SYLLABUS

(FOR THE STUDENTS ADMITTED FROM THE ACADEMIC YEAR 2014 TO 2020)

UNIVERSITY OF CALICUT

THENHIPALAM,CALICUT UNIVERSITY P.O

DEGREE OF

BACHELOR OF VOCATION (B.VOC)

IN

SOFTWARE DEVELOPMENT

UNDER THE

FACULTY OF SCIENCE

SYLLABUS

(FOR THE STUDENTS ADMITTED FROM THE ACADEMIC YEAR 2014–15ONWARDS)

BOARD OF STUDIES IN COMPUTER SCIENCE (UG)

THENHIPALAM,CALICUT UNIVERSITY P.O

KERALA,673635,INDIA

JULY,2014

BACHELOR OF VOCATION (SOFTWARE DEVELOPMENT)

PROGRAMME STRUCTURE

SEMESTER I									
C. No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
1.1	GEC1EG01	A01 Transactins essential English Language skills	4	20	80	100	4		4
1.2	GEC1ML02 GEC1HD02	MAL1A01(2) Malayalam – Bhashayum Sahithyavum-I A07(3) – Prose and one act plays	4	20	80	100	4		4
1.3	GEC1DM03	(CA1C02) Discrete Mathematics	4	20	80	100	4		4
1.4	SDC1IT01	Fundamentals of Computer & Programming in C	5	20	80	100	5		5
1.5	SDC1IT02	Internet Programming	4	20	80	100	4		4
1.6	SDC1IT03 (P)	Programming in C - Lab	5	20	80	100		5	5
1.7	SDC1IT04 (P)	Internet Programming -Lab	4	20	80	100		4	4
		Semester I Total	**30**			**700**	**21**	**9**	**30**
SEMESTER II									
C. No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
2.1	GEC2EG04	A02 Ways with words	4	20	80	100	4		4
2.2	GEC2ML05 GEC2HD05	MAL2A02(2) Malayalam-Bhashayum Sahithyavum-II A09 (3) Poetry and short stories	4	20	80	100	4		4
2.3	GEC2NM06	A09(3) Basic Numeric Skills	4	20	80	100	4		4
2.4	SDC2IT05	Data Structures	4	20	80	100	4		4
2.5	SDC2IT06	Programming in Java	5	20	80	100		5	5
2.6	SDC2IT07(P)	Data Structures through Java - Lab	5	20	80	100		5	5

2.7	SDC2IT08 (Pr)	Mini Project	4	0	100	100		4	4
		Semester II Total	**30**			**700**	**21**	**9**	**30**
SEMESTER III									
C. No	**Course Code**	**Course Name**	**Credit**	**Marks**			**H rs/ wk**		
				Int	**Ext**	**Tot**	**T**	**P**	**Tot**
3.1	GEC3EG07	A03 Writing for Academic and professional Success	4	20	80	100	4		4
3.2	GEC3TW08	Technical Writing & SEO	4	20	80	100	4		4
3.3	GEC3ES09	(EWM1B01) Environmental Science	4	20	80	100	4		4
3.4	SDC3IT09	Basic Networking Concepts	4	20	80	100	4		4
3.5	SDC3IT10	Introduction to RDBMS and SQL	5	20	80	100	5		5
3.6	SDC3IT11(P)	Networking - Lab	4	20	80	100		4	4
3.7	SDC3IT12(P)	Database - Lab	5	20	80	100		5	5
		Semester III Total	**30**			**700**	**21**	**9**	**30**
SEMESTER IV									
C. No	**Course Code**	**Course Name**	**Credit**	**Marks**			**Hrs/wk**		
				Int	**Ext**	**Tot**	**T**	**P**	**Tot**
4.1	GEC4EG10	04 Zeitgeist: Reading on Society and culture	4	20	80	100	4		4
4.2	GEC4SE11	Software Engineering Principles	4	20	80	100	4		4
4.3	GEC4ED12	(A14) Entrepreneurship Development	4	20	80	100	4		4
4.4	SDC4IT13	Operating Systems	4	20	80	100	4		4
4.5	SDC4IT14	Advanced Computer Networks	5	20	80	100	5		5
4.6	SDC4IT15(P)	Networking & OS - Lab	5	20	80	100		5	5
4.7	SDC4IT16 (Pr)	Project	4	0	100	100		4	4
		Semester IV Total	**30**			**700**	**21**	**9**	**30**
SEMESTER V									
C. No	**Course Code**	**Course Name**	**Credit**	**Marks**			**H rs/ wk**		
				Int	**Ext**	**Tot**	**T**	**P**	**Tot**
5.1	GEC5HR13	BC5B09 Human Resource Management	4	20	80	100	4		4

5.2	SDC5IT17	.Net and Database Administration	4	20	80	100	4		4
5.3	GEC5LS15	(S04B.06)Life Skill Development	4	20	80	100	4		4
5.4	SDC5IT18 (E1/E2)	J2EE/ Python Programming and Mobile Web	5	20	80	100	5		5
5.5	SDC5IT19 (E3/E4)	Mobile Software Development using Android / Programming Mobile Application	4	20	80	100	4		4
5.6	SDC5IT20(P)	.Net and Database - Lab	4	20	80	100		4	4
5.7	SDC5IT21(P)	Android and Python Programming - Lab	5	20	80	100		5	5
		Semester V Total	**30**			**700**	**21**	**9**	**30**

SEMESTER VI									
C. No	**Course Code**	**Course Name**	**Credit**	**Marks**			**Hrs**		
				Int	**Ext**	**Tot**	**T**	**P**	**Tot**
6.1	SDC6IT22 (Pr)	Internship & Project (900 hrs.)	30	0	100	100		900	900
		Semester VI Total	**30**			**100**			**900**
		Grant Total	**180**			**3600**			

Semester 1

SEMESTER I									
C. No	**Course Code**	**Course Name**	**Credit**	**Marks**			**Hrs/wk**		
				Int	**Ext**	**Tot**	**T**	**P**	**Tot**
1.1	GEC1EG01	A01 Transactins essential English Language skills	4	20	80	100	4		4
1.2	GEC1ML02 GEC1HD02	MAL1A01(2) Malayalam – Bhashayum Sahithyavum-I A07(3) – Prose and one act plays	4	20	80	100	4		4
1.3	GEC1DM03	(CA1C02) Discrete Mathematics	4	20	80	100	4		4

1.4	SDC1IT01	Fundamentals of Computer & Programming in C	5	20	80	100	5		5
1.5	SDC1IT02	Internet Programming	4	20	80	100	4		4
1.6	SDC1IT03 (P)	Programming in C - Lab	5	20	80	100		5	5
1.7	SDC1IT04 (P)	Internet Programming - Lab	4	20	80	100		4	4
		Semester I Total	**30**			**700**	**21**	**9**	**30**

Semester 1

ENG1AO1 : TRANSACTIONS ESSENTIAL ENGLISH LANGUAGE SKILLS

COURSE CODE	ENG1A01
TITILE OF THE COURSE	TRANSACTIONS: ESSENTIAL ENGLISH LANGUAGE SKILLS
SEMESTER IN WHICH THE COURSE TO BE TAUGHT	1
NO. OF CREDITS	4
NO. OF CONTACT HOURS	60(4 hrs/wk)

1. OBJECTVES OF THE COURSE

A. T o impart the necessary macro and micro English language skills to learners to enable them to express their feelings, opinions, ideas and thoughts fluently and accurately in a variety of personal and professional contexts.

B. To create in learners a definitive sense of the stylistic variations of English and how they are used in real life situations.

C. To inculcate in learners a taste for deeper pursuit and acquisition of advanced level of skills in English.

D. To guide them on how to participate in discussions and make seminar presentations with special focus on specific vocabularies and styles of usage in such contexts.

2. COURSE DISCRIPTION

I. COURSE SUMMARY:

Module 1: Pronunciation	10hrs
Module 2: Vocabulary	10 hrs
Module 3: Grammar	10 hrs
Module 4: speaking skills	10 hrs
Module 5: Reading skills	15hrs
Evaluation	10hrs

Total 60 hrs

II. COURSE DETAIL

Module I: Pronunciation: : Introduction- speech sounds-vowels-consonants-basic of word

/ sentence stress- resolving issues of L1 interference-e/m-learning corner

Module II: Vocabulary : Introduction- synonyms- collocations- phrasal verbs- idiomatic expressions- vocabulary in every day social contexts- e/m-learning corner

Module III : Grammar : Introduction- major tenses- modals- questions- negatives- frequently used constructions – dealing with common mistakes -e/m-learning corner

Module IV : Speaking Skills : Social Communication: introduction – sounding very polite- making a point / persuading –giving opinions / preferences –encouraging/ comforting- making suggestions/ regrets- complimenting – guessing –telephoning in English. Academic Communication: Discussion Skills- presentations skills- Debating skills- e/m-learning corner

Module V : Reading Skills : Introduction- effective reading comprehension skills- understanding generic / specific ideas / factual information – vocabulary in context- implications/ tone/ attitude/ viewpoint.

Code	Title	Author	Publisher
ENG1AO1	Transactions: Essential English language skills	Dr. Kunhammad K.K Dr. Abdual Latheef V	University of Calicut

GEC1ML02 Malayalam – MALIA01 (2) Malayalam Bhashayaum

Sahithyavum - I Lecture Hours per week: 4 **Credits: 4**

Internal: 20, External: 80 **Total Hours: 60**

GEC1HD02-07Prose And One Act Plays

Common Course in Hindi (Course No. 07)

Lecture Hours per week: 4 **Credits: 4**

Internal: 20, External: 80 **Total Hours: 72**

Aim of the course:

- To sensitize the students to the asthetic, cultural and social aspects of literacy appreciation and analysis.

Objectives of the course:

- To acquaint the students with different forms thoughts and styles used in Hindi prose writing, to make them able to express their thoughts in these different forms
- To introduce Hindi Drama to the students for appreciation and critical analysis
- To help them develop their creative thinking and writing.

Module I Introduction:

- Different form of prose writing, definition, principles and development – short stories, essay, sketch, satire and memoir.

Module Π : Selected prose forms

- short story, (2) essays

Module Ш Selected prose forms

- sketch, (2) satire (3) memoir.

Module IV Drama

- for defled study and evaluation.

References:

(1) Prescribed text books 1. Sahitya Sapthak – Ed: Prathibha Mudaliar – Aman Prakashan,
104A/80C Rambag, Kanpur.
(2) 2. Bina deevaron ke khar – Mannu Bhandari – Radhakrishna Prakashan, New Delhi - 2

GEC1MT02 – (CA1C02) Discrete Mathematics

Course No: 1.3

Course Code: GEC1MT02

Course Name:(CA1C02) Discrete Mathematics.

Credits: 4

Hours: 60

Aim of the Course: To equip the students with basic principles of Discrete Mathematics.

Objectives of the Course:

- To learn the mathematical logic & Boolean Algebra
- To learn the basics of Groups & Rings

Prerequisites:

Background of the basic science at +2 level

Course Outline

UNIT I (12T)

Mathematical Logic: Propositions and logical operators, Truth tables, equivalence and implementation, Laws of logic, Quantifiers. Set theory: Introduction, concept of set of theory relation, types of relation, equivalence relation.

UNIT II (12T)

Boolean Algebra and its properties, Algebra of propositions & examples, De-Morgan's Laws, Partial order relations, greatest lower bound , least upper bound, Algebra of electric circuits & its applications. Design of simple automatic control system

UNIT III (12T)

Graph: Simple and multigraph, Incidence and degree, Isomorphism, Sub graphs and Union of graphs, connectedness, Walks, Paths and Circuits, Euler's Formula, Eulerian graph, Hamiltonian graph, Chromatic Graphs, Planer Graphs, Travelling salesman problem, Complete, Regular and Bipartite graphs, Directed Graphs

UNIT IV (12T)

Trees: Properties of trees, pendant vertices. Centre of a tree, rooted and binary trees, spanning trees, spanning tree algorithms, fundamental. Circuits; spanning trees of a weighted graph: cutsets and cut-vertices; fundamental cutsets; connectivity and separativity; network. flows; max-flow min-cut theorem.

UNIT V (12T)

Plan on graphs, dual graphs, Kuratowski's two graph, matrix representation of graphs, incidence matrix, directed graphs, digraphs, directed paths and connectedness. Eular digraphs **References:**

1. *Elements of Discrete Mathematics*, C. L. Liu, TMH Edition
2. *Discrete Mathematical Structures with applications to Computer Science*, J.K. Tremblay and R Manohar, McGraw Hill
3. *Discrete mathematical Structures*, Kolman, Busby, Ross, Pearson
4. *Graph theory*, Harry, F., Addison Wesley.
5. *Finite Mathematics*, S. Lipchutz, Schaum Series, MGH.
6. *Graph Theory*, Deo. N, PHI

SDC1IT01 - Fundamentals of Computer & Programming in C

Course No: 1.4

Course Code: SDC1IT01

Course Name: Fundamentals of Computer and Programming in C

Credits: 5

Hours: 75

Objectives

On completion of this course, the student should be able to:

- Understand the basics and background of computer system and its components.
- Understand the basics of computer programming
- Write programs for solving simple computational problems using C.

Prerequisites

Background of the basic science at +2 level

Course Outline

Unit 1 (15 Hours)

Computer system concepts, Computer system characteristics, Capabilities and limitations, Evolution of Computers, Generations, Personal Computer (PCs) Functional Components & their Interconnections, evolution of PCs. Computer Languages - Machine Language, Assembly language, High Level Language. CPU - Functions, Components and organization, Memory-Characteristics, Memory hierarchy, Types. Input/output devices.

Unit 2(15 Hours)

Introduction: The problem solving aspect, Top-down design, Algorithms and flowcharts, Implementation of algorithms, Program verification, efficiency of algorithms. Introduction to C Programming, overview and importance of C, C Program Structure and Simple programs, Creation and Compilation of C Programs under Linux and Windows Platforms. Elements of C Language and Program constructs: Character Set, Tokens, Keywords and Identifier, Constants, Variables, Data types, Variable declaration and assignment of values, Symbolic constant definition. C-Operators, arithmetic expressions, evaluation of expressions and precedence, Type conversion in expressions, operator precedence and associativity, I/O operations.

Unit 3 (15 Hours)

Decision making, Branching and Looping. Array & Strings - One dimensional array, two dimensional array and multi-dimensional array, strings and string manipulation functions.

Unit 4 (15 Hours)

The Concept of modularization and User defined functions-Multi-function Program, calling functions, various categories of functions, nesting of functions and recursion, functions and arrays, scope and life-time of variables in functions, multi-file programs. Structures & Union: structure definition, giving values to members, structure initialization, comparison of structure variables, arrays of structures, arrays within structures, structures within arrays, structures and functions, Unions, bit- fields.

Unit 5 (15 Hours)

Pointers and Files: Understanding pointers, accessing the address of a variable, declaring and initializing pointers, accessing a variable through its pointer, pointer expressions, pointer and arrays, pointer and character string, pointers and functions, pointers and structures, pointer to pointer - dynamic memory allocation. Files: Defining, Opening and closing files - I/O operations on files – error handling on files random access of files command line operations. Preprocessor directives: Macro substitution directives - simple macro, macros with arguments - nesting of macros, Compiler control directives.

References:

1. E. Balaguruswamy, *Programming in ANSI C.*
2. YashwantKanithkar, *Let us C.*

3. M Morris Mano, *Computer System Architecture*
4. William Stallings, *Computer Organization & Architecture*, PHI

SDC1IT02 – Internet Programming

Course No: 1.5

Course Code: SDC1IT02

Course Name: Internet Programming

Credits: 4

Hours: 60

Objectives

- On completion of this course, the student should be able to:
- Get an exposure to develop and design simple web applications Create interactive web applications having images and animations?

Prerequisites

- Basic knowledge of Computer and Internet.

Course Outline

Unit 1 (12 Hours)

Introduction to Internet: What is Internet –Services provided by internet, Applications-telnet, HTTP-FTP, Email (POP, IMAP, SMTP) - TELNETUSENET-GOPHER-e commerce, video conferencing, e-business – Domain Names, DNS, WWW, URL, Browsers, Url, Search Engine, Web Servers.

Unit 2 (12 Hours)

HTML: Introduction to HTML-Essential Tags-Adding Images-Color and Background of Web Pages-Lists and their Types- Linking to External Documents- Images maps, Creating Tables-Frames- Forms.

Unit 3 (12 Hours)

Introduction to DHTML, CSS, JavaScript: Introduction to JavaScript –Basicsoperators, statements, Arrays, Functions Documents, Events and Event handlers, Writing JavaScript – Running JavaScript- Alert boxes-Accepting input from user-Creating Dynamic web pages using JavaScript- Relating JavaScript to DHTML. JQuery UI, Implementing JQuery UI, Responsive Design, JQuery Plugins.

Unit 4 (12 Hours)

Dreamweaver: Interface choosing a workspace-document window, toolbars, the launcher panel & tool sets, Site Control-defining a site- file and folder management, Basics, adding text, align page elements, modifying page properties, Linking, image maps, Typography, Tables, Rollovers, Cascading Style Sheets, Code, Forms- form objects, creating a form, creating a jump menu, Behaviours, Automation, history panel, Templates and Library Items, Inserting Media Objects.

Unit 5 (12 Hours)

Photoshop: Fundamentals, Photoshop Interface Tools, Options, Layers, Channels, Actions Restoring and enhancing images, Text editing, special effects Web application and animation. Flash: Flash Environment and Tools, Symbols, Animation And Organizing Large Projects, Action scripting, And Interactivity, Adding Media And Publishing Flash Movies.

References:

1. Steven Holzner, *HTML Black Book*, Dreamtech Press
2. Evan Bayross, *HTML, Java Script, DHTML, PERL, CGI*, BPB
3. Deitel&Nieto, *Internet and World Wide Web: How to Program*, Pearson Education.
4. Achyut S. Godbole&AtulKahate, *Web Technologies – TCP/IP to Internet Application Architectures*, Tata McGraw Hill, 2003.
5. Jon Duckett, *Web Programming with HTML,XHTML, CSS*, Wrox Beginning
6. Jim Converse & Joyce Park, *PHP & MySQL Bible*, Wiley
7. Earle Castledine& Craig Sharkie, *JQuery: Novice to Ninja*
8. Brian Underdahl, *Macromedia Flash MX 2004: The Complete Reference*
9. Thomno A. Powell, *The Complete Reference HTML and XHTML*, fourth edition, Tata McGraw Hill, 2003.
10. Brad Dayley and DaNaeDayley, *Adobe Photoshop CS6 Bible*

SDC1IT03 (P) – Programming in C (Lab)

C

ourse No: 1.6

Course Code: SDC1EC03 (P)

Course Name: Programming in C (Lab)

Credits: 5

Hours: 75

Objectives

On completion of this course, the student should be able to:

- Understand and practice the computer programming.
- Solve mathematical or scientific problems using C.

Prerequisites

- Theoretical knowledge of C Programming Language.

Course Outline

1. Simple C Programs
2. C Programs using Loops and decisions
3. Programs involving Arrays (Searching, sorting, merging etc.)
4. Two dimensional arrays (Matrix operations)
5. String Manipulations
6. Programs involving Structures (complex number operations record creation etc)
7. Programs involving Union
8. Programs involving functions and Recursion
9. Data manipulation using pointers
10. Pointers and array operation using pointers etc.
11. Pointers and structures
12. File operations (like create, copy delete etc)
13. Random access files
14. Command line arguments.

SDC1IT04 (P) – Internet Programming (Lab)

C

ourse No: 1.7

Course Code: SDC1EC04 (P)

Course Name:Internet Programming (Lab)

Credits:4

Hours: 60

Objectives

On completion of this course, the student should be able to

- Understand and Practice web development
- Get hands on interactive web, JavaScript and CSS
- Develop and design web application having images and animations

Prerequisites

- Theoretical knowledge of Internet Programming.

Course Outline

1. Web pages involving features of Html and CSS
2. Programs involving JavaScript
3. Programs involving features of DHTML, JQuery
4. Exercises involving improve quality of images
5. Exercises involving creating composite images
6. Exercises involving animation and organizing Layers 7.Web and animations using flash.

Semester 2

C. No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
2.1	GEC2EG04	A02 Ways with words	4	20	80	100	4		4
2.2	GEC2ML05 GEC2HD05	MAL2A02(2)Malayalam-BhashayumSahithyavum-II A09 (3) Poetry and Short Stories	4	20	80	100	4		4
2.3	GEC2NM06	A09(3) Basic Numeric Skills	4	20	80	100	4		4
2.4	SDC2IT05	Data Structures	4	20	80	100	4		4
2.5	SDC2IT06	Programming in Java	5	20	80	100	5		5
2.6	SDC2IT07(P)	Data Structures through Java Lab	5	20	80	100		5	5
2.7	SDC2IT08(Pr)	Mini Project	4	0	100	100		4	4
		Semester II Total	**30**			**700**	**21**	**9**	**30**

GEC2EG04 (A02) - Ways with Words: Literature in English

Lecture Hours per week: 5 **Credits: 5**

Internal: 20, External: 80 **Total Hours: 90**

1. OBECTIEVES OF THE COURSE

A. To help students develop the acumen to read, appreciate and discuss literature.
B. To introduce students with the linguistic qualities of a literary text and to unravel the many meanings of the text.
C. To acquaint the students with the different genres of literature and to analyse them

2. COURSE

DESCRIPTION

I.COURSE

SUMMARY

Module 1: POETRY	23hrs
Module 2: Short Story	25hrs
Module 3: Essay	20hrs
Module 4: One Act Play	10hrs
Evaluation	12hrs
Total	90hrs

II. COURSE DETAILS

MODULE 1: Poetry

1. Sonnet 29: Shakespeare
2. Ode to Autumn : John Keats
3. A Roadside Stand: Robert Frost
4. The House of My Childhood : Dilip Chitre
5. Old Folks Laugh: Maya Angelou
6. Once Upon a Time: Gabriel Okara
7. The Times They are A-Changing: Bob Dylan

MODULE 2: Short Story

1. Appointment in Samarra: W. Somerset Maugham
2. A Shocking Accident: Graham Greene
3. Lamp to the Slaughter: Roald Dahl
4. It Used to be Green Once: Patricia Grace

MODULE 3: Essay

1. Bores: E. V Lucas
2. Night Walkers and Mystery Mongers: Sense and Nonsense at the Edge of Science: Carl Sagan

MODULE 4: One Act Pay

1. Something Unspoken: Tennesee Williams

Core Text

code	title	author	publisher
GEC2EG04	Ways with words Literature in English	BOS, university of calicut	University of calicut

GEC2ML05 Malayalam – MAL2A01 (4) Malayalm Bashyayum

Sahithyavum II

Lecture Hours per week: 4Credits

Internal: 20, External:80 **Total Hours: 60**

Common course in Hindi [Course No: 08 (1) GEC2HD05 A09 (3)

Poetry and Short Stories

Lecture Hours per week: 4 Credits: 4

Internal: 20, External: 80 Total Hours: 72

GEC2NM06 – Basic Numerical Skills

Course No: 2.3

Course Code: GEC2NM06

Course Name:A09(3)Basic Numerical Skills

Credits: 4

Hours: 60

Objectives

On completion of this course, the student should be able to:

- Solve problems linear equations, metrics and progressions.
- Solve statistical problems and analyze data.

Prerequisites

- Background of Mathematics in +2 level

Course Outline

Unit 1 (15 hours)

Sets and set operation - Venn Diagrams - Elements of Co-ordinate system.
Matrices, Fundamental ideas about matrices and their operational rules – Matrix multiplication - Inversion of square matrices of not more than 3rd order- solving system of simultaneous linear equations.

Unit 2 (15 hours)

Theory of equations: meaning, types of equations –simple linear and simultaneous equations (only two variables) eliminations and substitution method only. Quadratic equation factorization and formula method ($ax^2 + bx + c = 0$ form only) problems on business application.

Unit 3 (10 hours)

Progressions: Arithmetic progressions finding the 'n'th term of an AP and also sum to 'n' terms of an AP. Insertion of Arithmetic means in given terms of AP and representation of

AP. Geometric progression: finding nth term of GP. Insertion of GMs in given GP and also representation of GP - Mathematics of Finance - simple and compound interest. (Simple problems only).

Unit 4 (10 hours)

Meaning and Definitions of Statistics - Scope and Limitations – Statistical enquiries - Scope of the problem - Methods to be employed - types of enquiries - Presentation of data by Diagrammatic and Graphical Method - Formation of Frequency Distribution.

Unit 5 (10 hours)

Measures of Central tendency - Arithmetic Mean, Median, Mode, Geometric and Harmonic mean, Measures of variation and standard, mean and quartile deviations – Skew ness and Kurtosis and Lorenz curve. Analysis of Time Series: Methods of Measuring - Trend and Seasonal variations - Index number - Unweighted indices - Consumers price and cost of living indices.

References

1. Sundaresan and Jayaseelan, *An Introduction to Business Mathematics and Statistical Methods*
2. Dr. A K Arte & R V Prabhakar, *A textbook of Business Mathematics*.
3. Sanchethi and Kapoor, *Business Mathematics*.
4. Gupta S.P., *Statistical Methods*
5. Navaneethan P., *Business Mathematics*
6. R.S.N. Pillai, Mrs. Bhagavathi, *Statistics*
7. P.R. Vittal, *Business Mathematics and Statistics*

SDC2IT05 - Data Structures

Course No: 2.4

Course Code: SDC2IT05

Course Name: Data Structures

Credits: 4

Hours: 60

Objectives

On completion of this course, the student should be able to:

- Get an idea of various data structure and their implementations.

Prerequisites

- Knowledge of C Programming.

Course Outline

Unit 1 (12 Hours)

Introduction to data structures - need for data structures, definition, categories of data structures, operations; Arrays storage representation of 1D, 2D and Multi-dimensional arrays, Sparse matrix, operations and Representation. Lists: Static and Dynamic Lists, Linked Lists, creation, operations on linked lists, records.

Unit 2 (12 Hours)

Stacks & Queues: Stack - Definition, Operation on stack, Implementation using arrays and linked lists, Applications of Stacks, Function Calling, Recursion- direct & indirect recursion, Evaluation of arithmetic Expressions, Conversion of Expressions - Prefix, Infix and Postfix expressions. Queues: Definition, Implementations using arrays and linked lists, Circular queue, Dequeue, Priority queues, Applications of queues.

Unit 3 (12 Hours)

Trees - Definition, Basic terminology, Binary trees, Representation of binary trees, Sequential representation of binary trees, Linked representation of binary trees, Traversals, Threaded binary tree. Binary Search Trees: Definition, Insertion, Deletion, Traversal and Searching BST, AVL Trees, Heap tree: Insertion and deletion (implementation not required).

Unit 4 (12 Hours)

Graphs: Graphs Terminologies, Representation of graphs, Adjacency Matrix, Adjacency List, Adjacency Multi-list, Graph search methods (BFS and DFS), Minimal Spanning Tree, Prims Algorithm and Kruskals Algorithms, Shortest path problem, Dijkstra Algorithm.

Unit 5 (12 Hours)

Searching and Sorting: Searching: Linear search, Binary search, Comparison of different methods, Hashing: Different hashing functions, Methods for collision handling. Sorting: Insertion sort, Bubble sort, Selection sort, Quick sort, Heap sort and Merge sort methods, Comparisons and Implementation.

References:

1. Robert Lafore, *Data Structures and Algorithms in Java*
2. William McAllister, *Data Structures and Algorithms Using Java*

3. Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft. *Data Structures and Algorithms*, Addison Wesley

SDC2IT06 - Programming in Java

Course No: 2.5

Course Code: SDC2IT06

Course Name: Programming in Java

Credits: 5

Hours:75

Objectives

On completion of this course, the student should be able to

- Learn the OOPS Concept and use object oriented approach for solving real life problems
- Develop GUI based applications using java

Prerequisites

Knowledge of Programming

Course Outline

Unit 1 (12 Hours)

Introduction to OOPS - Basic principles of Object Orientation. Introduction to Java - History, Versioning, the Java Virtual Machine, Byte code, Features of Java, Language Components - Primitive Data Types, Comments, Keywords, variables, literals, Control structures - The for Statement, The if Statement, The while and do while Statements, The switch Statement, The break Statement, The continue Statement, Operators - Casts and Conversions, Arrays.

Unit 2 (15 Hours)

Object-Oriented Programming - Defining New Data Types, introduction to Classes and methods, Constructors, Passing Objects to Methods, Method Overloading, Static and final, The this Reference, finalize, inner and nested classes. Inheritance: extends, Member access and inheritance, super keyword, Polymorphism-Dynamic method dispatch, method overriding. Abstract class, interface, Packages

Unit 3 (16 Hours)

Exceptions, Threads & IO in Java - The File and Standard Streams, Stream classes and interfaces, Using Byte Streams and Character Streams, Threads: Threads vs. Processes, Creating Threads, Runnable interface, Thread Class,

Inter thread communication, Synchronization. Exceptions: Basic of java

Exception Handling, Hierarchy, Developing user defined Exception Classes

Unit 4 (16 Hours)

Applets and AWT - Applet class, Types of applet, skeleton, Applet tag, passing parameters. Event Handling, Delegation event model, Event classes, Listeners, AWT classes and window fundamentals, Frames, Working with fonts, graphics and colours, AWT controls, layouts and Menus, Dialogue Boxes.

Unit 5 (16 Hours)

Swing, Database and Sockets: Swings, Japplets and frames, Controls, icon, labels, Buttons, Textbox, combo box, Tables and Panes. JDBC: introduction, architecture, Drivers, connections, statements, resultset and Meta data, Transactions. Sockets: Introduction to networking, InetAddress, URL, socket, server sockets, Datagrams.

References:

1. Java Complete Reference, Herbert Scheldt, Tata McGraw hill edition.
2. Programming in Java, E Balaguruswamy
3. Java Enterprise in a nutshell, David Flanagan, Jim Farley, William Crawford & Kris Mangnusson,OReill

SDC2IT07 (P) – Data Structure through Java (Lab)

Course No: 2.6

Course Code: SDC2IT07 (P)

Course Name: Data Structure through Java (Lab)

Credits: 5

Hours: 75

Objectives

On completion of this course, the student should be able to:

- Implement various data structures and to solve real life problems using data structures.
- Expertise in java programming.

Prerequisites

- Knowledge of Data Structures
- Theoretical knowledge of Java Programming language.

Course Outline

1. Simple Java programs like computing formulas expressions etc.
2. Programs involving loops and decisions like generating various series.
3. Programs involving class, inheritance and Interface.
4. Illustrate threads, packages and exception.
5. Illustrate usage of Applets like moving ball, face etc.
6. Programs involving AWT and events.
7. Swing applications and JDBC.
8. To implement array operations: insert and delete
9. To perform push and pop operations for stack
10. To perform insert and delete operations for linear queue.
11. To perform insert and delete operations for circular queue.
12. Implementing binary tree and traversals
13. Implementing binary search trees
14. Implementing sorting techniques like bubble sort, quick sort insertion sort etc.
15. To perform linear and binary searching, pattern matching etc.

SDC2IT08 (Pr) – Mini Project

Course No: 2.7

Course Code: SDC2IT08 (Pr)

Course Name: Mini Project

Credits: 4

Objectives

On completion of this course, the student should be able to:

- Develop software development skills
- Provide a solution for a real life situation.
- Get a chance to utilize and implement the skill acquired.

Prerequisites

- Knowledge of Programming/Data structures/Web development.

Semester 3

C. No	Course Code	Course Name	Credit	Marks			Hrs		
				Int	Ext	Tot	T	P	Tot
3.1	GEC3EG07	A03 Writing for Academic and professional success	4	20	80	100	4		4
3.2	GEC3TW08	Technical Writing & SEO	4	20	80	100	4		4
3.3	GEC3ES09	(EWM1B01) Environmental Science	4	20	80	100	4		4
3.4	SDC3IT09	Basic Networking Concepts	4	20	80	100	4		4
3.5	SDC3IT10	Introduction to RDBMS and SQL	5	20	80	100	5		5
3.6	SDC3IT11(P)	Networking Lab	4	20	80	100		4	4
3.7	SDC3IT12(P)	Database Lab	5	20	80	100		5	5
Semester III Total			**30**			**700**	**21**	**9**	**30**

GEC3EG07 -- A03 Writing for Academic and Professional Success

Lecture Hours per week : 4 **Credits: 4**

Internal: 20, External: 80 **Total Hours: 60**

1. **OBJECTIVE OF THE COURSE**
   A. To develop writing skill, to learn to integrate writing and thought and to apply the convections of academic writing correctly.
   B. To acquire the correct sense of format, syntax, grammar, pronunciation and spelling
   C. To acquire concepts, principles and vocabulary of reasoning and argumentation and use analysis, synthesis and evaluation to advance arguments

D. To gain and understanding of discourse convections ranging from structure and paragraphing to tone and mechanics

2. COURSE DESCRIPTIONS

I. COURSE SUMMARY

MUDULE 1: PROCESS OF WRITING	18hrs
MODULE 2 : ELEMENTS OF WRITING	12hrs
MODULE 3: WRITING FOR PROFESSIONAL PURPOSES-i	18hrs
MODULE 4: WRITING FOR PROFESSIONAL PURPOSES-ii	12 hrs
EVALUATION	12hrs
TOTAL	72hrs

II. COURSE DETAILS:

Module 1 : The Processes of Writing:

Introduction to Academic Writing: what is academic writing- Purpose of academic Writing- Types of academic writing- Features of academic writing Structuring the Essay: Planning an essay- Brain-storming- Organizing and outlining – Writing a Thesis statement- Nature of supporting sentence- writing paragraph- structure of an essay. Vocabulary for writing: selection of vocabulary- Abbreviations- Choice of nouns and adjectives- Appropriate verbs and adverbs- Conjunctions and prepositions- Prefixes and suffixes- Synonyms- Common errors. Composing the Content: Writing introductions and conclusions- Ordering the paragraph- Proof-reading and editing- finalizing the final draft.

Module II: Elements of Writing

Shaping Strategies: Discussions, persuasions and argument- Comparison and contrast- Cause and effect- Defining and classifying problems and solutions Mechanics and conventions of writing: Punctuations, Use of articles, Relevance of examples, Generalizations, Academic style.

Module III: Writing for Professional Purpose I

Writing Reviews: Reviewing books- Reviewing movies- Writing product Reviews- Writing case studies Writing Reports: Feasibility report, progress report – Evaluating reports Surveys: Conducting surveys- Designing Questionnaires, collecting data- writing descriptive reports

Module IV: Writing for Professional Purpose II

Writing CVs --Letter writing: Transmittal and cover letters- Emails --Writing summaries Writing memos -On writing blogs --Etiquette in writing

Core text

code	Title	Author	Publisher

ENG2A03	WRITING FOR ACADEMIC AND PREFESSIONAL SUCCESS	DR. Jacob George & Dr. Anwar Sadath	University of Calicut

GEC3TW08- Technical Writing & SEO

Course No: 3.2

Course Code: GEC3TW08
Course Name: Technical Writing & SEO

Credits: 4

Hours: 60

Objectives

On completion of this course, the student should be able to:

Acquire the skills and knowledge for professional technical communication, web content writing, soft skill development and search engine optimization.

Prerequisites

Basic communication skills in English.

Course Outline

Unit 1(12 Hours)

Basics of Technical Communication: Technical Communication - features; Distinction between General and Technical communication; Language as a tool of communication; Levels of communication: Interpersonal, Organizational, Mass communication; the flow of Communication: Downward, Upward, Lateral or Horizontal (Peer group); Barriers to Communication.

Unit 2 (12 Hours)

Constituents of Technical Written Communication: Word formation, Prefix and Suffix; Synonyms and Antonyms; Homophones; One Word Substitution; Technical Terms; Paragraph Development: Techniques and Methods -Inductive, Deductive, Spatial, Linear, Chronological etc; The Art of Condensation- various steps.

Unit 3 (12 Hours)

Soft skills: Communication skills, English-drafting, editing, grammar and composition, vocabulary, soft skills, Dreamweaver

Unit 4 (12 Hours)

Forms of Technical Communication - Business Letters: Sales and Credit letters; Letter of Enquiry; Letter of Quotation, Order, Claim and Adjustment Letters; Memos, Notices, Circulars; Job application and Resumes. Reports: Types; Significance; Structure, Style & Writing of Reports. Technical Proposal; Parts; Types; Writing of Proposal; Significance, Master Service agreement Service Level agreement, managing website.

Unit 5 (12 Hours)

SEO: Search Engines, Types of Search Engines, Search Engines working, rank websites based upon a search term, Directories, Difference between Search Engines and DirectoriesMonitor performance of website in the search engines.

References

1. Gerald J. Alred ,Charles T. Brusaw, Walter E. Oliu, *Handbook of Technical Writing*, Tenth Edition.
2. Gary Blake and Robert W. Bly, *The Elements of Technical Writing*, New York: Macmillan Publishers.
3. Hackos, JoAnn T., *Managing Your Documentation Projects*. Wiley, 1994.
4. R.L. Adams, *SEO Black Book - A Guide to the Search Engine Optimization Industry's Secrets* (The SEO Series 1).
5. Danny Dover, Erik Dafforn, *Search Engine Optimization (SEO) Secrets*.

GEC3ES09- (EWM1B01)Environmental Science

Course No: 3.3

Course Code: GEC3ES09

Course Name:(EWM1B01)Environmental Science

Credits: 4

Hours: 60

Objectives

On completion of this course, the student should be able to:

Get a basic idea of environment, environmental resources and their importance.
Learn the interrelationship between man, society & environment.
Learn about ecosystem and biodiversity.
Learn the impact of pollution and role of mankind to eradicate pollution.

Prerequisites

Nil

Course Outline

Calicut University, Syllabus for B.Sc. Environment and Water Management

I Semester-Core I-EWM-01- Fundamentals of Environmental Science 2 Hours/week

36 Hours/Sem- 4 Modules 4x9=36

B.Voc Software & Multimedia

Environmental Studies Syllabus

Module-1

Methodology and perspective of science. Types of knowledge, practical, theoretical and scientific knowledge. What is science, what is not science – Hypothesis – Theories and laws of science, observations, evidences and proofs. Definition, Scope and Importance of Environmental Science: Multidisciplinary nature of the environmental Science; Scope and importance; Need of Environmental awareness Interrelationship of ecology with other disciplines. Introduction to global environmental problems. Components of the environment: a.The atmosphere or the air: Layers of Atmosphere , Composition of air; importance of atmosphere, metereological conditions and air circulation. b.The hydrosphere or water: Importance of water, distribution of fresh water at global, national and state level. Hydrological Cycle. c.Lithosphere or the rock and the soil: Elementary composition of rocks in the earth crust. Types of rocks; Process of soil formation: Physical weathering, Chemical weathering of rocks; Role of soil in shaping the biosphere (9 Hours)

Module-2

Environmental Factors: Climatic Factors-Light, Temperature of Air (atmospheric temperature), Rainfall (precipitation), Humidity of air, atmosphere (gases and wind), fire Topographic Factors: height of mountains, direction of mountains and valleys, steepness of slope and exposure of slope Edaphic factors: Soil-soil formation, soil profile, soil erosion, soil conservation Biotic factors: Intraspecific interactions; Interspecific interactions: Neutralism, Commensalism, Mutualism, Parasitism, and Predation. Ecological adaptations of plants (Hydrophytes,

mesophytes, xerophytes, and halophytes) animals (aquatic conditions-hydrocoles; amphibious conditions or sec. hydrocoles), errestrial (mesocoles and xerocoles) (9 Hours)

Module-3

Ecosystem: Definition; Components of ecosystem; Abiotic components: Light, Temperature, Pressure, Water, Wind, Soil; Biotic components: Energy flow in an ecosystem: Primary production, Secondary production; Food chain: Grazing food chain, Detritus food chain; Ecological pyramids: Pyramid of number, Pyramid of biomass, Pyramid of energy; Food web; Ecological indicators. Biogeochemical cycles: a) Gaseous cycles: Oxygen cycle, Carbon cycle and Nitrogen cycle. b) Sedimentary cycles: Phosphorus cycle, Sculpture cycle. (9 Hours)

Module-4

Population Ecology and Community Ecology:Population characteristics- Population growth and its dynamics; natality, mortality, growth patterns; Age distribution, Malthusian theory; Community structure, succession and climax, Species diversity, ecological dominance, ecotone, niche, guild, edge effect, ecological equivalent, succession and climax Major Ecosystems: Terrestrial Ecosystem-Forest, grass land, arid, crop land Wet land-Ponds, lakes, rivers, oceans, estuaries Major terrestrial Biomes-Tropical Savannah, Tropical rain forest and deserts (9 Hours)

Text Books:

Ecology and Environment, 2008-2009.P. D. Sharma(Rastogi Publications, Meerut)

A text book of Environmental Studies., 2006.D.K.Asthana, MeeraAsthana (S.Chand&Co.)

Essential Environmental Studies, 2009.S.P.Misra, S.N.Pandey, (Ane Books Pvt.Ltd,Chennai)

Environmental Education – A Conceptual Analysis. P.Kelu,University of Calicut publication

Text Book of Environmental Studies, ErachBharucha, 2005.Orient Longman Pvt. Ltd.,Ernakulam

References

Fundamentals of Ecology Eugene P. Odum, (Natraj Publishers, Dehradun.)

Principles of Ecology P. S. Verma,V. K. Agarwal (S. Chand and Co. New Delhi)

Environmental Biology P. D. sharma(Rastogi Publications, Meerut)

Principles of Environmental Biology P. K. G. Nair (Himalaya Publ. House, N. Delhi

Environmental Biology M. P. Arora (Himalaya Publishing House, New Delhi)

Environmental Science Enger Smith, Smith, W. M. C.Brown(Company Publishing)

Principles of Soil Science Watt K. E. F.(1973),(McGraw Hill Book Co., New Delhi)

Introduction to Environmental Studies Turk & Turk

Ecology and Field Biology Robert Leo Smith (Harper Collins college publication)

General Ecology H. D. Kumar (Vikas Publishing house, New Delhi)

Elements of Ecology Brijgopal, N. Bharadwaj(Vikas Publishing house, New Delhi)

Fundamentals of Environmental Science G. S. Dahliwal,G. S. Sangha P. K.Ralhan (Kalyani Publishers, New Delhi)

Environmental Ecology Bill Freedman (Academic Press, New York)

Concepts of Ecology N. Arumugam(Saras Publication, Kottar, Dist. Kanyakumari)

Plant Ecology P. L. Kochhar

Environmental Science. V.K.Ahluwalia, Sunita Malhotra (Ane Books Pvt.Ltd,Chennai

Concepts of Ecology E J Koromandy, (Prentice hall of India)

ELEMENTS OF ECOLOGY (Thomas M. Smith and Robert Leo Smith)

SDC3IT09 - Basic Networking Concepts

Course No: 3.4

Course Code: SDC3IT09

Course Name: Basic Networking Concepts

Credits: 4

Hours: 60

Objectives

On completion of this course, the student should be able to
Understand the basics of data communication and exchange
Understand various techniques and rules for device communication

Prerequisites

Basic understanding of Data structures anfd digital Fundamentals.

Course Outline

Unit 1 (12 Hours)

Introduction to Computer networks, Topology, categories of networks, Internetwork, Internet, Network Models, Layered model, OSI and TCP/IP models, Transmission media, Wired and unwired media. Physical layer, Analog and Digital data, Periodic and A periodic signals, Composite signals, Digital data transmission, Transmission Modes - Analog Transmission, Multiplexing, Frequency division multiplexing, Time Division Multiplexing and Wave Division Multiplexing, Switching - Circuit switching, Packet Switching and Message Switching.

Unit 2 (12 Hours)

Data link layer, Error detection and correction, Types of errors, Single bit error and Burst error, Vertical redundancy check (VRC), longitudinal redundancy Check (LRC), Cyclic Redundancy

Check (CRC), Error correction - Single bit error correction, Hamming code Data compression- Human code, data link control, Line discipline, Flow control, Error control, Multiple Access, Random Access, ALOHA, pure ALOHA and slotted ALOHA, Polling, Wired LANs, Ethernet - IEEE standards.

Unit 3 (12 Hours)

Network layer, Networking and Internetworking devices - Repeaters, Bridges, Routers, Gateways, Logical addressing - IPv4 & IPv6 addresses, Network

Address Translation (NAT), Internet protocols, internetworking, Datagram, Transition from IPv4 to IPv6, Address Mapping-Error reporting and multicasting - Delivery, Forwarding and Routing algorithms, Distance Vector Routing, Link State Routing, Multicast routing protocols, The Dijkstra Algorithm.

Unit 4 (12 Hours)

Transport layer, Process-to-process Delivery: UDP, TCP and SCTP, Congestion control and Quality of Service, Application Layer, Domain Name Systems - Remote Login – Email -FTP, WWW, HTTP - Network management SNMP.

Unit 5 (12 Hours)

Network Security – Basics of Cryptography- Digital Signature, Encryption, Decryption, Firewall, Data Translation- Compression – Mails Services – Directory services – File Transfer and Access Management Protocol (FTAM) – Common Management Information Protocol (CMIP).

References:

1. Data Communications and Networking, Fourth Edition by Behrou A Forouzan, McGraw-Hill reprint, 2011.
2. Linux Administration - A Beginners Guide, Third Edition, Steven Graham and Steve Shah, Dream tech, 2003.

SDC3IT10 - Introduction to RDBMS and SQL

Course No: 3.5

Course Code: SDC3IT10

Course Name: Introduction to RDBMS and SQL

Credits: 5

Hours: 75

Objectives

On completion of this course, the student should be able to:

- Understand the need and working of Data Base and Data Base Management Systems.
- Learn the basic principles of database models and database design.
- Learn the basic of RDBMS and data manipulation using SQL.

Prerequisites

- Knowledge of Data Structures and programming skills.

Course Outline

Unit 1 (12 Hours)

Introduction to database systems, File Systems Versus a DBMS, View of data – Data abstraction, View levels, Data models, Instances and Schemas, Data Independence, Database languages, Database architecture, Database users ,
Database administrator, Role of DBA . The Entity – Relationship (ER) model - Entity sets, Relationship sets, Attributes, Constraints, Mapping Cardinalities, Keys, ER diagrams, Weak entity sets, Strong entity sets.

Unit 2 (12 Hours)

Relational Database Design - Relational Data Model: Relations, Domains and Attributes, Tuples, Keys. Integrity Rules, Relational Algebra and Operations, Relational Calculus and Domain Calculus. Normalization, need for normalization, functional dependency, Normal forms-First, Second, Third, BCNF, Multi valued functional dependency, Fourth and Fifth Normal forms. Decomposition and Transactions - ACID properties, States, Concurrent executions.

Unit 3 (12 Hours)

Data Definition in SQL - Data types, Creation, Insertion, Viewing, Updation, Deletion of tables, modifying the structure of the tables, Renaming, Dropping of tables. Data Constraints – I/O constraints, Primary key, foreign key, unique key constraints, ALTER TABLE command.

Unit 4 (12 Hours)

Database Manipulation in SQL - Computations done on table data - Select command, Logical operators, Range searching, Pattern matching, Grouping data from tables in SQL, GROUP BY, HAVING clauses, Joins – Joining multiple tables, Joining a table to itself. Views - Creation, Renaming the column of a view, destroys view, Granting and revoking permissions: Granting privileges, Object privileges, Revoking privileges

Unit 5 (12 Hours)

Program with SQL - Data types: Using set and select commands, procedural flow, if, if /else, while, goto, global variables, Security - Locks, types of locks, levels of locks. Cursors - Working with cursors, Error Handling, Developing stored procedures, create, alter and drop, passing and returning data to stored procedures, using stored procedures within queries, building user defined functions , creating and calling a scalar function , implementing triggers, creating triggers , multiple trigger interaction.

References:

1. Fundamentals of Database Systems, Elmasri&Navathe, Pearson Education.
2. Database System Concepts Abraham Silberschatz, Henry F Korth,S.
3. Introduction to Database Systems, CJ Date, Addison Wesley

SDC3IT11 (P) – Networking Lab

Course No: 3.6

Course Code: SDC3IT11 (P)

Course Name:Networking Lab

Credits:4

Hours: 60

Objectives

On completion of this course, the student should be able to:

- Learn the basics of network administration Set up and configure LAN and DNS server.

Prerequisites

- Theoretical knowledge of Computer Networking concept.

Course Outline

1. Configuring network host, assigning IP address, setting hostname and configuring the Network Interface card.
2. Setup a LAN with more than two systems.
3. Setup a Domain Name Server (DNS)
4. Configure Printer/ Scanner Server.
5. Set up Internet services

    i) File Transfer Protocol(FTP)
    ii) Post Office Protocol 3 (POP3)
    iii)Simple Mail Transfer Protocol(SMTP)

SDC3IT12 (P) - Database Lab

Course No: 3.7

Course Code: SDC3IT12 (P)

Course Name: Database Lab

Credits: 5

Hours: 75

Objectives

On completion of this course, the student should be able to:

- Learn data base administration
- Expertise SQL programming

Prerequisites

- Theoretical knowledge in DBMS & SQL

Course Outline

1. Familiarization of the relational database: Data definition commands - CREATE, ALTER, DROP, Adding Constraints -Primary key, foreign key, unique key, check, not null.
2. Basic SQL queries - INSERT, SELECT, DELETE, UPDATE, Using multiple tables, ordering of rows using ORDER BY, GROUP BY option, Set operations using UNION, EXCEPT, INTERSECT, Substring Comparison using LIKE operator, IN, BETWEEN operator.
3. Complex Queries - Nested Queries, EXISTS and UNIQUE/DISTICNT functions, NULL values, Renaming of attributes and Joining of tables, Aggregate functions and grouping.
4. Programs involving views
5. Programs involving cursors
6. Programs involving triggers
7. Stored procedures, stored procedures with parameters.

Semester 4

C. No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
4.1	GEC4EG10 (ENG4A06)	04 Zeitgeist:Reading on Society and culture	4	20	80	100	4		4
4.2	GEC4SE11	Software Engineering Principles	4	20	80	100	4		4
4.3	GEC4ED12	(A14) Entrepreneurship Development	4	20	80	100	4		4
4.4	SDC4IT13	Operating Systems	4	20	80	100	5		5
4.5	SDC4IT14	Advanced Computer Networks	5	20	80	100	5		4
4.6	SDC4IT15(P)	Networking & OS Lab	5	20	80	100		5	5
4.7	SDC4IT16 (Pr)	Project	4	0	100	100		4	4
		Semester IV Total	**30**			**700**	**21**	**9**	**30**

GEC4EG09 (04): ZEITGEST: READINGS ON READING ON SOCIETY AND CULTURE

Lecture Hours per week: 4 **Credits: 4**

Internal: 20, External: 80 **Total Hours : 90**

1. OBJECTIVES OF THE COURSE

a. To inculcate the value enshrined in the constitution of india and to provide an insight on the secular framework of the county.
b. To familiarize the learners with concepts such as conservation, sustainability and the life of marginalized and their interconnectedness.
c. To foster among the learners an awareness of the diverse problems faced by women and the sexual minorities and to promote a culture of inclusion and mutual respect.
d. To understand the “human” as articulated among the various cultures and promote a multicultural and plural understanding of rights.

2. COURSE DESCRIPTION

I. COURSE SUMMARY

Module 1:	Social Issues	20hrs
Module 2:	Environment	20hrs
Module3:	Gender	18hrs
Module 4:	Human Rights `	12hrs
Evaluation:		12hrs
Total		90hrs

COUSRE DETAILS

Module 1: Indian Constitution and Secularism

1. Preamble of Constitution of India
2. Should Gandhi's Assassins be Killed? Pearl S. Buck
3. Toba Tek Singh: Saadat Hassan Manto
4. The Flag: Kamala Das

Module 2: Sustainable Environment

1. The End of Living and the Beginning of Survival.
2. On Killing a tree: Gioeve Patel
3. Zlateh the Goat: Issac BAshevis Singer

Module 3: Gender

1. The Story of An Hour: Kate Chopin
2. The First Time I Utter A Prayer: Lee Mokobe
3. Claiming an Education: Adrianne Rich

Module 4: Human Rights

1. Refugee Blues: W.H Auden
2. Amnesty: Nadine Gordimer
3. Akkarmashi: Sarankumar Limbale (Extract from Chapter 1)
4. The Meaning of Life: Yuval Noah Harari (Extract from Chapter 19)

Code	Title	Author	Publisher
ENG2A04	ZEITGEST :READINGS ON CONTEMPORARY CULTURE	Bos, University of Calicut	University of Calicut

GEC4SE11- Software Engineering Principles

Course No: 4.2

Course Code: GEC4SE11

Course Name: Software Engineering Principles

Credits: 4

Hours: 60

Objectives

On completion of this course, the student should be able to:

- Learn engineering practices in Software development
- Learn various software development methodologies and practices.
- Learn various Evaluation methods in Software Development

Prerequisites

Background of Programming

Course Outline

Unit 1(12 hours)

Introduction to software Engineering, Software Components, Software Characteristics, Software Applications, Software engineering processes, Similarity and differences from conventional engineering processes Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, WIN-WIN spiral model, Formal method model, Time boxing model, Incremental model, Rapid Application Developmental(RAD) Model, Component based Development Model, Evolutionary development models, Iterative Enhancement Models.

Unit 2(12 hours)

Requirement Engineering Process: Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modelling, Data flow Diagrams, Entity Relationship Diagrams, Decision Tables, SRS Document, IEEE Standards for SRS. Software Quality Assurance (SQA): Verification and Validation, SQA Plans, software quality Frameworks, ISO 9000 models.

Unit 3(12 hours)

Basic Concept of Software Design, Architectural Design: Software Architecture, Data Design, Architectural Styles, Mapping Requirements into Software Architecture Low Level Design: Modularization, Design Structure, Charts, Pseudo Codes, flow Charts, Coupling and Cohesion Measures ,Design strategies: Function Oriented Design, Object oriented Design, Top –Down and Bottom-UP design

Unit 4(12 hours)

Top-Down and Bottom-Up Testing Strategies: Test Drivers and Test Stubs, White Box Testing, Black Box Testing, Test Data Preparation Software as an entity, Need for Maintenance, Categories of maintenance: Preventive, Corrective and perfective maintenance, cost of maintenance, Software ReEngineering, Reverse Engineering.

Unit 5(12 hours)

Software configuration management Activities: Change control Process, Software Version Control, An Overview of CASE Tools Estimation: Cost, Efforts, Schedule/Duration, Constructive cost Models, Resource Allocation Models, Software Risk Analysis and Management.

References:

1. R.S Pressman, *Software Engineering: A Practitioners Approach*, McGraw Hill.
2. James Peter, *Software Engineering, an Engineering Approach*, John Wiley.
3. Rajib Mall, *Fundamentals of Software Engineering*, PHI Publication.
4. K.K Agarwal and Yogesh Singh, *Software Engineering*, New Age International Publishers.
5. Carlo Ghezzi, M Jarayeri, D Manodrioli, *Fundamentals of Software Engineering*,PHIPublicatio n.
6. PankajJalote, *Software Engineering*, Narosa Publication.

GEC4ED12 – A14 Entrepreneurship Development

Course No: 4.3

Course Code: GEC4ED12

Course Name: A14 Entrepreneurship Development

Credits: 4

Objectives

Hours: 60

On completion of this course the student should be able to

- Familiarize the students with the concept of entrepreneurship
- Identify and develop the entrepreneurial talents of students
- Generate innovative business ideas in emerging industrial scenario

Prerequisites

Nil

Course Outline

Unit 1 (12 Hours)

Entrepreneur and fundamentals of entrepreneurship: - entrepreneurial competencies characteristics of entrepreneurship – barriers to entrepreneurship, factors affecting entrepreneurial growth – role of entrepreneur in economic development – challenges of women entrepreneurs.

Unit 2 (12 Hours)

Micro small and medium enterprises – legal framework – licenses – role of promotional institutions with special reference to kinfra, kitco. msme&dics – concessions – incentives and subsidies.

Unit 3 (10 Hours)

Project management – feasibility and viability analysis – technical – financial – network – appraisal and evaluation – project report preparation

Unit 4 (12 Hours)

Identification of business opportunities in the context of Kerala – rate of Ed clubs – industrial policies – skill development for entrepreneurs. Business incubation – meaning – setting up of business incubation centres.

Unit 5 (14 Hours)

Strategic importance HRM; objectives of HRM; challenges to HR professionals; role, Responsibilities and competencies of HR professionals; HR department operations; Human Resource Planning - objectives and process; human resource information system. Talent acquisition, recruitment and selection strategies, career planning and management, training and development, investment in trainingprogramme; executive development.

References

1. S. L. Gupta, Arun Mittal, *Entrepreneurship Development*
2. K Ramachandran, *Entrepreneurship Development*

SDC4IT13 - Operating Systems

Course No: 4.4

Course Code: SDC4IT13
Course Name: Operating Systems

Credits: 4

Hours: 60

Objectives

On completion of this course, the student should be able to:

- Learn the basic concepts and functions of operating system Understand processes and its life cycle.
- Learn and understand various Memory and Scheduling Algorithms.
- Gain an overall idea about the latest developments in Operating Systems.

Prerequisites

Knowledge of Data Structures

Course Outline

Unit 1 (12 Hours)

Introduction to system software and Operating System: Objectives and functions, The evolution of Operating Systems, Serial Processing, simple batch systems, Multi programmed batch systems, time sharing systems, parallel systems, distributed systems, cloud computing, real time systems. Booting and POST

Unit 2 (12 Hours)

Processor Management: Functions, Definition of Process, Process States, Process Control Block, Operations on Process, Process Communication, Communication in Client server System, Basic concepts of threads. CPU Scheduling: Scheduling Criteria, Scheduling algorithms - FCFS, SJF, Priority, RR, Multilevel, Feedback Queue, Concurrency, Principles of Concurrency, Process synchronization, The Critical Section Problem Mutual exclusion, Semaphores, Messages . Dead lock, dead lock Prevention, dead lock detection, and dead lock avoidance

Unit 3 (12 Hours)

Memory Management: Address binding, Logical Vs Physical address space, Dynamic Loading, Dynamic Linking and Shared Libraries, Overlays, Swapping, Contiguous Memory allocation, Paging, Segmentation, Virtual memory, Demand paging, Page replacement, Working set principle, Thrashing.

Unit 4 (12 Hours)

File Management: File system, Functions, File directory, File system structure, File system design: Symbolic, Basic, Logical and Physical file system layers, File organization, File allocation, free space management, File protection and security. Device Management : Disk scheduling , Disk scheduling policies , Device management : Functions , Techniques for device management : Dedicated , Shared , Virtual , Spooling , Channels and Control units.

Unit 5 (12 Hours)

Case Study 1: UNIX: Kernel, Shells and Shell programming basics
Case Study 2: Mobile OS: Concepts
Case study 3: Microsoft Windows NT

References:

1. Silberschatz, Galvin, Gagne, *Operating System Concepts*
2. Nutt G.J, *Operating Systems - A Modern Perspective*, Addison Wesley.
3. William Stallings, *Operating Systems, Internals and Design Principles*

SDC4IT14 - Advanced Computer Networks

Course No: 4.5

Course Code: SDC4IT14

Course Name: Advanced

Computer Networks

Credits: 5

Hours: 75

Objectives

On completion of this course, the student should be able to:

- Get an outline on TCP/IP networks and its protocols.
- Learn about wireless, mobile network and associated technologies.

Prerequisites

Knowledge of basic networking concepts

Course Outline

Unit 1 (15 Hours)

Introduction - TCP/IP Architecture, TCP/IP addressing, services, FTP, SMTP, TFTP, SNMP, Network file system, domain name system.

Unit 2 (15 Hours)

Transport layer protocols, user datagram protocol, transmission control protocol, Inter process communications: File and record locking, pipes, FIFO's, stream and messages, message queues, semaphores.

Unit 3 (15 Hours)

Sockets: Sockets system cells, reserved parts, stream pipes, socket option, asynchronous I/O, Sockets and signals.

Unit 4 (15 Hours)

Wireless and Mobile networks – Wireless - Wireless links – characteristics – IEEE 802.11 wireless LANs (wi-fi) - Cellular Internet Access - mobility – principles – higher levels Principles - addressing and routing to mobile users - Mobile IP - Handling mobility in cellular networks - Mobility and higher layer protocols – Elements of a wireless network – comparison with wired networks - IEEE802.11 Wireless LAN - IEEE802.11a, b, g – architecture of IEEE802.11 – IEEE 802.11: multipleaccess - Collision Avoidance - RTS-CTS exchange – IEEE 802.11 frames – mobility within same subnet – 802.15 – personal area network.

Unit 5 (15 Hours)

Emerging wireless and mobile technologies - Wireless Technology - Bluetooth, 3G, WiMax, Mobile Technology- GSM, CSMA, CDMA, GPRS, VSAT & GPS, Triband / Broadband Technology – NET, Leased lines, ISDN - 4G Systems: IPbased Mobile Telecommunications.

References:

1. R. Stevens, *Unix Network Programming*, PHI 1998
2. J. Martin, *Unix Network Programming*, Prentice Hall, 1994.
3. D.E. Comer, *Internetworking with TCP/IP*, Vol. 1, Vol. 2, Vol. 3
4. *Principles, Protocols, and architecture*, PHI, 2000

5. Feit, *TCP/IP*, McGraw Hill, 1996

6. Stevens, *TCP/IP Illustrated*, Vol. 1-3, Addison Wesley, 1998

7. Ashok K. Thalukder, Hasan Ahmed, Rupa R. Yavagal, *Mobile Computing-Technology, Application and Service Creation*, Tata McGraw Hill, 2010.

SDC4IT15 (P) – Networking & OS Lab

Course No: 4.6

Course Code: SDC4IT15 (P)

Course Name: Networking & OS Lab

Credits: 5

Hours: 75

Objectives

On completion of this course, the student should be able to:

- Learn to set up intranet Services, wireless networks and web servers
- Get a basic idea of router configuration and LAN interconnections Learn socket programming.
- Learn Linux administration and shell scripting.

Prerequisites

- Theoretical knowledge of Advanced computer networking
- Knowledge of Operating system concepts and Linux

• Course Outline

Networking Lab

1. Setting up Intranet Services
   a. Network File System (NFS)
   b. Network Information Service (NIS)
   c. Dynamic Host Configuration Protocol(DHCP)
   d. Samba printing
   e. Web server.

2. Configuring PC as a network router
3. Setting up a wireless network
   a. Infrastructure
   b. Ad hoc
4. Network Address Translation (NAT) protocol - setup a fire wall on a router
5. Configuring a thin client configuration – Ubunutu LTSP
6. Configuring PC as a Remote Access Server (RAS)
7. Determination of IP address classes
8. IP address setting and Classless Inter-Domain Routing (CIDR)
9. Network protocol analysis – capturing and analyzing TCP, UDP, IP, ICMP and ARP packets.
10. Connecting two LANs using a router
11. Socket programming (Java/C/Python)

OS Lab

1. Essential Linux commands, Processes in Linux, process fundamentals, connecting processes with pipes, redirecting input/output, Background processing, managing multiple processes, changing process priority, scheduling of processes. Batch commands, kill, ps, who, sleep. Printing commands, find, sort, touch, file, file processing commands - wc, cut, paste etc - mathematical commands - expr, factor etc. Creating and editing files with vi &joe editors
2. System administration - Common administrative tasks, identifying administrative files– configuration and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disabling of user's accounts, creating and mounting file system, checking and monitoring system performance - file security & Permissions, becoming super user using su. Getting system information with uname, host name, disk partitions & sizes, users, kernel - Backup and restore files, reconfiguration of hardware with kudzu, installing and removing packages with rpm command
3. Shell programming - Understanding shells, various types of shell available in Linux, shell programming in bash, Conditional and looping statements, case statement, parameter passing and arguments, Shell variables, system

shell variables, shell keywords, Creating Shell programs for automating system tasks.

4. Simple filter commands – pr, head, tail, cut, paste, sort, uniq, tr - Filter using regular expressions – grep, egrep, and sed.
5. Configuring X-windows desktop - Redhat configuration - Xfree86, understanding XF86config file, starting & using X desktop. KDE & GNOME graphical interfaces, changing X settings

References:

1. Cristopher Negus, *Red Hat Linux Bible*, Wiley Dreamtech India

2. YeswantKanethkar, *UNIX Shell Programming*, BPB

SDC4IT16 (Pr) - Project

Course No: 4.7

Course Code: SDC4BS16 (Pr)

Course Name: Project

Credits: 4

Hours: 60

Prerequisites

Software Engineering Concepts

Programming/ Web developing skills

The main aim of this project is to implement the theoretical knowledge gained from various areas to develop effective solutions to various real life computing problems. The course Project is one that involves practical work for understanding and solving problems in the field of computing. Students will select individually Commercial/Technical/Research Project based on Application Development Technologies learnt in previous semesters. Each student will have to prepare proper documentation consisting of Software Requirements

Specification (SRS), Modelling Techniques, Development Strategies, Implementation and Testing Strategies. Student may use any Design Methodologies such as SSAD, OOAD and UML, etc. The project work will be presented by students using Power Point Presentation Tool to the panel of Examiners, along with a live demonstration of the project.

Semester 5

C. No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
5.1	GEC5HR13	BC5B09 Human Resource Management	4	20	80	100	4		4
5.2	SDC5IT17	.Net and Database Administrator	4	20	80	100	4		4
5.3	GEC5LS15	(S04B.06) Life Skill Development	4	20	80	100	4		4
5.4	SDC5IT18 (E1/E2)	Python Programming and Mobile Web / J2EE	4	20	80	100	4		4
5.5	SDC5IT19 (E3/E4)	Mobile Software Development using Android / Programming Mobile Application	5	20	80	100	5		5
5.6	SDC5IT20	Net and Database - Lab	4	20	80	100		4	4
5.7	SDC5IT21(P)	Android and Python Programming	5	20	80	100		5	5
		Semester V Total	**30**			**700**	**21**	**9**	**30**

GEC5HR13 (P) –BC5B09 HUMAN RESOURCE MANAGEMENT

Course No: 5.1

Course Code: GEC5HR13 (P)

Course Name: BC5B09 HUMAN RESOURCE MANAGEMENT

Credits: 4

Hours: 60

Lecture Hours per week: 4 Credits: 4

Objectives:

- To familiarize the students with the different aspects of managing Human Resource in the Organization and
- To equip the students with appropriate knowledge and skills required for acquisition, development and retention of Human Resources.

Module I

Introduction – Human Resource Management (HRM) – Concept, Scope, Importance, Objectives & functions of HRM. Personal Management Vs. Human Resource Management: - HR Planning,Recruitment and selection: Manpower planning – concept and objectives, process of manpower planning, methods of manpower planning, convensional vs. strategic planning – Recruitment : meaning, Sources of Recruitment, Modern trends in Recruitment. Selection: – Meaning and Importance- Steps in selection procedure. Interviews – Types of Interviews – Test – types of test, induction, Job changes – transfer, promotions, demotions, separations

20 Hours

Module II

Human Resource Development:-Training – Concept – Need for Training – objectives – Approaches - Methods of Training. – Training Environment – Areas of training – Training Evaluation - Executive Developments – Process and Techniques.

15Hours

Module III

Performance Appraisal and Career planning: – need and importance – objectives – process – methods and problems of Performance appraisal, concept of career planning - features – methods – uses – career development

15 Hours

Module IV

Compensation Management: Compensation Planning – objectives – wage systems – Factors influencing wage system – components of employee remuneration – Basic wage – Dearness Allowance – Bonus - Fringe benefits and incentives.

15 Hours

ModuleI V

Grievance Redressal: Grievance – meaning and causes of grievances, Procedure of grievances handling – Absenteeism -- Discipline –Essentials of good discipline system

10 Hours

Reference Books:

1. Bernardin, John H: Human Resource Management, Tata McGraw Hill, New Delhi 2004.
2. Arthur M, Career Theory Handbook, Prentice Hall Inc, Englewood Cliff.
3. Belkaoui, A.R. and Belkaoui ,JM, Human Resource Valuation: A Guide to Strategies and Techniques, Quarum Books, Greenwood, 1995.
4. Dale, B, Total Quality and Human Resources: An Executive Guide, Blackwell, Oxford.
5. Greenhaus, J.H., Career Management, Dryden, New York.
6. Mabey, C and Salama, G., Strategic Human Resource Management, Blackwell, Oxford.
7. Aswathappa. K, Human Resource Management
8. Subba Rao, Human Resources Management.
9. Michael Porter, HRM and Human Relations.
10. Garry Dessler and BijuVarkkey, Human Resource Management, Pearson 2012
11. Amstrong's Hand book of Human Resource Management, Kogan-Page, 2012

SDC5IT17 -.Net and Database Administrator

Course No: 5.5

Course Code: SDC5IT17 (E2)

Course Name: **.Net and Database Administrator**

Credits:4

Hours:60

Objectives

On completion of this course, the student should be able to:

Learn the basic of .NET technology Expertiseweb development.

Prerequisites

Basic concepts of OOPS, RDBMS and Programming skills.

Course Outline

Unit 1 (15 Hours)

The origins of the .NET technology .net framework, Features of .net, architectures of C#.net. Introduction to visual studio,.net IDE interface and event driven programming. The common language runtime, The Just-In-Time Compiler visualstudio, . NET Framework class library introduction.NET languages, benefits of the .NET approach, C# and .NET.

Unit 2 (15 Hours)

Basic classes, declarations, conditionals, loops, arrays, strings, enumerations,

. Object Oriented Programming in c# .NET, Class and Object, Properties, methods and events. Constructors and Destructors, Method overloading, Inheritance,

Unit 3 (15 Hours)

Database: Connected and disconnected mechanism, Connection Objects, Command Objects, Data Adapters, Dataset Class, Data binding with controls like Text Boxes, List Boxes, Data grid. Exception, structured exception handling using try, catch and final statements, and user defined exception

Unit 4 (15 Hours)

Oracle Database Architecture - Preparing the Database Environment and Creating Database - Managing the Oracle Instance - Configuring the Oracle Network Environment - Managing Database Storage Structures - Administering User Security - Managing Data and Concurrency - Managing Undo Data Module - Implementing Oracle Database Security - Database Maintenance - Performance Management - Intelligent Infrastructure Enhancements - Backup and Recovery Concepts - Performing Database Backups - Performing Database Recovery - Moving Data Module

Unit 5 (15 Hours)

Database Architecture and ASM - Configuring for Recoverability - Using the RMAN Recovery Catalog - Configuring Backup Specifications - Using RMAN to Create Backups and recover - Performing User-Managed Backup and Recovery - Using RMAN to Duplicate a Database - Performing Tablespace Point-in-Time Recovery - Monitoring and Tuning RMAN Module - Using Flashback Technology - Diagnosingthe Database - Managing Memory - Managing Database Performance - Space Management - Managing Resources - Automating Tasks with the Scheduler - Administering the Scheduler.

References:

1. *.Net Framework Essentials* .3rd Edition (O'Reilly)
2. *Beginning with C#.Net.*Wroax publications

GEC5LS15 - (S04 B.06) Life Skill Education & Presentation Skill

Course No: 5.3

Course Code: GEC5LS15

Course Name:(S04B.06) Life Skill Education & Presentation Skill

Credits: 4

Hours: 60

Objectives

On completion of this course, the student should be able to:

Develop intra-personal, inter-personal, critical thinking, decision making and communication skills.

Establish self-management and help to maintain work life balance.

Get an insight to career planning and development

Prerequisites

Nil

Course Outline

Unit 1 (12 Hours)

Introduction to life skill education, definition, components, pillars of learning, need for life skill training, approaches - critical thinking skills/decision making skills, interpersonal/communication skills, criteria for using life skills.

Unit 2 (12 Hours)

Communication skills, communication, definition , components- sender, message, channel , receiver, feedback, types of communication, effective interpersonal communication, barriers, communication noise, listening, ways to improve interpersonal communication, effective public speaking interview, group discussion etc

Unit 3 (12 Hours)

Career planning, career planning steps, choosing a career, career development, career guidance and career guidance centre, need and importance of career guidance, career guidance centre and sources, making a career decision, preparing a resume and tips

Unit 4 (12 Hours)

Self management, self esteem, definitions, practice self acceptance, practice self acceptance characteristics of people with high self-esteem, low self esteem, characteristics and causes, self-esteem building, self awareness importance, develop self awareness, self control, developing self control, emotional intelligence or emotional quotient, emotional quotient , two aspects of emotional

intelligence, five domains of emotional eq or ei, social intelligence, coping with emotions, emotional intelligence,

Unit 5 (12 Hours)

Stress and strain: concept of stress, meaning and definition of stress, types of stress, major symptoms of stress, manage everyday stress. strain-mental strain, causes of strain, conflict, conflict resolution, understanding conflict in relationships, emotional awareness, managing and resolving conflict, stages of healthy conflict resolution, styles of conflict resolution, styles of dealing with conflict, developing positive thinking, positive and negative self-talk, better selftalk, impacts , assertiveness, behaviour , importance of assertive behaviour.

References:

1.E Wachira, *Essential Life Skills*

SDC5IT18 (E1/E2/) - Elective 1

E1. Python Programming and Mobile Web

Course No: 5.5

Course Code: SDC5IT18 (E1)

Course Name: Elective 1 -Python Programming and Mobile Web

Credits: 5

Hours: 75

Objectives

On **completion of this course**, the student should be able to:

- Expertise Python Programming
- Learn web based applications for mobile devices

Prerequisites

- Basic Knowledge of Programming
- Knowledge of HTML and JavaScript

Course Outline

Unit 1 (12 Hours)

Introduction to Python - Features, Python interpreter and Idle, data types, strings, variables, operators and expressions, control flow tools, loops, break, continue, data structures, Input and Output, functions.

Unit 2 (12 Hours)

Introduction to Object Oriented Concepts in Python- Class, class variable, data member, function overloading, instance variable, inheritance, instance, instantiation, method, object, operator overloading, exception handling.

Unit 3 (12 Hours)

Introduction to Mobile Web- Introduction to HTML, Basic formatting tags: heading, paragraph, underline break, bold, italic, underline, superscript, subscript, font and image. Different attributes like align, color, bgcolor, font face, border, size. Navigation Links using anchor tag: internal, external ,mail and image links. Lists: ordered, unordered and definition, Table tag, HTML Form controls: form, text, password, textarea, button, checkbox, radio button, select box, hidden controls, Frameset and frames.

Unit 4 (12 Hours)

Server side programming using Python- Server side scripting - CGI - role of Web server – XAMMPP /WAMP (choose any one of these servers) – Python server side script - XAMMPP/WAMP – capturing form data – validation – processing data – exchange of data between form and server .

Unit 5 (12 Hours)

Python- MySQLdb integration: Features of MySQL, data types, Introduction to SQL commands-SELECT, DELETE, UPDATE, INSERT. Python functions for MySQLdb operations – database connection, selection, query, fetching results- Insertion and Deletion of data using Python- Displaying data from MYSQL in webpage.

References:

1. David M.Beazly, *Python Essential Reference*

2. Mark Lutz, Programming *Python*

E2.J2EE

Course No: 5.5

Course Code: SDC5IT17 (E3)

Course Name: Elective 2- J2EE

Credits: 5

Hours: 75

Objectives

On completion of this course, the student should be able to:

Learn distributed enterprise applications using java.

Learn web development and server side programming using java Learn database managements and spring frameworks.

Prerequisites

Knowledge of OOPS concept

Basics of Java Programming.

Course Outline

Unit 1 (12 Hours)

Core Java EE: Platform Overview, Distributed Multi tiered Applications, Web & Business Components, services & types, Java EE Application Assembly & Deployment – Packaging Applications, Java EE modules, Getting Started with Web Applications, Model View Controller (MVC) Architecture.

Application deployment-Web application development and deployment Steps, Configuring Web application – Web application deployment descriptor (web.xml file)

Unit 2 (12 Hours)

SERVLETS: Servlet Overview, Life cycle of Servlet, Handling Client HTTP Request & Server HTTP Response, Initializing Parameters &ServletContext, Initializing a Servlet, initialization Parameters, ServletContext Attributes (Context binder), Session Management, Request Dispatcher & Redirecting.

Unit 3 (12 Hours)

JSP: Overview of JSP, JSP Architecture & life cycle, Components of Java Server Pages, Implicit Objects & Standard JSP Tags, Scope of JSP objects.

Unit 4 (12 Hours)

JDBC: JDBC Overview & Architecture, Step By Step Usage of JDBC API, Connecting to Database in Java, Prepared Statement & JDBC Transactions. Developing Web Application with MySQL Database by implementing Java Beans, DAO's & MVC Architecture.

Unit 5 (12 Hours)

Hibernate: Introduction to Hibernate, ORM Overview, Hibernate Environment, Hibernate Architecture & API, Hibernate Configuration, Hibernate Sessions, Persistent Class & Mapping Files, Building Hibernate application, Hibernate Query Language (HQL), Hibernate O/R Mappings – Collection & Association Mappings(Many-to-One, One-to-One, One-to-Many,Many-to-Many), Implementing Hibernate in Java Web Applications using Netbeans with MySQL.

Unit 6 (15 Hours)

Spring: Introduction to Spring Framework Architecture,Bean Definition, Bean Scopes & Bean Definition Inheritance, Spring IoC Containers, Understanding inversion of control (IoC) – Dependency Injection (DI), Spring Setter Injection, Spring Constructor Injection, Ioc in Action, Architecture of Spring Web MVC Framework, Spring MVC Getting Started – constructing web MVC application using Spring Framework, AbstractController in Spring MVC, Spring MVC Controllers hierarchy, SimpleFormController, Spring DAO design pattern, Building Spring MVC Framework Applications by using Netbeans.

References

1. James Keogh, *J2EE: The complete Reference*

SDC5IT18 (E3/E4) – Elective 2

(E3) Mobile Software Development using Android

Course No: 5.6

Course Code: SDC5IT18 (E4)

Course Name: Elective 2

Credits: 4

Hours: 60

Objectives

On completion of this course, the student should be able to

- Develop mobile applications with Google Android Platform
- Learn more about mobile operating system
- Get an insight to cross-platform mobile app development

Prerequisites

- Basic concepts of Operating Systems
- Programming skills in core Java

Course Outline

Unit 1 (15 Hours)

Introduction & environment set up: Introduction to object oriented programming and java basics, introduction to android and smart phones, Android Architecture & Virtual Machine, Mobile Technology terminologies, setting up the environment, Setting up Emulators, android fundamentals -

Activities and Applications Activity Life Cycles Activity Stacks, Activity States, introduction to manifest, resources & R.java , assets, Values – strings.xml

Unit 2 (15 Hours)

Basic UI design: Form widgets, views, Layouts &Drawable Resources - XML Layouts, Linear Layouts, Relative layouts, Table Layouts, android Widgets, UI XML Specifications Events, Bundles & Intents- Explicit Intents Implicit Intents Event Broadcasting with Intents Event Reception with Broadcast Receivers, Adapters and Data Binding

Unit 3 (15 Hours)

Files, Content Providers, and Databases: Saving and Loading Files, SQLite Databases Android Database Design Exposing Access to a Data Source through a Content Provider Content Provider Registration Native Content Providers, Android Debug Bridge (adb) tool, Linkify

Unit 4 (15 Hours)

Custom components, Threads & multimedia: Adapters and Widgets , Notifications , Custom components Threads running on UI thread, Worker thread Handlers & Runnable AsynTask(in detail), Playing Audio and Video, Recording Audio and Video, Using the Camera to Take and Process Pictures

Unit 5 (15 Hours)

Networking & Location based services: Live Folders, Using SD cards – Reading and writing, XML Parsing JSON Parsing Including external libraries in our application, Map-Based Activities, Maps via intent and Map Activity GPS, Location based Services configuration, Geo-coding, Accessing Phone services (Call, SMS, MMS) Network connectivity services, Using Wi-Fi & Bluetooth Action bar tabs and custom views on Action bars. Introduction to cross-platform application development tools like ruby on rail, phone gap etc.

References

1. Beginning Android 4, OnurCinar, Apress Publication
2. Professional Android 4 Application Development, Reto Meier

(E4) Programming Mobile Application

Course No: 5.6

Course Code: SDC5IT20 (E5)

Course Name: Elective 2

Credits: 4

Hours: 60

Objectives

On completion of this course, the student should be able to:

Develop mobile applications with HTml5 and Angular JS
Develop mobile web and applications that runs on multiple platforms.

Prerequisites

Basic knowledge about Html, CSS and JavaScript.

Background of Programming.

Course Outline

Unit 1 (15 Hours)

Html5 & csss3: Introduction to html5, html5 new elements, canvas, video and audio, web storage, geo-location, html5 apis, Css3- Backgrounds, border, color, fonts, multi column layout, selectors, contents

Unit 2 (15 Hours)

AngularJS: AngularJS architecture overview, Get Setup Data Binding-Wiring up a controller, Binding, Iteration, Forms binding and validation, Build: A two-way bound form with validation. Services and DI- Overview of the built-in AngularJS services, angular's $http and $resource services, Promises, Service registration and injection, Using services to build a service, Injecting services, Build: Create a twitter search service.

Unit 3 (15 Hours)

Templates and Routing- Linking and images, The routing API, PushState, hasbangs and SEO, Build: Using templates with iteration. Directives- Simple directives, Using templates, Working with controllers, Transclusion, Directive scope and isolate scope, Build: Tweet Directive. Advanced Topics-How to avoid polluting the global namespace, Using modules, Some AngularJS best practices, Using $watch, $digest, $apply, AngularJS events

Unit 4 (15 Hours)

PhoneGap: Installing PhoneGap, Building & Debugging on multiple Platforms, HTML 5 APIs, CSS transition & animation.

References

1. AngularJS , Green, Brad; Seshadri, Shyam,. O'Reilly Media.
2. Mastering Web Application Development with AngularJS, Kozlowski, Pawel; Darwin, Peter Bacon.
3. Murach's HTML5 and CSS3: Training and Reference by Zak Ruvalcaba, Mike Murach& Associates
4. Beginning PhoneGap Mobile Web Framework for JavaScript and HTML5, Apress,

SDC5IT20 (P) - Net and Database - Lab

Course No: 5.6

Course Code: SDC5IT20 (P)

Course Name: .Net and Database - Lab

Credits:4

Hours:60

Objectives

On completion of this course, the student should be able to:

Develop applications with C#.Net and ASP.Net
Develop mobile web and applications that runs on multiple platforms.

Prerequisites

Basic knowledge about .Net Technology.

Background of Programming.

Course Outline

C# - LAB Peograms

1. Simple C# programs
2. Create and populate Windows Forms
3. Create and use user controls in a Windows Forms application
4. Create menus in a Windows Forms applications
5. Add code to form and control event procedures sin a Windows Forms applications.
6. Validate user input in a Windows Forms applications
7. Bind Windows Forms applications to various data sources by using Microsoft ADO.NET
8. Debug a Windows Form Application (try/catch)

Database - Lab Programs

1. Preparing the Database Environment and Creating Database
2. Network Configuration
3. User Manager and configuration
4. Reporting and managing performance
5. Performing Database backup
6. Managing and Scheduling tasks
7. Configure oracle for recovery
8. Backup configuration

9. RMAN for backup and recovery
10. Monitoring using RMAN
11. Flashback Technology

1. Android & Python Programming
SDC5IT21 (P) - Elective Lab

Course No: 5.7

Course Code: SDC5IT21 (P)

Course Name: Elective Lab

Credits: 5

Hours: 75

Objectives

On completion of this course, the student should be able to:

Practice and implement the theoretical knowledge acquired in the selected elective course.

Develop industry standard applications with real life implications.

Prerequisites

Theoretical knowledge in the selected course.

Course Outline

Android

1. Creating Activities for Menu Items and Parsing XML Files
2. Writing Multi-Threaded Applications using AsyncTask
3. Using WebView and Using the Network
4. Using Audio Functions in Android

5. Graphics Support in Android
6. Preferences and Content Providers
7. PreferenceActivity
8. Creating Menus
9. Location Services and Google Maps in Android
10. Obtaining User Location
11. Obtaining a Maps API Key
12. Creating Status Bar Notifications
13. Data Storage
14. Simulating Sensors

Python:

1. Programs using Loops and decisions
2. Programs for constants and String Manipulations
3. Programs for Functions, arrays , tuple, list, Dictionary
4. Programs for Sessions and request handling
5. Programs for Modules, Input-Output, Exception Handling, OOPs concept
6. Programs for Database management, Multithreading Installation of WAMP/XAMPP Server, MySQL db, and Python MySQL interface
7. Exchange of data between web page and server
8. Storage /Retrieval/Updation of form data in MySQL DB

2. J2EE Programming

1. Practical demonstration on Distributed Multi tiered Applications, Web & Business Components,
2. Handling Client HTTP Request & Server HTTP Response,
3. Initializing Parameters &ServletContext.
4. Initializing a Servlet, Parameters,

5. Programme for ServletContext Attributes (Context binder), Session Management,
6. Programme for Request Dispatcher & Redirecting.
7. Programme on Components of Java Server Pages, Implicit Objects & Standard JSP Tags, Scope of JSP objects 8.Step By Step Usage of JDBC API
9. Connecting to Database in Java.
10. Developing Web Application with MySQL Database by implementing Java Beans, DAO's & MVC Architecture
11. Implementing Hibernate in Java Web Applications using Netbeans with MySQL
12. Building Spring MVC Framework Applications by using Netbeans

3. Programming Mobile Application

1. Practical sessions on Html5 & css3
2. Programme for Data Binding-Wiring up a controller, Binding, Iteration, Forms binding and validation, Build: A two-way bound form with validation
3. Programme for Angular js Services
4. Programme for Templates and Routing Directives- Simple directives, Using templates, Working with controllers, Transclusion, Directive scope and isolate scope, Build: Tweet Directive
5. JavaScript based object oriented programme on Advanced Angular JS
6. Installing Phone Gap, Building & Debugging on multiple Platforms

Presentation Skill/Seminar

Course Outline

Each student shall present a seminar on any topic of interest related to the branch-specific courses offered in previous semeste r of the programme. He / she shall select the topic based on the references: from reputed International Journals, preferably IEEE journals. They should get the paper approved by the Programme Co-ordinator / Faculty member in charge o f the seminar and shall present it in the class. Proper presentation aid ca n be used. Every student shall participate in the seminar. The students should und ertake a detailed study on the topic and submit a report prior to the presentation. Marks will be awarded based on the topic, presentation, participation in the seminar and the report submitted.

Social Service

Course Outline

The Social Work programme aims to develop competency among students in critical thinking, knowledge building and a set of practice skills in the area of conceiving, designing and managing social enterprises with a view to create wealth for the poor. The objective of the course is to nurture entrepreneurial attributes of young professionals and equip them to build entrepreneurial ventures in emerging social sectors. The programme seeks to create a cadre of professionals equipped to visualize economic opportunities, conceive and design plans, raise resources, develop products and services, and evaluate and change existing systems of operation. In addition, the students will develop competency in designing and redesigning appropriate and efficient service delivery systems, and creating and strengthening an effective organizational mechanism in social enterprises.

Semester 6

C. No	Course Code	Course Name	Credit	Marks			Hrs		
				Int	Ext	Tot	T	P	Tot
6.1	SDC6IT22 (Pr)	Internship & Project (900 hrs)	30	0	100	100		900	900
Semester VI Total			**30**			**100**			**900**

SDCIT22 (Pr) - Industrial Training and Project

Course No: 6.1

Course Code: SDCIT22 (Pr)

Course Name: Industrial Training and Project

Credits: 30

Hours: 900 Hours

Prerequisites

On completion of this course, the student should be able to:

Utilize the theoretical knowledge and practical experiences to solve a real life problem with high standard and accuracy.
Get a feel of organizational atmosphere and their practices.
Induce confidence to manage lage engineering projec ts and make him work ready.

Software Engineering concepts

Programming skills

Knowledge of OS, Data structure and Database concepts.

Course Outline

The student shall undergo Industrial training anda project of four month duration. Industrial training should be carried out in an industry / company approved by the institution and under the guidance of a staff member in the concerned field. At the end of the training he / she have to submit a report on the work being carried out.

The project is designed to develop practical ability and knowledge about practical tools/techniques in order to solve real life problems related to the industry, academic institutions and computer science research. The project should strictly stick to the software engineering principles. Students can take up any application level/system level project pertaining to a relevant domain. Projects can be chosen either from the list provided by the faculty or in the field of interest of the student. For external projects, students should obtain prior permission after submitting the details of the external guide, institution and synopsis of the work. The project guide should have a minimum qualification of ME/M.Tech/MCA/M.Sc in Computer Science or related fields.

At the end of each phase, presentation and demonstration of the project should be conducted, which will be evaluated by a panel of examiners. A detailed project report duly approved by the guide in the prescribed format should be submitted for end semester assessment. Marks will be awarded based on the report and their performance during presentations and demonstrations. Publishing the work in Conference Proceedings/ Journals with National/ International status with the consent of the guide will carry an additional weightage in the review process.

References:

1. Software Engineering: A Practitioner's Approach, Roger S Pressman
2. Systems Analysis and Design, Elias M. Awad.

SYLLABUS

(FOR THE STUDENTS ADMITTED FROM THE ACADEMIC YEAR 2021–22 ONWARDS)

CARMEL COLLEGE (AUTONOMOUS)

MALA

BACHELOR OF VOCATION (B.Voc) PROGRAMME IN

SOFTWARE DEVELOPMENT

CURRICULUM AND SYLLABI

CHOICE BASED CREDIT SEMESTER SYSTEM

UNDER

FACULTY OF SCIENCE

CONTENTS

REGULATIONS

FOR THE DEGREE OF B.VOC SOFTWARE DEVELOPMENT

1. TITLE OF THE PROGRAMME

This programme shall be called Bachelor of Vocation (B.Voc) Software Development as per the guidelines of UGC.

2. PROGRAMME - AN OVERVIEW

The University Grants Commission (UGC) has launched a scheme on 27 February, 2014 for skill development based higher education as part of college/university education, leading to Bachelor of Vocation (B.Voc.) Degree with multiple exits such as Diploma/Advanced Diploma/ Degree under the NSQF. B Voe Software Development is a vocational undergraduate program having 3 years' duration. Considering the implementation modalities, the guidelines of the scheme have been revised by UGC in the years 2015 and 2018. The B.Voc. programme is focused on universities andcolleges providing undergraduate studies which would also incorporate specific job roles and their NOSs along with broad based general education. This would enable the graduates completing B.Voc to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge

The main purpose of this programme is to mould the students with adequate skills in Software Development by providing them sufficient theoretical knowledge,Lab experiments, training in academic projects and involvement in real time client projects at 6th semester whole time internship in industries. This will enable the students to get hired in public and private IT organizations.

Broad Objectives

1. To provide judicious mix of skills relating to a software profession and appropriate content of general education.

2. By integrating with industries, ensure that the students have adequate knowledge and skills in computer applications so that they are work ready at each exit point of theprogramme.

3. To provide flexibility to students by means of pre-defined entry and multiple exit points.

4. To integrate NSQF within the undergraduate level of higher education in order to enhance employability of the graduates and meet industry requirements. Such graduates apart from meeting the needs of local and national industry are also expected to be equipped to become part of the global workforce.

   To provide vertical mobility to students coming out of 10+2 with vocational subjects and Community Colleges.

PROGRAMME OUTCOMES (POs)

Software Development Graduates will be able to:

P01:	Open up a channel to IT Industries by supplying sufficient work ready students by developing skilled manpower in the various areas of Information Technology like: Web Deveopment, Database Management, Software Development, Computer Languages, Software Engineering, Mobile Applications, Multimedia Applications, etc.
P02:	Create, select and apply appropriate techniques, resources, mathematical and professional business skills and Modern IT Tools to complex software engineering activities and business presentations.
P0 3	Identify opportunities of Industry-Institute interactions by doing internships in industries.
P04:	Equip the graduates to go for their higher studies. After acquiring B.Voc, there is further educational opportunity to go for MVoc, MCA, MSc Computer Science, MBA, MTech etc.
POS:	Become an entrepreneur who can provide solutions and develop software products for Enterprise needs.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PS01	Demonstrate understanding of the principles and working of the hardware and software aspects of computer systems.
PS02	Understand the impact of general education in the areas like Disaster Management, Gender Studies, Environmental Science, Public Health, Sanitation and Safety, Entrepreneurship, Human Rights, IPR, Consumer Protection etc. and need for sustainable development.
PS03:	Develop competent technical speaking and writing skills in English so as to enable the graduate effectively communicate in the work place.
PS04:	Develop competency in advanced programming languages such as Machine Learning, Al, Big Data, IOT, OBA, Python, J2EE, Android, Dot Net etc. and learn the development of software and web applications using these.
PSOS:	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

3. ELIGIBILITY CRITERIA FOR ADMISSION

a) The admission to this programme will be as per the rules and regulations of the University for UG admissions.

b) Candidates who have passed (Eligible for Higher Studies) the HSE of the Kerala State Board of Higher Secondary Examination or any other examination recognized as equivalent thereto with Mathematics/Computer Science/Computer Application/ Information Technology/ Informatics Practice/lnformatics/WebTech/Additional Mathematics are eligible for admission.

c) Index Mark:

1. Total Part Ill + marks secured for Mathematics in the case of Science group with Mathematics as one of the subject AND Total Part Ill + marks secured for Computer Science/Computer Application/ Information Technology/ Informatics Practice/ Informatics/ Web Technology/ Additional Mathematics in the case of other combinations without Mathematics as one of the subject. If the Candidates has studied both Mathematics and any one of the following subjects Computer Science/Computer Application/ Information Technology/Informatics Practice/Informatics/ Additional Mathematics, then the marks secured for Mathematics or Computer Science/Computer Application/ Information Technology/ Informatics Practice/ Informatics/ Web Technology/ Additional Mathematics whichever is higher will added.
2. An additional 25 marks will be awarded for VHSE/HSE with vocational pass out students.

d) **Tie Break:** If there is a tie in the index marks priority must be given to Mathematics/Computer Science as the case may be. If there is a tie again the marks of the second subsidiary subject marks of English and then the marks for second language will be considered before going to general conditions.

e) Separate rank lists shall be drawn up for reserved seats as per the existing rules.

f) **Grace Marks** may be awarded to a student for meritorious achievements in co-curricular activities such as Sports/ Arts/ NSS/NCC/ Student Entrepreneurship.

g) The eligibility criteria for admission shall be as announced by the University from time to time. The admission to this programme will be as per the rules and regulations of the University for UG admissions.

4. DURATION OF THE PROGRAMME

a) Duration of an undergraduate programme is six semesters distributed over a period of 3 academic years.

b) An academic week is a unit of five working days in which distribution of work is organized from Monday to Friday with Six contact periods of one-hour duration on each day.

c) A sequence of 18 such weeks (16 instructional weeks and 2 weeks for examination) constitutes a semester.

5. COURSE STRUCTURE

a) **Programme** means the entire course of study and examinations for the award of a degree.

b) **Course:** Course means a segment of subject matter to be covered in a semester.

c) This undergraduate programme includes 3 types of courses, GEC, SDC and AEC *viz.*,

i. General Education Components (GEC): General course means a course that comes under the category of courses, including compulsory English and additional language courses and a set of General courses applicable for Language Reduced Pattern (LRP) programmes, the selection of which is compulsory for all students undergoing programme. This programme follows the GEC of LRP (A11- A14) that comes under Group No. 6 which is newly created for BVoc programmes as per CBCSS VUG 2022 Regulations.

ii. Skill Development Components (SDC):

a) This component should match the skill gap identified.

b) At least 50% of Skill Development Component should be allotted to practical and can grow up to 60% based on the nature of the course. The practical component can be carried out/in the college and/or the industry partner premises

iii. Ability Enhancement Courses/ Audit Courses (AEC/AC) are courses which aremandatory for a programme but not conducted for the calculation of SGPA or CGPA. There shall be one audit course each in the first 4 semesters. Audit courses are not meant for class room study. The students can attain only pass (Grade P) for these courses. At the end of each semester there shall be examination conducted by the college from a pool of questions (Question Bank).The students can also attain these credits through online courses like SWAYAM, MOOC etc. (optional). The list of passed students must be sent to the University from the colleges at least before the fifth semester examination. The list of courses in each semester with credits is given below.

Semester	Courses	Credit
1	Environment Studies	4
2	Disaster Management	4
3	*Human Rights /Intellectual Property Rights /Consumer	4
4	*Gender Studies/Gerontology	4

*Colleges can opt any one of the courses.

iv. Electives: In the 4th and 5th semester selective courses are included. Students are allowed to select elective courses in consultation with their faculties.

6. CREDIT

a) Each course shall have certain credits. **Credit** is a unit of academic input measured in termsof weekly contact hours'/course contents assigned to a course.

b) A student is required to acquire a total of **180** credits for the completion of the programme which shall be counted for SGPA andCGPA.

c) Each semester has a credit of 30. Out of which the general education components shall not exceed 40% of the total credit of eachsemester.

d) The maximum credit for a course shall not exceed 5 and the minimum credit for a course is 2.

e) **Extra credits** are mandatory for the programme. Extra credits will be awarded to students who participate in activities like NCC, NSS and Swatch Bharath. Those students who could not join in any of the above activities have to undergo Calicut University Social Service Programme (CUSSP). Extra credits are not counted for SGPA or CGPA. The maximum credits acquired under extra credits shall be 4. If more Extra credit activities are done by a student that may be mentioned in theGrade card.

7. EXAMINATION

a) There shall be University examinations at the end of each semester.

b) The medium of examination is in English.

c) Evaluation and Grading:

Mark system is followed instead of direct grading for each question. For each course in the semester letter grade and grade point are introduced in 10-point indirect grading system as per guidelines given in Annexure-1.

d) **Course Evaluation:** The evaluation scheme for each course shall contain two parts internal assessment and external assessment.

8. AWARD OFDEGREE

The successful completion of all the courses (General Education Components, SkillDevelopment Components and Audit Courses) prescribed for this degree programme with 'P' grade shall be the minimum requirement for the award of degree.

Levels of Awards

B.Voc Software Development is a programme with Multiple Exit points as shown below:

Awards	Duration	NSQF Level
Diploma	1 year/ 2 semesters	Level 5
Advanced Diploma	2 years / 4 semesters	Level 6
B.Voc Degree	3 years / 6 semesters	Level 7

GRADUATE ATTRIBUTES

The Job Roles, Qualification Packs and NSQF Levels proposed to be covered in each year. Reference : http://www.nsdcindia.org/nos

IT-ITeS Sector Skill Council (SSC) : NASSCOM		
QP Code	**Job Roles and Descriptions**	**NSQF Level**
At the end of 1st Year (NSQF Level 6)		
SSC/Q0508	**Junior Software Developer** Entry level roles in the software industry including support and help desk, testing, user interaction design, maintenance, enhancement, development and documentation.	**Level 4**
SSC/Q2212	**Domestic Data Entry Operator** Maintain proper entry of required data of customers through use of various data entry software and techniques.	
SSC/Q0110	**Domestic IT Helpdesk Attendant** Managing and resolving client queries/ issues primarily telephonic through calls	
SSC/Q1301	**Test Engineer** Responsible for conducting scheduled and unscheduled tests in the areas of integration, performance, and application etc.	**Level 5**
SSC/Q0503	**Web Developer** Responsible for designing and maintaining web-based applications that include static and dynamic content. This includes the design, layout and coding of a website.	
SSC/Q0504	**Media Developer** Responsible for designing and improving the look and feel, functionality and graphic appeal of the developed application.	
SSC/Q0505	**Technical Writer** Responsible for creating technical documentation related to an application like job-aids, help documents and training material.	
SSC/Q0101	**Engineer-Technical Support(Level-1)** Manage, co-ordinate and resolve incidents as quickly as possible at primary support level.	
SSC/Q0801	**Infrastructure Engineer** Provide technical assistance in the installation, configuration, administration, support and maintenance of systems, storage or back-up services of databases etc.	

<table>
<tr><td colspan="3">At the end of 2nd Year(NSQF Level 6)</td></tr>
<tr><td>SSC/Q0509</td><td>Master Trainer for Junior Software Developer

Master Trainer for Junior Software Developer will be accountable to train and equip students of Oto 2 years' experience. Major responsibility being to prepare trainees and enable them to procure, and perform to a reasonable extent, at entry level jobs that exist in the IT Services Industry.

Entrepreneurship:Enable students to participate and pursue entrepreneurial opportunities arising out of e-governance.

Business Process Outsourcer:Enable to undertake and carry out data processing activities in computerized environments. Analyze business operations, trends, costs, revenues, financial commitments.

Website Developer:Able to develop websites for various applications .

Software Tester:Able to carry out Software testing and debugging activities.

Documentation Support:lnvolvement in preparation and training of software manuals.

System Admin : IT administration</td><td>Level6</td></tr>
<tr><td colspan="3">Attheendof3rdYear (NSQF Level 7)</td></tr>
<tr><td>SSC/Q0501</td><td>Software Developer
Responsible for using specialized knowledge of software programming languages, software integration and delivery platforms to build software products and deliver business solutions.</td><td rowspan="4">Level7</td></tr>
<tr><td>SSC/Q1302</td><td>QA Engineer
Design and implement Quality Assurance nonns, standards and guidelinesto be followed across the organization</td></tr>
<tr><td>SSC/Q0701</td><td>Understand the client's business requirements and translate them into technology requirements for the technology consultants. They act as facilitators in the process of solving and development of the end producVservice.</td></tr>
<tr><td>SSC/Q0201</td><td>Application Maintenance Engineer
Responsible for ensuring the availability of an application or product for end users. Such roles provide on-going/ad-hoc support for software products or customized applications aimed towards correction of faults/bugs or improvement of performance.</td></tr>
</table>

SSC/Q0507	**Engineer Trainee** Responsible for supporting the work area/domain they are aligned to by assisting in performing the key activities and tasks involved.	
SSC/Q0401	**Junior Data Associate** Responsible for designing and implementing processes and layouts for complex, large-scale data sets used for modeling, data Management, manipulation, and research purposes.	**Level 7**
SSC/Q1101	**Sales and Pre-Sales Analyst** Support business development activities such as coordination with stakeholders, creating proposals and bids for project sales	
SSC/Q0901	**Security Analyst** Ensure the confidentiality, integrity and availability of system and data to the 'right' users within/outside of the organisation.	
SSC/Q0502	**UI Developer** Responsible for designing User interface for the developed application	
SSC/Q0905	**Analyst End Point Security** Responsible for troubleshooting and maintaining EPS solutions as well as assisting in installing and configuring EPS solutions as per instructions, when required.	
SSC/Q0909	**Analyst Security Operations Centre** Responsible for monitoring, analyzing and responding to alarms, raising tickets, follow-up for closure of tickets and any enhancements to existing information security measures.	
SSC/Q0904	**Analyst Identity and Access Management** Responsible for implementing, maintaining, provisioning and reconciling identity and access management to information technology and data	
SSC/Q0912	**Penetration Tester** Rresponsible for testing, identifying vulnerabilities, recording the test results, making reports and enhancing the existing tools and security services.	
SSC/Q0903	**Analyst Application Security** Responsible for analyzing application deployment architecture, security controls & taking corrective actions	
SSC/Q0907	**Analyst Compliance Audit** Responsible for conducting compliance audit, reporting and addressing risk issues.	

B. VOC SOFTWARE DEVELOPMENT PROGRAMME STRUCTURE

SEMESTER I

C. No	Course Code	Course Name	Credit	Marks Int	Marks Ext	Marks Tot	Hrs./Week T	Hrs./Week P	Hrs./Week Tot
1.1	A01	English-1	3	15	60	75	3		3
1.2	A02	English-2	3	15	60	75	3		3
1.3	A07(3)	Language other than English-1	4	20	80	100	4		4
1.4	SDC1IT01	Discrete Mathematics	4	20	80	100	4		4
1.5	SDC1IT02	Programming in C	4	20	80	100	4		4
1.6	SDC1IT03(P)	Programming in C - Lab	4		20	80	1100		4 4
1.7	SDC1IT04(P)	Web Programming - Lab	4	20	80	100	1	3	4
1.8	SDC1IT05(P)	Office Automation & Design - Lab	4	20	80	100	1	3	4
		Ability Enhancement Course -I (Environment Studies)	4						
		Semester Total	30			750	20	10	30

SEMESTERII

C.No	Course Code	Course Name	Credit	Marks Int	Marks Ext	Marks Tot	Hrs/Week T	Hrs/Week P	Hrs/Week Tot
2.1	A03	English - 3	4	20	80	100	4		4
2.2	A04	English -4	4	20	80	100	4		4
2.3	A08(3)	Language other than English -2	4	20	80	100	4		4
2.4	SDC2IT06	Programming in Java	4	20	80	100	4		4
2.5	SDC2IT07	Relational Database Management System	4	20	80	100	4		4
2.6	SDC2IT08(P)	Programming in Java - Lab	3	15	60	75		3	3
2.7	SDC2IT09(P)	RDBMS-Lab	3	15	60	75		3	3
2.8	SDC2IT10(Pr)	Mini Project (Including Industrial Visit)	4	20	80	100		4	4
		Ability Enhancement Course-II (Disaster Management)							

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SEMESTER Ill

IC.No	Course Code	Course Name	Credit	Marks			Hrs/Week		
				Int	Ext	Tot	T	P	Tot
3.1	A11	Basic Mathematics and General Awareness	4	20	80	100	4		4
3.2	A12	Professional Business Skills	4	20	80	100	4		4
3.3	SDC3IT11	Software Engineering	3	15	60	75	3		3
3.4	SDC3IT12	Programming in Python	4	20	80	100	4		4
3.5	SDC3IT13	Computer Networking Concepts	4	20	80	100	4		4
3.6	SDC3IT14(P)	Data Structures Using Java- Lab	4	20	80	100	1	3	4
3.7	SDC3IT1 5(P)	Programming in Python - Lab	4	20	80	1100		4	4
3.8	SDC3IT16(P)	Computer Networking - Lab	3	15	60	75		3	3
	Ability Enhancement Course - Ill Human Rights\ Intellectual Property Rights\ Consumer Protection (Can opt anyone)		4						
		Semester Ill Total	**30**			**750**	**20**	**10**	**30**

SEMESTER IV

C.No	Course Code	Course Name	Credit	Marks			Hrs/Week		
				Int	Ext	Tot	T	P	Tot
4.1	A13	Entrepreneurship Development	4	20	80	100	4		4
4.2	A14	Public Health, Sanitation & Safety	4	20	80	100	4		4
4.3	SDC4IT17	Operating Systems	4	20	80	100	4		4
4.4	SDC4IT18	Computer Security	3	15	60	75	3		3
4.5	SDC4IT19 E1/E2	E1: J2EE E2: .Net Programming	3	15	60	75	3		3
4.6	SDC4IT20(P)	Operating Systems and Computer Security - Lab	4	20	80	100		4	4
4.7	SDC4IT21 (P)	E1: J2EE - Lab E2: Dot Net Programming- Lab	4	20	80	100		4	4
4.8	SDC4IT22(Pr)	Project Work/ Internship (Including Industrial Visit)	4	20	80	100		4	4
	Ability Enhancement Course (Audit Course)- IV Gender Studies\ Gerontology (Can opt any one)		4						
		Semester IV Total	**30**			**750**	**19**	**11**	**30.**

SEMESTERV

C.No	CourseCode	CourseName	Credit	Marks int	Ext	Tot	Hrs/Week T	P	Tot
5.1	SDC5IT23	Big Data Analytics	3	15	60	75	3		3
5.2	SDC5IT24	Machine Learning and Artificial Intelligence	3	15	60	75	3		3
5.3	SDC5IT25	Cloud Computing	3	15	60	75	3		3
5.4	SDC5IT26	Android App Development	3	15	60	75	3		3
5.5	SDC5IT27 E1 / E2 / E3 / E4	E1: Data Base Administration E2: Quality Assurance & TestingE3: Internet of Things(loT) E4: Financial and Management Accounting	3	15	60	75	3		3
5.6	SDC5IT28(P)	Android App Development- Lab	4	20	80	1100		4	4
5.7	SDC5IT29(P)	Machine Learning and Al - Lab	3	15	60	75		3	3
5.8	SDC5IT30(P)	Big Data Analytics - Lab	4	20	80	100		4	4
5.9	SDC5IT31 (P)	Cloud Computing & Electives - Lab Opt any One (OBA/Testing/IOT/Tally)	4	20	80	100		4	4
		Semester V Total	**30**			750	16	14	

SEMESTER VI

F-Marks

C.No	Course Code	Course Name			Ext	Tot	Hrs/Week T	P	Tot
6.1	SDC6IT32	Term paper	2	50	-	50			
6.2	SDC6IT33(Pr)	Internship & Project (900hrs.)	28					900	900
		Internship		40	160	200			
		Project		40	160	200			
		Semester VI Total	**30**			**450**			**900**
		Grand Total	**180**			**4200**			

SEMESTER1

SDC1IT01 Discrete Mathematics

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 Hours Per Week:4 Total hours: 64
(This course taken from BCA programme: Course code: CA1 CO2)	

Course Objectives

1. . To learn the mathematical logic & Boolean Algebra
2. To learn the basic principles of set theory and graph theory.
3. To learnmathematical modeling using ordinary and partial equations.

Course Outcomes:

CO-1: Understand mathematical logic and Boolean algebra.

CO-2: Evaluate Boolean functions and simplify expression using the properties of Boolean algebra

CO-3: Understand some basic properties of graphs and related discrete structures,And be able to relate to practical examples

CO-4: Understand some basic properties of trees and related discrete structures

CO-5: Demonstrate different traversal methods for trees and graphs.

Course Outline:

Module I (12Hrs.)

Mathematical Logic: Propositions and logical operators, Truth tables, equivalence and Implementation, Laws of logic, Quantifiers.

Module II (12 Hrs.)

Boolean Algebra and its properties, Algebra of propositions & examples, De-Morgan's Laws, Partial order relations, greatest lower bound, least upper bound, Algebra of electric circuits & its applications. Design of simple automatic control system

Module Ill (14 Hrs.)

Graph: Simple and multigraph, Incidence and degree, Isomorphism, Sub graphs and Union of graphs, connectedness, Walks, Paths and Circuits, Euler's Formula, Eulerian graph, Hamiltonian graph, Chromatic Graphs, Planer Graphs, Travelling salesman problem, Complete, Regular and Bipartite graphs, Directed Graphs

Module IV (14 Hrs.)

Trees: Properties of trees, pendant vertices. Centre of a tree, rooted and binary trees, spanning trees, spanning tree algorithms, fundamental. Circuits; spanning trees of a weighted graph: cut sets and cut-vertices; fundamental cut sets; connectivity and separativity network. flows; max-flow min- cut theorem.

Module V (12 Hrs)

Plan on graphs, dual graphs, Kuratowski's two graph, matrix representation of graphs, incidence matrix, directed graphs, digraphs, directed paths and connectedness. Eular digraphs

Textbooks

1. Discrete Mathematical Structures with applications to Computer Science, J.K. Tremblay and R.Manohar, McGraw Hill

References:

Elements of Discrete Mathematics, C. L. Liu, TMH Edition Discrete mathematical Structures, Kolman, Busby, Ross, Pearson Graph theory, Harry, F., Addison Wesley.
Finite Mathematics, S. Lipchutz, Schaum Series, MGH.
Graph Theory, Deo. N, PHI

SDC1IT02 -PROGRAMMING IN C

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 Hours Per Week:4 Total hours: 64

Course Objectives

1. Understand the basics and background of computer system and its component
2. Understand the basics of computer programming
3. Write programs for solving simple computational problems using C.

Course Outcomes:

CO-1: Read, understand and trace the execution of programs written in C language.
CO-2: Write the C code for a given algorithm.
CO-3: Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
C0-4:Write programs that perform operations using derived data
CO-5: Choose the right data representation formats based on the requirements of the problem

Course Outline

Module I (10 Hrs)

Computer system concepts, Computer system characteristics, Generation of computer, lntroductionto Programming:- The problem solving aspect, Top-Down design, Algorithms and flowcharts, Implementation of algorithms, Program verification, efficiency of algorithms, Web Software Categories of Programming Languages: Machine Level Languages, Assembly Level Languages, High Level Languages Programming Design, Number system representation:- Binary, Decimal, Octal, Hexadecimal, Conversion from one number system to another, binary arithmetic. Addition, subtraction, multiplication, division.

Module II (10 Hrs)

Introduction to C Programming, overview and importance of C, C Program Structure and Simple programs, Creation and Compilation of C Programs under Linux and Windows Platforms. Elements of C Language and Program constructs, C -operators, arithmetic expressions, evaluation of expressions and precedence, Type conversion in expressions, operator precedence and associativity, 1/0 operations.

Module Ill (11 Hrs)

Decision making, Branching and Looping. Arrays& Strings one dimensional array, two dimensional array and multidimensional array, strings and string manipulation functions, bitwise operations, debugging.

Module IV (15 Hrs)

The Concept of modularization and User defined functions Multifunction Program, calling functions, various categories of functions, nesting of functions and recursion, functions and arrays, scope and lifetime of variables in functions, multi file programs. Structures and Union: structure definition, giving values to members, structure initialization, comparison of structure variables, arrays of structures, arrays within structures, structures within arrays, nested structures, structures and functions, Unions, bit fields

Module V (18 Hrs)

Pointers and Files: Understanding pointers, accessing the address of a variable, declaring and initializing pointers, accessing a variable through its pointer, pointer expressions, pointer and arrays, pointer and character string, pointers and functions, pointers and structures, pointer to pointer, dynamic memory allocation.

Files: Defining, Opening and closing files 1/0 operations on files - error handling on files random access of files command line operations. Preprocessor directives: Macro substitution directives

simple macro, macros with arguments nesting of macros, Compiler control directives, Command line arguments.

Reference Books

E. Balaguruswamy, Programming in ANSI C.

Yashwant Kanithkar, Let us C.

M Morris Mano, Computer System Architecture

William Stallings, Computer Organization & Architecture, PHI

SDC1IT03 (P) -PROGRAMMING IN C - LAB

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 Hours Per Week:4 Total hours: 64

!Course Objectives

1. To make the student learn a programming language.
2. To learn problem solving techniques.
3. To teach the student to write programs in C and to solve the problems

Course Outcomes:

C0-1: To impart adequate knowledge on the need of programming languages and problem solving techniques.

CO-2:To develop an in-depth understanding of functional and logical concepts of C Programming.

C0-3: Recollect various programming construct like decision making, branching and looping to develop c programs

CO-4: Implement different Operations on arrays, functions, structures & unions

CO-5: Implement different Operations on pointers, and files.

Course Outline

Basic C Programming:

1. Write a program to print sample strings like "hello world", 'Welcome to C Programming" with different formats using escape sequences.
2. Write a Program to print different data types in 'C' and their ranges.
3. Write a Program to initialize, assignment & printing variables of different datatypes.

Operators

4. Write Program to demonstrate arithmetic operators. (+,-,*,/,%)

5. Write Program to demonstrate logical operators. (logical AND, logical OR)
6. Write Program to read radius value from the keyboard and calculate the area of circle andprint the result in both floating and exponential notations.
7. Write Program to calculate simple interest.
8. Write Program to convert temperature. (Fahrenheit -Centigrade and vice-versa).
9. Write Programs to demonstrate relational operators.(<,>,<=,>=,==,!=)
10. Write a program to check equivalence of two numbers using conditional operator.
11. Write a Program to demonstrate pre increment and post increment. (++a, a++ where a is a value to be initialized)
12. Write a Program to demonstrate pre decrement and post decrement. (-a, a-where a is a value to be initialized)
13. Write a program for computing the volume of sphere, cone and cylinder assume that dimension is integer's use type casting where ever necessary?

Decision Statements

14. Program to read marks of a student in six subjects and print whether pass or fail (using if- else).
15. Write a Program to calculate roots of quadratic equation (using if-else).
16. Program to calculate electricity bill. Read starting and ending meterreading.
    a. The charges are asfollows.
    b. No. of Units Consumed Rate in (Rs.)
    c. 1-100 1.50 per unit
    d. 101-300 2.00 per unit for excess of 100 units
    e. 301-500 2.50 per unit for excess of 300 units
    f. 501-above 3.25 per unit for excess of 500units

Switch operations

17. Write Program to perform arithmetic operations using switch case.
18. Write Program to display colors using switch case (VIBGYOR).
19. Write Program to display vowels and consonants using switch case.
20. Write Program to display names of days in a Week using switch case.

Basic Loop operations (Do the Following Programs Using for, while, do-while loops.)

21. Write program to calculate sum of individual digits of a given number.
22. Write program to check whether given number is palindrome or not.
23. Write program to print prime numbers in the given range.
24. Write program to display multiplication tables from 1 to 10 except 3 and 5.

Advanced loops

25. Write program to print the Fibonacci series for given 'N' value.
26. Write program to check whether a given number is a Fibonacci number or not.
27. Write program to read 2 numbers x and n then compute the sum of the Geometric Progression. 1+x+ x2+x3+---------- +xn
28. Write a program to Pascal Triangle.

Arrays, Strings & Functions

1-DArrays

29. Write program to store 10 elements in the 1-D array and print sum of the array.
30. Write program to print minimum and maximum elements in the 1-D array.
31. Write program to count no. of positive numbers, negative numbers and zeros in the array.
32. Write program to search the given element by using linear search.
33. Write program to sort the given elements using bubble sort technique.

2-DArrays

34. Write program to perform matrix addition and matrix subtraction.
35. Write program to perform matrix multiplication by checking the compatibility.
36. Write program to print the transpose of a matrix.

Strings

37. Write program to perform various string manipulations using built-in functions.
38. Write program to print the given strings in ascending order.
39. Write program to verify the given string is palindrome or not (without built-in functions, with using built-in functions).
40. Write program to concatenate two strings using arrays.

Functions

41. WAP to find sum of two numbers using functions.
42. WAP to find product of two numbers using functions without arguments, without return type.
43. WAP to find difference of two numbers using functions without arguments, with return type.
44. WAP to find sum of two numbers using functions with arguments & without return type.

Functions, Recursion and Pointers

45. Write program to swap two numbers using Call by Value and Call by Reference.
46. Write a program to calculate factorial, gcd using recursion and non-recursion functions.
47. Write program to perform arithmetic operations using pointer.
48. Write a program matrix addition using pointers.

Structures

49. WAP to create structure for an account holder in a bank with following Fields: name, account number, address, balance and display the details of five account holders.
50. WAP to find total marks of individual student & average marks of 10 students using structur.

File: (File operations using command line arguments)

51. WAP to copy the contents of one file to another file using command line arguments.
52. Write a program to reverse the first n characters in a file use command line arguments.

Reference Books:

1. Problem Solving and Program Design in C, 4th edition, by jeri R. Hanly and Elli B.Koffman.
2. E. Balaguruswamy, Programming in ANSI C

SDC1IT04 (P) WEB PROGRAMMING - LAB

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits :4 Hours Per Week:4 Total hours: 64

!Course Objectives

1. Understand and Practice web development
2. Get hands on interactive Html, CSS, JavaScript, Bootstrap PHP
3. Develop and design web application having images and animations

Course Outcomes:

C0-1: Understand the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.

C0-2: Design and develop web pages using CSS styles, internal and/or external style sheets.

C0-3:- Develop interactive web applications using HTML, CSS, JavaScript and XML.

C0-4:- To develop the ability to build efficient web based applications using PHP

C0-5:- To learn the basic constructs in PHP Programming.

Course Outline

Basics of HTML (1O Hrs.)

1. The Introduction of HTML Documents
2. Illustration of Body and pre Tag
3. Illustration of text Formatting & Text font tags

4. Illustration of background image and color
5. Illustration of List tags (Ordered, Unordered, Nested List)
6. Illustration of Tables tagsand Frame tags
7. Illustration of Hypertext Tag
8. Illustration of ImageTags
9. Illustrations of Forms and Attributes
10. Managing Forms
11. Create Simple Webpages using the above

CSS & JavaScript (22 Hrs.)

12. Illustrations of CSS properties and attributes
13. Illustration of selectors inCSS
14. lllustration of box model in CSS
15. Illustration of form validation
16. Create a webpage which displays "Hello World" with font size 20 pixels, bold format, in "Times New Roman" fond green in color using lnline CSS, Embedded CSS & External CSS.

JavaScript

17. Write a JavaScript program to find the area and circumference of a circle (use form)
18. Write a program to find the sum of the digits and reverse of a number(use form).
19. Write a JavaScript program using 3 dialog boxes(alert, prompt, confirm)
20. Write a JavaScript program for validating the Email registration form.
21. Write a JavaScript program to create a color palette and change the background color (using mouseover event).
22. Write a JavaScript program to change the background color of the document using an arrayof colors. (Array)
23. Validating Form Entries
24. Browser detection and Browser compatibility checking for website.

Basics of PHP (32 Hrs.)

25. Write a PHP program to store current date/time in a cookie and display the 'last visited on' date/time on the web page upon reopening of the same page.
26. Write a program to demonstrate session.
27. Create a PHP program to display the biodata of a person in a table format, by reading the personal details using an HTML page.
28. Create a table "product" with fields itemcode, itemname, unitprice using MYSQL. Write PHP program to insert records into the table and display the items in a table format.

29. Write a PHP program for insert, delete, update and display operation on account table. The account table contains fields such as account no, name and amount.
30. Create a MySQL table student with fields roll no, name, mark, grade. Write a PHP program to insert data and display the mark list of a student by accepting the register no of the student.
31. Create a login page using MYSQL database Integrating Web forms using PHP.
32. Programs implementing features of PHP Built-in Support for layout, grids, fluid grids, and responsive designs using Bootstrap.
33. Create a small website using PHP

SDC1IT0S (P) - OFFICE AUTOMATION & DESIGN LAB

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits: 4 Hours Per Week:4 Total hours: 64

!Course Objectives

1. Understand the need and working of Design Software's and its tools.
2. Learn the basic principles of design.
3. Learn to create interactive design content for Web & Social Media.

Course Outcomes:

CO-1: By learning the course, the students will be able · to perform documentation Gain proficiencyin identified technical skills, understand the process ofword,

CO-2: To create Social Media Advertisements.

CO- 3: To create informatics video content for presentation. To establish as an Interactive content designer for Digital media.

CO- 4: To design Website layout and elements.

Course Outline MS

Word (10 Hrs.)

1. Using word to create project certificate.
2. Creating project abstract Features to be covered: -Formatting Styles, inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.
3. Creating a Newsletter: Features to be covered: -Table of Content, Newspaper columns, Images from files and clipart, drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs

4. Creating a Feedback form- Features to be covered- Forms, Text Fields, Inserting objects, Mail Merge in Word

MS Excel (15 hrs.)

1. Creating a Scheduler - Features to be covered: Gridlines, Format Cells, Summation, auto fill, Formatting Text
2. Calculations - Features to be covered: - Cell Referencing, Formulae in excel - average, standard deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP
3. Performance Analysis - Features to be covered: - Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting
4. Cricket Score Card - Features to be covered: -Pivot Tables, Interactive Buttons, Importing Data, Data Protection, Data Validation
5. Create a Google Excel sheet with 4 sheets for displaying the internal mark of students

MS PowerPoint (10 hrs)

6. PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows, Hyperlinks, Inserting, Images, Clip art, Video, Objects, Tables & Charts
7. Master Layouts (slide, t emplate, and notes), Types of views (basic, presentation, slide sorter, notes etc.), Inserting - Backg round, textures, Design Templates, Hidden slides. Auto content wizard, Slide Transition, Custom Animation.
8. A PPT presentation with 10 slides

Illustrator/ lnkscape, Photoshop/GIMP (29 Hrs.)

Basic designing concept using Photoshop /GIMP& Illustrator/ lnkscape

9. Image processing, RAW image editing, Hue & Saturation, Levels & Curves, Filters
10. Photo editing, Different types of selection Techniques, Retouching a photograph
11. Masking & Slicing Tools
12. Visiting Cards.
13. Brochures
14. Logo designing (lllustrator/lnkscape)
15. Vector design- SVG Files Creation, Create SVG Animation (character, shapes, products in Illustrator/lnkscape)
16. Web layout design (Photoshop/GIMP)
17. Web Adds- GIF, SVG (Adobe Animate)
18. Create Animated Web banner

SEMESTER II

SDC21T06 PROGRAMMING IN JAVA

100 Marks [Internal: 20, External: 80] Examination : 2.5 Hours	Credits:4 Hours Per Week:4 Total hours: 64

CourseObjectives

1. Learn the OOPS Concept and use object oriented approach for solving real life problems
2. To learn the core Java language
3. To demonstrate skills in writing programs using exception handling techniques and multithreading.
4. To understand streams and efficient user interface design techniques
5. Develop GUI based applications usingjava

CourseOutcomes:

C0-1: To Familiarize Java programming Constructs

C0-2: To solve the inter-disciplinary applications using the Basic Principles of OOPs(Class, Object Inheritance, Polymorphism etc.) and Packages

C0-3: To familiarize the concepts of Threads, Synchronization, Files and facilitate students in handling exceptions

C0-4: To Learn Common abstract user interface components to design GUI in Javausing Applet, AWT and Swing

C0-5: Apply JDBC to provide a program level interface for communicating with database using java programming

Course Outline:

Module I (14 Hrs.)

Java Basics- Review of Object oriented concepts, History of Java, Java buzzwords, JVM architecture, Byte code, Features of Java, Language Components - Primitive Data Types, Keywords, variables, literals, Control structures - Decision Making Statements,Looping Statements,Jump Statements, Operators and Expressions - Casts and Conversions, Arrays. Simple java program, constructors, methods, Static block, Static Data, Static Method String and String Buffer Classes.

Module II (14 Hrs.)

Inheritance and Polymorphism: Basic concepts, Types of inheritance, Member access rules, Usage

of this and Super key word, Method Overloading, Method overriding, Abstract classes, Dynamic method dispatch, Usage of final keyword.

Packages and Interfaces: Defining package, Access protection, importing packages, Defining and Implementing interfaces, and Extending interfaces.

I/ 0 STREAMS: Concepts of streams, Stream classes - Byte and Character stream, reading console Input and Writing Console output, File Handling.

Module Ill (1O Hrs)

Exception Handling: Exception types, Usage of Try, Catch, Throw, Throws and Finally keywords, Built-in Exceptions, Creating own Exception classes.MULTI THREADING: Thread, Thread lifecycle, creating threads using Thread class and Runnable interface, Synchronization, Thread priorities, Inter Thread communication

Module IV(14 Hrs)

Applets -Hierarchy of Applet, Life Cycle of Applet, Applet tag, Display Graphics and Animation in Applet.AWT Controls - The AWT class hierarchy, user interface components- Labels, Button, Text Components, Check Box, Check Box Group, Choice, List Box, Panels - Scroll Pane, Menu, Scroll Bar. Working with Frame class, Colour, Fonts and layout managers.Event Handling- Events, Event sources, Event Listeners, Event Delegation Model (EDM), Handling Mouse and Keyboard Events, Adapter classes, Inner classes. Swings:lntroduction to Swings, Hierarchy of swing components. Containers, Top level containers - JFrame, JWindow, JDialog, JPanel, JButton, JToggleButton, JCheckBox, JRadioButton, JLabel,JTextField, JTextArea, Jlist, JComboBox, JScrollPane

Module V (12Hrs)

Swing and JDBC: JDBC: introduction, architecture, Drivers, connections, statements, result set and Meta data, Transactions, creating Java Packages.

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1. Java Complete Reference, Herbert Scheidt, Tata McGraw hill edition.
2. Programming in Java, E Balaguruswamy
3. Java Enterprise in a nutshell, David Flanagan, Jim Farley, William Crawford & Kris Mangnusson,OReilI
4. Head First Java, O'rielly publications
5. T. Budd (2009), An Introduction to Object Oriented Programming, 3rd edition, PearsonEducation, India.
6. J. Nino, F. A. Hosch (2002), An Introduction to programming and 00 design using Java, John Wiley & sons, New Jersey. 4. V. Daniel Liang

SDC2IT07-RELATIONALDATABASE MANAGEMENT SYSTEM

100 Marks [Internal: 20, External: 80] Examination : 2.5 Hours	Credits: 4 Hours Per Week:4 Total hours: 64

Course Objectives

1. Understand the need and working of Data Base and Data Base Management Systems.
2. Learn the basic principles of database models and database design.
3. To understand essential DBMS concepts such as: database security, integrity and normalization.
4. Learn the basics of RDBMS and data manipulation using SQL.
5. To study PUSQLlanguage

Course Outcomes:

C0-1:Describe the fundamental concepts of database management systems

C0-2: Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.

C0-3: Improve the database design by normalization.

C0-4: populate relational database and formulate SQL queries on data

C0-5: To learn PUSQL Programming Constructs (Trigger,Cursor,Stored Procedure)

Course Outline

Module I (12 Hrs.)

Introduction to database systems, Purpose of Database System, File Systems Versus a DBMS, View of data - Data abstraction, Data models, Instances and Schemas, Query Processor, Data Independence, Database Languages and Interfaces, Database architecture and Three Level Architecture, Database users and Administrators

Module II (12 Hrs.)

Entity-Relationship Model - Conceptual Data Models for Database Design Entity Relationship Models, Concept of Entity, Entity Sets, Relationship Sets, Attributes, Domains, Constraints, Keys, Strong and Weak Entities, Concepts of EER, Relational Data Model - Introduction to the Relational Model Relations, Domains and Attributes, Tuples, Keys. Integrity Constraints over Relations,

Enforcing Integrity constraints, Relational Algebra and Operations, Relational Calculus and Domain Calculus, Logical data base Design: ER to Relational.

Module Ill (12 Hrs.)

Relational Database Design - Relational database design Anomalies in a Database, Normalization Theory, Functional Dependencies, First, Second and Third Normal Forms, Relations with more thanone Candidate Key, Good and Bad Decompositions, Boyce-Codd Normal Form, Multivalued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form.

Module IV (13 Hrs.)

SQL Concepts: Basics of SQL, DDL, DML, DCL, Tables - Create, Modify and Delete table structures, Rename and Drop tables, defining constraints - Primary key, foreign key, unique, not null, check, IN operatorComputations done on table data - Select command, Logical operators, Range searching, Pattern matching, grouping data from tables in SQL, GROUP BY, HAVING clauses, Joins - Joining multiple tables, joiningtable to itself, Views - Creation, Renaming the column of a view, destroys view

Module V (15 Hrs.)

Program with SQL - Data types: Base and Composite, Attributes . Variables - Constants -Using set and select commands, Control Structures, IF, IF THEN ELSE, IF THEN ELSEIF, CASE. Loops: LOOP, EXIT, CONTINUE, WHILE, FOR, and FOREACH, Security - Locks, types of locks, levels of locks. Cursors - Working with cursors, Error Handling, developing stored procedures, create, alter and drop, passing and returning data to stored procedures, using stored procedures within queries, building user defined functions, creating and calling a scalar function, implementing triggers, creating triggers multiple trigger interaction.

ReferenceBooks:

1. JohnWatson, OCAOracle Database12clnstallationand AdministrationExamGuide
2. Paul Nielsen, Microsoft SQL Server 2000 Bible, Wiley Dreamtech India Pubs
3. CJ Date, Introduction to Database Systems, Addison Wesley.
4. Silberschatz, Korth, "Data base System Concepts", 4th ed., McGraw hill, 2006.
5. Raghu Ramakrishnan and Johannes Gehrke, Database Management Systems (3/e),McGraw Hill, 2003
6. https://docs.oracle.com

SDC21T08 {P) - PROGRAMMING IN JAVA - LAB

75 Marks [Internal: 15, External: 60] Examination: 2 hrs	Credits: 3 Hours Per Week: 3 Total hours: 48

!CourseObjectives

1. To practice programming in Java.
2. To learn GUI Application development in JAVA.
3. Capable to build database connectivity programs using JDBC

Course Outcomes

001: Able to write programs for solving real world problems

CO2: Apply the concepts of polymorphism and inheritance for problem solving in Java. Implement the concepts of packages and interfaces

003: Develop programs for exception handling, multi-threading and 10 application programs

004: Design GUI applications using Applet and swing components

COS: Build database connectivity programs using JDBC

Course Outline

Java Programs using Basic Language Constructs - (8 Hrs)

1. Simple Java programs like computing formulas expressions etc.
2. Write a program to find the distance between two points.
3. Write a program to find the sum, difference, product, quotient and remainder of two numbers passed as command line argument.
4. Read an array of 10 or more numbers and write a program to find the smallest element in the array b) Largest element in the array c) Second largest element in the array.
5. Write a program to perform base conversion
   a. Integer to binary b. Integer to Octal c. Integer to Hexadecimal
6. Write a program to verify DeMorgan"s Law
7. Write a program to merge two arrays.
8. Write a program to find the trace and transpose of a matrix.
9. Program to find the sum of the digits and reverse of a given number using class & objects
10. Program to find the volume of cube, rectangular box, cylinder using function overloading.

Inheritance, Polymorphism, Interface and Packages - (8 Hrs.)

11. Create a class student with methods to read and display the student details. Create a derived class result with methods to read marks of 5 subjects. Write a java program to display the total and grade of students, creating objects of class result.
12. Create a class Employee with ID, Name Designation and Dept. Create a child class salary with Basic, HRA, DA and Allowance . Write a program to compute the net salary assuming that HRA is 1250, DA, Allowance are 110% and 35% of the Basic salary.
13. Create an interface calculator having methods to perform basic arithmetic operation. Write a program to implement the interface to perform operation on integer and float values.
14. Create a class factorial with a method that accept a number and return its factorial in package P1. Using the factorial class, write a program to find the factorial of a number.

Exceptions, Threads, 1/0 Streams -- (10 Hrs.)

15. Write a program to handle arithmetic exception.
16. Write a multi thread java program for displaying odd numbers and even numbers up to a limit (Hint Implement thread using Runnable interface).
17. Write a multi thread java program for displaying numbers ascending and descending order
18. Write a program to copy a file to another. Pass the file names as command linearguments.

Applet, AWT, Swing -- (10 Hrs.)

19. Write JAVA program to paint like paint brush in applet.
20. Write JAVA program to display analog clock using Applet.
21. Write JAVA program to create different shapes and fill colors using Applet.
22. Write JAVA program that display the x and y position of the cursor movement using Mouse.
23. Write JAVA program that identifies key-up key-clown event user entering text in a Applet
24. Write JAVA program to build a Calculator in Swings
25. Write JAVA program that to create a single ball
26. Create an Applet for displaying smiling face.
27. Create an Awr application to add.remove items in a listbox.
28. Create an Awr application to select gender using radio buttons

Implement JDBC with MySQL Database - (12 Hrs)

29. Write a program to display IP address of the system.
30. Write a program to implement echo server(Aserverthatechothemessagestheclientsends
31. Create a database table employee (id, name, design, dept.). Write a program to list the
32. employees using JDBC.
33. Write a program to insert a new employee record to the above tableTo find the sum of command line arguments and count the invalid integers entered.

SDC21T09(P) RDBMS-LAB

75 Marks [Internal: 15, External: 60] Examination : 2 Hours	Credits: 3 Hours Per Week:3 Total hours: 48

!CourseObjectives

1. To explain basic database concepts, applications, data models, schemas &instances.
2. To demonstrate the use of constraints and relational algebra operations.
3. Describethe basics of SQL and construct queries using SQL.
4. To facilitate students in Database design
5. To study PUSQLlanguage

Course Outcomes:

CO-1:Applythe basic concepts of Database Systems and Applications .

C0-2: Use the basics of SQL and Formulate queries using SQL DMUDDL/DCL Commands in database creation and interaction.

C0-3: Design a commercial relational database system (Oracle, MySQL) by writing SQL using the system.

C0-4: Capable to build and Manage PUSQL Programs

Course Outline

Lab Exercises

1. Create a table employee with fields (EmplD,EName, Salary, Department, Age). Insert some records. Write SQL queries using aggregate functions for
   a) Display the total number ofemployees.
   b) Display the age of the oldest employee of each department.
   c) Display departments and the averagesalaries
   d) Display the lowest salary in employee table
   e) Display the highest salary in sales department;

2. A trading company wants to keep the data of their Order Processing Application using the following relations.

   Customer _Master

   Customer_Number - Primary Key

   Customer_Name - Not NULL

   Address -

   Pincode-

   Order_Master

   Order_Number- Primary Key

Order_date- Not NULL

Customer_Number- Refers Customer_master table

Order_amount - Not NULL

Order_Detail

Line_Number- Primary Key

Order_Number- Primary Key

ltem_No - Not NULL, Refers ITEM table

Quantity- Not NULL

ITEM

ltem_No - Primary Key

UnitPrice - Not NULL

SHIPMENT

Order_Number- Primary Key

Warehouse_No - Primary Key, Refers Warehouse table

Ship_Date - Not NULL with Integrity Check **WAREHOUSE**

Warehouse_No - Primary Key

City - Not NULL

a) Create the above tables by properly specifying the primary keys and foreign keys.
b) Enter at least five tuples for each relation.
c) Produce a listing : Cust_Name, No_of_orders, Avg_order_amount, where the middle column is the total number of orders by the customer and the last column is the average order amount for that customer.
d) List the Order_Number for orders that were shipped from **a//** the warehouses that the company has in a specific city.
e) Demonstrate the deletion of an item from the ITEM table and demonstrate a method of handling the rows in the ORDER_ITEM table that contains this particular item.

3. In this session you need to create database for an Employee management system of an ABC organization. The details about different tables are given below. According to that you can proceed further and create tables using PostgreSQUMySQL Create the following tables with the specified constraints:

Department:

Department Number- Primary Key

Department Name - Not NULL unique

Manager ID - Refers to EmployeeID of employee table.

Manager

Date of Joining - Not NULL.

Employee:

First Name - Not NULL

Middle Initials

Last Name - Not NULL

Employee ID- Primary Key

Date of Birth- Not NULL

Address

Gender - M or F

Salary - Range of 5000 to 25000

Date of Joining

Department Number - Refers to Department Number of Department table.

Department location:

Department Number - Refers to Department number of department table. Department

Location - Not NULL.

Department number & Department location are combined Primary Key

Project:

Project Name - Not NULL. Project

Number - Primary Key. Project

Location - Not NULL.

Department number - Refers to department number of Department table.

Works-on:

Employee ID - Not NULL refers to Employee ID of Employee table. Project

Number - Not NULL refers to Project number of Project table. Hours - Not

NULL.

Employee ID & Project Number are combined primary key.

Dependent:

Employee ID - Refer to employee table Employee ID field

Dependent Name - Gender- M or F

Date of Birth - Not NULL

Relationship - Not NULL

Now enter a few sets of meaningful data and answer the following queries.

a) List the department wise details of all the employees.
b) Find out all those departments that are located in more than one location.
c) Find the Iist of projects.
d) Find out the list of employees working on a project.
e) List the dependents of the employee whose employee id is 001

4. These sessions is similar to the previous one, but in this session, assume that you are developing a prototype database of the College library management system, for that you needto create the following tables:

Book Records Book

details

Member details and

Book issue details

Book Records: Accession Number ISBN Number

Books: ISBN Number Author Publisher Price

Members: Member ID Member Name Maximum Number of books that can be issued Maximum Number of days for which book can beissued

Book Issue: Member ID Accession Number Issue Date Return Date You

must create constraints, including referential integrity constraints, as appropriate.

Please note accession number is unique for each book. A book, which has no return date, can be considered as issued book. Enter suitable data into the tables. Now answer the following:

a) Insert data in all the three tables (use insert).
b) Insert appropriate description associated with each table and the column (use comment).
c) Display the structure of the tables.
d) Display the comments that you have inserted.
e) Using SELECT statement, write the queries for performing the following function:
    i. Get the list of all books (No need to find number of copies).
    ii. Get the Iist of all members.
    iii. Get the Accession number of the books which are available in the library.
    iv. On return of a book by a member calculate the fine on that book.
    v. List of books issued on 01-Jan-2005.
    vi. Get the Iist of all books having price greater than Rs. 500/-
    vii. Get the list of members who did not have any book issued at anytime.
    viii. Get the Iist of members who have not returned the book.
    ix. Display member ID and the list of books that have been issued to him/her from time to time.
    x. Find the number of copies of each book (A book accession number would be different but ISBN number would be the same).
    xi. Find the number of copies available of a book of given ISBN number.
    xii. Get the member ID and name of the members to whom no more books can be issued, because they have already got as many books issued as the number for which they are entitled.

5. This session is based on Lab 2 where you have created a library management system. In this session you have different query specification. You must create appropriate forms, reports, graphs, views and data filtering, use of multilevel report, etc. to answer these queries.
   a) Get the list of ISBN-Number, Book name, available copies of the books of which available copies are greater than zero.
   b) Get the list of ISBN-Number, Book name, Total copies, available copies of the book of whichavailable copies are greater than zero. List should be displayed in alphabetical order of book name.
   c) Get the list of ISBN number, Book name, Author, total copies, cost (cost is price totalcopies). List should be displayed in descending order of cost.
   d) Get the list of books issued to each member.
   e) Write query to know the maximum and average price of the books.
   f) Get the list of all existing members and the number of days for which a member is allowed to keep the book. Also find out the members who have got the maximum number of books issued.
   g) Get the list of member codes of those members who have more than two books issued.
   h) Find the detaiIs of the books presently issued to a member.
   i) Create the history of issue of a book having a typical accession number.
   j) To set the width of the book name to 35.
6. Create the following table and perform the necessary tasks defined below one by one. You must use the query tools/ SQL/ Reports/ Forms/ Graphs/Views/ using client/server wherever needed. Create the following table named customer

Column name	Type	size
Customer ID	Character	10
Name	Character	25
Area	Character	3
Phone	Numeric	7

   Insert the appropriate data into table and do the following.

   a) Update Phone numbers of all customers to have a prefix as your city STD Code
   b) Print the entire customer table
   c) List the names of those customers who have e as second letter in their names.
   d) Find out the Customer belonging to area "abc".
   e) Delete record where area is NULL.
   f) Display all records in increasing orderof name.
   g) Create a table temp from customer having customer-id, name, and area fields only
   h) Display area and number of records within each area (use GROUP by clause)
   i) Display all those records from customer table where name starts with "a" or area is "abc".
   j) Display all records of those where name starts with "a" and phone exchange is 55.

7. Answer the following queries using Library system as created earlier. You must create a view to know member name and name of the book issued to them, use any inbuilt function and operators like IN, ANY, ALL,EXISTS.
   a) List the records of members who have not been issued any book using EXISTS operator.

b) List the members who have got issued at least one book (use IN/ ANY operator).
c) List the books which have maximum Price using ALL operator.
d) Display Book Name, Member Name, and Issue date of Book. Create a view of this query ofthe currently issued books.

8. Create a table of Employee (emp_number, name, depLnumber, salary) and Department (depL number, depLname). Insert some records in the tables through appropriate forms having integrity checks. Add some records in employee table where department value is not present in department table. Now answer the following query:
a) Display all records from employee table where department is not found in department table.
b) Display records from employee table in a report format with proper headings. This report must also contain those records where department number does not match with any value of department table.
c) Display those employee records who have salary less than the salary of person whose
d) emp_number= A100.
e) Create another table: SalesData (RegionCode, City, SalespersonCode, SalesQty).
f) Display records where salesperson has achieved sales more than average sales of all sales persons of all the regions.

9. Create the following tables:
Order party: (Order number, Order date, customer code)

Order: Order number, Item code, Quantity

a) The key to the second table is order-number+ item-code
b) Create a form for data entry to both the tables.

10. Create a table shop with fields ltem_lD, ltem_Name, Price, and Quantity. Write a procedure 'sales' to update the quantity by accepting ltem_lD and Quantity as argument.
Write PostgreSQL block to invoke the procedure

11. Implement student information system

12. SQL scripts to display various reports like Result of an Examination, Salary Report, Sales Report, Sales reports grouped on Sales person or item, etc

13. Write simple PostgreSQL anonymous blocks for displaying whole numbers from 1 to 100,odd numbers from 1 to 100, even numbers from 1 to 100, positive whole numbers up to a given number, odd numbers from 1 to a given number, even numbers from 2 to a given number, Fibonacci numbers up to 100, Strange numbers up to 1000, factorials of the numbers from 1 to 10, etc.

14. Create a table product with the fields(Product_code primary key, ProducLName, Category, Quantity, Price). Insert some records Write the queries to perform the following.
a) Display the records in the descending order of Product_Name
b) Display ProducLCode, ProducLName with price between 20 and50
c) Display the ProducLName and price of categories bath soap, paste, washing powder

d) Display the product detaIls whose Quantity less than 100 and greater than 500
e) Display product names starts with's'
f) Display the products which not belongs to the category 'paste'
g) Display the product names whose second letter is 'a' and belongs to the Category 'washing powder'

15. Create a STUDENT table with following fields:

Field Name	**Type**	**Width**
RegNo	Character	10
Name	Character	20
Paper1	Numeric	3
Paper2	Numeric	3
Paper3	Numeric	3
Paper4	Numeric	3
Papers	Numeric	3
Total	Numeric	3
Result	Character	6
Grade	Character	1

Enter the RegNo, Name and Marks in 5 Papers of at least 10 students. Write a SQL program to process the records to update the table with values for the fields

Total (Paper1+Paper2+Paper3+Paper4+Paper5),

Result ("Passed" if total is greater than or equal to 50% of the total;

"Failed" otherwise), and

Grade ("A" if mark obtained is greater than or equal to 90% of the total mark, "B" if

mark obtained is greater than or equal to 75% of the total mark, "C" if mark

obtained is greater than or equal to 60% of the total mark,

"D" if mark obtained is greater than or equal to 50% of the total mark, and "F" if

mark obtained is less than 50% of the total mark).

Display a report in descending order of the total mark,showing the data entered into thetable along with the total marks, result and grade.

16. Prepare a salary report of the employees showing the details such as:
EmpNo, Name, Basic Pay, DA, Gross Salary, PF, Net Salary, Annual Salary and TaxFor this

purpose, create a table named SALARIES having the following structure.

Field Name	Type	Width
EmpNo	Character	10

Name	Character	20
Basic	Numeric	6

Enter the records of at least 10 employees. Use the following information for calculating the details for the report:

DA is fixed as the 40% of the basic pay. PF

is fixed as 10% of the basic pay.

Gross Salary is (Basic Pay + DA). Net

Salary is (Gross Salary - PF)

Annual Salary is (12 * Net Salary)

Tax is calculated using the following rules:

If annual salary is less than 100000, No Tax

If annual salary is greater than 100000 but less than or equal to 150000, then the taxis 10% of the excess over 100000.

If annual salary is greater than 150000 but less than or equal to 250000, then the taxis 20% of the excess over 150000.

If annual salary is greater than 250000, then the tax is 30% of the excess over 250000.

17. Generate a Hospital information system that can generate the following reports:

a) Patients who belongs to in-patient category

b) Patients who belongs to out-patient category

For this purpose, create a table named HOSPITAL having the following structure.

Field Name	**Type**	**Width**
PatientlD	character	10
Name	character	20
Age	numeric	3
Doctor	character	20
PatientType	character	15
ConsultCharge	numeric	6
BloodTestCharge	numeric	6
XrayCharge	numeric	6
OtherCharges	numeric	6
TotalAmount	numeric	6

Enter the records of at least 10 patients. Write a SQL program to display the report in the ascending order of patient name.

18. Using the Hospital table created in Lab 16, generate a Hospital information system that can generate the following reports:
    a. Patients undergone blood test.
    b. Patients who have taken X-Rays

19. Design a Hotel Bill calculating system that generates hotel bills for the customers.

20. Design an Electricity Bill Report generating system that generates electricity bills details of customers for a month.

21. Generate a Library Information System that generates report of the books available in the library.

22. Programs involving multiple tables.

23. Create a table named Elec_Bill (CusLNo, CusLName, Units_Consumed, Bill_Amt). Set bill_amt as null. Write a PostgreSQL function to calculate the Bill_Amt by accepting CusLNo and Units_Consumed. Write a PostgreSQL block to update the calculated amount by invoking the function.

24. Create two tables

    Book (BooklD, BookName, Author, Publisher) and

    Book_Del (Date_of_Del, BooklD, BookName)

    Create and application to generate a trigger before deleting a record from book table. The trigger procedure should insert the deleted BooklD and BookName along with current date to the table Book_Del.

PUSQL Programs

a. PUSQL Program to Reverse a String
b. Pl/SOL Program for Palindrome Number
c. PUSQL Program to Swap two Numbers
d. PUSQL Program for Armstrong Number
e. PUSQL Program to Find Greatest of Three Numbers
f. PUSQL Program to Print Patterns
g. PUSQL Program involving cursors
h. PUSQL Program involving triggers
i. PUSQL Program Stored procedures, stored procedures with parameters

SDC2IT10 (Pr) MINI PROJECT

100 Marks [Internal: 20, External: 80] Exami nation: 2.5 Hours	Credits:4 Hours Per Week:4 Total hours: 64

Course Objectives

1. To learn hand on experience of industrial programming skills
2. To provide practical knowledge on software development process
3. To give an awareness about Industrial practices

Course Outcomes:

C0-1 Acquire the basic knowledge about handling real world projects
C0-2: Apply academic skills in industrial circumstances
C0-3: Able to gain practical knowledge and implement all learning concepts in form of an application .

The main objective of this project course is to provide learners a platform to demonstrate their practical and theoretical skills gained during Semester 1 and Semester2 of study in First year of B.Voc Mobile Application Development Programme satisfying their job role Intern Developer / Intern Web Developer. Topics selected should be complex and large enough to justify as First year of B.Voc Mobile Application Development Programme Mini project. The courses studied by the students during the First year of B.Voc Mobile Application Development Programme provide them the comprehensive background knowledge on diverse subject areas in computer science suchFront end and backend development etc., which will be helping students in doing project work. Students can also undertake group project to learn how to work in groups. However, the maximum number of students in a group must be limited to 4. For internal evaluation, the progress of the student shall be systematically assessed through *two or three* stages *of evaluation at periodic intervals.* A bonafied project report shall be submitted in hard bound complete in all aspects.

Industrial Visit:

Guide Lines:

Minimum one day visit to National research Institutes, Laboratories, and places of scientific Importance or Software Companie s.

OR

One week Industrial Training/ internship at any software firms/ Research Labs The Industrial visit should be done in first or second semester.

A 10 - 20 page Industrial visit/ Training report have to be submitted with certificate from industry/ institute, sufficient photos and analysis along with Project for evaluation in the second semester.

SEMESTER III

A11 BASIC MATHEMATICS AND GENERAL AWARENESS

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 Hours Per Week:4 Total hours: 64

Course Objectives

1. Understand and explain the importance of critical thinking.
2. To overcome or solve the problems occurring in our everyday life.
3. To understand basic of computer and relative concepts.
4. To make the students understand the various services offered by various banks and insurance companies

Course Outcomes:

CO-1: Apply numerical and reasoning skills in competitive examinations.

CO-2: Understand some basic concepts of research and its methodologies.

CO-3: Bridge the fundamental skills of computers with the present level of knowledge of the students.

CO-4: To train and equip the students with the skills of modern banking and insurance.

Course Outline:

Module - 1: Numerical Ability (12 Hours)

Data Interpretation (Bar Graph, Line Chart, Tabular, Pie Chart), Inequalities/ Quadratic Equations, Number Series, Simplification and Approximation, Percentages, Average, Ratio and Proportion, Partnership, Profit and Loss, Simple Interest & Compound Interest, Problem on Ages, Data Sufficiency, Speed, Distance and Time, Work, Time and Wages, Probability, Permutation and Combination.

Module-2: Reasoning Ability (15 Hours)

Advance Puzzles, Seating Arrangements, Distance and Direction, Blood Relations, Syllogism, Order and Ranking, Coding-Decoding, Machine Input-Output, Alphabet and Number Series. Analogy, Passage and Conclusions, Statement and Conclusion, Statement and Assumptions, Statement and Arguments, Decision Making

Module-3: Research Aptitude (12 Hours)

Research: Meaning, Types, and Characteristics, Positivism and Post positivism approach to research, Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative

methods, Steps of Research, Thesis and Article writing: Format and styles of referencing, Application of ICT in research, Research ethics.

Module - 4: Computer Aptitude (15 Hours)

History of computers, Basics of computer's hardware and software, Short Cut Keys, operating system, Internet, Networking, Basics of MS-Office: MS-word, MS-Excel, MS-PowerPoint, Database, Hacking, Security Tools and Viruses.

Module - 5: General/ Financial Awareness (16 Hours)

History of Banking in India, Banking and Financial Reforms in India, Financial Institutions in India, Functions of Banks,Types of Bank Accounts, Types of Loans, Types of Mortgages, Types of Cheque & Cards, Foreign Banks in India, Fund Transfer Services, Structure of Banking Industry, Principles of Insurance, Credit & Debit, Mutual Funds, Bombay Stock Exchange (SSE), National Stock Exchange (NSE), Banking Ombudsman, Inflation, Money Laundering & Anti-Money Laundering, Green Banking, RBI Act, 1934.

Text Book References:

1. Quantitative Aptitude for Competitive Examinations - Quantitative Aptitude R.S Agrawal, S.Chand,ISBN: 9789352534029, 9789352534029
2. Edition: Revised & Enlarged Edition, 2020
3. Verbal Reasoning (Useful for Various Competitive Exams), Dr. LAL & KUMAR, ISBN: 978- 81-7482-581-0
4. Teaching and Research aptitude, Upkar's Publications, Pratiyogitha Darpan,ISBN: 97874822154.
5. Banking Awareness (English, Paperback, unknown), Arihant Publishers, ISBN: 9789311124667,9789311124667

A12 PROFESSIONAL BUSINESS SKILLS

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 Hours Per Week:4 Total hours: 64

Course Objectives

1. To update and expand basic Informatics skills of the students
2. To equip the students to effectively utilize the digital knowledge resources for their study

Course Outcomes:

C0-1: Able to become a professional by acquiring various soft skills needed for business success

C0-2: Explore the world of e-learning and also the various consequences of Cyberspace and crimes.

C0-3: Application of data analysis and the role of artificial intelligence in e-business.

C0-4: Apply the skills of digital marketing and e-commerce.

Course Outline:

Module I **(15 Hrs)**

Professionalism: Meaning -Definition - Characteristics - Traits and Qualities of a good professional - Professionalism in business - Professional Skills: important soft skills for business success- Professionalism in Communication : Verbal Communication: Professional Presentation - Different Presentation Postures- Written Communication : Email - Significanceof Email in business

- Email etiquette: format- rules - dos and don'ts-Technical Documentat ion: Standards -Types

Module II **(12 Hrs)**

E-Learning: Introduction of electronic learning - benefits and drawbacks of e-Learning - Online education - Digital age learners - Knowledge resources on internet - E-books, Audio, Video and other means for e-learning- Introduction to e-content development and tools - Online libraries - MOOCs - Thee-Learning as a service Industry - major technologies usedin e-earning- different approaches for e-Learning delivery- E-learning in India

Module Ill **(18 Hrs)**

Business Data Analysis: Features of New Generation Computers - Concept of data analysis- Business Data Analysis - Data Analyst - Types of analysts - organization and source of data, importance of data quality, dealing with missing or incomplete data- Social Networking Analysis - Big Data Analysis - Role of Data Scientist in Business & Society - Role of Artificial Intelligence and Intelligent Agents in e-business - Ethical and Legal considerationsin Business Analytics

Module IV (15 Hrs)

Socio - Cyber Informatics: IT and society - Digital Divide - Digital Natives-Cyber space - New opportunities and threats - Cyber ethics - Cyber-crimes -Types - Cyber Laws - Organizations related with cyber laws-Cyber addictions - Information overload - Health issues - e-waste andGreen Computing -Recent E-governance initiatives in India

Module V (20 Hrs)

Digital Marketing: Introduction to Digital Marketing Environment -meaning & Concept -Need for digital marketing - Advantages and disadvantages of digital marketing -Trends indigital marketing- Types of digital marketing - Business models in digital marketing Business to Business (B2B), Business to Customer (B2C), Customer to Customer (C2C), Business to Employees (B2E), Business to Government (B2G) - Online advertising -types ofonline advertising - Top e-commerce websites around the world and its scenario in India. PPC (Pay per Click) advertising - Search engine Analytics - search engine ads - social media channels and ads

References Books:

1. Professional Business Skills - Lee Pelitz 2nd Edition
2. Peter Norton, Introduction to Computers, Tata McGraw Hill Private Limited, New Delhi,
3. Alan Evans, ITL ESL, Leslie Lamport, Dolores Etter, Darren George,
4. Kenneth C Laoudon, Gary Rogers, Rainer Handel, INFORMATICS-Technology in Action,
5. Pearson Education, Delhi, 2009.
6. V.Rajaraman, Introduction to Information Technology, PHI Learning Private
7. Limited,New Delhi, 2009.
8. Godfrey Parkin,DigitalMarketing:Strategies for online success,New Holland
9. publishers Ltd,2009
10. Damian Ryan,Understanding Digital marketing:Marketing strategies for Engaging
11. the Digital generation,Kogan page,3rd Edition,2014
6. Jonah Berger,Contagious Why things catch on,Simon&Schuster,2013
7. Turban E, Armson, JE, Liang, TP &Sharda, Decision support and Business
12. Intelligence Systems, 8thEdition, John Wiley & Sons, 2007
13. Frank J. Ohlhorst, Big Data Analytics, 1st Edition, Wiley, 2012.
14. 10.Efraim Turban, Ramesh Sharda, Jay Aronson, David King, Decision Support andBusiness
15. Intelligence Systems, 9th Edition, Pearson Education, 2009
16. 11.Microsoft Office 2007 Business Intelligence- Reporting, Analysis, and Measurement
17. from the Desktop, Doug Harts, TATA McGraw-HiII Edition, 2008

1. Data Mining for Business Intelligence: Concepts, Techniques, and Applications in

18. Microsoft Office Excel with XLMiner, GalitShmueli, Nitin R. Patel, Peter C. Bruce, Wiley
19. Publication, 2010

SDC3IT11 SOFIWARE ENGINEERING

75 Marks [Internal: 15, External: 60] Examination 2.5 Hours	Credits:3 Hours Per Week:3 Total hours: 48

CourseObjectives

1. To apply software engineering knowledge and methods
2. Ability to identify the needs of software development cycle.
3. Understand and identify various software designing problems, and solve these problems by designing and selecting software engineering models, criteria, strategies, and methods.
4. Analyse various communication methods and skills to communicate with their team mates to conduct their practice-oriented software projects.

Course Outcomes:

00-1 : Understand the basic concepts of software engineering techniques.

00-2 : Apply Techniques of Test Design.

00-3 : Understand Test Design Management.

00-4 : Analyze the various software testing approaches.

Course Outline:

Module 1 (1O Hrs.)

Introduction to software Engineering, Software Components, Software Characteristics, software Applications, Software engineering processes, Similarity and differences from conventional engineering processes Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, WIN-WIN spiral model, Formal method model, Time boxing model, Incremental model, Rapid Application Developmental(RAD) Model, Component based Development Model, Evolutionary development models, Iterative Enhancement Models.

Module 2 (10 Hrs.)

Requirement Engineering Process: Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modelling, Data flow Diagrams, Entity Relationship Diagrams, Decision Tables, SRS Document, IEEE Standards for SRS. Software Quality Assurance (SQA): Verification and Validation, SQA Plans, software quality Frameworks, ISO 9000 models.

Module 3 (1O Hrs)

Basic Concept of Software Design,ArchitecturalDesign: Software Architecture, Data Design,

Architectural Styles, Mapping Requirements into Software Architecture Low Level Design: Modularization, Coupling and Cohesion Measures.

Module 4 (8 Hrs.)

Top-Down and Bottom-Up Testing Strategies: White Box Testing, Black Box Testing, Maintenance, Categories of maintena nce: Preventive, Corrective and perfective maintenance, cost of maintenance, Software Reengineering, Reverse Engineering.

Module 5 *(J* Hrs.)

Software configuration management Activities: Change control Process, Software Version Control, An Overview of CASE Tools Esti mation.

References:

1. R.S Pressman, Software EngineeringA Practitioners Approach, McGraw Hill.
2. James Peter, Software Engineering, an Engineering Approach, John Wiley.
3. Rajib Mall, Fundamentals of Software Engineering, PHI Publication.
4. K.K Agarwal and Yogesh Singh, Software Engineering, New Age International Publishers.
5. Carlo Ghezzi, M Jarayeri, D Manodrioli, Fundamentals of Software Engineering,PHI PubI
6. Pankaj Jalote, Software Engineering, Narosa Publication.

SDC3IT12 PROGRAMMING IN PYTHON

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credit s:4 HoursPerWeek:4 Total hours: 64

!Course Objectives

1. Expertise Python Programming
2. Learn web based applications for mobile devices

Course Outcomes:

C0-1:Explain basic principles of Python programming language
C0-2: Implement object oriented concepts
C0-3: Implement database and GUI applications.
C0-4: Implementing Server side programming using Python Server side scripting.
C0-5: Explaining the features of displaying data from MYSQL in webpage

Course Outline

Module 1 (10 Hrs)

Introduction to Python Features, Python interpreter and Idle, data types, strings, variables, operators and expressions, control flow tools, loops, break, continue, data structures, Input and Output, functions .

Module II (14 Hrs)

Introduction to Object Oriented Concepts in Python Class, class variable, data member, function overloading, instance variable, inheritance, instance, instantiation, method, object, operator overloading, exception handling.

Module Ill (15 Hrs.)

- Introduction to Mobile Web Introduction to HTML, Basic formatting tags: heading, paragraph, underline

break, bold, italic, underline, superscript, subscript, font and image. Different attributes like align, colour, bgcolor, font face, border, size. Navigation Links using anchor tag: internal, external, mail and image links. Lists: ordered, unordered and definition, Table tag, **HTML** Form controls: form, text, password, text area, button, checkbox, radio button, select box, hidden controls,Frameset and frames.

Module IV (10 Hrs.)

Server side programming using Python Server side scripting CGI role of Web server - XAMMPP /WAMP (choose any one of these servers) - Python server side script XAMMPP/WAMP - capturing form data - validation - processing data - exchange of data between form and server

ModuleV (15 Hrs)

Python MySQL Database Integration integration: Features of MySQL, data types, Introduction to SQL commands SELECT, DELETE, UPDATE, INSERT. Python functions for MySQL data base operations - database connection, selection, query, fetching results Insertion and Deletion of data using Python Displaying data from MYSQL in webpage

ReferenceBooks:

1. David M.Beazly, Python Essential Reference
2. Mark Lutz, Programming Python
3. Python Pocket Reference: Python in your pocket, Mark Lutz

SDC3IT13 COMPUTER NETWORKING CONCEPTS

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 HoursPerWeek:4 Total hours: 64

Course Objectives

1. To develop an understanding of computer networking basics.
2. To develop an understanding of different components of computer networks, various protocols, modern technologies and their applications.

Course Outcomes:

CO-1: Recognize the technological trends of Computer Networking.
CO-2: Discuss the key technological components of the Network.
CO-3: Evaluate the challenges in building networks and solutions to those
CO-4: Analyze, specify and design the topological and routing strategies for an IP based networking infrastructure
CO-5:-Havea working knowledge of datagram and Network Security

Course Outline

Module I (10 Hrs)

Introduction to Computer networks, Network Technologies- Classi fication- Network Topologies, Network Models, Layered model-OSI and TCP/IP models, Transmission media, Physical layer, Analog and Digital data, Periodic-aperiodic signals, Composite signals,Transmission Modes, Digital data transmission, Different Linecoding techniques, digital data toanalog-ASK, FSK, PSK QAM Multiplexing techniques.

Module II (10 Hrs)

Data link layer, Error detection and correction- Types of errors, Error detection techniques -Vertical redundancy check (VRC), longitudinal redundancy Check (LRC),Checksum, Cyclic Redundancy Check (CRC), Error correction, Hamming code, Line discipline, Flow control-Stop & wait, Sliding window, Error control, HLDG, Multiple Access, Random Access, ALOHA, Polling, Wired **LANs,** Switching -Circuit, Packet and Message switching, SONET, Frame Relay, ATM, IP and related protocols ICMP, NAT, ARP and RARP, TCP/IP, IEEE Ethernet standards.

Module Ill (15 Hrs)

Network layer- Networking devices, Addressing - Physical addressing IPv4 & IPv6, Network Address Translation (NAT), Internet protocols, Datagram, Address Mapping, Error reporting and multi casting Delivery, Forwarding and Routing algorithms, Distance Vector Routing, Link

StateRouting, OSPF, Transport layer- UDP, TCP, Congestion control techniques, QoS, Application Layer-email, www, http, SNMP & CMIP.

Module IV (l 5 Hrs)

Wireless LAN- IEEE 802.11 Architecture, Generations of Cellular Network, DSSS, FHSS, Medium Access, CSMS/CA, Back-off algorithm, IEEE 802.11 Framing, Cellular Telephone Network-Frequency Reuse, Mobility Management, MAC Techniques- FDMA,TDMA, CDMA, Wi-Max, PAN, Satellite Network, Latest technologies in Wireless and communication and Remote Sensing

Module V (14 Hrs)

Network Security-Cryptography, Cryptographic types and Algorithms, Digital Signature, VPN, Firewalls, Introduction to Berkeley sockets, TCP and UDP socket functions, sockets and Unix signals, client-server socket implementation, Datalink access, programming libp cap.

Reference Books:

1. Andrew S. Tanenbaum, "Computer Networks", Fifth Edition, Pearson Education India, 2013.
2. Peterson and Davie, "Computer Networks, A Systems Approach", 5th ed., Elsevier, 2011.
3. 3. W. Richard Stevens, Bill Fenner and Andrew Rudoff, "Unix Network Programming", Volumes 1 and 2, Third Edition, Addison-Wesley Professional, 2003.
4. Michael Donahoo, Ken Calvert, Pocket Guide to TCP/IP Socket Programming in C, Morgan Kaufmann Series in Networking,2000.

SDC3IT14 (P)- DATA STRUCTURE USING JAVA- LAB

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 HoursPerWeek:4 (1 Theory +3 Labs) Total hours: 64

Course Objectives

1. To familiarize the students with language environment and to develop the programs for solving the problems using function overloading, constructors andobjects.
2. Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.

Course Outcomes:

C0-1: Ability to identify the appropriate data structure for given problem.

C0-2: Graduate able to design and analyze the time and space complexity of algorithm or program.

C0-3: Ability to effectively use compilers includes library functions, debuggers and trouble shooting.

C0-4: Illustrate the programs using DS

Course Outline

Practical 1 (20 Hrs)

1. Write JAVA programs to implement recursive and non-recursive
   i) Linear search
   ii) Binary search
2. Write a JAVA programs to
   implementi.Bubble sort
   ii. Selection
   sortiii.Quick sort
   iv.Insertion sort
   v.Merge sort
   vi.Heap sort

Practical 2 (24 Hrs)

3. Write a JAVA programs to implement the following.
   i.To implement array operations: insert anddelete ii.
   To perform push and pop operations for stack
   iii. To perform insert and delete operations for linear queue. iv.To perform insert and delete operations for circular queue. v.To perform linear and binary searching, pattern matching etc.
   vi.Write JAVA programs to implement the deque (double ended queue) ADT using a doublylinked list and an array

Practical 3 (20 Hrs)

4. Implementing binary tree and traversals
5. Implementing binary search trees

SDC31T15 (P) PROGRAMMING IN PYTHON - LAB

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 HoursPerWeek4 Total hours: 64

c ourseObjectives

1. Problem solving using Python
2. Programming Capability

Course Outcomes:

CO- 1: Write, test, and debug simple Python programs.

CO- 2: Implement Python programs with conditionals and loops.

CO- 3: Develop Python programs step-wise by defining functions and calling them.

CO- 4: Use Python lists, tuples, dictionaries for representing compound data.

CO- 5: Read and write data from/to files in Python

Course Outline

Practical -1 (20Hrs.) - Exercise 1: Programs on basic control structures & loops.

1. Write a program for checking the given number is even or odd.
2. Using a for loop, write a program that prints the decimal equivalents of 1/2, **1**/3, 1/4 ... 1/10
3. Write a program for displaying reversal of a number.
4. Write a program for finding biggest number among 3 numbers.
5. Write a program using a while loop that asks the user for a numbe,rand prints a countdown from that number to zero.

Exercise 2: Programs on operators & 1/0 operations.

6. Write a program that takes 2 numbers as command line arguments and prints its sum.
7. Implement python script to show the usage of various operators available in python language.
8. Implement python script to read person's age from keyboard and display whether he is eligible for voting or not.
9. Implement python script to check the given year is leap year or not.

Practical II (20Hrs.) - Exercise 3: Programs on Python Script.

10. Implement Python Script to generate first N natural numbers
11. Implement Python Script to check given number is palindrome or not.
12. Implement Python script to print factorial of a number.
13. Implement Python Script to print sum of N natural numbers.

14. Implement Python Script to check given number is Armstrong or not.
15. Implement Python Script to generate prime numbers series up to n

Exercise 4: Programs on Lists.

16. Finding the sum and average of given numbers using lists.
17. To display elements of list in reverse order.
18. Finding the minimum and maximum elements in the lists.

Practical Ill (24 Hrs.) - Exercise 5: Programs on Strings.

19. Implement Python Script to perform various operations on string using string libraries.
20. Implement Python Script to check given string is palindrome or not.
21. Implement python script to accept line of text and find the number of characters, number of vowels and number of blank spaces in it.

Exercise 6: Programs on functions.

22. Define a function max_of_threeO that takes three numbers as arguments and returns the largest of them.
23. Write a program which makes use of function to display all such numbers which are divisible by 7 but are not a multiple of 5, between 1000 and 2000.

SDC3IT16 (P) COMPUTER NETWORKING- Lab

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 HoursPerWeek:4 Total hours: 64

!CourseObjectives

1. To develop an understanding of computer networking basics.
2. To develop an understanding of different components of computer networks, various protocols, modern technologies and their applications.

Course Outcomes:

CO-1: Recognize the technological trends of Computer Networking.
CO-2: Discuss the key technological components of the Network.
CO-3: Evaluate the challenges in building networks and solutions to those
CO-4: Analyze, specify and design the topological and routing strategies for an IP based networking infrastructure
COS:Have a working knowledge of datagram and Network Security

Course Outline:

Practical 1 (10 Hrs) - Exercise 1

1. Configure IP address for nodes (IP4 and IP6).
2. Create network patch code for cross-over/straight-through cabling.

Practical 2 (20 Hrs) - Exercise 2

3. Install and configure switches/routers to provide network/internet connectivity.
4. Install and enable proxy server, setup NFS.

Practical 3 (20 Hrs) - Exercise 3

5. Install and configure CIFS for Windows/Linux resource sharing.
6. Implement socket client-server applications
7. Enable telnet, ftp, rsh, ssh and other remote computing technics for both Linux and Windows environments.

Practical 4 (14 Hrs) - Exercise 4

8. Capture packets from network and analyze them.
9. Configure DNS on Windows and configure WindowsServer Active Directory Servicesand test authentication for network users
10. Implement DHCP Service in yourlab.

SEMESTER IV

A13 ENTREPRENEURSHIP DEVELOPMENT

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 HoursPerWeek:4 Total hours: 64

Course Objectives

1. To familiarize the students with the concept of entrepreneurship.
2. To identify and develop the entrepreneurial talents of the students.
3. To generate innovative business ideas in the emerging industrial scenario

Course Outcomes:

CO-1: Able to understand the nature of entrepreneurship and the financial assistance and guidance from the government.

CO-2: Confirm an entrepreneurial business idea

CO-3: Explore entrepreneurial leadership and management style.

CO-4: Confidence in Setting up of Industrial unit.

Course Outline:

Module I (15 Hrs)

Concepts of entrepreneur: Entrepreneur- Definitions - Characteristics of entrepreneur Classification of Entrepreneur-Entrepreneurial traits -Entrepreneurial functions - role of entrepreneurs in theeconomic development - Factor effecting entrepreneurial growth -Entrepreneurship - Meaning - definition - Entrepreneur vs lntrapreneur - Women Entrepreneurs - Recent development - Problems - Entrepreneurial Development Programmes- Objectives of EDP- Methods of training- Phases of EDP.

Module II (17 Hrs)

Institutional support and incentives to entrepreneurs- Functions of Department of lndustriesand Commerce (DIC) - Activities of Small Industrial Development Corporation (SIDCO)-Functions of National Small Industries Corporation(NSIC)- Functions of Small Industries Development Bank of India (SIDBI) - Khadi Village Industry Commission (KVIC)-Small Industries Service Institute (SISl)- Functions and services of Kerala Industrial Technical Consultancy Organisation (KITCO)-Activities of Science and Technology EntrepreneurshipDevelopment Project (STEDP)-Strategies of National Entrepreneurship Development Board(NEDB) -Objectives of National Institute for entrepreneurship and small business development (NIESBUD) - TechnoPark-Functions of techno park Incentives- Importance Classification of incentives - Subsidy- Types of Subsidy.

Module Ill (15 Hrs)

Micro Small and Medium Enterprises- Features- Objectives- Importance- Role of SME in theeconomic development- MSME Act 2006- Salient features- Credit Guarantee Fund Trust Scheme for MSMEs - Industrial Estates-Classification-Benefits- Green channel- Bridge capital- Seed capital assistance-Margin money schemes - Single Window System- Sickness Causes - Remedies- Registration of SSI.

Module IV (18 Hrs)

Setting up of Industrial unit-(Only Basic study) Environment for Entrepreneurship - Criteriafor selecting particular project- Generating project ideas-Market and demand analysisFeasibility study- Scope of technical feasibility- Financial feasibility- Social cost-benefitanalysis-Government regulations for project clearance-Import of capital goods- approval offoreign collaboration-Pollution control clearances- Setting up of micro small and mediumenterprises-Location decision- Significance.

Module V (15 Hrs)

Project Report - Meaning-Definition - Purpose of project reports-Requirements of goodreport - Methods of reporting - General principles of a good reporting system - Performa of aproject report -

Sample project report. (The preparation of sample project report shall betreated as an assignmentof this course).

Reference Books:

1. Shukla M.B. Entrepreneurship and small Business Management,Kitab Mahal Allahabad.
2. Sangram Keshari Mohanty, Fundamentals of entrepreneurship,PHl,New Delhi.
3. Nandan H. Fundamentals of Entrepreneurship,PHI, NewDelhi.
4. Small-Scale Industries and Entrepreneurship, Himalaya Publishing ,Delhi
5. C.N.Sontakki,Project Management,Kalyani Publishers, Ludhiana.
6. Sangam Keshari Mohanty. Fundamentals of Entrepreneurship, PHI, NewDelhi
7. Peter F. Drucker- Innovation and Entrepreneurship.
8. Vasanth Desai, Small Business Entrepreneurship, Himalaya Publications.
9. MSME Act 2006.

A14 PUBLIC HEALTH, SANITATION & SAFETY

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 Hours PerWeek:4 Total hours: 64

Course Objectives

1. To familiarize the students with the concept of entrepreneurship.
2. To identify and develop the entrepreneurial talents of the students.
3. To generate innovative business ideas in the emerging industrial scenario

Course Outcomes:

After learning the course, the students should be able to:

C0-1: Identify the diseases associated with occupation
C0-2: Identify the hazard in industrial area and propose preventive measures
C0-3: Manage safety in industries and propose safety measures and PPE
C0-4: Demonstrate the hygiene and sanitation procedures
C0-5: Demonstrate the microorganism responsible for the disease and their control

Course Outline:

Module 1 (12 Hrs)

Health-Physical, Mental, Social - Positive health- Quality of life Index.

Healthprogrammes: Healthprogrammes controlmeasures in operation in India- Tuberculosis, poliomyelitis, leprosy, filariasis and diphtheriaHealth situation in India- Health Problems-Primary health care in India -PHCs National Programmes for elimination of diseases. -Water borne diseases and air borne diseases. Methods of disease transmission .

Module 2 (12 Hrs)

Sanitation: Definition and meaning. Micro bial growth pattern and factors affecting microbial proliferation.Sewage **Disposal:** disposal of sewage and night soil-treatment of sewage system **Wastedisposal-** Disposal of solidwaste; Waste water handling :Pre-treatment, primary treatment, secondary treatment, tertiary treatment and disinfection. **Water** - supply sources- impurities and purification of water.

Module 3 (14 Hrs)

Contamination: Sources of contamination and protection against contamination.
Methods of killing micro-organism-Useofheat, chemicals and **radiation.Methods of inhibiting microbial growth-** Use of refrigeration, chemicals, dehydration and fermentation **Principles of hygiene:** General principles of hygiene-its relation to food preparation and food handling habits.

Personnel hygiene- Meaning & importance; Hygienic practices of employees; personal hygiene and contamination of food Products-Sanitation Training and Education for Food Service Workers.

Module 4(12 Hrs)

Food Borne infection, intoxication: Food poisoning-causes and types-Definition, Exotoxin, Endotoxin, intoxications control measures food borne in toxication and infection-sources-effects and prevention. symptoms&control: *Botulism, Staphylococcus, E.coliandsalmonella.Food* infections
-sources, symptoms Methods of Prevention & investigation of food borne disease out break.

Module 5 (14 Hrs)

Occupational Safety, Health and Environment: Definition-safety at work place- safe use of machines and tools-hazard-physical hazard (noise, radiation, fire, Electrical, illumination)-chemical hazard-biological hazard-Personal Protective Equipment - Accident preventive techniques-First Aid- Plant Layout for safety-safety of different sectors.

References:

1. Parke.K.2007.Textbook of preventive and Social Medicine19thEdition,M/s. BanaraisdasisBhanetPublishers,Jaba Ipur,India.
2. William,C.,Frazieran dDennieC. Westheff.1996.FoodMicrobiology4thEdition,TataMcGrahlilC ompanylimited
3. S.Roday-Food Hygiene and Sanitation
4. M.Jacob.(1989)-Safe food Handling.
5. V.N.Reinhold- Principles of Food Sanitation
6. B.C.Hobbs & R.J.Gilbert- Food Poisoning and Hygiene.

SDC4IT17 OPERATING SYSTEMS

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 HoursPer Week:4 Total hours: 64

Course Objectives

1. Understand the basic components of a computer operating system, and the interactions among the various components.
2. Cover an introduction on the policies for scheduling, deadlocks, memory management, synchronization, system calls, and file systems

Course Outcomes:

C0-1 Understand the functions of Operating System

C0-2 Classify the different types of OS

C0-3 Understand the memory management policies, allocation and scheduling of processes

C0-4 Evaluate the requirement for process synchronization and coordination handled by operating system

C0-5 Understand the virtual memory & their policies, 1/0 management, File management and disk scheduling.

Course Outline

ModuleI(10Hrs)

Fundamentals Operating System (OS): OS functions and characteristics, Historical Evolution ofOS, Parallel systems, distributed systems, booting, issues in operating system design.

Module II (15 Hrs.)

Process Management: Process abstraction, process address space, process management, system calls, threads, process hierarchy. CPU Scheduling-levels of scheduling, comparative study of scheduling algorithms, multiple processor scheduling. Deadlocks - Characterization, prevention and avoidance, deadlock detection and recovery. Concurrent Processes- Critical section problem, semaphores, monitors, inter-process communication, message passing mechanisms.

Module Ill (15 Hrs.)

Memory Management-Storage allocation methods, address binding, virtual memory concept, demand paging, page replacement algorithms, segmentation, dynamic linking and sharing libraries, thrashing.

Module IV (10 Hrs.)

File Systems: Functions, File access and allocation methods, Directory system, File protection mechanisms, implementation issues, file system hierarchy, directory system, file protection mechanisms, implementation issues. File allocation, free space management, file protection and security, Hardware organization, device scheduling policies, device drivers. Device management: Functions, Techniques for devicemanagement: Dedicated, Shared, Virtual, Spooling,Channels and Control units.

Module V (14 Hrs.)

Case Studies: Windows, Unix/Linux.

Reference Books:

1. Silberschatz, Galvin, Gagne, Operating System Concepts
2. Nutt G.J, Operating Systems a Modern Perspective, Addison Wesley
3.William Stallings, Operating Systems,lnternals and Design Principles
4.Mark Minasi, The Complete PCU pgrade and Maintenance

SDC4IT18 COMPUTER SECURITY

75 Marks [Internal: 15, External: 60] Examination 2 Hours	Credits:3 Hours Per Week:3 Total hours: 48

!Course Objectives

1. This course provides a broad introduction to a variety of topics in applied computer, Network and system security.
2. These include system/software vulnerabilities, applied cryptography, host-based and network-based security, privacy, anonymity, usability, security economics, risks and vulnerabilities, policy formation, controls and protection methods, and issues of law and privacy

Course Outcomes:

CO- 1:Explain some common software vulnerability issues and classifications mechanisms

C0-2: Understand different security protocols.

C0-3: Understand security models for computer systems security

CO-4: Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools.

C0-5: Explain the various controls available for protection against internet attacks, including authentication, integrity check, firewalls, and intruder detection systems.

Course Outline:

Module I (8 Hrs)

Computer security - Overview of Computer Security Concepts and Foundations, Basics of Computer Security- Overview- Definition of terms - Security goals - Shortcomings -Attack and defense

Module II (1O Hrs)

Encryption and Cryptography - Ciphers and codes - Block & Stream Ciphers - Symmetric and Asymmetric Cryptosystem - Public key algorithms - Key distribution - Digital signatures - Pretty good privacy - Authentication and Key Exchange Protocols - Directory Authentication service - Diffie-Hellman key exchange - Kerberos.

Module Ill (10 Hrs)

Software Security - Buffer Overflow - Malicious code - Worms - Intruders - Error detection and correction - OS protection policies - Trusted Systems - Memory protection - Access control matrix - User authentication - Security models - Disaster recovery

Module IV (10 Hrs)

Database Security- Integrity constraints - Multi-phase commit protocols - Networks Security- Internet Security Protocols and Standards - Threats in networks - TCP Attacks, DNS Vulnerabilities,SSL/TLS, DDoS - Privacy enhanced email - DS authentication - Next Generation System Designs and Challenges - Internet-of-Things and Smart Grid Security - Data & Infrastructure Security in Cloud/Edge Computing

Module V (10 Hrs)

Web and Electronic Commerce - Threats on the web - Secure socket layer - Client-side certificates - Applet security model - cyber-security Policies & Initiatives - NCCC - CERT-In - NCIIPC - security policy: Case Study - Unix Windows NT - Browsers and Java scripts - Risk Modeling - Cyber-Risk Assessment- Threat Information Sharing -Cyber-insurance

Reference Books:

1. Cryptography & Network Security, PHI William Stalling
2. Cryptography & Network Security, Mc Graw Hill Atul Kahate
3. Cryptography & Network Security, PHI 4Forouzan
4. Modern Cryptography, Theory & Practice, Pearson Education. Wenbo Mao

SDC4IT19 E1 - J2EE

75 Marks [Internal: 15, External: 60] Examination: 2 Hours	Credits:3 Hours Per Week:3 Total hours: 48

Course Objectives

1. On completion of this course, the student should be able to: Learn distributed enterprise applications using java.
2. Learn web development and server side programming using java
3. Learn database managements and spring frameworks.

Course Outcomes:

CO1: - Learn distributed enterprise applications using java.

CO2 - Learn web development and server side programming using java

CO3: - Learn database managements and spring frameworks.

C04: -The students will be able to develop a small project.

Course Outline:

Module I (6 Hrs)

Core Java EE: Platform Overview, Distributed Multi tiered Applications, Web & Business Components, services & types, Java EE Application Assembly & Deployment - Packaging Applications, Java EE modules, Getting Started with Web Applications, Model View Controller (MVC) Archit ecture. Application Deployment Web application development and deployment Steps, Configuring Web application - Web application deployment descriptor (web.xml file)

Module II (8 Hrs)

Servlets: Servlet Overview, Life cycle of Servlet, Handling Client HTTP Request & Server HTTP Response, Initializing Parameters & Servlet Context, Initializing a Servlet, initialization Parameters, Servlet Context Attributes (Context binder), Session Management, Request Dispatcher &Redirecting.

Module Ill (8 Hrs)

JSP: Overview of JSP, JSP Architecture & life cycle, Components of Java Server Pages, Implicit Objects & Standard JSP Tags, Scope of JSP objects.

Module IV (8 Hrs)

JDBC: JDBC Overview & Architecture, Step by Step Usage of JDBC API, Connecting to Database inJava, Prepared Statement & JDBC Transactions. Developing Web Application with MySQL Database by implementing Java Beans, DAO's & MVC Architecture.

Module V (8 Hrs)

Hibernate: Introduction to Hibernate, ORM Overview, Hibernate Environment, Hibernate Architecture& API, Hibernate Configuration, Hibernate Sessions, Persistent Class & Mapping Files, Building Hibernate application, Hibernate Query Language (HQL), Hibernate O/R Mappings - Collection & Association Mappings (Many-to-One, One-to-one, One-to-Many,Many-to-Man,y)Implementing Hibernate in Java Web Applications using NetBeans with MySQL.

Module VI (8 Hrs)

Spring: Introduction to Spring Framework Architecture, Bean Definition, Bean Scopes & BeanDefinition Inheritance, Spring loC Containers, Understanding inversion of control (loC) - Dependency Injection (DI), Spring Setter Injection, Spring Constructor Injection, lac in Action, Architecture of Spring Web MVC Framework, Spring MVC Getting Started - constructing web MVC application using Spring Framework, AbstractController in Spring MVC, Spring MVC Controllers hierarchy, SimpleFormController, Spring DAO design pattern, Building Spring MVC Framework Applications by using Netbeans.

SDC4IT19 E2 - .NET PROGRAMMING

75 Marks [Internal: 15, External: 60] Examinatio n: 2 Hours	Credits:3 Hours Per Week:3 Total hours: 48

Course Objectives

1. Programming in C # programming language,
2. Knowledge of object-oriented paradigm in the C # programming language,
3. Understand security scenario and preventive measures of .NET environments
4. Acquire good idea about different tools available to secure computer environment

Course Outcomes:

C0-1: Knowledge of the structure& model of the programming language C # (note) **C0-2:** Use the programming language C # for various programming technologies **C0- 3:** Develop software in C # (application)

C0-4: Evaluate user requirements for software functionality required to decide whether the programming language C# can meet user requirements(analysis)

CO-5:Propose the use of certain technologies by implementing them in the C # programming language to solve the given problem

Module I (1O Hrs)

The origins of the .NET technology .net framework, Features of .net, architectures of C#.net. lntroductionto visual studio,.net IDE interface and event driven programming. The common language runtime, The Just-In-Time Compiler visualstudio, NET Framework class library introduction.NET languages, benefits of the.NET approach, C# and .NET.

Module II (10 Hrs)

Basic classes, declarations, conditionals, loops, arrays, strings, enumerations, Windows Forms and Controls, Menus, Image List, Tree Views, List Views, Toolbars, Status Bar and Progress bars. Object Oriented Programming in c#.NET, Class and Object, Properties, methods and events. Constructors and Destructors, Method overloading,Inheritance.

Module Ill (1O Hrs)

Database : Connected and disconnected mechanism, Connection Objects, Command Objects, Data Adapters, Dataset Class, Data binding with controls like Text Boxes, List Boxes, Data grid. Exception, structured exception handling using try, catch and final statements, and user defined exception.

Module IV (9 Hrs)

Building a Web Application, Examples Using Standard Controls, Using HTML Controls, Validating Form Input Controls using Validation Controls, Data Management with ADO.net, Creating a Site Navigation Hierarchy, Navigation Controls, Membership and Role Management, Login Controls, Securing Applications, cachingfor Performance, working with XML, Using Crystal Reports in Web Forms.

Module V (9 Hrs)

Databases: Introduction, Using SQL to work with database, retrieving and manipulating data with SQL, working with ADO.NET, ADO.NET architecture, ASP.NET data control, data source control, deploying the web site.

Reference Books :

1. .Net Framework Essentials .3rd Edition (O'Reilly)
2. Beginning with C#.Net. Wroax publications
3. Ian Gariffiths, Mathew Adams, Jesse Liberty, -Programming C# 4.0ll, OReilly, Fourth Edition, 2010.
4. Andrew Troelsen, Pro C# 5.0 and the .NET 4.5 Framework, Apress publication, 2012.
5. Andy Wigley,Daniel Moth,Peter Foot, Mobile Development Handbook, MicrosoftPress, 2011.

SDC4IT20 (P) OPERATING SYSTEMS AND COMPUTER SECURITY - LAB

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 HoursPer Week:4 Total hours: 64

Course Objectives

1. To understand and appreciate the principles in the design and implementation of operating systems software
2. To study about the basics of Unix/Linux/Windows systems
3. To understand the Shell scripting concepts.
4. To understand security scenario and preventive measures
5. To have a fairly good idea about different tools available to secure computer environment

Course Outcomes:

C01: Familiarization with UNIX system calls for process management and inter process communication. Experiments on process scheduling and other operating system tasks through simulation/implementation.

CO2: - Ability to implement inter-process communication, to design and solve synchronization problems, to implement operating system concepts such as scheduling, deadlock management, file management, and memory management.

C03: - Understand security environment and requirement of in cyberspace.

C04: - Identify tools to secure organizations IT infrastructure and assets.

COS:- Take precautionary measures to ensure protection from attacks, damagesand costs.

Course Outline

Practical 1:(10 Hrs) - BASICS OF UNIX COMMANDS

1. Write a command to list all the links from a directory?
2. Create a read-only file in your home directory?
3. How will you find which operating system your system is running on in UNIX?
4. How will you run a process in background?
5. How do you know if a remote host is alive or not?

Practical 2: (15 Hrs) --- Shell Scripting

6. Write a shell script that accept a file name starting and ending line numbers as arguments and display all the lines between given line no:
7. Write a shell script that delete all lines containing a specified word.
8. Write a shell script that displays a list of all the files in the current directory
9. Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordi ngly. whenever the argumentis a file or directory.
10. Write a shell script that accept a list of file names as arguments count and report the occurrence of each word.
11. Write a shell script to find the factorial of given integer
12. Write a shell script that list the all files in a directory

Practical 3 (15 Hrs) -- CPU SCHEDULING ALGORITHMS

13. First Come First Serve(Fcfs)
14. Shortest Job First(Sjf)
15. Round Robin
16. Priority

Practice 4 (10 Hrs)

17. DINING-PHILOSOPHERS PROBLEM
18. Scan network - detect hosts online, do port scan, identify services running in each hosts, detect OS
19. Sniffing - Use Wireshark, tcpdumb and ethereal to analyze traffic
20. IDS - Use IDS to study logs.

Practice 5 (1O Hrs)

21. Firewall - Use firewall options in Windows and Linux to protect host and network - Windows Firewall, Linux IPTable and ufw etc.
22. Detect Threats - Use nmap for port scanning, OS finger printing, tcp and udp port scanning
23. Crack Identification - Identify how Computers are cracked using buffer overflow.

SDC4IT21 (P) E1 - J2EE - Lab

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 Hours PerWeek: 4 Total hours: 64

Course Objectives

1. Ability to design console based, GUI based and web based applications.
2. Able to understand integrated development environment to create, debug and run multi-tier and enterprise-level applications

Course Outcomes:

CO-1: Ability to Create Web Applications using Java Servlet

CO-2: Graduate able to Manage Web Session using Servlet and JSP

CO-3: Ability to effectively Handle Errors and Exceptions in Web Applications

CO-4: Ability to use NetBeans/ Eclipse IDE for creating J2EE Applications

CO-5: Ability to create applications using Hibernate & Spring Framework

Practical 1 (15 Hrs)

1. Practical demonstration on Distributed Multi-Tiered Applications, Web & Business Components,
2. Handling Client HTTP Request & Server HTTP Response,
3. Initializing Parameters & Servlet Context.
4. Initializing a Servlet, Parameters,
5. Programme for Serviet Context Attributes (Context binder), Session Management,

Practical 2 (14 Hrs)

6. Programme for Request Dispatcher & Redirecting.
7. Programme on Components of Java Server Pages, Implicit Objects & Standard JSP Tags, Scope of JSP objects

Practical 3 (15 Hrs)

8. Step By Step Usage of JDBC API
9. Connecting to Database in Java.
10. Developing Web Application with MySQL Database by implementing Java Beans, DAO's & MVC Architecture

Practical 4 (10Hrs)

11. Implementing Hibernate in Java Web Applications using Netbeans/ Eclipse with MySQL
12. Building Spring MVC Framework Applications by using Netbeans/ Eclipse

SDC4IT21 (P) E2 - .NET LAB

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 Hours Per Week: 4 Total hours: 64

Course Objectives

1. Understand the fundamentals of developing modular application by using object oriented methodologies
2. Introduce to .Net IDEComponent Framework.
3. Develop applications with C#.Net
4. Develop custom interfaces for applications and leverage the available built-in interfaces in building complex applications

Course Outcomes:

C0-1: Students will be able to design web applications using C#.NET

C0-2: Build applications on Visual Studio .NET platform by understanding the syntax and semantics of C#

C0-3: Illustrate the use of generics and collections in C#. Learn about advanced andlatest features of C#

C04: Create simple data binding applications using ADO.Net connectivity.

Practical 1 (15 Hrs)

1. . Simple C# programs
2. Create and populate Windows Forms
3. Create and use user controls in a Windows Forms application

Practical 2 (15 Hrs)

4. Create menus in a Windows Forms applications
5. Add code to form and control event procedures sin a Windows Forms applications.

Practical 3 (14 Hrs)

6. Validate user input in aWindows Forms applications
7. Bind Windows Forms applications to various data sources by using Microsoft ADO.NET

Practical 4 (20 Hrs)

8 Debug a Windows Form Application (try/catch)

9 Adrotator Control

10. Calendar control
    i. Display messages in a calendar control
    ii. Display vacation in a calendar control
    iii. Selected day in a calendar control using style
    iv. Difference between two calendar dates

11. Treeview control
    i. Treeview control and datalist
    ii. Treeview operations

12. Validation controls

13. Query textbox and Displaying records

14. Display records by using database

SDC41T22 (Pr)- PROJECT WORK/ INTERNSHIP

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 Hours Per Week: 4 Total hours: 64

Course Objectives

1. Learn hands on experience of industrial programming skills.
2. Acquire the live experience by doing internship in companies.
3. Able to know how data collection is done form the live environment .
4. To apply various levels testing strategies

Course Outcomes:

CO1: Identify the requirements of real world problems.CO2: Study and enhance software/ hardware skills.

CO3: Demonstrate and build the project successfully by hardware requirements, coding, emulating and testing.

CO4: To report and present the findings of the study conducted in the preferred domain

CO5: Demonstrate Team work

Course Outline

The main aim of this project is to implement the theoretical knowledge gained from various areas to develop effective solutions to various real life computing problems. The course Project / Internship is one that involves practical work for understanding and solving problems in the field of computing and it shall be done considering the following criteria.

Every student may opt for a 30 days internship in IT companies, or a project in the college itself with the guidance of the faculty at the department.

The project shall be done either individually or group wise. If it is group project, it is recommended to have a maximum of 2 members. The project may be Commercial /Technical/Research Project based on Application Development Technologies learnt in previous semesters.

Each student should submit their Project Report (in duplicate) within a period of two weeks at the department. This period shall be counted from the last date of completion of their Training. The supervisor in the organization under whose guidance the training is carried out will berequired to grade the student's report.

An Internship Completion Certificate from the organization in which the student is undergoing internship should also be submitted at the Department and attached in the Internship Report.

Each student will have to prepare proper documentation consisting of Software Requirements Specification (SRS), Modelling Techniques, Development Strategies, Implementation and Testing Strategies.

Student may use any Design Methodologies such as SSAD, OOAD and UML, etc.

The project work shall be presented by students using Power Point Presentation Tool to the panel of Examiners, along with a Iive demonstration of the project.

The evaluation of the Internship and Project will be done separately by an External Examiner appointed by the University and the evaluation process follows 80% external assessment and 20 % internal assessment.

Marks shall be distributed as per the following tables shows below:

Marks Distribution -Project Work

Distribution	External Evaluation (80)	Internal Evaluation (20)
Design and Development	40	5
Presentation	20	5
Record	10	5
Viva	10	5

Marks Distribution - Internship

Distribution	External Evaluation (80)	Internal Evaluation (20)
Report	50	10
Presentation	20	5
Viva	10	5

Industrial Visit:

- Minimum one or two day visit to Techno Parks, Digital Parks, National research Institutes.Laboratories, and places of scientific Importance or Software Companies .
- A Report should be submitted by the students within two weeks after the visit with enoughphotographs and certificates, if any, received from the institution.

SEMESTERV

SDC51T23 BIG DATAANALYTICS

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:3 Hours Per Week: 3Total hours: 48

Course Objectives

1. To understand the computational approaches to Modeling, Feature Extraction.
2. To understand the need and application of Map Reduce.
3. To understand the various search algorithms applicable to Big Data.
4. To analyze and interpret streaming data.
5. To learn how to handle large data sets in main memory.
6. To learn the various clustering techniques applicable to Big Data

Course Outcomes:

C0-1: -Design algorithms by employing Map Reduce technique for solving Big Data problems.

C0-2: -Identify similarities using appropriate measures.

C0-3: -Design solutions for problems in Big Data by suggesting appropriate clustering techniques

C0-4: -Discuss algorithms for Analytical Theory and Methods

C0-5:- Point out problems associated with streaming data and handle them

Course Outline

Module I (8Hrs)

Introduction to Big Data: Evolution of Big Data, Best Practices for Big Data Analytics, Big Data Characteristics, Validating, The Promotion of the Value of Big Data, Big Data Use Cases Characteristics of Big Data Applications, Perception and Quantification of Value Understanding Big Data Storage, A General Overview of High-Performance Architecture HDFS, Map Reduce and Varn, Map Reduce Programming Model.

Module II (1O Hrs.)

Clustering and Classification: Advanced Analytical Theory and Methods, Overview of Clustering K-Means, Use Cases, Overview of The Method, Determining The Number of Clusters Diagnostics, Reasons to Choose and Cautions . Classification: Decision Trees,

Overview of A Decision Tree, The General Algorithm, Decision Tree Algorithms, Evaluating A Decision Tree Decision Trees in R, NaYve Bayes, Bayes? Theorem, NaYve Bayes Classifier.

Module Ill (1O Hrs)

Association and Recommendation System: - Advanced Analytical Theory and Methods: Association Rules, Overview, Apriori Algorithm, Evaluation of Candidate Rules, Applications of Association Rules, Finding Association & Finding Similarity, Recommendation System: Collaborative Recommendation- Content Based Recommendation, Knowledge Based Recommendation- Hybrid Recommendation Approaches.

Module IV (10 Hrs)

Stream Memory: Introduction to Streams Concepts, Stream Data Model and Architecture, Stream Computing, Sampling Data in A Stream, Filtering Streams, Counting Distinct Elements in A Stream Estimating Moments, Counting Oneness in A Window, Decaying Window, Real Time Analytics Platform (RTAP) Applications, Case Studies Real Time Sentiment Analysis, Stock Market Predictions. Using Graph Analytics for Big Data: Graph Analytics

Module V (1O Hrs)

NoSQL Data Management for Big Data and Visualization: - NoSQL Databases : Schema-Less Models? Increasing Flexibility for Data Manipulation-Key Value Stores- Document Stores - Tabular Stores, Object Data Stores, Graph Databases Hive, Sharding, H Base, Analyzing Big Data with Twitter ,Big Data for E-Commerce Big Data for Biogs, Review of Basic Data Analytic Methods using R.

Reference Books:

1. . Jure Leskovec, AnandRajaraman,Jeffrey David Ullman, "Mining of Massive Datasets", Cambridge University Press, Second Edition, 2014.
2. Jiawei Han, MichelineKamber, Jian Pei, "Data Mining Concepts and Techniques", Morgan Kaufman Publications, Third Edition, 2011.
3. Ian H.Witten, Eibe Frank "Data Mining - Practical Machine Learning Tools and Techniques", Morgan Kaufman Publications, Third Edition, 2011.
4. David Hand, HeikkiMannila and Padhraic Smyth, "Principles of Data Mining", MIT Press,2001.

SDCSIT24 MACHINE LEARNING & ARTIFICIAL INTELLIGENCE

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:3 Hours Per Week: 3 Total hours: 48

Course Objectives

1. To introduce the prominent methods for machine learning
2. To study the basics of supervised and unsupervised learning
3. To study the basics of connectionist and other architectures

Course Outcomes:

C0-1: Differentiate Various Learning Approaches, and to Interpret the Concepts of Supervised Learning

C0-2: Compare The Different Dimensionality Reduction Techniques

C0- 3: Apply Theoretical Foundations of Decision Trees to Identify Best Split and Bayesian Classifier to Label Data Points

C0- 4: Illustrate The Working of Classifier Models Like SVM, Neural Networks and Identify Classifier Model for Typical Machine Learning Applications

Course Outline

Module I (8Hrs)

Introduction to Machine Learning, Examples of Machine Learning applications - Learning associations, Classification, Regression, Unsupervised Learning, Reinforcement Learning. Supervised learning- Input representation, Hypothesis class Version space, Vapnik- Chervonenkis(VC)Dimension, Model Development and Operations.

Module II (1O Hrs)

Classification- Cross validation and re-sampling methods- K-fold cross validation, Boot strapping, Measuring classifier performance- Precision, recall, ROC curves. Bayes Theorem, Bayesian classifier, Maximum Likelihood estimation, Density functions, Linear Regression,Logistic Regression.

Module Ill (1O Hrs)

Decision Trees- Entropy, Information Gain, Tree construction, ID3, Issues in Decision Tree learning- Avoiding Over-fitting, Reduced Error Pruning, Problem of Missing Attributes, Gain Ratio, Classification by Regression (CART), Random Forest, Neural Networks- The Perceptron, Activation Functions, Training Feed Forward Network by Back Propagation.

Module IV (10 Hrs)

Kernel Machines- Support Vector Machine, Optimal Separating hyper plane, Soft-margin hyperplane, Kernel trick, Kernel functions . Discrete Markov Processes, Hidden Markov models, three basic problems of HMMs- Evaluation problem, finding state sequence, Learning model parameters. Combining multiple learners, Ways to achieve diversity, Model combination schemes, Voting, Bagging, Booting

Module V (1O Hrs)

Unsupervised Learning, Clustering Methods, K-means, Expectation-Maximization Algorithm, Hierarchical Cluster, Python Libraries for ML, Open CV, Matplotlib, pip, Numpy, Pandas, Scikit- Learn, Scypy, TQDNM, TensonFlow, KERAS, PyTorch, Statmodels,Plotly,NLTK, Scrapy, and PySpark

References:

1. Christopher M. Bishop, Pattern Recognition and Machine Learning, Springer, 2006.
2. Ethem Alpayd1n, Introduction to Machine Learning (Adaptive Computation and Machine Learning), MIT Press, 2004.
3. Margaret H. Dunham. Data Mining: introductory and Advanced Topics, Pearson, 2006
4. Mitchell. T, Machine Learning, McGraw Hill.
5. Ryszard S. Michalski, Jaime G. Carbonell, and Tom M. Mitchell, Machine Learning: An Artificial Intelligence Approach, Tioga Publishing Company.

SDC51T25 CLOUD COMPUTING

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:3 Hours Per Week:3 Total hours: 48

Course Objectives

1. Comprehensive and in-depth knowledge of Cloud Computing concepts, technologies, architecture and applicat ions.
2. To expose the students to frontier areas of Cloud Computing and information systems, while providing sufficient foundations to enable further study and research.

Course Outcomes:

C0-1: Articulate the main concepts, key technologies , strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing.

C0-2:-ldentify the architecture and infrastructure of cloud computing, including Saas, PaaS, laaS, public cloud, private cloud, hybrid cloud, etc.

C0-3: Explain the core issues of cloud computing such as security, privacy, and interoperability.

C0-4: Choose the appropriate technologies, algorithms, and approaches for the related issues.

C0-5:-ldentify problems, and explain, analyze, and evaluate various cloud computing solutions.

Course Outline

Module I **(8 Hrs)**

Int roduction: Distributed Computing and Enabling Technologies, Cloud Fundamentals: Cloud Definition, Evolution , Architecture, Applications, Deployment models, and Service models.

Module II **(10 Hrs)**

Virtualization Concepts: Issues with virtualization, technologies and architectures, Internals of virtual machine monitors/hypervisors, virtualization of data centers, and Issues with Multi- tenancy.

Module Ill **(10 Hrs)**

Implementation: Case Study of Cloud Computing Systems like Amazon EC2 and S3, GCP, Microsoft Azure etc., Build Private/Hybrid Cloud using open source tools, Deployment of Web Services from Inside and Outside a Cloud Architecture. MapReduce and its extensionsto Cloud Computing, HDFS, and GFS. Interoperability and Service Monitoring Managing interoperability, Vendor lock-in, Interoperability approaches. SLA Management, Metering Issues, and Report generation.

Module IV (10 Hrs)

Resource Management and Load Balancing: Distributed Management of Virtual Infrastructures, Server consolidation, Dynamic provisioning and resource management, Resource Optimization, Resource dynamic reconfiguration, Scheduling Techniques for Advance Reservation, Capacity Management to meet SLA requirements and Load Balancing, Various load balancing techniques.

Module V (1O Hrs)

Migration and Fault Tolerance: Broad Aspects of Migration into Cloud, Migration of Virtual Machines and techniques. Fault Tolerance Mechanisms. Security: Vulnerability Issues and Security Threats, Application-level Security, Data level Security, and Virtual Machine Level Security, Infrastructure Security, and Multi-Tenancy Issues. IDS: host-based and network- based, Security-as-a-Service. Trust Management, Identity Management, and Access Controls Techniques. Advances: Grid of Clouds, Green Cloud, Mobile Cloud Computing, Kubernetes, Edge Computing Vs Cloud

References:

1. Cloud Computing Principles and Paradigms,Rajkumar Buyya,James Broberg,Andrzej Goscinski, Wiley Publishers
2. Cloud Computing Bible, Barrie Sosinsky.Wiley Publishers.
3. Cloud ComputingWeb-based Applications that change the way you work and collaborate online,Michael Miller, Pearson Education.
4. Mastering Cloud Computing,Rajkumar Buyya,Christian Vacchiola,SThamaraiSelvi,McGraw
5. Cloud Computing and SOA Convergence in Your Enterprise:AStep-by-Step Guide.DavidS.Linthicum.
6. Cloud Security and Privacy:An Enterprise Perspective on Risks and Compliance,TimMather,SubraKumaraswamy, ShahedLatif, O'Reilly .
7. CloudComputing:A Practical Approach.Toby Velte,Antohy TVelte,Robert Elsenpeter, McGra

SDC5IT26 ANDROID APP DEVELOPMENT

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:3 Hours Per Week:3 Total hours: 48

Course Objectives

1. Develop mobile applications with Google Android Platform
2. Learn more about mobile operating system
3. Get an insight to cross platform mobile app development

Course Outcomes:

C0-1: Understand the installation of Android Development Kit

C0-2. Design GUI for their simple applications

C0-3. Perform multi-screen applications

C0-4. Working with images and text files

CO-5. Develop Mobile Application using Android

Course Outline

Module I (1OHrs)

Introduction & environment set up: Introduction to object oriented programming and java basics, introduction to android and smart phones, Android Architecture & Virtual Machine, Mobile Technology terminologies, setting up the environment, Setting up Emulators, android fundamentals Activities and Applications Activity Life Cycles Activity Stacks, Activity States, introduction to manifest, resources &R.java, assets, Values - strings.xml

Module II (10 Hrs)

Basic UI design: Form widgets, views, Layouts &Draw able Resources XML Layouts, Linear Layouts, Relative layouts, Table Layouts, android Widgets, UI XML Specifications Events, Bundles & Intents Explicit Intents Implicit Intents Event Broadcasting with Intents Event Reception with Broadcast Receivers, Adapters and Data Binding.

Module Ill (10 Hrs)

Files, Content Providers, and Databases: Saving and Loading Files, SQLite Databases Android Database Design Exposing Access to a Data Source through a Content Provider Content Provider Registration Native Content Providers, Android Debug Bridge (adb) tool, Linkify.

Module IV (15 Hrs)

Custom components, Threads & multimedia: Adapters and Widgets,Notifications, Custom components Threads running on UI thread, Worker thread Handlers & Runnable AsynTask(in detail), Playing Audio and Video, Recording Audio and Video, Using theCamera to Take and Process Pictures.

Module V (15 Hrs)

Networking & Location based services: Live Folders, Using SD cards - Reading andwriting, XML Parsing JSON Parsing Including external libraries in our application, Map- Based Activities, Maps via intent and Map Activity GPS, Location based Services configuration, Geocoding, Accessing Phone services (Call, SMS, MMS) Network connectivity services, Using WiFi & Bluetooth Action bar tabs and custom views on Action bars. Introduction to cross-platform application development tools like ruby on rail, phone gap etc.

References:

1. Beginning Android 4, Onur Cinar, Apress Publication.
2. Professional Android 4 Application Development, Reto Meier

SDC5IT27 E1 DATA BASE ADMINISTRATION

75 Marks [Internal: 15, External: 60] Examination 2.5 Hours	Credits:3 Hours Per Week:3Total hours: 48

Course Objectives

1. The key goal is to prepare students for a professional career in the field of data administration and databasedesign
2. To get acquaint students with good knowledge of DBMS. During the course,students will learn about database design and database handlingactivities.
3. To get acquaint students with basics of database security andadministration.

Course Outcomes:

C0-1: Will be able to work in a group on the design, and implementation of a database system project.

C0-2: Experiences how to manage data by establishing a database connection over the current programming languages.

C0-3: Experiences on how to implement an application using a database management system.

C0-4: Will be able to do database administration works.

Course Outline

Module I (8Hrs)

Oracle Database Architecture,Preparing the Database Environment and Creating Database,Managing the Oracle Insta nce, Configuring the Oracle Network Environment,Managing Database Storage Structures,Administering User Security,Managing Data and Concurrency,Managing Undo Data Module, Implementing Oracle Database Security,Database Maintenance,Performance Management, Intelligent Infrastructure Enhancement.s

Module II (10 Hrs)

Backup and Recovery Concepts-Performing Database Backups, Performing Database Recovery Moving Data Module, Database Architecture and ASM,Configuring for RecoverabilityUsing the RMAN recovery Catalog,Configuring Backup Specifications, -Using RMAN to CreateBackups and Recovery,Performing User Managed Backup and Recovery, Using RMAN to Duplicate a Database, Performing Table space, Point-in Time Recovery, Monitoring and Tuning RMAN Module Using Flashback Technology, Diagnosing the Database, Managing Memory, Managing Database Performance, Space Management,Managing Resources,Automating Tasks with the Scheduler, Administeringthe Scheduler.

Module Ill (9 Hrs)

SQL SERVER Architecture - SQL DB Files, Locks in SQL Server, Transaction Isolation Levels,SQL server Installation, SQL Server Backup & Restore -Types of Backups,Understanding SQLLSN & Backups-Restore, Data Import & Export, Security Model- SQL Server Authentication VsWindows Authentication, Server Level Roles, Transparent Data Encryption.

Module IV (9Hrs)

SQL Server Performance Tuning, index, defragmentation and Maintenanc,eCreating & Running Traces,Database Mirroring,Clustering, Replication,SQLCMD & PSScripts

Module V (9 Hrs)

CaseStudies: MySQUMaria DB, PostgreSQL

References:

1. JohnWatson, OCAOracle Database12clnstallationand AdministrationExamGuide
2. OracleDatabaseAdministrationforMicrosoftSQLServerDBAs(Oracle Press)
3. Hans-JUrgen Schonig,Mastering PostgreSQL13: Build,administer,and maintain databaseapplications efficiently with PostgreSQL13,4th Edition.
4. https:// docs.oracle.com

SDC5IT27 E2- QUALITY ASSURANCE AND TESTING

75 Marks [Internal: 1 5, External: 60] Examination 2 Hours	Credits:3 Hours PerWeek:3 Total hours: 48

Course Objectives

1. To identify the basics of testing, test planning &design and test team organization
2. To study the various types of test in the life cycle of the software product.
3. To build design concepts for system testing and execution
4. To learn the software quality assurance metrics, defect prevention techniques
5. To learn the techniques for quality assurance and applying for applications.

Course Outcomes:

C0-1: Perform functional and nonfunctional tests in the life cycle of the software product.
CO-2: Understand system testing and test execution process.
CO-3: Identify defect prevention techniques and software quality assurance metrics.
CO-4: Apply techniques of quality assurance for typical applications.

Module 1 (8 Hrs.)

Quality Revolution, Verification and Validation, Failure, Error, Fault, and Defect, Objectives of Testing, Testing Activities, Test Case Selection White-Box and Black Test Planning and design, Test Tools and Automation, Power of Test. Test Team Organization and Management-Test Groups, Software Quality Assurance Group System Test Team Hierarchy, Team Building .

Module II (8 Hrs)

System Testing - System Integration Techniques-Incremental, Top Down Bottom Up Sandwich and Big Bang, Software and Hardware Integration, Hardware Design Verification Tests, Hardware and Software Compatibility Matrix Test Plan for System Integration. Built- in Testing. functional testing - Testing a Function in Context. Boundary Value Analysis, Decision Tables. acceptance testing - Selection of Acceptance Criteria, Acceptance Test Plan, Test Execution Test. software reliability - Fault and Failure, Factors Influencing Software, Reliability Models.

Module Ill (12 Hrs)

System test categories Taxonomy of System Tests, Interface Tests Functionality Tests. GUI Tests, Security Tests Feature Tests, Robustness Tests, Boundary Value Tests Power Cycling Tests Interoperability Tests, Scalability Tests, Stress Tests, Load and Stability Tests, Reliability Tests, Regression Tests, Regulatory Tests.Test Generation from FSM models- State-Oriented Model. Finite-State Machine Transition Tour Method, Testing with State Verification. Test Architectures- Local, distributed, Coordinated, Remote. system test design- Test Design Factors Requirement Identification, modeling a Test Design Process Test Design Preparedness, Metrics, Test Case Design Effectiveness. system test execution- Modeling Defects, Metrics for Monitoring Test Execution Defect Reports, Defect Causal Analysis, Beta testing, measuring Test Effectiveness.

Module IV(8 Hrs)

Software quality - People's Quality Expectations, Frameworks and ISO-9126, McCall's Quality Factors and Criteria - Relationship. Quality Metrics . Quality Characteristics ISO 9000:2000 Software Quality Standard. Maturity models- Test Process Imp rovement, Testing Maturity Model.

Module V (9 Hrs)

Quality Assurance - Root Cause Analysis, modeling, technologies, standards and methodologies for defect prevention. Fault Tolerance and Failure Containment - Safety Assurance and Damage Control, Hazard analysis using fault-trees and event-trees. Comparing Quality Assurance Techniques and Activities . QA Monitoring and Measurement, Risk Identification for Quantifiable Quality Improvement. Case Study: FSM-Based Testing of Web-Based Applicat ions.

References:

1. Software Testing And Quality Assurance-Theory and Practice, Kshirasagar Nak Priyadarshi Tripathy, John Wiley &Sons lnc,2008
2. Software Quality Engineering: Testing, Quality Assurance, and Quantifiable Improvement, Jeff Tian, John Wiley & Sons, Inc., Hoboken, New Jersey. 2005.
3. Software Quality Assurance - From Theory to Implementation, Daniel Galin, Pearson Education Ltd UK, 2004Software Quality Assurance, Milind Limaye, TMH, New Delhi, 2011

SDC5IT27 E3 - INTERNET OF THINGS {loT)

75 Marks [Internal: 15, External: 60] Examination 2.5 Hours	Credits:3 Hours PerWeek:3 Total hours: 45

Course Objectives

1. To understand Smart Objects and loT Architectures
2. Tolearn about various !OT-related protocols
3. To build simple loT Systems using Arduino and Raspberry Pi.
4. To understand data analytics and cloud in the context of loT
5. To develop loT infrastructure for popular applications

Course Outcomes

C01: - Explain the concept of loT.
CO2: -Analyze various protocols for loT.
C03: -Design a PoC of an loTsystem using Raspberry Pi/Arduino
C04: -Apply data analytics and use cloud offerings related to loT.
COS: -Analyze applications of loT in real time scenario.

Course Outline

Module 1(9 Hrs)

Fundamentals Of loT :-Evolutionof Internet of Things, Enabling Technologies , loT Architectures: one M2M, loT World Forum (loTWF) and Alternative loT models, Simplified loT Architecture and Core loT Functional Stack Fog, Edge and Cloud in loT- Functional blocks of an loT ecosystem, Sensors, Actuators, Smart Objects andConnecting Smart Objects.

Module II (1O Hrs)

loT Protocols:-loT Access Technologies: Physical and MAC Layers, Topology and Security Of IEEE 802.15.4, 802.15.4g, 802.15.4e, 1901.2a, 802.11ah And Lorawan, Network Layer: IP Versions, Constrained Nodes And Constrained Networks, Optimizing IP For loT: From 6lowpan To 6Lo, Routing Over Low Power And Lossy Networks, Application Transport Methods: Supervisory Control And Data Acquisition, Application Layer Protocols: Coap And MQTT.

Module Ill (8Hrs)

Design and Development :-Design Methodology, Embedded Computing Logic, Microcontroller, System On Chips, lot System Building Blocks, Arduino, Board Details, IDE Programming, Raspberry Pi, Interfaces and Raspberry Pi with Python Programming.

Module IV (10 Hrs)

Data Analytics and Supporting Services:-Structured Vs Unstructured Data And Data In Motion Vs Data In Rest, Role Of Machine Learning, No SQL Databases , Hadoop Ecosystem - Apache Kafka, Apache Spark, Edge Streaming Analytics And Network Analytics, Xively Cloud For lot, Python Web Application Framework - Django -AWS For loT- System Management With NETCONF-YANG

Module V (8 Hrs)

Case Studies/Industrial Applications: -Cisco loT System, lbm Watson loT Platform, Manufacturing, Converged Plantwide Ethernet Model (Cpwe), Power Utility Industry, Gridblocks Reference Model, Smart and Connected Cities: Layered Architecture, Smart Lighting, Smart Parking Architecture and Smart Traffic Control

References:

1. Arshdeep Bahga, Vijay Madisetti, -Internet of Things - A hands-on approach, Universities Press, 2015
2. Olivier Hersent, David Boswarthick, Omar Elloumi , -The Internet of Things - Key applications and Protocols, Wiley, 2012 (for Unit 2).
3. Jan Ho.. lier, Vlasios Tsiatsis , Catherine Mulligan, Stamatis , Karnouskos, Stefan Avesand. David Boyle, "From Machine-to-Machine to the Internet of Things - Introduction to a New Age of Intelligence", Elsevier, 2014.
4. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), -Architecting the Internet of Things, Springer, 2011.
5. Michael Margolis, Arduino Cookbook, Recipes to Begin, Expand, and Enhance Your Projects, 2nd Edition, O'Reilly Media, 2011.

SDC5IT27E4 FINANCIAL& MANAGEMENT ACCOUNTING

75 Marks [Internal: 15, External: 60] Examination: 2 Hours	Credits: 3 Hours Per Week:3 Total hours: 45

Course Objectives

1. To get a general introduction on accounting and its general applications.
2. To get an understanding on various tools for financial statement analysis.
3. To get an understanding on accounting procedures upto the preparation of various financial and management statements.

Course Outcomes:

C0-1: To get a general introduction on accounting and its general application.
C0-2:To get a general understanding on various tools for financial statement analysis
C0-3:To get a general understanding on accounting procedures up to the preparation of various financial statements.

Course Outline

Module I (10 Hrs)

Principles of accounting, Some fundamentals concepts and conventions, Systems of accounting double entry principles, Advantages of Double entry system, personal, real, nominal accounts. Cash book-forms of cash books, subdivisions of Journal, Ledgers, limitations of financial Accounting, Trial balance, Final accounts, Trading P/L *Ne,* Balance sheet

Module II (8 hrs)

Invitation to management accounting: Analysis and interpretation of trading accounts and financial Statements , Horizontal Vertical analysis , Common size Balance sheet, common size income Statement, comparative income and balance sheet, trend analysis.

Module 111(8 hrs)

Ratio analysis: uses of ratios in interpreting trading accounts and financial statements, different types of ratios, Liquidity ratios, turnover ratios-activity ratios, solvency ratios.

Module IV(9 hrs)

Fund flow statement, schedule of changes in working capital, fund from operation, cash flow Statement, cash from operating activities, cash from financing activities, cash from investing

activities

Module V(l O hrs)

Marginal costing- Break even point - cost volume profit analysis- margin of safety -standard costinganalysis of variance-material-labour-0/H-sales Variables-Budget and Budgetary control- different types of budgets- master budget- sales budget-production budget-flexible budget-cash budgetadvantages-preparation

References:

1. Pandey I.M "Financial Management" Vikas publishing house
2. Kellock.J "elements of Accounting" Heinmann
3. S.N Maheshwari "advanced Accountancy" Vikas publishing house
4. A.Vinod "cost andManagement accounting"-Calicut University central co-operative stores

SDC51T28 (P) ANDROID APP DEVELOPMENT - LAB

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 HoursPerWeek:4 Total hours: 64

Course Objectives

1. To understand activities and intents, designing user interface using views, data persistence, content providers,
2. To understand messaging and networking, location-based services, and developing android services

Course Outcomes:

C01: -Demonstrate their skills of using Android software development tools

CO2: -Demonstrate their ability to develop software with reasonable complexity on mobile platform

CO3:-Demonstrate their ability to deploy software to mobile devices

C04:- Demonstrate their ability to debug programs running on mobile devices

Lab Exercises:

1. Developing Simple Applications for Android
2. Creating Applications with Multiple Activities and a Simple Menu using ListView
3. Creating Activities for Menu Items and Parsing XML Files
4. Writing Multi-Threaded Applications using AsyncTask
5. Using WebView and Using the Network
6. Using Audio Functions in Android
7. Graphics Support in Android
8. Preferences and Content Providers
9. Preference Activity
10. Creating Menus
11. Location Services and Google Maps in Android
12. Obtaining User Location
13. Obtaining a Maps API Key
14. Creating Status Bar Notifications
15. Develop a mob app including all the above features

SDCSIT29 (P) MACHINE LEARNING AND Al - LAB

75 Marks [Internal: 15, External: 60] Examinatio n: 2 Hours	Credits:3 Hours Per Week:3 Total hours: 48

Course Objectives

1. Understand various algorithms related to machine learning
2. To discover patterns in your data and then make predictions based on often complex patterns to answer business questions

Course Outcomes:

C0-1: Have a good understanding of the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc.
C0-2: Be able to design and implement various machine learning algorithms in arange of real-world applications.
C0- 3: Apply various machine learning algorithms in real world entities
C0- 4: Develop Al Solutions

Course Outlines:

Lab Exercises:

1. Experiment the vacuum cleaner world example
2. The probability that it is Friday and that a student is absent is 3 %. Since there are 5 school days in a week, the probability that it is Friday is 20 %. What is the probability that a student is absent given that today is Friday? Apply Baye's rule in python to get the result. (Ans: 15%)
3. Extract the data from database using python
4. Implement the Romanian Example using the Depth First Search
5. Design a program for the greedy best first search or A* search
6. Construct the simulated annealing algorithm over the travelling salesman problem.
7. Implement a basic binary genetic algorithm for a given problem
8. Experiment the Graph Coloring CSP or Crypt Arithmetic Puzzle
9. Implement the Tic-Tac-Toe game using any adversarial searching algorithm
10. Implement k-nearest neighbours classification using python

SDC51T30 (P} BIG DATA ANALYTICS - LAB

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 Hours Per Week:4 Total hours: 64

Course Objectives

1. Understand the Big Data Platform and its Use cases
2. Provide an overview of Apache Hadoop
3. Exposure to Data Analytics with R.

Course Outcomes:

C0-1: Identify Big Data and its Business Implications.
C0-2: Access and Process Data on Distributed File System **C0-3:**
Develop Big Data Solutions using Hadoop Eco System **C0-4:**
Apply Machine Learning Techniques using R.

Course Outlines:

a) R Programming -- (20 Hrs)

1. Study of basic Syntaxes in R
2. Implementation of vector data objects operations
3. Implementation of matrix, array and factors and perform vain R
4. Implementation and use of data frames in R
5. Create Sample (Dummy) Data in Rand perform data manipulation with R
6. Study and implementation of various control structures in R
7. Data Manipulation with dplyrpackage
8. Data Manipulation with data.tablepackage
9. Study and implementation of Data Visualization with ggplot2
10. Study and implementation data transpose operations in R

b) Hadoob -- (20Hrs)

11. Draw and explain Hadoop Architecture and Ecosystem with the help of a case study using WorkCount example. To define and install Hadoop.

12. Implement the following file management tasks in Hadoop System (HDFS): Adding files and directories, retrieving files, Deleting files

13. Run a basic Word Count MapReduce program to understand MapReduce Paradigm: To count words in a given file, to view the output file, and to calculate execution time.

c) NoSQL - MongoDB (24Hrs)

14. Perform NoSQL database using mongodb to create, update and insert.
15. Study and implement basic functions and commands in R Programming.
16. Build Word Cloud, a text mining method using R for easy to understand and visualization than a table data.
17. Implement Bloom Filters for filter on Stream Data in Python.
18. Implement Flajolet-Martin Algorithm for counting distinct elements in Stream Data.
19. Implement clustering program using R programming.
20. Find Term Frequency and Inverse Document Frequency (tf-idf) Matrix for Recommendation Systems and Plot TF Using R used.
21. Finding similar documents with Cosine Similarity in R.

SDC5IT31 (P) CLOUD COMPUTING AND ELECTIVES - LAB

(Electives: DBA /loT/ Testing/ Tally)

100 Marks [Internal: 20, External: 80] Examination 2.5 Hours	Credits:4 Hours Per Week:4 Total hours: 64

Course Objectives

1. Understand the techniques of cloud computing
2. Able to know various applications of DBA
3. Understand the applications of loT
4. Get awareness about various testing strategies
5. To know the financial and management techniques of business

Course Outcomes:

CO-1: Apply various cloud services in development process

CO-2: Database installation and creation and Managing Database instances

CO-3: Develop technique of testing in various stages of development

CO-4 Able to understand the application areas of IOT

CO-5: Apply fundamental principles of financial & management accounting

CLOUD COMPUTING - LAB

Exercises (32 Hrs)

1. Install QMEU/KVM Virtual Machine environment
2. Setup LAMP in QEMU/KVM Virtual environment
3. Install Google App Engine and setup simple web app using Python/Java
4. Enable/use different micro services provided by GCP
5. Document, Draft and implement a cloud computing lab for academic purpose
6. Experiment using
   i. Cloud monitoring tools: Amazon Cloudwatch, Microsoft Cloud monitoring, AppDynamics, Retrace etc.
   ii. Configuration management tools: Puppet, Chef, Ansible, CFEngine, JUJU, Bamboo
   Workflow management tools: Evernote, Jira, VersionOne, Workzone, Scrum Mate etc

DBA- LAB

Exercises (32 Hrs)

1. Laboratory Component
2. Different Database Systems Installation
3. Tuning
4. Backup
5. Recovery
6. Monitoring
7. User Creation and Maintenance
8. Security Auditing
9. Migration Etc.

loT LAB

Exercises (32 Hrs)

1. Study and Install !DE of Arduino and different types of Arduino.
2. Write program using Arduino IDE for LED blinking.
3. Write Program for RGB LED using Arduino.
4. Write Program to monitor temperature using Arduino.
5. Implement RFID, NFC using Arduino.
6. Implement MQTT protocol using Arduino.
7. Study and Configure Raspberry Pi.
8. WAP for LED blink using Raspberry Pi.
9. Implement Zigbee Protocol using Arduino / Raspberry Pi.
10. Experiments with different categories of loT sensors such as Smart Agriculture Sensors

TESTING LAB

Exercises (32 Hrs)

1. Write a test case based on controls.
2. Test data in a flat file.
3. Manual test case to verify student grade
4. Write and test a program to select the number of students who have scored more than 60 in any
5. one subject(or all Subjects)
6. Write and test a program to login a specific web page.
7. Write and test a program to get the number of list items in a list/ combo box.
8. Test a HTML file.
9. Test a program in MS Excel for Data Driven Wizard.
10. Test the addition of two values in C++ Program

TALLY- LAB

Exercises (32 Hrs)

1. Company creation, deletion, alteration
2. Groups and Legders in Tally
3. Journal Vouchering
4. Inventory Accounting
5. Bill wise entry (BR/BP)
6. Cost Centres
7. Import and Export ledgers
8. GST,CST etc
9. Preparation of Trading Profit and Loss Account
10. Preparation of Balance Sheet

SEMESTER VI

SDC61T32 TERM PAPER

Number of Credits: 2 Course Evaluation: 50 Marks [Internal Assessment only] No External Assessment
Course Objectives
To acquire the confidence in presenting the topic and preparing a report.
Course Outcomes:
C0-1: Demonstrate capacity to improve student achievement, engagement & retention **C0-2:** Analyze the problem of study and collect necessary data. **C0-3:** Students work in traditional rhetorical forms and write a research paper. **C0-4:** Implement, evaluate and generate reports.

Course Outline

The student is expected to do an extensive literature survey and analysis in an area related to computer science especially in mobile application development, chosen by him/her, underthe supervision of a faculty member from the department.

He/ she shall select the topic based on the references: from reputed International Journals, preferably IEEE journals. The students should undertake a detailed study on the topic and submit a report prior to the presentation

Evaluation of term paper should be done internally. A faculty member can be appointed as a guide/ supervisor. The student has to choose an area for his/her workafter due consultation and approval from theguide.

The topic shall be presented in the class taking duration of 15-20 minutes. A committee consisting of three/four faculty members shall evaluate the seminar presentation.

Proper presentation aids can be used. Every student shall participate in the seminar.

Mark Distribution:

Criteria	Marks (50)
Content(setsoutrelevantissues,explainskeyterms,confidentwithmaterial, aids understanding)	10
Delivery (speed, eye contact, clarity, audibility, tone)	10
Use of visual aids uses handout or other visual aids, relevant to content	10
Structure:(logical,easytofollow,providesheadings,eachsection relates to overall purpose)	10
Response to questions:willing to answer questions, actively seeks questions	10

SDC61T33 (Pr) INTERNSHIP & PROJECT

Number of Credits /Semester: 28
Total Hours/ Semester: 840 Hrs
Examination: 2.5 Hrs

Course Evaluation:

Internship 200 Marks [Internal: 40, External: 160]
Project 200 Marks [Internal: 40, External: 160]

Course Objectives

To get full time industrial exposure and experience real time live projects

To work as a Software Engineer applying the knowledge in the field of testing, designing, programming and maintenance to cater to the specific needs of the people

Course Outcomes:

C0 1: Ability to integrate existing and new technical knowledge for industrial application

CO2: Acquire interpersonal, communication and other critical skiIls in the job interview process.

003: Develop work habits and attitudes necessary for job success

004: Real time work experience helps to get placed easily

Course Outlines

Each student shall undergo an internship and also do an individual Project and submit towards the end of the internship

The students are required to do the Internship in IT Firms, Govt/Private organizations, Software development companies or any other organizations which related to their work of study under the supervision of a Department guide.

- Each student should submit a synopsis of the project work they indent to do to their concerned guide for approval before the commencement of their project.

  The student has to make regular discussions with the guide throughout the life time of the Internship and project

The Internship will be reviewed periodically every month by the department guide.

A valid certificate as Internship certificate from the organization should be produced as a proof that the work is carried out in the respective organization.

At the end of the semester the candidate shall submit the hard copy and soft copy of Internship report and project report to the department.

The evaluation of the Internship and Project will be done separately by an External Examiner appointed by the University and the evaluation process follows 80% external assessment and 20 % internal assessment.

The mark distribution for the Internship and Project shall be in the following pattern

Mark Distribution for Internship

Distribution	**External**	**Internal**
Report	100	*30
Viva	60	10
Total	160	40

Mark Distribution for Project

Distribution	**External**	**Internal**
Report (Design, Presentation)	100	*30
Viva	60	10
Total	**160**	**40**

***Review based Split up**

Review I =10; Review II= 10; Review Ill= 10 = Total 30

APPENDIX A

Mark Split Up For Practical's, Term Paper and Projects/ Internship

In order to get uniformity in the mark distribution of Practical sessions, Term Paper, Mini Project and Main Project, the following criteria shall be followed by the Examiners.

For Practical's (LAB) - External Evaluation

Distribution	Marks (60)	Marks (80)
Algorithm/Flowchart/Coding	30	50
Output / Result	10	10
Record	10	10
Viva	10	10
Tota	**60**	**80**

For Practical's (LAB)- Internal Evaluation

Distribution	Marks(15)	Marks (20)
Problem Solving/Coding	5	10
Regularity/ Attendance	5	5
Rough Record	5	5
Tota	**15**	**20**

For Project Work

Distribution	Internal (20)	External (80)
Design and Development	5	40
Presentation	5	20
Record	5	10
Viva	5	10
Total	**20**	**80**

For Internship

Distribution	Internal (20)	External (80)
Report	50	50
Presentation	20	20
Viva	10	10
Total	**20**	**80**

TermPaper- Internal Evaluation (6th Semester)

Distribution	Marks (SO)
Content (sets out relevant issues, explains key terms, confident with material, aids understanding)	10
Delivery (speed, eye contact, clarity, audibility, tone)	10
Use of visual aids uses handout or other visual aids, relevant to content	10
Structure: (logical, easy to follow, provides headings, each section relates to overall purpose)	10
Response to questions: willing to answer questions, actively seeks questions	10

For Internship & Project Evaluation (6th Semester)

Mark Distribution for Internship

Distribution	External	Internal
Report	100	*30
Viva	60	10
Total	160	40

Mark Distribution for Project

Distribution	External	Internal
Report (Design, Presentation)	100	*30
Viva		10
t-T_o_ta_l 160 ---, 160		**40**

***Review based Split up**

Review I =10 ; Review II = 10; Review 111= 10 = Total 30

(Appendix B)

Guidelines for Project Report & Layout

Cover Page and First Page

<PROJECT TITLE>

(A PROJECT REPORT)

Submitted by

<NAME>

For the award of the Degree of

Department of Vocational Studies (B.Voc)

In Software Development

(University of Calicut)

<College LOGO>

Under The Guidance of

<NAME>

Dissertation in partial fulfilment of requirements for the Award of Degree in Multimedia

<<NAME OF THEDEPARTMENT>>

«NAME OF THE INSTITUTION» (AFFILIATED TO THE UNIVERSITY OF CALICUT)

«ADDRESS»

MONTH YEAR

<College Name>

<College LOGO>

CERTIFICATE

This is to certify that the project report entitled TITLE HERE submitted by «Name of the Student» (Register Number:) to University of Calicut for the award of the degree of Vocational Studies in Software Development of Calicut University during the year 2022 -2023.

Principal **Head of the Department** **Project Guide**

PROJECT EVALUATION REPORT OF THE EXAMINERS

Certified that the candidate was examined by us in the Project Viva Voce Examination held on .... and his/her Register Number is .....

Examiners:

1.

2.

DECLARATION

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person or material which has been accepted for the award of any other degree or diploma of the universityor other institute of higher learning, except where due acknowledgment has been made in thetext.

Signature:

NAME HERE

DATE

REg.No

New Page/

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **<NAME><Reg.No:>** B.Voe in Software Development<2th/4th/6th> semester student **of<College Name>,** has done the project work on the topic **"<Project Title>"** under guidance of< **NAME>.** towards the fulfilment of the award of Degree in Software Development. During the period of **<Month/ Date/ Year>**

During the tenure of the project, her conduct was good and satisfactory. We wish her all the best for future endeavors

ACKNOWLEDGEMENT

I would like to thank .....

NAME

New Page/

SYNOPSIS

My project is focusing on the ..

UST OF CONTENTS

S.NO **CONTENTS** **PAGE NO**

SI.NO CONTENTS

5. SYSTEM IMPLEMENTIONS AND

SYSTEM IMPLIMENTAIONS

SYSTEM MAINTANCE

6. CONCLUSION

The purpose of this section is to provide a summary of the whole project. In this context, it is similar to the Abstract, except that the Abstract puts roughly equal weight on all report chapters, whereas the Conclusion chapter focuses primarily on the findings, conclusions and/or recommendations of the project.

7. FUTURE ENHANCEMENTS

8. BIBLIOGRAPHY

Ideas or contents taken from other sources should be properly cited. It is important that you give proper credit to all work that is not strictly your own, and that you do not violate copyright restrictions.

References should be listed in alphabetical order of authors' surname, and should give sufficient and accurate details..

9. APPENDIX

SCRRENSHOTS

DATABASE TABLES

DATAFLOW DAIGRAM

ACTIVITY DAIGRAM

CLASS DAIGRAM

APPENDIX C - EXTERNAL EVALUATION (THEORY)

Question Paper Type I

Scheme of Examinations:

The external QP with 80 marks and Internal examination is of 20 marks. Duration of each external examination is 2.5 Hrs. The pattern of External Examination is as given below. The students can answer all the questions in Sections A&B. But there shall be Ceiling in each section.

Section A

Short answer type carries 2marks each-15 questions	Ceiling-25

Section B

Paragraph/Problem type carries 5marks each- 8questions	Ceiling-35

Section C

Essay type carries10marks (2 out of 4)	2X10=20
Total	80

Question Paper Type II

Scheme of Examinations:

The external QP with 60 marks and Internal examination is of 15 marks. Duration of each external examination is 2 Hrs. The pattern of External Examination is as given below. The students can answer all the questions in Sections A & B. But there shall be Ceiling in eachsection.

Section A

Short answer type carries 2marks each- 12 questions	Ceiling-20

SectionB

Paragraph/Problem type carries 5marks each- 7questions	Ceiling-30

SectionC

Essay type carries 10marks (1 out of 2)	1X10=10
Total	60

APPENDIX D :- MODEL QUESTION PAPERS

BVOC DEGREE EXAMINATION

SDC1IT01: Discrete Mathematics

Time : 2.5 Hours Total: 80 Marks

PART A: Short answer type carries 2 marks each (Ceiling - 25)

1. What is the difference between equal set and equivalent set? Write example.
2. Draw truth table of P V Q V ~R.
3. State Demorgan's law.
4. What is automatic control system?
5. Define walk and trail.
6. What is Euler graph?
7. Define bipartite graph with example.
8. What are the properties of trees?0
9. Define cutset.
10. Draw Kuratowski's first graph
11. Prove the tautology. PAQ _,Q
12. Check whether the relation R is equivalence or not.

    A={l,2,3} R={(1,1),(2,2),(3,3),(1,2),(2,1)}
13. Define Conjunction.

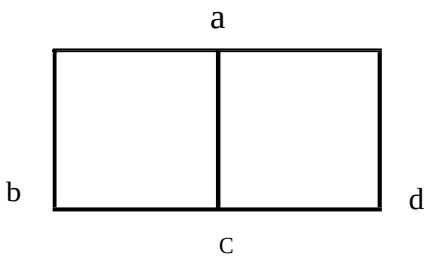
14.Define Planar graph

15. Draw any digraph with 5 vertices and 10 edges.

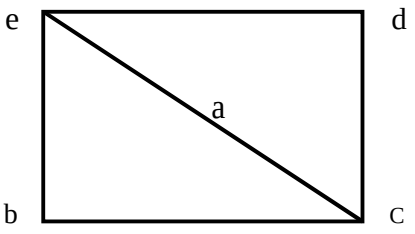
PART B: Paragraph type carries 5 marks each (Ceiling - 35)

1. Find upper bounds and lower bounds of A.(relation is subset)P={ {a},{b},{c},{ab},{ac},{abc}}A={ {c},{ab}}
2. Write any 4 properties of boolean algebra.
3. Show that following graphs are isomorphic or not.

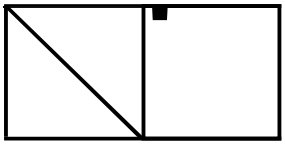
G1:



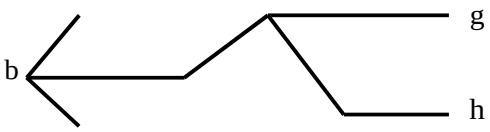
G2:



4. Write the adjacency matrix of following graph.



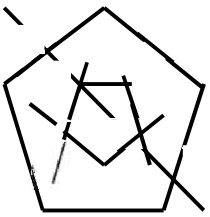
5. Find the centre of the following tree.



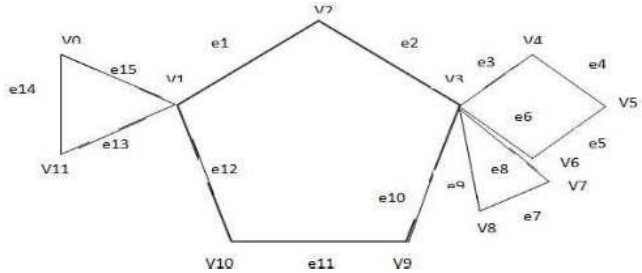
6. What is a spanning tree? Draw an example diagram.
7. Draw a planar graph and its dual graph.
8. Differentiate connectivity and separativity.

PART C : Answer any 2 question { **2*10=20)**

1. Solve the traveling salesman problem.



2. Find Euler tour using Fleury's algorithm.



3. Explain different types of relations with examples.

4. Show that for any two sets A & B, A-(AnB)=A-8. Also explain set operations with Venn diagram

BVOC DEGREE EXAMINATION

SDC1IT02 : Fundamentals of Computer & Programming in C

Time: 2.5 Hours Total: 80 Marks

PART A: Short answer type carries 2 marks each (Ceiling - 25)

1. Write the order of precedence of arithmetic operators.
2. Write the tokens in C language.
3. Define algorithm.
4. Write 3 types of array.
5. Write any 4 string manipulation function.
6. What is recursion?
7. Write all storage classes in C language.
8. Draw memory reservation diagram of structure.
9. What is a pointer?
10. Write syntax of any 2 method for dynamic memory allocation.
11. Briefly explain symbolic constants.
12. What is local and global variable?
13. Specify the use of printf() and scanfO functions.
14. What are function prototypes?
15. List any 4 bit-wise operators.

PART B: Paragraph type carries 5 marks each (Ceiling - 35)

1. Explain type conversion in detail with example.
2. Explain structure of a C program with example.
3. Explain 3 types of looping with example.
4. Write a program to access elements from a 1D array.
5. Briefly explain the difference between structure and union with example.
6. Write a program to find the sum of 2 variables by implementing function.
7. What all are the types of computer languages? Explain briefly.
8. What is an operator?

PART C : Answer any 2 question (2*10=20)

1. Write algorithm, flowchart and program to find area of circle.
2. Write a program showing file manipulation function.
3. Write a program to add two matrix.
4. What is the call by value vs call by reference with example code and diagram?

BVOC DEGREE EXAMINATION

SDC2IT07: Database Management System

Time: 2.5 Hours Total : 80 Marks

PART A: Short answer type carries 2 marks each {Ceiling - 25)

1. List any eight applications of DBMS.
2. Define theterms data and information
3. What are the disadvantages of file processing system?
4. Give the levels of data abstraction?
5. Define instance andschema?
6. Define the terms 1) physical schema 2) logical schema.
7. What is conceptual schema?
8. Define data model?
9. What is storage manager?
10. What are the components of storage manager?
11. List the data structures implemented by the storage manager.
12. What is a data dictionary?
13. Explain application of DBMS.
14. List various users of DBMS & specify theroles.
15. Explain GROUPBY clause withexample.

PART B : Paragraph type carries 5 marks each (Ceiling - 35)

1. Briefly discuss the different layers of ANSI SPARC architecture . Define physical and logicaldata independence. How does this architecture help in achievingthese?
2. Define the terms entity, attribute, role and relationship between the entities, giving examplesfor each of them.
3. What are the three data anomalies that are likely to occur as a result of data redundancy?Can data redundancy be completely eliminated in database approach? Why or why not?
4. Construct an ER diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted.
5. Convert following ER - diagram into a relational database (the primary keys are underlined
6. Describe five main functions of a database administrator.
7. Differentiate database schemes and instances.
8. What is deadlock? How to prevent deadlock?

PART C: Answer any 2 questions { 2*10=20)

1. Write note on entity -relationship data model. Explain the different notations for expressing entity relationships using ER diagrams, with a suitable example.
2. Explain the three different groups of data models with examples
3. Explain the followingterms:-
   (a) Data Redundancy and consistency
   (b) Explain Referential Integrity
   (c) Data atomicity
   (d) Domain constraints
   (e) Data models
4. Explain specialization and generalization concepts in ER diagram with Suitable example.

BVOC DEGREE EXAMINATION

SDC2IT06 Programming in Java

Time: 2.5 Hours Total: 80 Marks

PART A: Short answer type carries 2 marks each {Ceiling - 25)

1. List out Java Keywords.
2. Write about one of the SELECTION statements of Java.
3. . Write the usage of break and continue statements
4. List out the properties of static variables and methods
5. What is a package
6. write about NEW operator
7. Define class and write the syntax of a class
8. List out Thread properties
9. List out some of the source of errors in programming.
10. Define an applet?
11. Define an interface?
12. List the different awt components in Java?
13. What are weak and strong entities? How are they represented in E-R diagram?
14. What is meant by Data Independence?
15. What is DBMS?

PART B: Paragraph type carries 5 marks each {Ceiling - 35)

1. Explain Byte code concept of Java. (b) Explain for loop with an example.
2. Explain data type conversion and casting feature of java with an example.
3. Explain use of command line arguments.
4. Explain about abstract classes and abstract methods.
5. Explain life cycle of a Thread.
6. Explain briefly about access modifiers and their usage.
7. Explain about try-catch functionality in Exception Handling
8. What is an Entity Relationship diagram, describe its components using suitable example.

PART C: Answer any 2 questions { 2*10=20)

1. Explain the concept of importing packages in java with example.
2. Discuss the concept inheritance with an example. Explain 3 types of inheritance in Java.
3. Draw an E-R diagram for Library Management System.
4. What is structured query language? How the DDL and DML are different? Explain.

BVOC DEGREE EXAMINATION

SDC3IT11: Software Engineering

Time :2 Hours Total : 60 Marks

PART A: Short answer type carries 2 marks each (Ceiling - 20)

1. Define maintenance.
2. What is RAD.
3. What is meant by feasibility study
4. Define object oriented design.
5. What is meant by a test driver and test stub?
6. What is meant by a risk?
7. What are the Characteristics for a good design.
8. What is a pseudocode.
9. What are different software quality frameworks?
10. Explain computer system engineering.
11. Explain spiral model.
12. Explain cohesion and coupling.

PART B : Paragraph type carries 5 marks each (Ceiling - 30)

1. Explain UNIT testing.
2. Explain Software requirement specification process.
3. Explain classical waterfall model.
4. Explain the types of user interfaces.
5. Differentiate Re Engineering and reverse engineering.
6. Explain different program analysis tools.
7. What are the characteristics of a good software design?

PART C : Answer any 1 question (1*10=10)

1. Explain SDLC lifecycle.
2. Define Testing. Explain different types of testing in detail.

SDC3IT13: Basic Networking Concepts

Time : 2.5 Hours | Total : 80 Marks

PART A : Short answer type carries 2 marks each **(Ceiling - 25)**

1. Explain digital and analog data?
2. What do you mean by peak amplitude?3.Compare internet and intranet?
4. What do you mean by burst error?
5. What do you mean by single bit error? write an example?6.List the classes in classful addressing?
7. What are the key significance of class A?8. Explain the services of TCP?
9. Explain silly window syndrome?
10. What do you mean by keepalive timers?
11. Compare retransmission and persistence timers?
12. What do you mean by Masquerading?
13. What is client/server network?
14. Define HUB, router.
15. What is the point to point and multipoint connection in NETWORKING?

PART B : Paragraph type carries 5 marks each **(Ceiling - 35)**

1. Compare mesh and star topologies?
2. What is the key differences between ring and star topology?3.Explain transmission impairments.
4. Differentiate ARP and RARP protocols. 5.Explain error detection and error correction?
6. Draw and explain the header format of IPv4?
7. State Dijkstra's algorithm?
8. Illustrate various differences between LAN, WAN and MAN?

PART C : Answer any 2 questions **(2*10=20)**

1. What is the significance of switching? Explain switching techniques with neat diagrams.
2. Compare and contrast the header format of TCP and UDP?
3. Explain the Different layers of the OSI model.4.Explain SMTP.

BVOC DEGREE EXAMINATION

SDC3IT12: Python Programming

Time : 2.5 Hours Total : 80 Marks

PART A : Short answer type carries 2 marks each (Ceiling - 25)

1. What is IDLE?
2. Expressions, and Variables in Python programming language3.Explain the basic data types available in Python
4. Write Python Program to reverse a number 5.Write notes on compound boolean expressions.
6. Explain if-elif-else statement
7. What is recursion.?
8. Differentiate identifiers and keywords.
9. Explain built in functions.
10. Explain the concept of scope and lifetime of variables in Python programming .
11. Explain function call?
12. What is tuple? How to create and access tuple in python.
13. What are the properties of algorithm?
14. Give the features of python.
15. List the standard data types in python.

PART B: Paragraph type carries 5 marks each (Ceiling - 35)

1. Discuss the int(), float(), str(), chr() and complex() type conversion functions with examples2. Explain operator precedence and associativity .
3. Illustrate the different types of control flow statements available in Python
4. Explain mathematical functions, date time functions.
5. Differentiate Simple if statement, if-elif-else statement with an example.
6. How to update and delete dictionary values.
7. Explain ring operations
8. What is a function? Mention the type of function and use with example.

PART C : Answer any 2 questions (2*10=10)

1. Explain functions and function composition with example
2. Explain tuple and operations in python
3. What is Dictionary? Explain Python dictionaries in detail discussing its operations andmethods.
4. What are the basic list operations that can be performed in Python? Explain each operationwith its syntax and example.

BVOC DEGREE EXAMINATION

SDC4IT17 - OPERATING SYSTEM

Time: 2.5 Hours Total: 80 Marks

PART A: Short answer type carries 2 marks each {Ceiling - 25)

1. What is OS?
2. What is a thread?
3. What is PCB?
4. What are concurrent processes?
5. What do you mean bymutual exclusion?
6. Define distributed system?
7. What is virtual memory?
8. What is a file system?
9. What is a deadlock?
10. Define paging.
11. What is swapping?
12. What do you mean by multiprogrammed systems?
13. What are operating system services?
14. What is Access control?
15. List out any four process control system calls?

PART B: Paragraph type carries 5 marks each {Ceiling - 35)

1. Briefly explain about OS as resource manager.
2. What is booting?
3. What do you mean by critical region?
4. Explain concurrent processing.
5. Explain spooling.
6. What are the functions of OS.
7. Explain the structure of theOS.
8. Explain FCFS scheduling algorithm with example.

PART C : Answer any 2 questions (2*10=20)

1. Explain Scheduling algorithms with example in detail.
2. Explain the File management system in OSin detail.
3. What are different types of operating system? Explain them in detail.
4. Explain the basic concepts of segmentation indetail.

BVOC DEGREE EXAMINATION

SDC5IT23: Big data analytics

Time : 2 Hours **Total : 60 Marks**

PART A : Short answer type carries 2 marks each **(Ceiling - 20)**

1 Explain Data Evolution and Data Growth
2 Explain Type of Data
3 Describe Data Classification
4 Influence of Data Science Components in analysis
5 Characteristics of Big Data
6 Explain anyone application of Big Data PAR
7 Explain the need of Data Analytics with a simple scenario
8 Explain 360 view of customers on the perspective of big data.
9 Illustrate Hadoop ecosystem components.
10 Explain SPARK architecture and its advantages.
11 Brief about phases in Map Reduce framework.
12 What is the basic API concept of Map Reduce?

PART B : Paragraph type carries 5 marks each **(Ceiling - 30)**

1 Explain the different sources of data with example.
2 Explain the Hadoop architecture and its process
3 Explain SPARK architecture and its advantages.
4 Brief about phases in Map Reduce framework.
5 What is the basic API concept of Map Reduce?
6 Explain the different big data role.
7 Explain the limitations of big data.

PART C : Answer any 1 question **(1*10=10)**

1 Brief the influencing of big data in Risk and security domain.
2 Explain the progress of big data technology in real time applications.

BVOC DEGREE EXAMINATION

SDC5IT24 - MACHINE LEARNING& ARTIFICIAL INTELLIGENCE

Time : 2 Hours Total : 60 Marks

PART A : Short answer type carries 2 marks each (Ceiling - 20)

1 List out some popular machine learning algorithms?

2 Distinguish between classification andregression.

3 Write down the limitations of K-meansclustering.

4 Define structured SVM.

5 Mention the applications of Reinforcement learning.

6 Illustrate Bayesian Model Comparison

7 Explain Probabilistic Principal Component Analysis

8 Explain the Bias-VarianceTrade off.

9 Consider a data set consisting of variables having more than 30% missing values? For example, out of 50 variables, 8 variables have missing values higher than 30%. How will youdeal with them?

10 Consider a cancer detection data set List out the steps to be performed to build a classification model with 95% accuracy.

11 How can you choose a classifier based on training setsize?

12 Explain Latent Dirichlet Allocation (LDA)

PART B : Paragraph type carries 5 marks each (Ceiling - 30)

13 How is KNN different from K-means clustering?

14 Explain about Markov model with an example.

15 How will you define the number of clusters in a K-means clustering algorithm?

16 What is Back Propagation and Explain it's Working.

17 What is the role of Activation function?

18 Define structured SVM.

19 Mention the applications of Reinforcement learning.

PART C : Answer any 1 question (1*10=10)

1 A doctor knows that Cold causes fever 50% of the time – Prior probability of any patient having cold is 1/50,000 – Prior probability of any patient having fever is 1/20. If a patient has fever, what's the probability he hascold?

2 Analyze tic-tac-toe moves by applying reinforcement learning?

BVOC DEGREE EXAMINATION

SDC5IT25 : Cloud Computing

Time : 2 Hours Total : 60 Marks

PART A : Short answer type carries 2 marks each (Ceiling - 20)

1 What do you mean by Cloud ecosystem?

2 What is Open Nebula?

3 Define Data Security.

4 What do you mean by Virtual machine security?

5 Elaborate the NIST reference architecture of cloud computing with diagram.

6 Describe cloud computing models indetail.

7 How to implement the virtualization in various level? Explain with example.

8 Elaborate the usage of Google drive with example.

9 Explain the various economic constraints of cloud in detail.

10 Explain Software as a Service Security in detail.

11 Elucidate the Identity management and access control in detail.

12 Explain layered cloud architecture development in detail.

PART B : Paragraph type carries 5 marks each (Ceiling - 30)

1 Discuss the mapping applications indetail.

2 Write short note on thefollowing

Eucalyptus • OpenStack

3 How to adopt cloud architecture for an organization? Explain withexample.

4 Analyze the role and need of cloud storage providers for running an E-Commerce application for abusiness.

5 How to implement the virtualization in various level? Explain with example.

6 Elaborate the usage of Google drive with example.

7 Explain the various economic constraints of cloud in detail.

PART C : Answer any 1 question (1*10=10)

8 Explain Cloud security challenges and risks

9 Elucidate about Cloud platform for an organization

BVOC DEGREE EXAMINATION

SDC5IT26 MOBILE SOFTWARE DEVELOPMENT USING ANDROID

Time : 2 Hours Total : 60 Marks

PART A : Short answer type carries 2 marks each (Ceiling - 20)

1. What is android?
2. List any four fundamental components?
3. What do you mean by intent?
4. What is fragment?
5. What is the use of ADT?
6. What is activity?
7. What is AVD
8. What is a widget?
9. List any two layout managers.
10. What is a popup menu?
11. What is content provider?
12. What is the use of intent?

PART B : Paragraph type carries 5 marks each (Ceiling - 30)

1. How to implement SQLite database?
2. What do you mean by resource reference Syntax?
3. Describe about the environment setup of android.
4. List any 4 android widgets.
5. What do you mean by spinner?
6. What do you mean by R file?
7. Explain about android button with example

PART C : Answer any 1 question (1*10=10)

1. What are radio boxes and check boxes in android? Write a sample program to show the useof them.
2. Explain Android SDK stack with a suitable diagram.