ಕ್ರಮಾಂಕ/No: MU/ACC/CR.39/2018-19/A8

NOTIFICATION

Sub: Syllabus of Computer Science an optional course for B.Sc Degree Programme under Choice Based Credit System -reg

Ref: Decision of the Academic Council at its meeting held on 01.02.2019 vide Agenda No:3:69(2018-19)

Pursuant to the above, the Syllabus of Computer Science an optional course for B.Sc Degree Programme under Choice Based Credit System which was approved by the Academic Council at its meeting held on 01.02.2019 is hereby notified for implementation with effect from the academic year 2019-20.

Copy of the Syllabus shall be downloaded from the Mangalore University Website. www.mangaloreuniversity.ac.in

REGISTRAR.

To:

1) The Principals of the Colleges concerned.
2) The Registrar (Evaluation), Mangalore University.
3) Dr. Doreswamy, Chairman, U.G. Combined BOS in Computer Science & Computer Application's & Professor, Department of Computer Science, Mangalore University.
4) The Superintendent, Academic Section, O/o the Registrar, Mangalore University.
5) The Director, DUIMS, Mangalore University – with a request to publish in the Website.
6) Guard File.

MANGALORE UNIVERSITY

Revised Curriculum Structure and Scheme of Examinations

Bachelor of Science Degree Programme
OPTIONAL SUBJECT: COMPUTER SCIENCE

Choice Based Credit System(CBCS)
(2019-2020 onwards)

MANGALORE UNIVERSITY

B.Sc-Computer Science Degree Programme- Curriculum Structure and Scheme of Examinations

T- Theory and **P**- Practical,
CC- **Co-Curricular** , EC – **Extra-Curricular**

I / II/III/IV Semesters

Group 1	*Courses*	No.of Courses L/P	Instruction Hours/Week	Duration of Exam(hrs)	Marks			Credits
					IA	Exam	Total	
I	2 Optional Courses	2T	2 x 4	2 x 3	2 x 20	2 x 80	2 x 100	2 x 2 =4
		2P	2 x 3	2 x 3	2 x 20	2 x 10	2 x 50	2 x1 =2
	1 Computer Science Course	1T	1 x 4	1 x 3	1 x 20	1 x 80	1 x 100	1 x 2 =2
		1P	1 x 3	1 x 3	1 x 10	1 x 40	1 x 50	1 x1 =1
II	One course from 4 Electives	1T	1 x 2	1 x 2	1 x 10	1 x 40	1 x 50	1*1 =1
III	2 Languages	2L	2 x 4	2 x 3	2 x 20	2 x 80	2 x 100	2 x 2 =4
	Elective Foundation	1T	1 x 2	1 x 2	1 x 10	1 x 40	1 x50	1*1 =1
IV	CC & EC	1T	1 x 2	1 x 2	1 x 50	--	1 x50	1*1=1
						Semester Credit Total		16

V /VI Semester

Group	Courses	No.of Courses L/P	Instruction Hours/Week	Duration of Exam(hrs)	Marks			Credits
					IA	Exam	Total	
I	2 optional Courses	Two Optional with two Practical						
		2*2T	2*(2 x 3)	2*(2 x 3)	2*(2 x 20)	2*(2 x 80)	2*(2 x 100)	2*(2 x 2) =8
		2*2P	2*(2 x 2)	2*(2 x 3)	2*(2 x 10)	2*(2 x 40)	2*2 x 50)	2*(2 x 1) =4
	Computer Course	One Optional with one Practical						
		2T	2 x 3	2 x 3	2 x 20	2 x 80	2 x 100	2 x 2 =4
		1P	1 x 4	1 x 3	1 x 20	1 x 80	1 x 100	1 x 2 =2
						Semester Credit Total		18

MANGALORE UNIVERSITY

B.Sc Computer Science Degree Programme- Curriculum Structure and Scheme of Examinations

I SEMESTER

Group	Course Code	Course	Instruction Hours/Week	Duration of exams (Hours)	Marks and Credits			
					IA	Exam	Total	Credits
I	BSCCSC131	**Digital Fundamentals**	4	3	20	80	100	**2**
	BSCCSP132	Digital and MS Office Lab	3	3	10	40	50	**1**
II	BSCCSCE133 BSCCSCE134	**E1:Computer Network and Security E2: Open Source Software**	2	2	10	40	50	1
		Total	9	8	40	160	200	**4**

II SEMESTER

Group	Course Code	Course	Instruction Hours/ Week	Practical Hours/ Week	Duration of exams (Hours)	Marks and Credits			
						IA	Exam	Total	Credits
I	BSCCSC181	**Problem Solving using C Language**	4	-	3	20	80	100	**2**
	BSCCSP 182	C programming Lab	3	3	3	10	40	50	**1**
II	BSCCSCE183 BSCCSCE184	E1: Cloud Computing E2: Data Mining with R	2	-	2	10	40	50	**1**
		Total	9	3	8	40	160	200	**4**

III SEMESTER

Group	Course Code	Course	Instruction Hours/ Week	Practical Hours/ Week	Duration of Exams (Hours)	Marks and Credits			
						IA	Exam	Total	Credits
I	BSCCSC231	**Data Structures**	4	-	3	20	80	100	**2**
	BSCCSP232	Data Structures Lab	3	3	3	10	40	50	**1**
II	BSCCSCE233 BSCCSCE234	E1: System Administration and Maintenance E1: Desktop Publishing	2	-	2	10	40	50	**1**
		Total	9	3	8	40	160	200	**4**

MANGALORE UNIVERSITY

B.Sc Computer Science Degree Programme- Curriculum Structure and Scheme of Examinations

IV SEMESTER

Group	Course Code	Course	Instruction Hours/Week	Duration of exams (Hours)	Marks and Credits			
					IA	Exam	Total	Credits
I	BSCCSC281	**Operating Systems and LINUX**	4	3	20	80	100	**2**
	BSCCSP 282	Linux Lab	3	3	10	40	50	**1**
II	BSCCSOE283	E1: Fundamentals of Information Technology	2	2	10	40	50	**1**
	BSCCSOE284	E1: Office Automation Tools						
		Total	9	8	40	160	200	**4**

V SEMESTER

Group	Course Code	Course	Instruction Hours/Week	Duration of exams (Hours)	Marks & Credits			
					IA	Exam	Total	Credits
I	BSCCSC331	**RDBMS and Oracle**	3	3	20	80	100	**2**
	BSCCSC332	**E1**: Microprocessor Architecture and 8086 programming	3	3	20	80	100	**2**
	BSCCSC333	**E1:** Web Development Using PHP						
	BSCCSP333	E1: Oracle and 8086 Programming Lab /	4	**3**	20	80	100	**2**
	BSCCSP334	E2: Oracle and Web Design Lab						
		Total	10	**9**	60	240	300	**6**

VI SEMESTER

Group	Course Code	Course	Instruction Hours/Week	Duration of exam (Hrs)	Marks & Credits			
					IA	Exam	Total	Credits
I	BSCCSC381	**Object Oriented Programming with JAVA**	3	3	20	80	100	**2**
	BSCCSC382	**E1:** Visual Programming / **E2:** Computer Graphics and Animation	3	3	20	80	100	**2**
	BSCCSC383							
	BSCCSP383	E1:Java Programming and Visual Basic Lab /	4	**3**	20	80	100	**2**
	BSCCSP384	E2:Java Programming and Computer Graphics Lab						
		Total	10	**9**	60	240	300	**6**

Total Marks: 1400
Total number of Credits: 28

MANGALORE UNIVERSITY

B.Sc Computer Science Degree Programme- Curriculum Structure and Scheme of Examinations

I SEMESTER

Group	Course Code	Course	Instruction Hours/Week	Duration of exams (Hours)	IA	Exam	Total	Credits
I	BSCCSC131	**Digital Fundamentals**	4	3	20	80	100	**2**
	BSCCSP132	Digital and MS Office Lab	3	3	10	40	50	**1**
II	BSCCSCE133	**E1:Computer Network and Security**	**2**	**2**	**10**	**40**	**50**	**1**
	BSCCSCE134	**E2: Open Source Software**						
		Total	9	8	40	160	200	**4**

Group-I
Course-1   **BSCCSC 131: Digital Computer Fundamentals**   **48 hours**
  Theory/Week: 4 Hrs   I.A: 20
  Credits: 2   Exam: 80

Course Objectives
- To study the fundamentals of computer and peripherals
- To study the numbers systems, Boolean algebra, combinational and sequential circuits

Course outcomes:
Upon successful completion of the course the student will be able to:
- Know the concept of computer and peripherals.
- Understand the usage of number system and Boolean algebra in computers.

UNIT – I	12 Hours

Introduction to Computer Systems: Introduction, Characteristics of Computers, Evolution of Computers, Generations of Computers, Classification of Computers, Computer System, Application of Computers.
Primary Memory- Introduction, memory representation, Memory hierarchy, RAM, Types of RAM-SRAM and DRAM, ROM- types of ROM.
Secondary Memory- Introduction, Classification of secondary memory, Magnetic tape, Magnetic disk, Optical disk.
Input devices – Type of input devices, **output devices**- types of output devices.

UNIT - II	12 Hours

Number Systems: Binary numbers, Number base conversions, Octal and hexadecimal numbers, Complements, Binary codes.
Boolean Algebra and Logic Gates: Basic Definitions, Basic Theorems and properties of Boolean Algebra, Boolean Functions, Algebraic Manipulation, Canonical and Standard forms (SOP, POS), Other Logic Operations and Digital Logic Gates.
Simplification of Boolean Functions: Karnaugh Map method for 2, 3 and 4 variable expressions, Product of Sums Simplification.

UNIT - III	12 Hours

Universal gates, NAND and NOR implementation, Don't Care Conditions.
Combinational Logic: Adders, Subtractors, Code conversion, Exclusive-OR and Equivalence functions.
Combinational Logic with MSI and LSI: Binary parallel adder, Decimal adder, Magnitude comparator, Decoders, Encoders, Multiplexers, Demultiplexers

UNIT - IV	12 Hours

Sequential Logic: Introduction, Flip flops, RS-FF, D-FF, T-FF, JK-FF, Triggering of flip-flops, State table, State diagram, State equations. Flip Flop excitation tables, Design Procedures, Design of counters using RS, JK, D, and T flip flops, Design with state equations. **Registers, Counters**: Introduction, Registers, Shift registers, Ripple counters, Synchronous Counters.

Text Books:
1. ITL Education Solution Limited, **Introduction to Information Technology**, Second Edition 2012 Pearson Education.
2. M. Morris Mano, Digital Logic and Computer Design, Pearson @2016.

Group-I Prcatical-1	BSCCSP 131 : **Digital Logic and MS Office Lab**	**36 hours**
Practical/Week: 3 Hrs Credits: 1	Programming exercises Hardware and MS Office	I.A: 10 Exam: 40

CS102: Digital Logic and MS Office Lab

I   Experiments on Digital logic:
(Circuit diagram and truth table: 4, Rig up the circuit: 4   Output: 02)

Part A
1. Prove that NAND and NOR are Universal gates by constructing NOT, AND and OR gates from them.
2. Realize the DeMorgan's theorems.
3. Construct a half adder and half subtractor and verify their truth table.
4. Construct a full adder and verify its truth table.
5. Realize a 2 to 1 line multiplexer using NAND gates and verify the action.
6. Realize a magnitude comparator with 2 input lines and verify its action.

Part B
1. Construct clocked SR flip flop using the IC 7400.
2. Realize the action of D Flip Flop using the IC 7474.
3. Realize the action of JK Flip Flop using the IC 7476.
4. Design and construct a 2-bit asynchronous up/down counter using JK Flip Flop.

II. Exercises in MS-Office package

MS WORD Exercises (15 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)
       d) Border and shading,
       e) Paragraph and line alignment
       f) Mathematical expressions

   2. 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.

3. Draw the following using various drawing tools.
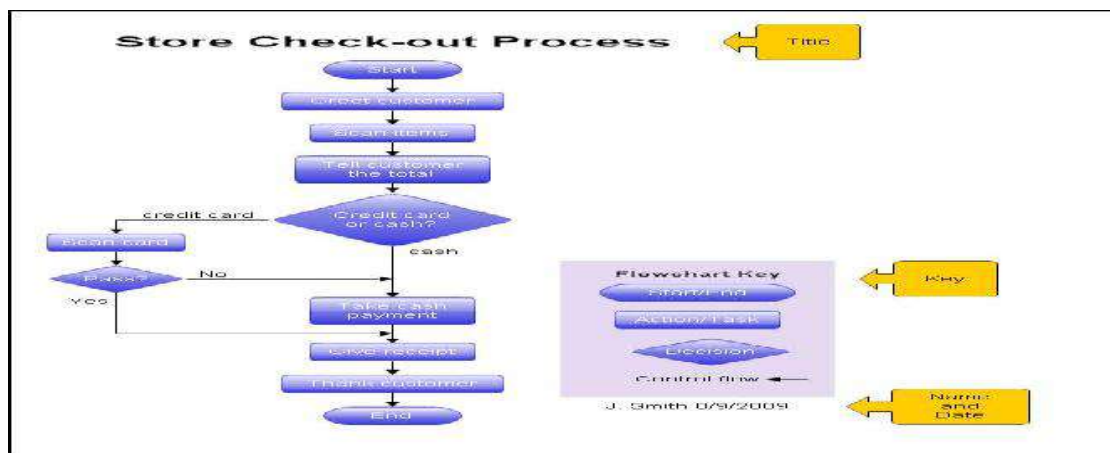
4. Using Mail Merge in MS Word, Prepare interview call letters for 5 candidates, for teaching posts in two different subjects. Interviews dates should be different for the two subjects. For each candidate interview time should be different.

MS EXCEL Exercises (15 marks)

1. Prepare a worksheet containing regno, name, marks in 5 subjects of 5 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 >=75, First class if >=60 and <75, second class if <60 and >=50, third class otherwise. Using custom sort, sort the data according to class: Distinction, first, second 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, data labels and axes labels.

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

For the first 30 units -- Rs. 2.5 per unit, for the next 70 units Rs. 3.5 per unit, for the next 100 units-Rs. 4.5 per unit, for the next 100 units - Rs. 6 per unit and for units above 300 - Rs. 8 per unit. A fixed amount of Rs. 150 is also charged. 5% tax has to be paid on the sum of bill amount and 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. 1000.

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

If basic < = 5000, DA is 15% of basic, if basic > 5000 and is < = 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 >= 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.

(Note: Give proper title, column headings for each worksheet. Insert at least five 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 Practical Examination of I Semester

The practical examination in the concerned subject specified in the I Semester shall be conducted for 40 marks. There shall be two components – Writing the Circuit diagram, truth table and rigging the Circuit and result and Viva voce components. 40 marks can be distributed as follows.

Each Practical paper includes three Parts- PART A, PART B and PART C. One question shall be asked in each part.

Sl. No.	Details			Marks	Total
I	**PART A** **Combinational Circuits**	i.	Writing the Circuit and truth table	05	**08**
		ii.	Rigging the Circuit and result	03	
	PART B **Sequential Circuits**	i.	Writing the Circuit and truth table	06	**10**
		ii.	Rigging the Circuit and result	04	
	PART C **MS word or MS Excel**	i.	Creation of Document or Spreadsheet	08	**12**
		ii.	Formatting or animated slide show	04	
	Record				**05**
II.	**Viva –Voce**				**05**
			Total Marks		**40**

I SEMESTER : Discipline Supportive Subject

GROUP-II   **24 Hours**
COURSE-1
Theory/Week : 2 hours   **BSCCSCE133: Computer Network and Security**   **IA: 10**
Credit:1   **Exam: 40**

Course Objective
- To introduce basics of computer network, internet concepts, information security and cyber security.

Course outcomes:
Acquire knowledge about
- Basics of components of Network and Internet.
- Basics of Internet technology, such as http and the World Wide Web and internet applications.
- Concepts of information security, cyber security and Overview of Emerging Technologies.

UNIT - I   12 Hours

Computer Network: Introduction to computer network, types of computer network: LAN, WAN, MAN, Topologies, **Network Devices:** NIC, repeaters, hub, bridge, switch, gateway, IP address and router.

Internet Terms: Web page, Home page, website, internet browsers, URL, Hypertext, ISP, Web server, download and upload, online and offline.

Internet Applications: www, telnet, ftp, e-mail, search engines, Video Conferencing,

Social Media: Twitter, Face book, YouTube, WhatsApp, and LinkedIn, advantage and disadvantages, privacy issues.

E-commerce: advantages of e-commerce, Benefits and limitations of ecommerce. Legal and ethical issues in ecommerce

UNIT - II   12 Hours

Information Security: Introduction, History of Information security, What is Security, Security Goals, Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Components of Information System, Balancing Information Security and Access, Approaches to Information Security, Implementation, The Security Systems Development Life Cycle.

Computer Security: The Need for Computer Security, Basic Security Concepts, Threats to Users, Threats to Hardware, Threats to Data.

Cyber Security: Cyber law, Cyber banking, E-payment, Cyber act, Cybercrime.

Overview of Emerging Technologies: Bluetooth, cloud computing, big data, data mining, mobile computing and embedded systems.

Reference Books:

1. Security : Michael E. Whitman, Herbert J.Mattord, Principles of Information , CENGAGE Learning, 4th Edition.
2. William Stallings, Cryptography and Network Security,Pearson Education, 4th Edition
3. Information Technology Amended Act, 2008

GROUP-II **COURSE-2**	**I SEMESTER : Discipline Supportive Subject**	**24 hours**

Theory/Week : 2 hours **Credit:1**	**BSCCSCE133- E2: Open Source Software**	**IA: 10** **Exam: 40**

Course Objective
- To introduce the concepts, strategies, and methodologies related to open source software development.

Course outcomes:
Upon successful completion of the course the student will:
- familiar with open source software products and development tools currently available in the market.
- be able to utilize open source software for developing a variety of software applications, particularly Web applications.

UNIT - I	**12 Hours**

The philosophy of OSS, commercial software vs OSS, free software vs freeware.
The Linux operating system, GPL, LGPL and other licenses

UNIT - II	**12 Hours**

Category of OSS Application Software, Study of Commercial Application software vs OSS, Open Office, GAMBAS, GIMP etc.
Software Development Using Open Source and Free Software Licenses: Introduction, Models of Open Source and Free Software Development, Forking, Choosing an Open Source or Free Software License, Drafting Open Source Licenses

Text Books:
1. Andrew St. Laurent, Understanding Open Source and Free Software Licensing – O'Reilly Media, 2004

Reference Books:
1. P. Rizwan Ahmed, Open Source software, Margham Publications, 2015
2. Ashish Gavande, Understanding Free and Open Source, 2017

MANGALORE UNIVERSITY

B.Sc-Computer Science Degree Programme- Curriculum Structure and Scheme of Examinations

II SEMESTER B.Sc. Computer Science

Group	Course Code	Course	Theory Hours/ Week	Practical Hours/ Week	Duration of exams (Hours)	IA	Exam	Total	Credits
I	**BSCCSC 181**	**Problem Solving using C Language**	4	-	3	20	80	100	**2**
	BSCCSP 182	C programming Lab	-	3	3	10	40	50	**1**
II	**BSCCSCE 183** **BSCCSCE 184**	Elective-II: **Expanded Scope subjects** E1: Cloud Computing E2: Data Mining with R	2	-	2	10	40	50	**1**
		Total	6	3	8	40	160	200	**4**

Group-I
Course-1
Theory/Week: 4 Hrs
Credits: 2

BSCCSC 181: Problem Solving using C Language

48 hours
I.A: 20
Exam: 80

Course Objectives:
- To learn the algorithms and flowcharts for solving a specific problem.
- To learn the programming skills using C programming language.

Course outcomes:
Upon successful completion of the course the student will be able to:
- Write the algorithm and flowcharts to solve a problem.
- Write the C programs for a particular problem.

UNIT – I   12 Hours
Algorithm- Features, simple examples. Flowchart –Symbols used in a flowchart, suitable examples. Program Translators – Assembler, Compiler, and Interpreter. Programming languages -Machine level language, Assembly level language, High level languages. **Overview of C:** Importance of C, C character set, C tokens, Constants, variables and data types. Declaration of variables, assigning values to variables. Data type conversion, basic structure of C program, executing a C program, sample C program. **Operators in C:** Arithmetic operators, relational operators. Logical operators, assignment operators, increment and decrement operators, conditional operators, bitwise operators, special operators, Hierarchy of operations.

UNIT - II   12 Hours
Input and output statements, reading a character: getchar(), writing a character: putchar(), formatted and unformatted i/o statements. **Control structures: Branching**: if, if-else, nested if, else-if ladder, switch. **Looping:** while, do-while and for loop, nested loops. **Arrays:** Introduction, single dimensional array, two-dimensional arrays, initializing 2-d arrays, multidimensional arrays. Operations on arrays: traversal, insertion and deletion.

UNIT - III   12 Hours
Handling of character strings: Declaring & initializing string variables, reading strings from terminal, writing strings to screen, Arithmetic operations on characters, putting strings together, comparison of two strings, string handling functions. **User defined functions**: Need for user defined functions, Declaring, defining and calling C functions return values & their types, Categories of functions: With/without arguments, with/without return values, recursion, and functions with arrays, the scope, visibility & lifetime of variables (Storage classes).

UNIT - IV   12 Hours
Structures: Definition and declaration of a structure, assigning and accessing the members of a structure, structure initialization, structure elements in memory, comparison of structure variables, structure with in the structure, array within structures. **Unions:** Definition and declaration, accessing the members of a union. Comparison of structure and union. **Pointers:** Introduction to pointers, advantages of pointers, declaration of pointer variable, pointer expressions, pointers and functions: call by value and call by reference. **The Preprocessor**: Macro substitution and file inclusion.
Files: Definition, types of files. Creating text file. Modes of opening a file, formatted and unformatted i/o operations.

Texts Books:

1. E. Balaguruswamy, Programming in ANSI C, Tata Mc Graw-Hill
2. M.T.Somashekara, Problem Solving with C, PHI.
Reference Books:
3. S. Byron Gottfried, Programming with C, Tata McGraw-Hill
4. Brain Kernighan & Dennis M. Ritchie, ANSI C Programming, PHI

Group-I Prcatical-2	BSCCSP 182 : C Programming Lab	36 hours
Practical/Week: 3 Hrs Credits: 1	Programming exercises in C	I.A: 10 Exam: 40

BSCCSP 182: C Programming Lab

PART A

1. Write a C program to find the roots of the given quadratic equation using if-else statement.
2. Write a menu driven C program using switch statement to find
    Reverse of a number (ii) Factorial of N
3. Write a C program to find the value of Sin(x). [x - $x^3/3!$ + $x^5/5!$-………$x^n/n!$]
4. Write a C Program to generate the prime numbers between two given integers.
5. Write a C program to find the biggest and smallest of 3 numbers using nested ternary operator.

(Note: Write flowcharts for the programs of PART A in the record and flowcharts not be asked in the examination)

PART B

6. Write a C program to transpose a matrix of order N x M and check whether it is symmetric or not.
7. Write a function to find the factorial of a number and use this function in the main program to calculate the value of nCr.
8. Write a recursive function to generate the nth Fibonacci number and use this function in the main program to display the first n Fibonacci numbers.
9. Write a function to find the GCD of two integers and use this function in the main program to find the LCM of two integers.
10. Write user defined functions to i) find the length of a string ii) concatenate two strings. Call these two functions in the main program.

PART C

11. Write a C program to declare the result of students using array of structures. The student record contains the fields name, regno, marks in 3 subjects, total, percentage and result. The student is considered to be pass if he/she scores more than 34 in all the subjects, otherwise he/she is considered to be fail.
    If the percentage>=75 , declare the result as Distinction
    If the percentage>=60 , declare the result as I Class
    If the percentage>=50 , declare the result as II Class
    Otherwise declare the result as III Class

12. Write a C program to prepare the payslip of n employees using array of structures. Input the employee name, employee number and basic pay. Calculate the DA, HRA, PF,PT Gross and Net pay as follows:
    If basic <=40000   DA= 40% of basic
                         HRA= 10% of basic
                         PF= 12% of Gross
                         PT=150

Otherwise   DA= 50% of basic

        HRA= 15% of basic

        PF= 12% of Gross

        PT=200

Gross pay= Basic +DA+HRA and   Net Pay = Gross pay-PF-PT

13. Write a C program to create a file of integers and store the even integers in the file "EVEN" and odd integers in the file "ODD".

14. Write a C program to create two text files ABC and XYZ. Accept the filenames as the input and check for the existence of the filenames. If the files are exist, append the contents of ABC to XYZ and display the contents of both the files.

Scheme of Practical Examination for II Semester

Sl. No.	Details			Marks	Total
I	**PART A** **Combinational Circuits**	i.	Problem solving and coding	04	**08**
		ii.	Compiling the code and debugging	02	
			Execution and testing	02	
	PART B **Sequential Circuits**	i.	Problem solving and coding	05	**10**
		ii.	Compiling the code and debugging	03	
			Execution and testing	02	
	PART C **MS word or MS Excel**	i.	Problem solving and coding	06	**12**
		ii.	Compiling the code and debugging	03	
			Execution and testing	03	
	Record				**05**
II.	**Viva –Voce**				**05**
			Total Marks		**40**

GROUP-II
COURSE-3

II SEMESTER : Expanded Scope
BSCCSCE 183 – E1: Cloud Computing

24 hours

IA: 10
Exam: 40

Theory/Week : 2 hours
Credit:1

Course Objective
- To introduce the concept of cloud computing, its applications and architecture.

Course outcomes:
Upon successful completion of the course the student will be able to:
- Know the concept of cloud computing, historical development of cloud computing, advantages and disadvantages of Cloud Computing.
- Know the areas of Cloud applications and its architecture.
-

12 Hours

UNIT - I

Introduction to Cloud Computing : Introduction, Meaning and definitions of Cloud Computing, Historical development, Vision of Cloud Computing, Characteristics of Cloud Computing as NIST.
Cloud Computing Reference Model: An Overview, Cloud Computing Environments, Cloud Service Requirements, Cloud and Dynamic Infrastructure, Advantages and disadvantages of Cloud Computing, Cloud adoption and rudiments.

UNIT - II   12 Hours

Overview of Cloud applications: : Introduction, Overview of Cloud applications, ECG analysis in the cloud, Protein structure prediction, Gene expression data analysis, Satellite Image Processing, Customer Relationship Management (CRM), Enterprise Resource Planning (ERP), Social Networking. **Cloud Computing Architecture:** Introduction, Cloud Computing Architecture, Cloud Reference Model: NIST, IBM, DMTF, CSA, CISCO Cloud Reference Architecture. Types of Cloud, Cloud Interoperability, Cloud Standardization, Scalability, Fault Tolerance.

Text Book:
1. Pawan Thakur and Roohi Ali, Cloud Computing, Satya Prakashana, New Delhi, 2014.

Reference Book:
2. Rajkumar Buyya, James Broberg and Andrzej M. Goscinski ,Cloud Computing: Principles and Paradigms Wiley, 2011.

GROUP-II
COURSE-4

II SEMESTER: Expanded Scope   **24 hours**

Theory/Week : 2 hours   **BSCCSCE 184 – E2: Data Mining with R**   **IA: 10**
           Credit:1   **Exam: 40**

Course Objectives:
Help the students to
   • Learn the basic concepts of R: the data frame and data manipulation
   • Discover powerful tools for data preparation and data cleansing
   • Visually find patterns in data
   • Work with complex data sets and understand how to process data sets
   • Get to know how object-oriented programming is done in R
   • Explore graphs and the statistical measure in graphs

Course outcomes:
Upon successful completion of the course the student will gain:
   • Ability to identify the characteristics of datasets
   • Ability to select and implement data mining techniques in R suitable for the applications
     under consideration.
   • Ability to recognize and implement various ways of selecting suitable model parameter for different
     machine learning techniques.
   •

UNIT - I	**12 Hours**

Introduction to Data Mining and R: A brief introduction to Data Mining, Main tasks and objectives,
Illustrative case studies, A brief introduction to R and Rstudio, Basic concepts of the R language.
Data Munging: Presentation of the first case study, Importing data into R, Data summarization, Examples
and exercises in R.   Data Visualization and Reporting: Data visualization, Examples and exercises in R,
Reporting, Dynamic reports and presentations in R using knitr.

UNIT - II	**12 Hours**

Predictive Analytics: Introduction to predictive modelling, Classification and regression tasks,
Evaluation metrics, Linear discriminants and linear regression, classification and regression trees, Support
vector machines, Ensembles and Random forests, Model evaluation strategies, Reliability of estimates
Model Evaluation and Selection: Experimental methods for performance estimation, Cross validation,
Holdout, Bootstrap, The performance Estimation package, Illustrations in R, Statistical significance of the
observed differences, Illustrative case studies and hands on practice.

Text Books:

1. G. K. Gupta, Introduction to Data Mining with Case Studies, 3rd Edition, PHI Yanchang
   Zhao,2016
2. Yonghua Cen, Data Mining Applications with R, 1st Edition, Academic Press, 2013
3. Pang-Ning Tan, Michael Steinbach,Vipin Kumar, Introduction to Data Mining, Pearson, 2013

Reference Books:

1. M Ramakrishna Murthy, Introduction to Data Mining and Soft Computing Techniques, Laxmi
   Publications Pvt Ltd, 2017.
2. Paul Teetor, R Cookbook: Proven Recipes for Data Analysis, Statistics, and Graphics, O'reilly
   Cookbooks, 2011
3. Garrett Grolemund, Hadley Wickham, Hands-On Programming with R: Write Your Own
   Functions and Simulations, 1st Edition, O'reilly , 2014

MANGALORE UNIVERSITY

B.Sc-Computer Science Degree Programme- Curriculum Structure and Scheme of Examinations

III SEMESTER

Group	Course Code	Course	Instruction Hours/Week	Practical Hours/ Week	Duration of Exams (Hours)	IA	Exam	Total	Credits
I	BSCCSC231	**Data Structures**	4	-	3	20	80	100	**2**
	BSCCSP232	Data Structures Lab	3	3	3	10	40	50	**1**
II	BSCCSCE233	E1: System Administration and Maintenance	2	-	2	10	40	50	1
	BSCCSCE234	E1: Desktop Publishing							
		Total	9	3	8	40	160	200	**4**

Group-I
Course-3
Theory/Week: 4 Hrs
Credits: 2

BSCCSC 231: Data Structures

48 hours
I.A: 20
Exam: 80

Course Objective

- To understand the basic data structures and algorithms.

Course outcome:
Upon successful completion of the course the student will be able to:

- To solve the problems using data structures such as stacks, queues, trees, linked lists and graphs and writing programs for these using C language.

UNIT – I   12 Hours
Introduction to Data Structures: Introduction: Definition, Need for Data Structures, Types of Data Structures. **Linear Data Structures:** Arrays - Definition, Declaration and storage of one and two dimensional arrays. Sparse matrices. **Sorting**: Introduction, Bubble sort, Insertion sort, Selection sort, Quick sort and Merge sort. Comparison of different sorting techniques.

UNIT - II   12 Hours

Searching – Introduction, Linear search, Binary Search, Comparison of different searching techniques. **Linked List**: Introduction, characteristics, types of linked lists, Representation of singly linked list in memory, Dynamic memory allocation, Singly linked list – Operations, algorithms, Representation of polynomials using linked lists, addition of polynomials. Circular linked list – Operations, Doubly linked list - operations. Memory allocations and garbage collection.

UNIT - III   12 Hours
Stacks – Array representation of stacks, Linked representation of stacks, operations, Applications of stacks- Recursion, Implementation of recursive procedure by stack (factorial function and Fibonacci sequence). **Arithmetic expressions**: prefix, infix and postfix notation, infix to postfix conversion, evaluation of postfix expression. **Queues**: Array representation of queue, Linked representation of queue, Types of queues- Simple queue, circular queue, double-ended queue, priority queue, operations on queues.

UNIT - IV   12 Hours
Trees: Terminologies, types, tree properties, binary tree-properties, memory representation – Array and Linked representation, Binary search tree – Creation through insertion, searching. Tree traversals - recursive algorithms for tree traversals, Applications of binary trees - representation of an expression using binary tree. **Graphs:** Terminologies, Matrix representation of graphs, Traversals: Breadth First Search and Depth first search.

Text Books:

1. Seymour Lipschutz, Schaum's Outlines Series, Data Structures with C, Tata McGraw Hill, 2011.
2. R. Venkatesan and S. Lovelyn Rose, Data Structures, First Edition: 2015, Wiley India Pvt. Ltd. Publications,2011

Reference Books:

1. Mark Allen Weiss, Data Structures and Algorithm analysis in C, 2nd Edition, Pearson Educations, 2013.
2. Yedidyah Langsam, Moshe J, Augenstein and Aaron M, Tenenbaum, Data Structures Using C and C++, 2nd Edition, PHI Publication,2014
3. J.P Trembly and Sorenson, An Introduction to Data Structures with Applications, 2nd Edition, McGraw Hill 2000.

Group-I Practical-3	BSCCSP 232 : Data structures Lab	36 hours
Practical/Week: 3 Hrs Credits: 1	Programming exercises in data structures	I.A: 10 Exam: 40

CS202 : Data structures Lab

PART A

1. Write a C program to sort the numbers using bubble sort method.
2. Write a C program to sort the numbers using quick sort method.
3. Write a C program to sort the numbers using insertion sort method.
4. Write a C program to search an element in the array using linear search method.
5. Write a C program to search an element in the array using binary search method.

PART B

6. Write a C program to implement the stack operations using arrays.
7. Write a C program to evaluate a postfix expression.
8. Write a C program to implement queue operations using arrays.
9. Write a C program to perform the inorder, preorder and postorder traversal of a binary tree.

PART C

10. Write a menu driven C program to create a linked list and implement the following operations on a singly linked list.
    - Insert after a given node
    - Delete a given element
    - Count and display the contents of the linked list
11. Write a C program to implement a stack operations using linked list.
12. Write a C program to implement a queue operations using linked list.
13. Write a C program to add two polynomials using linked list

Scheme of Practical Examination for III Semester

Sl. No.	Details				Marks	Total
I	PART A Combinational Circuits	i.	Problem solving and coding		04	08
		ii.	Compiling the code and debugging		02	
			Execution and testing		02	
	PART B Sequential Circuits	i.	Problem solving and coding		05	10
		ii.	Compiling the code and debugging		03	
			Execution and testing		02	
	PART C MS word or MS Excel	i.	Problem solving and coding		06	12
		ii.	Compiling the code and debugging		03	
			Execution and testing		03	
	Record					05
II.	Viva –Voce					05
				Total Marks		40

GROUP-II COURSE-5	III SEMESTER: Skill Development Course	24 Hours
Theory/Week : 2 hours Credit:1	BSCCSCE 233 – E1: System Administration and Maintenance	IA: 10 Exam: 40

Course Objectives:
- To make the students to learn and understand the system administration tools of windows operating system.
- To make the students to learn about Linux operating system

Course outcomes:
Upon successful completion of the course the student will:
- be able to install the windows operating systems, to setup network and to use the tools of control panel.
- be able to install and manage the Linux operating systems.

UNIT - I   12 Hours

Basics of operating system, services, Installation and configuration, maintenance Windows as operating system, history, versions. PC hardware, BIOS, Devices and drivers.
Kernal Configuration and building, Application installation, configuration and maintenance,
Server services and Client services, Difference between Windows XP/windows7 and windows server 2003/2008.
Network Administration, Ipconfig, Ping, tracert, route, hostname, net, netstat, whoami, Set manual IP address, check connectivity – ipv4, ipv6. Control Panel- add/remove new programmes
Control Panel -> Administrative Tools , Start->Accessories->System tools ->All options (Remote desktop, backup/restore etc.)

UNIT - II   12 Hours

Linux/Unix Operating systems, Kernel, API, cli, gui. Difference between linux/unix and other operating systems. Features and Architecture - Linux features, advantages, disadvantages.
LAN – sharing printer, files and folder over the network. Computer Management, Local security Policy, Performance Monitor, Task Scheduler, Antivirus and firewall.

Reference Books:
1. AEleenFrisch Essential System Administration: Tools and Techniques for Linux and Unix, O'Reilly Media, 2002
2. Mark G. Sobell, A Practical Guide to Linux, Addison Wesley, 1997
3. Tom Adelstein, Bill Lubanovic, Linux System Administration, O'Reilly Media,2007
4. Tom Carpenter, Microsoft Windows Operating System Essentials, John Weily,2012

GROUP-II COURSE-6	III SEMESTER : Skill Development Course	24 Hours
Theory/Week : 2 hours Credit:1	BSCCSCE 234 – E2: Desktop Publishing	IA: 10 Exam: 40

Course Objectives:

- To make the students to learn and understand the Desktop publishing tools like Page Maker and CorelDraw.

Course outcomes:

Upon successful completion of the course the student will:

• be able to create and format the document using the PageMaker and CorelDraw.

UNIT - I	**12 Hours**

Desktop Publishing: Introduction, The steps in conventional publishing, the steps in Desktop publishing, uses of DTP, Desktop publishing programs. **PageMaker:** Introduction, Creating and opening publications, Opening publications created in previous PageMaker versions, about templates, applying masters to new pages as you create them, working with Palettes, Adding text and graphics to templates, Building your own template, specifying a save option preference, Setting up pages-Changing document setup options, Creating master pages, Applying master pages, Applying Grids.

Text Formatting and word processing: Threading text blocks, Threading text frames. Balancing columns-controlling page and column breaks, Adding jump lines, Formatting characters, Formatting paragraphs-Setting indents and tabs-Adding rules above or below paragraphs, Using paragraph styles-Understanding how text is composed-Tracking type-Setting word and letter spacing-Customizing hyphenation for specific words- Customizing hyphenation for paragraphs-Leading: Adjusting the space between lines of text. Grouping and ungrouping objects, locking objects- Masking objects-Aligning and distributing objects-Rotating, skewing, and reflecting objects. Drawing and editing lines and shapes-Using frames-Changing the stacking order of objects- Cropping a Graphic-Wrapping text around graphics- Attaching a graphic to text. Using image control on a bitmap.

UNIT - II	**12 Hours**

CorelDraw Basics: Getting started with CorelDraw, The CorelDraw Screen, Property Bar, Drawing Basic, Geometric Figures, Drawing Polygon, Creating a File, Opening in Existing Corel Drawing, Views, the View Manager, Undoing, Redoing, and Repeating action, Drawing and Selecting: Getting familiar with the Toolbars, Getting started with the Project, more about Lines. Working with Objects shapes, using the transformation Decker, Adding Effects to Object, Working with Text-The Text Tool, Getting started with the book cover, converting from one text type to another, Formatting Text, The text editor.

Text Books:

1. M.C Sharma, **Desk Top Publishing on PC**, BPB Publications, 2000.
2. Adobe**, Adobe PageMaker 7.0 - Classroom in a Book**, BPB Publications, 2002.
3. Gary David Bouton, **CorelDRAW X5 : The Official Guide**, Tata Mcgraw Hill Education Private Limited, 2011.

MANGALORE UNIVERSITY

B.Sc Computer Science Degree Programme- Curriculum Structure and Scheme of Examinations

IV SEMESTER

Group	Course Code	Course	Instruction Hours/Week	Duration of exams (Hours)	IA	Exam	Total	Credits
					Marks and Credits			
I	BSCCSC281	**Operating Systems and LINUX**	4	3	20	80	100	**2**
	BSCCSP 282	Linux Lab	3	3	10	40	50	**1**
II	**BSCCSOE283**	E1: Fundamentals of Information Technology	2	2	10	40	50	**1**
	BSCCSOE284	E1: Office Automation Tools						
		Total	9	8	40	160	200	**4**

Group-I
Course-4
Theory/Week: 4 Hrs
Credits: 2

BSCCSC 281: Operating Systems and LINUX

48 hours
I.A: 20
Exam: 80

Course Objectives
- To learn the basics of operating systems.
- To learn the management of resources like processor, memory, device and information by operating system.

Course outcomes:
Upon successful completion of the course the student will be able to:
- understand the concepts of operating system, resources of operating system
- understand the management of memory, processor and devices and files.
- understand Linux environment, commands and shell programming.
-

| UNIT – I | 12 Hours |

Introduction: Operating system, Mainframe systems, Desktop Systems, Multi processor Systems, Distributed Systems, Cluster systems, Real time Systems, Hand held Systems. **Operating System Structures:** System Components, Operating System Services.**Process Management**: Process concept, Process Scheduling, Operations on process, Cooperative Process, Inter profess Communication. **Threads:** Overview, Multithreading Models.

| UNIT - II | 12 Hours |

CPU Scheduling: Basic concepts, Scheduling criteria, Scheduling algorithms, multiple processor scheduling. **Process Synchronization:** Background, The critical section Problems, Synchronization, Classic problems synchronization hardware, Critical region Monitor, Semaphore. **Deadlocks**: System model, Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, Deadlock avoidance, Deadlock detection.

| UNIT - III | 12 Hours |

Memory Management: Background, Swapping, contiguous Memory allocations, Paging, segmentation, segmentation with paging, **Virtual Memory:** Background, demand paging, page replacement, allocation of frames and thrashing. **File Management**: File concept, Access methods, Directory structure, File system Mounting, File sharing, Protection.

| UNIT - IV | 12 Hours |

Linux: An introduction, reason for its popularity, Linux files system, login and logout.
Linux commands: Command format, Directory oriented command, wild card characters, File oriented commands, File Access Permissions, Process oriented commands, Background processing, Communication oriented commands, General purpose commands, Pipe and Filters related commands, vi editor, Shell programming, System administration.

Text Books:
1. Silberschartz, Galvin and Gagne, Operating Systems Concepts by, 6th/ 7th Edition, John Wiley & sons Pvt. Ltd., 2011.
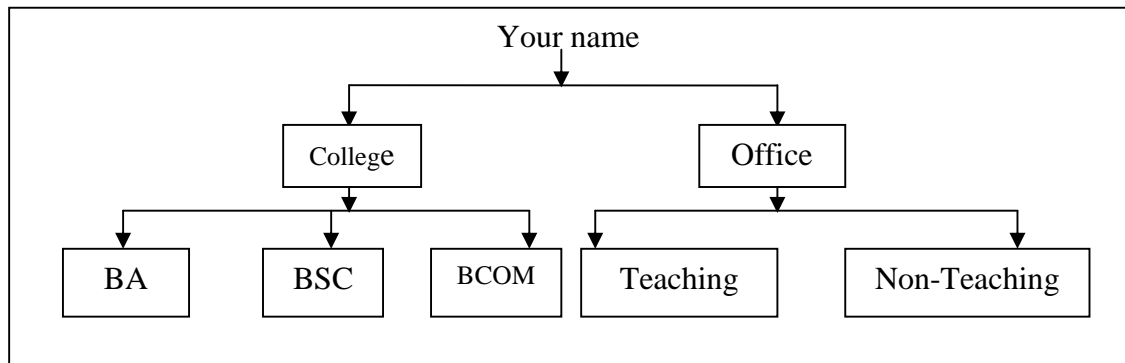2. B Mohamed Ibrahim, Linux: A Practical Approach by Firewall Media, 2009

Reference Books:
1. Richard Petersen, Linux: The Complete Reference, 6th Edition, Tata McGraw Hill Publisher.

Group-I Practical-4	BSCCSP 282: LINUX Lab	36 hours
Practical/Week: 3 Hrs Credits: 1	Programming exercises in LINUX	I.A: 10 Exam: 40

BSCCPS 282: Linux Lab

PART - A

1. Create the directory structure.

   i. Put a file under BA, B.Com, Teaching and Non Teaching with meaningful content.
   ii. Goto BA directory and then move its file to non teaching directory.
   iii. Change the directory to nonteaching from root directory using only single command.
   iv. From BA copy the content to B.Com. Delete BA directory recursively.

2. Consider the above directory structure.
   i. List the files in long format. Starting from root directory including sub directory contents
   ii. Count how many files exist in office directory.
   iii. Display the present path.
   iv. Display current date in the form MM/DD/YY HH:MM:SS

3. Create a file which contains students information such as Rollno, Name, Gender, class (BCA, Bsc, B.com), Total marks.
   a. Append the 2 more records.
   b. Display the contents.
   c. Display the records of only BSc course and sort on reverse order of name and store in BSCnew.txt.
   d. Display the contents of BSCnew.txt
   e. Rename the student.dat to stud.dat

4. Using the above stud.dat file
   a. Add the following permission
      i. Execute for user.
      ii. Remove write permission for group
      iii. Check the changes in the permission by listing the file.
   b. Select only the female names and store in female.dat and male names to male.dat
   c. Combine these names from both the files .Show the new file.
   d. Change the case of alphabets of the contents in male.dat.
   e. List all the files that start with "B" in the current directory.

PART B

1. Write a program to accept 'n' and display the first 'n' Fibonacci numbers.
2. Write a program to accept an integer and find its sum and reverse it. Also check for palindrome.
3. Write a program to accept 'n' and find the sum of the series 1! + 3! + 5! …… + n!
4. Write a program to find the largest number among a set of integers
5. Write a shell script to accept 'n' integers and count +ves, -ves and zeroes separately. Also find the sum of +ves and –ves.
6. Write a shell script to accept many characters and count individual vowels, digits, spaces, special characters and consonants.

PART C

1. Write a shell script to accept student name and marks in 3 subjects through command line arguments. Find the total marks, Average and grade (depending on the average marks).
2. Write a menu driven shell script for the following.
   (a) Display the current working directory
   (b) Rename a file (check for the existence of the source file)
   (c) List the users logged in.
   (d) Append the contents of a file to another file (Display the message if the file doesn't exist in the directory).
3. Write a shell script to accept your option for deleting (-d) or for copying (-c) a file and filename(s) through command line arguments
       (e.g. for deletion: $sh filename –d file1
           for copying: $sh filename –c file1 file2)
     and check for the following
   (a) Check whether the given arguments are sufficient for the selected option.
   (b) File to be copied or deleted must be present in the directory.
   (c) While copying, if the destination file already exists, prompt for overwriting
4. Write a shell script to accept many filenames through command line. Do the following for each filename
   (a) If it is an ordinary file, display its content and also check whether it has execute permission.
   (b) If it is directory, display the number of files in it.
   (c) If the file/directory does not exist, display a message
5. Write a menu driven shell script for the following.
   (a) List of directory having all the permission
   (b) List of ordinary files with the assigned permissions
   (c) Count the number of directories and the files separately
   (d) List all file names/ directory names in the present working directory which has the specified pattern
   (e) Assign execute permissions to specified file for the owner and group.
   (f) Exit

Scheme of Practical Examination for IV Semester

Sl. No.	Details			Marks	Total
I	PART A Combinational Circuits	i.	Problem solving and coding	04	08
		ii.	Compiling the code and debugging	02	
			Execution and testing	02	
	PART B Sequential Circuits	i.	Problem solving and coding	05	10
		ii.	Compiling the code and debugging	03	
			Execution and testing	02	
	PART C MS word or MS Excel	i.	Problem solving and coding	06	12
		ii.	Compiling the code and debugging	03	
			Execution and testing	03	
	Record				05
II.	Viva –Voce				05
			Total Marks		40

GROUP-II COURSE-7	IV SEMESTER : Other Domain Subject	24 Hours
Theory/Week : 2 hours Credit:1	BSCCSOE 283- E1: Fundamentals of Information Technology	IA: 10 Exam: 40

Course Objectives:
• To make the students to learn and understand the basics of computer for its effective use in day to day life.

Course outcomes:
Upon successful completion of the course the student will:
- be able to know the functional units of computer, Input/output devices, storage devices.
- be able to know the computer software, network, Internet usage and cyber security issues.

UNIT - I   12 Hours

Introduction to Computers: Introduction, Characteristics computers, Evolution computers Generation of computers, Classification of computers, Application of computers. **Functional units Computer:** Block diagram of computer, functional components- CPU, main memory unit. **Primary memory:** Introduction, memory representation, memory hierarchy, Random access memory, Types of RAM, Read-only memory, Types of ROM. **Secondary Storage**: Introduction, classification, magnetic tape, magnetic disk, Optical disk, **Input devices**: Introduction, Types of input device- keyboard, mouse, scanner, web camera, Optical Mark Recognition, Bar code reader. **Output devices**: Introduction, Types of output devices- monitors, printers and plotters.

UNIT - II   12 Hours

Computer software: Introduction, software definition, relationship between software and hardware, software categories. **Computer Network and Internet:** Introduction to computer network, types of computer network- LAN, WAN, MAN. Basics of internet, www, http, html, IP Address, electronic mail, web browsers, search engines. **Social Media**: Twitter, Facebook, YouTube, WhatsApp, and LinkedIn, advantage and disadvantages, privacy issues. **E-commerce**: advantages of e-commerce, Benefits and limitations of ecommerce. Legal and ethical issues in ecommerce. **Cyber Security**: Cyber law, Cyber banking, E-payment, Security, Cyber act, Cybercrime. **Overview of Emerging Technologies:** Bluetooth, cloud computing, big data, data mining, mobile computing and embedded systems.

References

1. **Introduction to Information Technology,** ITL Education Solution Limited, Pearson Education, 2012.
2. Information Technology Amended Act, 2008

GROUP-II COURSE-8	IV SEMESTER : Other Domain Subject	24 Hours
Theory/Week : 2 hours Credit:1	BSCCSOE 284-E2: Office Automation Tools	IA: 10 Exam: 40

Course Objectives:
- To make the students to learn and understand the basics of windows operating systems and MS office tools.

Course outcomes:
Upon successful completion of the course the student will:
- be able to use the computer with the knowledge of windows operating systems
- be able to use the MS office tools like Word, excel and PowerPoint.

UNIT - I	12 Hours

MS Windows : Introduction to M.S. Windows XP; Features of Windows; Desktop, structure, Windows Explorer, the search, Recycle bin, configuring the screen and mouse, adding or removing programs, adding new hardware, system tools, scandisk, Windows XP media player, help, Windows Vista, Windows 7. **Introduction to open office/MS office/Libre office : Word Processing**: **MS Word:** Introduction, starting with MS Word, MS word screen and its components, Formatting Text, Pages, Tables, mail-merge.

UNIT - II	12 Hours

MS Excel: Introduction, starting with MS Excel, basics of MS Excel, MS Excel screen and its components, formatting, formulas, charts and graphs. **MS PowerPoint:** Introduction, Basics of MS Power point, MS Power point screen and its components, Adding and formatting text, pictures, graphic objects, including charts, objects, formatting slides, notes, hand-outs, slide shows, animations.

Reference Books

1. Sushila Madan , *Introduction to Essential tools*,JBA,2009.
2. Anita Goel, *Computer Fundamentals*, Pearson, 2012
3. Andy Channelle, *Open Office from novice to Professionals*, Apress, 4th Edition, 2009
4. James Stein berg, Open Office Basic – An introduction, CreateSpace Independent Publishing Platform, 2012
5. Vikas Gupta, Comdex Linux and Open Office Course Kit: Revised and Upgraded, Dreamtech press, 2010

MANGALORE UNIVERSITY

B.Sc Computer Science Degree Programme- Curriculum Structure and Scheme of Examinations

V SEMESTER

Group	Course Code	Course	Instruction Hours/Week	Duration of exams (Hours)	Marks & Credits			
					IA	Exam	Total	Credits
I	BSCCSC331	**RDBMS and Oracle**	3	3	20	80	100	**2**
	BSCCSC332	**E1**: Microprocessor Architecture and 8086 programming OR	3	3	20	80	100	**2**
	BSCCSC333	**E1:** Web Development Using PHP						
	BSCCSP334	E1: Oracle and 8086 Programming Lab OR	4	**3**	20	80	100	**2**
	BSCCSP335	E2: Oracle and Web Design Lab						
		Total	10	**9**	60	240	300	**6**

Group-I
Course-5
Theory/Week: 4 Hrs
Credits: 2

BSCCSC 331: DATABASE CONCEPTS AND ORACLE

36 hours
I.A: 20
Exam: 80

Course Objectives
- To learn the basics concepts of database systems.
- To learn the oracle commands and PL/SQL programming

Course outcomes:
Upon successful completion of the course the student will be able to:
- Understand the concepts of database, its models, relational model, relational algebra and design theory of relational database.
- Create tables, joining the tables, writing SQL queries and writing PL/SQL programs.

<div align="center">

UNIT – I   **9 Hours**
</div>

Introduction to Databases Introduction, characteristics of database approach, Actors on the scene, advantages of using DBMS approach.
Database System Concepts and Architecture, Categories of Data models, Schemas, Instances, and Database States. Three-Schema Architecture and Data Independence. DBMS Languages, Database System Environment, Centralized and Client/Server Architecture for DBMSs, Classification of DBMS.

<div align="center">

UNIT - II   **9 Hours**
</div>

Data Modeling using the E-R Model Entity types, Entity sets, Attributes, Keys, Relationship types, Relationship sets, roles and structural constraints, Weak entity Types. E-R diagrams.
Introduction to Oracle: Creation of Database: Creating, changing and dropping the tables. Integrity Constraints specification, maintaining reference integrity constraints, Data insertion, deletion and modification.

<div align="center">

UNIT - III   **9 Hours**
</div>

Querying the Database: Information retrieval using SELECT statement, Various features of SELECT statement, Aggregate functions, ORDER BY clause, Working with expressions and sub queries, Handling of multiple tables.
PL/SQL Basics: Introduction, PL/SQL execution environment, PL/SQL syntax, Block structure, Conditional statements, iterative statements, Oracle transactions. **Cursors-** Definition, use, declaring, opening, fetching and closing of cursor, cursor attributes implicit and explicit cursor.

<div align="center">

UNIT - IV   **9 Hours**
</div>

Functions: Definition, creation, execution and syntax of function, an application using a function. **Procedures:** Definition, creation, execution and syntax of procedures, an application using a procedure, deleting a procedure. **Database Triggers:** Definition, uses, comparison with procedures, constraints, parts of triggers, types of triggers, syntax, deleting a trigger, applications using triggers. **Packages:** Creation and use of packages.

Text Books:
1. Elmasri and Navathe, Fundamentals of Database Systems, Pearson Education Asia Publication, 7th edition.
2. Ivan Bayross, SQL, PL/SQL: The programming Language , BPB Publications

Reference Books:
1. Ivan Bayross, Commercial Application Development using Oracle D2K, BPB Publications.
2. Scott Ullman, Oracle 8 PL/SQL Programming, Tata McGraw Hill Edition

Group-I
PAPER-6
Theory/Week: 3 Hrs
Credits: 2

Elective Stream-I:
BSCCSC 332: E1:MICROPROCESSOR
ARCHITECTURE AND 8086 PROGRAMMING

36 hours
I.A: 20
Exam: 80

Course Objectives
- To learn the basics concepts of microprocessors and structure of 8086 processor.
- To learn the instructions of 8086 and write the 8086 programming.

Course outcomes:
Upon successful completion of the course the student will be able to:
- Understand the architecture of 8086 processor, addressing modes.
- Understand the directives and instructions of 8086, interrupts and its services.
- Write the 8086 programs.

| UNIT - I | 9 Hours |

Architecture of 8086: Introduction to Microprocessors, 8086 Internal Architecture, basic 8086 configuration, Memory Organization; Input and Output Structure; Programmable Hardware Registers; Addressing Modes; Levels of Programming. **Advanced Processors:** Introduction, Intel 80186 Processor, Intel 80286 Processor, Intel 80286 Processor, Intel 80486 Processor, Intel Pentium Processor, Intel P6 Processor, and Intel i860 Processor.

| UNIT - II | 9 Hours |

Assembler Directives: Symbols, Variables and Constants; Data Definition and Storage Allocation Directives; Program Organization Directives; Alignment Directives; Program End Directive; Value-Returning Attribute Directives; Procedure Definition Directives; Macro Definition Directives; Data Control Directives; Branch Displacement Directives; Header File Inclusion Directives; Target Machine Code Generation Control Directives. **80x86 Instructions:** Introduction; Assembler Instruction Format; Data Transfer Instructions; Arithmetic and Logical Instructions.

| UNIT - III | 9 Hours |

Branch Instructions; Loop instructions, Processor Control Instructions; String Operation Instructions. **Assembly Language Programming:** Introduction; Program Segments; Procedures; Program Structure; Input-Output Structure and Programming. Program Development Tools. **Software Interrupts in C:** Introduction; Interrupt Interface Calls – Parameters to Interface Functions, Function: int86, Function: int86x, Function: intdos, Function: intdosx, Function: intr, Function: getinterrupt.

| UNIT - IV | 9 Hours |

Inline Assembly Language Programming; Mixed Language Programming – Procedure Calling Conventions: C Language Conventions. **Interrupts and Interrupt Service Routines:** Introduction; 8086 Interrupts and Interrupt actions; How does an Interrupt Work? Interrupt Service Routines (Algorithm).

Text Books:
1. K. R. Venugopal, Rajkumar, **Microprocessor x 86 Programming**, BPB Publications, 2013.
2. Yu-Cheng Liu, Glenn A Gibson, Microcomputer systems: The 8086/8088 family, PHI 2nd edition.

Reference books:
1. Udaya Kumar **Advanced Microprocessor and Assembly Language Programming**, Umashankar, BPB Publications.

Group-I
Course-7
Theory : 3 hrs/week
Credits:

Elective Stream-I:
BSCCSC 333-E2: Web Development Using PHP

36 Hours
IA   : 20
Exam : 80

Learning Objectives
1. To understand the usage of PHP and MySQL in web development.
2. To familiarize PHP language data types, logic controls, built-in and user-defined functions.
3. To develop database application using PHP
4. To build a simple, yet functional web application using PHP/MySQL.

Learning Outcome : At the end of the course the students will be able to
1. Design and publish static and dynamic web pages
2. Develop database application using PHP
3. Build a simple, yet functional web application using PHP/MySQL.

UNIT - I   9 Hrs

Introduction To HTML- Concepts of Hypertext, Versions of HTML, Structure of HTML, Elements of HTML Syntax - Head, Body section, Building HTML Document; Inserting Texts, Images, background and color controls, Different HTML Tags – Heading (<H1> … <H6>), Paragraph (<P>), Text Formatting (<B>, <I>, <U>, <TT>, <STRIKE>, <BIG>, <SMALL>, <SUP>, <SUB>), Line Break (<BR>), Use of Font Size and Attributes (<FONT>), <PRE>, <DIV>, <SPAN>, <CENTER>, <HR>, List types and its tags (<OL>, <UL>, <DL>), Hyperlinks (External and Internal), <MARQUEE>, Table layout and presentation (<TABLE>), <IMG>, Forms (<FORM>, <TEXT>, <TEXTAREA>, PASSWORD , SUBMIT, RESET, BUTTON, CHECKBOX, RADIO, SELECT, OPTION; ASP and HTML FORM (GET and POST Method).

UNIT - II   9 Hrs

Using PHP: PHP Crash Course, Embedding PHP in HTML- PHP Tags, PHP Statements, Whitespace, Comments, Adding Dynamic Content-Calling Functions, Accessing Form Variables-Short, Medium and Long Variables, String Concatenation, Variables and Literals, Understanding Identifiers, Examining Variable Types-PHP's Data Types, Type Strength, Type Casting, Variable Variables, Declaring and Using Constants, Understanding Variable Scope, Using Operators-Arithmetic Operators, String Operators, Assignment Operators, Comparison Operators, Logical Operators, Other Operators, Using Variable Functions, Making Decisions with Conditionals-if Statements, else Statements, elseif Statements, switch Statements, Comparing the Different Conditionals, Repeating Actions Through Iteration-while Loops, for and foreach Loops, do..while Loops

Storing and Retrieving Data: Saving Data for Later, Processing Files, Opening a File-Choosing File Modes, Using fopen() to Open a File, Opening Files Through FTP or HTTP, Addressing Problems Opening Files, Writing to a File-Parameters for fwrite(), File Formats, Closing a File, Reading From a File-Opening a File for Reading: open(), Knowing When to Stop: feof(), Reading a Line at a Time:fgets(), fgetss() and fgetcsv(), Reading the Whole File:readfile(), fpassthru() and file(), Reading Character:fgetc(), Reading an Array Length: read().

UNIT - III   9 Hrs

Using Arrays: What is an Array?, Numerically Indexed Arrays-Accessing Array Contents, Using Loops to Access the Array, Arrays with Different Indices: Initializing an Array, Accessing the Array Elements, Using Loops, Array Operators, Multidimensional Arrays, Sorting Arrays-Using sort(), Using assort() and ksort() to Sort Arrays, Sorting in Reverse

String Manipulation and Regular Expressions: Creating Sample Application: smart From Mail, Formatting Strings- Trimming Strings: chop(), ltrim() and trim(), Formatting Strings for Presentation, Formatting Strings for Storage: addslashes(), stripslashes(), Joining and Splitting Strings with String Functions- Using explode(), implode(), and join(), Using strtok(), Using

substr(), Comparing Strings-Performing String Ordering: strcmp(), strcasecmp() and strnatcmp(), Testing String Length with strlen(), Matching and Replacing Substrings with String Functions-Finding Stings in Strings: strstr(), strchr(), strrchr(), and stristr(), Finding the Position of a Substring: strops() and strrpos(), Replacing Substrings: str_relpace() and substr_replace().

<div align="center">

UNIT - IV   **9 Hrs**

</div>

Reusing Code and Writing Functions: The advantage of Reusing Code, Using require() and include()- Filename Extensions and require(), Using require() for Website Templates, Using auto_prepend_file and auto_append_file, Using Functions in PHP- Calling Functions, Calling an Undefined Function, Understanding Case and Function Names, Defining Your Own Functions, Examining Basic Function Structure, Using Parameters, Understanding Scope, Passing by Reference Versus Passing by Value, Using the return Keyword, Implementing Recursion

Working With Databases: What is a Database?, Some Essential SQL, Creating a MySQL database, Creating a New Table, Putting Data into the New Database, Accessing the Database in PHP-Connecting to Database Server, Connecting to Database, Reading the Table, Displaying the Table Data, Closing the Connection, Updating the Database, Inserting New Data Items into a Database, Deleting Records, Creating New Tables, Creating a New Database, Storing Your Data.

Text Books
1. Ivan Bayross, Web Enabled Commercial Application Development Using HTML, DHTML, JavaScript, Perl CGI, 2nd Revised Edition, BPB Publication
2. Luke Welling, Laura Thomson, PHP and MySQL Web Development, Fourth Edition, Pearson
3. Steven Holzner ,The Complete Reference PHP, , McGraw Hill Education.

Reference Books
1. Boronczyk, Naramore, Gerner, Scouarnec, Stolz, Glass, Beginning PHP6, Apache, MySql Web Development, , Wrox, 2016
2. Brett McLaughlin, PHP & MySql, 2nd Edition, O'REILLY

Group-I Practical-5	**BSCCSP 334:**E1: Oracle and 8086 Programming Lab OR **BSCCSP 335:**E2: Oracle and Web design Lab	**48 hours**
Practical/Week: 4 Hrs Credits: 2	Programming exercises in Elective either E1 or E2	I.A: 20 Exam: 80

ORACLE LAB

PART - A

1. Create a table EMPLOYEE with the following columns :

Column	data type	Constraint
ENO	number	Constraint NOT NULL and PRIMARY KEY
ENAME	varchar2	Constraint NOT NULL
DEPT	varchar2	Constraint NOT NULL
BASIC	number	Constraint Basic >=5000 and <=45000

Insert 5 records to the table.

Alter the table to add the columns DA, HRA, GrossPay, PF, PT and Netpay and calculate the   DA, HRA, GrossPay, PF, PT and Netpay as follows:
DA = 80% of BASIC if BASIC <=50000 therwise DA = 70% of BASIC
HRA= 10% of BASIC, GrossPay=
BASIC+DA+HRA
PF = 2 % of BASIC and PT=5% of BASIC
Netpay = GrossPay-(PF+PT)

Write the SQL statements for the following:

a) Display the details of all the Employees.
b) Display the names of employees of Finance department.
c) Display the names of all the employees in alphabetical order.
d) Display the name and Netpay of all the employees in decreasing order of their Netpay.
e) Display the details of the all employees whose Netpay is in between 15000 and   35000.
f) Display the name and basic of the employees whose name contains KUMAR.
g) Display the name and basic of the employees whose name ends with 'th'.
h). Count the number of employees in each department.
i). Delete all the employees of Accounts department.

While inserting records note the following:
Enter department names such as Accounts, Finance, Education, etc.
Enter Designation like Manager, Supervisor, Clerk, Attenteder, etc.
Also   enter   some   employee   names   ending
with "th".

2. Create the following tables by identifying primary and foreign keys. Specify the **not null** property for mandatory keys.

SUPPLIERS (Supplier_no, Sname, Saddress, Scity) COMPUTER_ITEMS (Item_No,

Supplier_no, Item_name, quantity)

Insert 5 Records into both the tables and execute the following queries.
   a) List item and supplier details.
   b) List the names of the suppliers who are supplying the Keyboard.
   c) Display the items supplied by Microtech.
   d) List the items supplied by the suppliers Cats and Electrotech.
   e) List the name of the suppliers and items whose quantity is more than 10.

3. Create table Department with fields Deptno Varchar2(3) must begin with Dname
   must be Accounts, Purchase, Sales or Service. Impose Primary Key on Deptno.
   Create another table Emp with fields Eno Number(5), Ename Varchar2(15) Not
   Null, Deptno   Varchar2(3) referencing the Department table, Salary Number(10,2).
   Impose Primary Key on Eno.

   Insert 5 records each to both the tables and execute the following queries.
   a) Update the salary of employees by 20% in the department of Sales and Service.
   b) Display the name of employees working in the departments of Accounts, Purchase and
      Sales.
   c) Display the name of employees working in the department of Purchase or
      Sales having salary>20000.
   d) Display the name of the departments which are not having any employees.

4. Create Item_Master table with the fields Itemno having Primary Item_Name(HDD,
   MONITOR, CDROM, KEYBOARD, UPS), Stock defined as Not Null and Price
   which is greater than 10000 and less than 30000
   Create another table Item_Trans with the fields Itemno referencing the
   Item_Master table, Quantity   greater than 25 and Trans_Date.

   Insert 5 records to each of the tables and execute the following queries.
   a) Display all the records from the Item_Master table.
   b) List the Item_Name whose Stock is less than 100
   c) List the Item_Name and the Stock where Price lies between 2500 and 25000.
   d) Display the Itemno, Item_Name and the Quantity where Quantity>=100
   e) Display the amount where amount=Price*Quantity with Amount as new column
      heading.
   f) Display the Itemno, Item_Name, Quantity, Trans_date where the transaction
      date greater than March 2008.
   **(Note: Minimum of 5 records must be inserted in each table. Any four queries to be
   asked in the examination)**

PART - B

5. Write a PL/SQL program to accept the students rollno, name and their marks in 3 subjects
   from a base table Student (having RollNo, Sname, Marks in three subjects) and declare the
   result based on the following rules:

   If student has scored below 35 in any subject he/she is declared as FAIL. If the Total
   >=180 then declare the result as I CLASS. If the Total >=150 but <180 then declare the
   result as II CLASS. If the Total <120 then declare the result as III CLASS.
   Assume the records of 5 students. Create the output which contains the roll number, name of
   the student, marks in 3 subjects, total mark and result in the following format.

```
=====================================================================
   ROLLNO  NAME        MARK1   MARK2  MARK3    TOTAL       RESULT
=====================================================================
```

6. Write a PL/SQL cursor program to calculate electricity bill of several domestic customers. Accept Input RR No, name of the customer, previous meter reading, and current meter reading from the table. The rates of electricity consumption are as follows -

For the first 30 units -- Rs. 2.5 per unit, for the next 70 units Rs. 3.5 per unit, for the next 100 units-
Rs. 4.5 per unit, for the next 100 units - Rs. 6 per unit and for units above 300 - Rs. 8 per unit. A fixed amount of Rs. 150 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.
Assume the records of 5 customer details. Create the output which contains the RR number, name of the Customer, student, previous meter reading, and current meter reading, Units Consumed, Total Bill in the following format.

```
=====================================================================

   RR No.   Customer NAME      Current meter    Previous meter   Units       Total
                               Reading          Reading          Consumed    Bill

=====================================================================
```

7. Create a package which includes a function to compute the factorial of a number, a procedure to
   compute the value of nCr, and another procedure to compute nPr both uses the factorial function.
   Execute the package program for the required calculation.

8. Create a trigger to
   i) update the MASTER (ItemNo, Item_Name, Quantity) table when a record is inserted into SALES (ItemNo, Item_Name, Quantity) table
   ii) update the MASTER table when a record is inserted into NEWSTOCK (ItemNo, Item_Name, Stock) table.
   (Insert at least five records into Master table and perform the transactions on Sales and Newstock using existing items only).

8086 PROGRAMMING LAB

PART I –NUMERICAL PROGRAMS

1. Write an 8086 program to count the number of logical 1s and 0s in a byte.
2. Write an 8086 program to generate Fibonacci series.
3. Write an 8086 program to perform the addition and subtraction of two 16 bit BCD numbers.
4. Write an 8086 program to find the smallest and largest in an array of bytes.
5.

PART II –STRING MANIPULATION PROGRAMS

6. Write an 8086 program to Reverse a string and check whether it is a palindrome.
7. Write an 8086 program to Search a character in a string and display relevant result.
8. Write an 8086 program to Compare two strings and check whether they are identical or not.
9. Write an 8086 program to Convert uppercase characters to lower case and vice versa in a given string containing upper and lower case characters, as well as some special characters.

Common Scheme of Practical Examination of V Semester

The practical examination in the concerned subject specified in the V Semester shall be conducted for 80 marks. There shall be two components – Problem solving and execution and Viva voce components. 80 marks can be distributed as follows.

Each Practical paper includes three Parts- PART A, PART B and PART C. One question shall be asked in each part.

Sl. No.	Details			Marks	Total
I	**PART A** SQL Queries **or** Web design / 8086 programming (Examiner's choice)	i.	Problem solving and coding	07	15
		ii.	Compiling the code and debugging	05	
		iii.	Execution and testing	03	
	PART B PL/SQL Programming	i.	Problem solving and coding	12	25
		ii.	Compiling the code and debugging	08	
		iii.	Execution and testing	05	
	PART C Web Design / 8086 Programming	i.	Problem solving and coding	12	25
		ii.	Compiling the code and debugging	08	
		iii.	Execution and testing	05	
II	**Record**				**10**
	Viva –Voce				**05**
	TOTAL				**80**

MANGALORE UNIVERSITY

B.Sc Computer Science Degree Programme- Curriculum Structure and Scheme of Examinations

VI SEMESTER

Group	Course Code	Course	Instruction Hours/Week	Duration of exam (Hrs)	IA	Exam	Total	Credits
I	BSCCSC381	**Object Oriented Programming with JAVA**	3	3	20	80	100	**2**
	BSCCSC382 BSCCSC383	**E1:** Visual Programming / **E2:** Computer Graphics and Animation	3	3	20	80	100	**2**
	BSCCSP 383 **BSCCSP384**	E1:Java Programming and Visual Basic Lab / E2:Java Programming and Computer Graphics Lab	4	**3**	20	80	100	**2**
		Total	10	**9**	60	240	300	**6**

Total Marks: 1400
Total number of Credits: 28

Group-I
Course-8
Theory/Week: 4 Hrs
Credits: 2

BSCCSC 381: Object Oriented Programming with JAVA

36 hours

I.A: 20
Exam: 80

Course Objectives
- To learn the concepts of Object Oriented Programming.
- To learn the Object oriented programming using Java.

Course outcomes:
Upon successful completion of the course the student will be able to:
- Understand the concepts of OOP and Java fundamentals.
- Write the Java programs using the concepts of inheritance, interfaces, packages, multithreading and applets.

UNIT – I **9 Hours**

Fundamentals of Object-Oriented Programming: Introduction, Object-oriented paradigm, Basic concepts of OOP, Benefits of OOP, Applications of OOP. **Java Fundamentals:** Java Evolution, Overview of Java language. Comparison of C and Java. **Data Types and Operators:** Java's Primitive Types, Literals, Variables, The Scope and Lifetime of variables, Type Conversion in Assignments, Casting Incompatible Types. **Using I/O**: Byte streams and character streams, predefined streams, reading console input, reading characters, strings, writing console output. **Control Statements:** Additional features of for loop, labelled loops.

UNIT - II **9 Hours**

Arrays: One-Dimensional Arrays, Multidimensional Arrays,: Two –Dimensional Arrays, Irregular Arrays, Initializing Multidimensional Arrays, Alternative Array Declaration Syntax, Assigning Array References, Using the length member, Iterating Over Multidimensional Arrays, Applying the Enhanced for, Strings, Using Command-Line Arguments. **Classes, Objects and Methods:** Class Fundamentals, Creating Objects, Reference Variables and Assignment, Adding Methods, Returning from a Method, Returning a Value, Using Parameters, constructors, Parameterized Constructors, Adding a Constructor, The new operator, Garbage Collection and Finalizers, The finalize() method, The this keyword, Controlling Access to Class Members, Java's Access Modifiers, Pass Objects to Methods, Returning Objects, Method Overloading, Overloading Constructors, Recursion. Understanding static: Static Blocks, Introducing Nested and Inner Classes, Variable-Length Arguments.

UNIT - III **9 Hours**

Inheritance: Inheritance Basics, Member Access and Inheritance, Constructors and Inheritance, Using super to Call, Superclass Constructors, Using super to Access Superclass Members, Creating a Multilevel Hierarchy, call to the Constructors, Superclass References and Subclass Objects, Method Overriding, Overridden Methods Support Polymorphism, Use of Overridden Methods, Using Abstract Classes, Using final, The Object Class. **Packages and Interfaces :** Packages, Packages and Member Access, Understanding Protected members, Importing packages, Java's standard packages, Interfaces, Implementing Interfaces, Using Interface References ,Variables in Interfaces, Extending Interface. **Exception Handling:** The Exception Hierarchy, Exception Handling Fundamentals, try and catch, The Consequences of an Uncaught Exception, Using Multiple catch statements, Catching Subclass Exceptions, nested try blocks, Throwing an Exception, Using finally, Using throws, Java's Built-in Exceptions.

UNIT - IV **9 Hours**

Multithreaded Programming : Multithreading fundamentals, The Thread Class and Runnable Interface, Creating a Thread, Creating Multiple Threads, Determining When a Thread Ends, Thread Priorities, Thread Communication Using notify(), wait() and notifyAll(), Suspending, Resuming, and Stopping Threads

Applets, Events, and Miscellaneous Topics: Applet Basics, Applet Organization and Essential Elements, The Applet Architecture, A Complete Applet Skeleton, Applet Initialization and Termination,, Requesting Repainting-The update() Method, Using the Status Window, Passing parameters to Applets, The Applet Class, Event Handling The Delegation Event Model, Events, Using the Delegation Event Model.

Text Books:
1. E Balagurusamy, **Programming With Java: A Primer, 4ᵗʰ edition** Tata McGraw Hill Education Private Limited, 2010.
2. Herbert Schildt, **Java: A Beginner's Guide, 5th Edition** Tata McGraw Hill Education Private Limited, 2011.
3.

Reference books:
1. Junaid Khateeb and Dr. G T Thampi, Computer Programming in Java, Dreamtech, 2011

2. Herbert Schildt, The Complete reference Java, Seventh edition, Tata McGraw Hill Publishing

Group-I
Course-9
Theory/Week: 4 Hrs
Credits: 2

BSCCSC 382- E1: VISUAL BASIC.NET PROGRAMMING

36 hours

I A: 20
Exam: 80

Course Objectives: To learn programming with graphical interface using object oriented concept.

Course Outcome: To develop skill in VB.NET framework, tools, programming and connectivity with databases.

UNIT - I   9 Hrs.

Essential Visual Basic .NET,Working with Visual Basic .NET, New features, .NET framework and common language runtime, system name space File extensions in VB.Net, The visual Basic integrated Development Environment : start page,menu system,tool bars, New project dialog box, graphical designers, code designers, Intellisense, object browser, Toolbox, Solution explorer, property window, dynamic help window, component tray,server explorer, output window, task list,command window. **The Visual Basic Language**: Visual basic statements- General syntax with keywords public, protected, friend, private, static, readonly. Option and import statements, Declaring constants and variables(with public, protected, friend, private, static, readonly.) Datatypes, datatype conversion, checking data types, declaring arrays and dynamic arrays, Redim and Preserve keywords, Handling Strings, string handling functions, conversion between strings to numbers and vice versa, characters and character codes, Operators,Operator precedence, commenting, Decision making: if...else, select case statements, Selections - switch and choose, Loop - Do, For, For Each...Next, While statements; With statement, Math methods, dates time properties, formatting date and time,End statement

UNIT - II   9 Hrs

Sub procedures and Functions: scope, exceptions, creating Sub procedures and Functions with private and public only, passing variable no. of arguments, using optional procedure arguments, preserving variable's values between Procedure calls with static variables, scope- block, procedure, module, name space, **Exception handling**: unstructured exception handling, using Resume Next and Resume Line, On ErrorGoTo 0, getting an exception's number and description, raising an exception intentionally, structured exception handling, exception filtering in the Catch Block, Multiple Catch statements, using Finally, throwing an Exception, throwing a Custom Exception. **Windows Forms**: About Windows Forms,form designer, **Form properties**- Text, control box, maximize and minimize box, formborderstyle, cotrolling tab order,setting initial positions, back color, background image, enabled, visible,forecolor, height, icon, isMDIchild, Ismdicontainer, Location, Mdichildren, Mdiparent, name,width, windowstate, **Windows forms methods** – Activate,close, focus, hide, layoutmdi, refresh, show, showdialog. **Events:** Activated,Click,Closed, Closing, Doubleclick, Forcolorchanged, Gotfocus,Move, Sizechanged, Textchanged. **MDI** :Creating MDI applications, creating MDI child windows in code,Arranging MDI child windows. MsgBox function, InputBox function,creating dialog box, Displaying reading from dialog box,creating accept and cancel button. Handling Mouse events and handling keyboard events. Sending keystrokes to other programs.

UNIT - III   9 Hrs

Text Boxes, Rich Text Boxes, Labels and Link Labels: Use of Text boxes, Rich Text Boxes, Labels and Link Labels, Creating Multiline, Word-wrap Text Boxes, Accessing Text, Adding Scroll Bars, Aligning text, Making aText Box read-only, selecting and replacing Text in a Text Box, copying or getting selected text to or from the clipboard, creating a password control, controlling input in a Text Box, TextChanged event creating textbox in code. Accessing Text in a Rich Text Box, creating Bold, Italic, Underline and Strikeout Text, Indenting Text in Rich Text Boxes,,Adding Bullets to Rich Text Boxes, Text color in RTF boxes, saving and loading RTF files from and to Rich

Text Boxes, Aligning Text in RTB, creating RTB in Code. Using Labels instead of Text Boxes, Formatting, aligning Text in labels, Label Events, using Labels to give access keys to Controls without Captions, Use of Link Labels,Creating link labels,linking to another form. Use of Buttons, Checkboxes, Radio Buttons, Panels and Group boxes .

Buttons : Setting forecolor and back color, font,taborder,picture, click event **Checkboxes:**Getting and setting checkbox state, creating three state checkboxes.**Radiobutton:**Getting and setting radiobutton state,toggle buttons.Adding controls to panel and groupbox in code. Use of List Boxes, Checked List Boxes, Combo Boxes and Picture Boxes. Listbox: Adding item,referring item by index,selected index changed, click,removing item,sorting, counting items, SelectedItem, SelectedIndex, multicolumn, multiselect listboxes, clearing a list box,**CheckListBox**:Determining the items checked, checking or unchecking items through code, handling item check events in checked list box. Types of comboboxes: simple, dropdown, dropdown list. **Picturebox:** setting or getting the image,adjusting box size, creating image maps. **Use of** Scroll Bars, Track Bars, Pickers, Tool Tips and Timers Properties of scrollbars and trackbar: Largechange, Smallchange, Maximum, Minimum, Value. Scroll event , Orientation, Tickstyle,Tickfrequency. **DateTimePicker:** Maxdate, Mindate, customformat, text, value. Setting datetime picker custom formats. Creating tooltips, Timer properties, methods and events. **Use of I**mage Lists, Tree and List Views, Progress Bars. Creating and using imagelist with other controls, Handling treeview events, creating in code, Creating, selecting, handling listviews, creating progress bar.

UNIT - IV   9 Hrs

Menus : Creating menus, submenus, adding checkmark to items, manu access key, menu shortcuts, merging MDI menus, creating context menu, creating Open File, Savefile, Font, Color dialog boxes,Printing, creating printpreview, pagesetup dialoboxes. **Data Access with ADO.NET:**databases, Basic SQL commands, Working with ADO.NET,Overview of ADO.NET objects, Accessing with server explorer, populating a dataset, **Binding Controls to Databases:**Various ways to bind the data,simple binding, complex binding, binding data to control, Navigating data sets, Adding and deleting from a dataset, canceling a dataset edit, updating the underlying datastore, Performing data validation in controls. **Handling Database in Code**: creating a table, datacolumns, datarows, in code, accessing individual data items. Writing datasets to XML and reading datasets from XML.

Text Book:
Steven Holzner, **Visual Basic.NET Programming Black Book**, Dreamtech Press

Reference Books:
1. Bradley, Millspaugh Julia Case, Anita, **Programming in Visual Basic. NET**, Tata McGraw Hill
2. Dr Garima Khadelwal, **Programming with Visual Basic. NET**, Prakhar Publishers Distributors

Group-I
Course-10
Theory/Week: 4 Hrs
Credits: 2

BSCCSC 383- E2: Computer Graphics and Animation

36 hours
I.A: 20
Exam: 80

Course Objectives
- To learn the concepts of Computer graphics and animation
- o learn the Object oriented programming using Java.

Course outcomes:
Upon successful completion of the course the student will be able to:
- Understand the basic algorithms for line drawing, circle drawing.
- Understand geometric transformation and its implementation.
- Understand the concept of animation and multimedia.

UNIT – I   **9 Hours**
Overview of Graphics Systems: Video Display devices, Raster-Scan Displays, Raster -Scan Systems, Random Scan Systems, Graphics Monitors and Workstations, Input Devices, Hard-Copy Devices, Graphics Software. **Output Primitives**: Points and Lines, Line Drawing Algorithms- DDA, Bresenham's, Loading the Frame Buffer, Line Function, Circle Generating Algorithms, Ellipse Generating Algorithms, Filled-Area primitives.

UNIT - II   **9 Hours**
Attributes of Output Primitives: Line attributes, Curve Attributes, Color and Grayscale levels, area fill attributes, Character attributes. **Two Dimensional Geometric Transformations**- Basic Transformations, Matrix Representations and Homogeneous Coordinates, Composite Transformations, Other Transformations, Transformations between Coordinate Systems, Affine Transformations. **Two-Dimensional Viewing:** The Viewing Pipeline, Viewing Coordinate Reference Frame, Window-to-Viewport Coordinate Transformation, Two-Dimensional Viewing Functions, Clipping operations, Point clipping, Line clipping-Cohen- Sutherland Line clipping, Polygon clipping-Sutherland-Hodgeman Polygon clipping.

UNIT - III   **9 Hours**
Introduction: What is Multimedia? Definition, use of multimedia, delivering multimedia. **Text**: The Power of meaning, About fonts and faces, Using fonts in multimedia, Using text in multimedia, computers and text, Font editing and design tools, Hypermedia and hyper text. **Images:** How to create, Making still images, color, image file formats. **Sound:** The Power of sound, digital audio, MIDI audio, MIDI vs. Digital audio, Multimedia system Sounds, Audio File formats, Vaughan's Law of Multimedia minimums, Adding sounds to multimedia Project.

UNIT - IV   **9 Hours**
Animation: The Power of motion, Principles of animation, Animation by computer. **Video:** Using video, How video works and is displayed? Digital video container, obtaining video clips, Shooting and editing videos. **Making multimedia**: The stages of multimedia project, the needs for multimedia project, Input and output devices needed, software needed required authoring system.

Text Books:
1. Donald Hearn, M. Pauline Baker, **Computer Graphics - C version,** 2nd Edition LPE Pearson.(Units - I and II)
2. Tay Vaughan, **Multimedia: Making It Work,** 8th Edition, by Tata McGraw Hill, 2011.(Units - III and IV)

Reference Books:
1. Steven Harrington, **Computer Graphics: A Programming Approach,** McGraw Hill Education.
2. Ze-Nian Li and Mark S Drew, **Fundamentals of Multimedia**, PHI, 2009
3. Ralf Steinmetz and Klara Nahrstedt, **Multimedia: Computing, Communication** , Pearson Education India; 1ed.2002.

Group-I Practical-6	**BSCCSP 384-**E1: Java Programming and Visual Basic Lab **OR** **BSCCSP 385-** E2;: Java Programming and Computer Graphics lab	**48 hours**
Practical/Week: 4 Hrs Credits: 2	Programming exercises in Elective either E1 or E2	I.A: 20 Exam: 80

III B.Sc. (VI SEMESTER) COMPUTER SCIENCE

SCHEME OF PRACTICAL EXAMINATION

Examination duration: 3 Hours   **Max. Marks: 80**

Q. No. 1: Part A- Java Programming **or** Web Computer Graphics/ VB. NET programming
  (Examiner's choice)   20 marks
Q. No. 2: Part B- Java Programming   25 marks
Q. No. 3: Part B- Computer Graphics /VB. NET programming   25 marks
Record: 10 marks

Java PROGRAMMING LAB

PART I

1. Write menu driven Java program
   a) to accept an integer, reverse it and find the sum of individual digits.
   b) to generate the first N Fibonacci Numbers.

2. Write a Java Program to create a base class contains name, code and designation and another base class consisting of the data members which stores the fixed percentage value to calculate DA, HRA, PF, Tax and LIC amount. Create a derived class using these two base classes that contains data members account number, date of joining and basic pay.
   Calculate the   Gross = basic pay +DA +HRA and   Net = Gross Tax –PF- LIC
   (Implement using interface)

3. Write a Java Program to demonstrate multithreading using runnable interface. Define three different threads, one to calculate square of first n integers, another to calculate cube of first n integers and third thread to find the square root of the first n integers. Apply various thread priority.

4. Create a package to convert temperature in centigrade into Fahrenheit, and one more package to calculate the simple Interest. Implement both package in the Main () by accepting the required inputs for each application.

PART II

5. Create an applet to implement simple calculator. The integer data are to be entered through the text box and the operation that is to be performed (operator) (+, -, *, /) to be given through command buttons. When the user press the compute button result should be displayed.
- Do the validation for empty textbox for numbers.
  - Handle "Division by zero"

6. Write an applet program to accept the students rollno, name and their marks in 3 subjects and declare the result based on the following rules:

If student has scored below 35 in any subject he/she is declared as FAIL. If the Total >=180 then declare the result as I CLASS. If the Total >=150 but <180 then declare the result as II CLASS. If the Total <120 then declare the result as III CLASS.

7. Write an applet program to accept book code, book name, and price. Calculate the discount based on code as follows.

Code	Discount rate
101	15%
102	20%
103	25%
Any other	5%

Find the discount amount and Net bill amount. Display the bill.

8. Write an applet program to accept meter no. customer name, previous reading, current reading. Use Data validation to see that current reading is more than previous reading. Produce the bill in neat format.

Bill is calculated as follows. Compute total no of units consumed and total amount to be paid by each consumer the condition is

If unit consumed is <=150 charge is 200.
For the next 50 units Rs 1.50 per unit
For the next 100 units charge = Rs2.00/ unit
For the next additional units charge is Rs 3.00 per unit or Rs 500 whichever is maximum.

VB. NET programming lab

PART I

1. Write a VB.Net program to find the Sum of digit and check palindrome or not and display the results in text box and label.
2. Write a VB.net program to count the number of vowels, words, digits, special characters in an inputted screen and display
3. Write a VB.Net program to select a course from a list box and display the fees and regulation using the text boxes and labels (Fees maintained in an array in the program)
4. Design a VB interface containing
a. A picture box whose picture should be changed every 5 second (use 5 pictures).
b. Textboxes to display date & time and day greeting based on time.
c. Use scrollbars to control font size and background color (RGB) of the textbox that shows greeting message.

PART II

1. Create a VB interface with menu options STRING and NUMBER. Under String use option TOGGLE CASE (convert lower to uppercase and upper to lowercase letters) and NUMBER use option FACTORIAL. Use user defined functions to find FACTORIAL and TOGGLE CASE. If

the option selected is NUMBER, apply the validation for entering only the +ve number. Accept the necessary inputs through input box.

2. Design VB interface to conduct simple multiple choice Quiz with at least 5 questions. Use radio button for selecting the answers. One question can be answered only once. Show the total score through the message box when the user wishes.

3. Create an VB.Net application program for a post with the ability to take input from a student [name, father's name, date of birth (by using date picker), sex (option buttons), qualification (Using list box), address (Using Multiline text box), hobbies(check box)]. Use proper validation and display required messages. Store the valid information in a table and use datagrid to view the inserted records.

4. Create a table TELEPHONE containing Telephone no, name and address of a customer as the fields. Set up a VB interface with command buttons to add, edit, delete, save.

Apply validation rule telephone number to check for only +ve numeral. All the data are mandatory. Record should not be duplicated. When editing Telephone no. should not be modified. While editing or deleting, if the accepted Telephone no is not exist give proper message with confirming prompt delete.

Common scheme of Practical Examination of VI Semester

The practical examination in the concerned subject specified in the V Semester shall be conducted for 80 marks. There shall be two components – Problem solving and execution and Viva voce components. 80 marks can be distributed as follows.

Each Practical paper includes three Parts- PART A, PART B and PART C. One question shall be asked in each part.

Sl. No.	Details			Marks	Total
1.	**PART A** Java Programming **or** Web Computer Graphics/ VB. NET programming (Examiner's choice)	i.	Problem solving and coding	07	**15**
		ii.	Compiling the code and debugging	05	
		iii.	Execution and testing	03	
2.	**PART B** Java Programming	i.	Problem solving and coding	12	**25**
		ii.	Compiling the code and debugging	08	
		iii.	Execution and testing	05	
3.	**PART C** Computer Graphics /VB. NET programming	i.	Problem solving and coding	12	**25**
		ii.	Compiling the code and debugging	08	
		iii.	Execution and testing	05	
4.	**Record**				**10**
5.	**Viva –Voce**				**05**