I.A: 20<br/>Exam: 80</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>UNIT-I</b>                                                           | <b>12 Hrs.</b>              |
| <p><b>Database System Concepts</b> 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>                                                                                                                                                                                                                                                 |                                                                         |                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>UNIT-II</b>                                                          | <b>12 Hrs.</b>              |
| <p><b>Relational model:</b> Basic Concepts of relational data model, Relational Algebra, Basic and additional operations of relational algebra. Simple queries using relational algebra. <b>Design theory of Relational Database:</b> Introduction to Relational database design, Functional dependency, and Normal forms based on Primary Keys. Normal forms (1NF, 2NF, 3NF and BCNF), Armstrong Inference rules. <b>Recovery Techniques:</b> Recovery Concepts.</p>                                                                                                                                                                                                                                                                                                                               |                                                                         |                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>UNIT-III</b>                                                         | <b>12 Hrs.</b>              |
| <p><b>Introduction to Oracle: Creation of Database:</b> Creating, changing and dropping the tables. Integrity Constraints specification, maintaining reference integrity constraints, Data insertion, deletion and modification. <b>Querying the database:</b> 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>                                                                                                                                                                                                                                                                                                                                 |                                                                         |                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>UNIT-IV</b>                                                          | <b>12 Hrs.</b>              |
| <p><b>PL/SQL Basics:</b> Introduction, PL/SQL execution environment, PL/SQL syntax, Block structure, Conditional statements, iterative statements, Oracle transactions. <b>Cursors-</b> Definition, use, declaring, opening, fetching and closing of cursor, cursor attributes implicit and explicit cursor. <b>Functions:</b> Definition, creation, execution and syntax of function, an application using a function. <b>Procedures:</b> Definition, creation, execution and syntax of procedures, an application using a procedure, deleting a procedure. <b>Database triggers:</b> Definition, uses, comparison with procedures, constraints, parts of triggers, types of triggers, syntax, deleting a trigger, applications using triggers. <b>Packages:</b> Creation and use of packages.</p> |                                                                         |                             |
| <p><b>Text Books :</b></p> <ol style="list-style-type: none"> <li>1. Silberschatz and Korth, <b>Database System Concepts</b>, McGraw Hill Publication. (Chapter 1).</li> <li>2. Elmasri and Navathe , <b>Fundamentals of Database Systems</b>, Pearson Education Asia Publication, 4<sup>th</sup> edition. (Chapter 2, 3.1 to 3.7,5,6,10, 17.1 to 17.3 19.1)</li> <li>3. Ivan Bayross, <b>Commercial Application Development using Oracle D2K</b>, BPB Publications (Chapters 1, 2, 3, 4, 5, 6)</li> </ol>                                                                                                                                                                                                                                                                                          |                                                                         |                             |
| <p><b>Reference Books :</b></p> <ol style="list-style-type: none"> <li>1. Ivan Bayross, <b>SQL, PL/SQL The programming Language</b>, BPB Publications</li> <li>2. Scott Urman, <b>Oracle 8 PL/SQL Programming</b>, Tata McGraw Hill Edition</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                         |                             |

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

|                                             |                                                                                                                                                                                                                                                                                       |                             |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| <b>Practical-V</b>                          | <b>CS303: Microprocessor and Oracle Lab/<br/>Microprocessor and Computer Graphics Lab</b>                                                                                                                                                                                             | <b>48 hours</b>             |
| <b>Practical/Week: 4 Hrs<br/>Credits: 2</b> | <ul style="list-style-type: none"><li>i. 8086 programs using Arithmetic and Logic Instructions; String Manipulation Operations; Keyboard / Screen Handling; Software interrupts in C.</li><li>ii. Programming exercises in Oracle and Computer Graphics.(Elective Subjects)</li></ul> | <b>I.A: 20<br/>Exam: 80</b> |

## 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:<br>E2.1<br>E2.2        | 03                 | 03                 | 20        | 80               | 100        | 2        |
| CS353        | Visual Basic.NET Lab                       | 02                 | 04                 | 20        | 80               | 100        | 2        |
|              | Web Designing Lab/<br>Java Programming Lab | 02                 |                    |           |                  |            |          |
| <b>Total</b> |                                            | <b>10</b>          |                    | <b>60</b> | <b>240</b>       | <b>300</b> | <b>6</b> |

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

E2.1 : Computer Networks and Web Design

E2.2 : Java Programming

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                             |                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-----------------------------------|
| <b>PAPER-VII</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>CS351: VISUAL BASIC .NET PROGRAMMING</b> | <b>48 hours</b>                   |
| <b>Theory/Week: 3 Hrs</b><br><b>Credits: 2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                             | <b>I A: 20</b><br><b>Exam: 80</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>UNIT-I</b>                               | <b>12 Hrs.</b>                    |
| <b>Introduction:</b> 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. <b>Introduction to Visual Basic.Net IDE:</b> Creating a project, Types of project in .Net, Exploring and coding a project, Solution explorer, toolbox, properties window, Output window, Object Browser.                                                                                                                                                                                                                                                                                    |                                             |                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>UNIT-II</b>                              | <b>12 Hrs.</b>                    |
| <b>Object Oriented Features:</b> Classes and Objects, Access Specifiers: Private, Public and Protected, Building Classes, Reusability, Constructors, Destructor, Inheritance, Overloading, Overriding, Polymorphism. <b>VB.Net Programming Language:</b> 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. <b>Control Flow Statements:</b> Conditional statement, Loops, Nesting of Loops. Exception Handling(using : Try-catch, Multiple catch, Finally, Resume next)                                                                                                                                                                       |                                             |                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>UNIT-III</b>                             | <b>12 Hrs.</b>                    |
| <b>GUI Programming:</b> 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. <b>Dialog Controls:</b> PageSetupDialog, PrintDialog, PrintPreview Dialog, PrintPreviewControl, PrintDocument, OpenFileDialog, SaveFileDialog, <b>Multiple Document Interface:</b> Creating and Using MDI applications, Creating DialogBox, Adding and removing Controls at runtime                                                                       |                                             |                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>UNIT-IV</b>                              | <b>12 Hrs.</b>                    |
| <b>Error Handling in Windows Forms:</b> 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. <b>Working With Database:</b> 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. |                                             |                                   |
| <b>Text Book:</b><br>Steven Holzner, <b>Visual Basic.NET Programming Black Book</b> , Dreamtech Press                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                             |                                   |
| <b>Reference Books:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                             |                                   |
| 1. Bradley, Millspaugh Julia Case, Anita, <b>Programming in Visual Basic. NET</b> , Tata McGraw Hill                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                             |                                   |
| 2. Dr Garima Khadelwal, <b>Programming with Visual Basic. NET</b> , Prakhar Publishers Distributors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                             |                                   |
| 3. M Vishwanath Pai, <b>A Book on VB.NET</b> , 2011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                             |                                   |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                             |                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------|
| <b>PAPER-VIII</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Elective Stream-II:<br/>CS352-E2.1: COMPUTER NETWORKS AND WEB DESIGN</b> | <b>48 hours</b>             |
| <b>Theory/Week: 3 Hrs<br/>Credits: 2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                             | <b>I A: 20<br/>Exam: 80</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>UNIT-I</b>                                                               | <b>12 Hrs.</b>              |
| <b>Computer Networks:-Networking and OSI Reference Model:</b> 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. <b>Topologies:</b> Topology; Bus topology; Star topology; Extended star topology. <b>IP Addressing:</b> Addressing Overview; Classes of IP addresses; Subnet Addressing; Subnet Masking; Subnet Planning. <b>The Application, Presentation, Session and Transport Layers:</b> The Application Layer; The Presentation Layer; The Session Layer; The Transport Layer.                                                                                                                                                                                                                                                                                                                                                                        |                                                                             |                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>UNIT-II</b>                                                              | <b>12 Hrs.</b>              |
| <b>HTML</b> - 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                                                                                                                                                                                                        |                                                                             |                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>UNIT-III</b>                                                             | <b>12 Hrs.</b>              |
| <b>Overview of Dynamic Web page:</b> 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.<br><b>Overview of ADO.NET,</b> 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. |                                                                             |                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>UNIT-IV</b>                                                              | <b>12 Hrs.</b>              |
| <b>Web services:</b> 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                             |                             |
| <b>Text Books :</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                             |                             |
| <ol style="list-style-type: none"> <li>1. Amato Vito, <b>Cisco Systems Networking Academy: First Year Companion Guide</b>, Techmedia Publication/BPB/Pearson Education Asia.</li> <li>2. Ivan Bayross, <b>HTML 5 and CSS 3 Made Simple</b>, B P B Publications, 2011</li> <li>3. Neha Kotecha, Sonal Mukhi, Vijay Mukhi, <b>ASP. Net with C# The Basics</b>, BPB Publishers, 2011</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                             |                             |

**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



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                      |                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------|
| <b>PAPER-VIII</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Elective Stream-II:</b>           | <b>48 hours</b> |
| <b>Theory/Week: 3 Hrs</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>CS352: E2.2: JAVA PROGRAMMING</b> | <b>IA: 20</b>   |
| <b>Credits: 2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                      | <b>Exam: 80</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>UNIT-I</b>                        | <b>12 Hrs.</b>  |
| <p><b>Java Fundamentals:</b> 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><b>Data Types and Operators:</b> 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><b>Using I/O:</b> Byte streams and character streams, predefined streams, reading console input, reading characters, strings, writing console output.</p> <p><b>Control Statements:</b> 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>                                                                                                                                                                                                                                                                                                                                 |                                      |                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>UNIT-II</b>                       | <b>12 Hrs.</b>  |
| <p><b>Arrays:</b> 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><b>Classes, Objects and Methods:</b> 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><b>Inheritance:</b> 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> |                                      |                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>UNIT-III</b>                      | <b>12 Hrs.</b>  |
| <p><b>Packages and Interfaces :</b> 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><b>Exception Handling:</b> 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><b>Multithreaded Programming :</b> 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><b>Applets, Events, and Miscellaneous Topics:</b> 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><b>Using AWT controls, Layout managers and menus.</b></p> <p><b>Control Fundamentals</b> - Labels, Buttons, CheckBoxes, CheckboxGroup, Choice Controls, Lists, Scroll Bars, TextField, TextArea.</p> <p><b>Layout Managers:</b> FlowLayout, BorderLayout, GridLayout, Menu Bars and Menus</p> <p><b>Introducing Swing:</b> 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><b>Text Books:</b></p> <ol style="list-style-type: none"> <li>1. Herbert Schildt, <b>Java: A Beginner's Guide, 5th Edition</b>, Tata McGraw Hill Education Private Limited, 2011.</li> <li>2. Herbert Schildt, <b>The Complete reference Java</b>, Seventh edition, Tata McGraw Hill Publishing Company Limited. (Chapters: 13, 24)</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |         |
| <p><b>Reference books:</b></p> <ol style="list-style-type: none"> <li>1. E Balagurusamy, <b>Programming With Java: A Primer</b>, Tata McGraw Hill Education Private Limited, 2009</li> <li>2. Junaid Khateeb and Dr. G T Thampi, <b>Computer Programming in Java</b>, Dreamtech, 2011</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |         |

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