FAROOK COLLEGE (AUTONOMOUS)

Farook College P.O. Kozhikode – 673632

Bachelor of Vocation (B.Voc)

IN

Software Development

(With effect from the academic year 2020-2021)

SYLLABUS

As per General & Academic- Regulations for B.Voc. Programme

under University of Calicut w.e.f 2014

Prepared by:

Board of Studies in Vocational Studies

Farook College (Autonomous)

UNIVERSITY OF CALICUT
G & A - I - F

No. 33055/GA - I - F 1/2022/Admn

Calicut University.P.O
Dated: 08.06.2022

From
    The Registrar
To
    The Principal,
    Farook College (Autonomous)
    Kozhikode

Sub:- Syllabus approval- B.Voc Software Development (2020, 2021 Admission)

Ref:- Item no (3) of the Minutes of the meeting of the Board of Studies in Computer Science
      and Application UG held on 11.05.2022.

With the reference to the above, I am to inform you that the Syllabus of B.Voc Software Development (2020, 2021 Admission) submitted by your college have been approved by the Board of Studies in Computer Science and Application UG held on 11.05.2022.

Yours faithfully
Ajitha P.P
Joint Registrar
(For The Registrar)

COURSE STRUCTURE

				Semester 1					
COURSE NUMBER	**SUBJECT CODE**	**SUBJECT/ TITLE**	**CREDITS**	**MARKS**			**Hrs/wk**		
				Int	**Ext**	**Tot**	**TH**	**PRA**	**Tot**
1.1	GEC1EG01	BEN1A01: Transactions: Essential English Language Skills	4	20	80	100	4		4
1.2	GEC1ML02 GEC1AR02 GEC1HD02	BML1A07(3): Bhashayum Sahithyavum-1 BAR1A03: Communicative skill in Arabic BHN1A07(3): Prose and one act plays	4	20	80	100	4		4
1.3	GEC1DM03	BCA1CO2-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 1 - Total			**30**			**700**	**21**	**9**	**30**

Semester 2									
COURSE NUMBER	SUBJECT CODE	SUBJECT/ TITLE	CREDITS	MARKS			Hrs/wk		
				Int	Ext	Tot	TH	PRA	Tot
2.1	GEC2EG04	BEN1A02: Ways with Words: Literatures in English	4	20	80	100	4		4
2.2	GEC2ML05 GEC2AR05 GEC2HD05	BML2A08(3): Bhashayum Sahithyavum-II BAR2A06: Literature in Arabic BHN2A08(3) : Poetry and Short Stories	4	20	80	100	4		4
2.3	GEC2MT06	BCS3A11 Numerical 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 2 - Total			30			700	21	9	30

								Semester 3			

				MARKS				Hrs/wk		
COURSE NUMBER	SUBJECT CODE	SUBJECT/ TITLE	CREDITS	Int	Ext	Tot	TH	PRA	Tot
3.1	GEC3EG07	BEN2A03: Writing for Academic and Professional Success	4	20	80	100	4		4
3.2	GEC3FM08	BCA2C03: Financial and Management Accounting	4	20	80	100	4		4
3.3	GEC3ED09	BCM4A13: Entrepreneurship Development	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 3 - Total			**30**			**700**	**21**	**9**	**30**

		Semester 4							
COURSE NUMBER	SUBJECT CODE	SUBJECT/ TITLE	CREDITS	MARKS			Hrs/wk		
				Int	Ext	Tot	TH	PRA	Tot
4.1	GEC4EG10	BEN2A04: Zeitgeist: Readings on Contemporary Culture	4	20	80	100	4		4
4.2	GEC4SE11	BCS4A14 Principles of Software Engineering	4	20	80	100	4		4
4.3	SDC4IT13	Internet of things (IOT)	4	20	80	100	4		4
4.4	SDC4IT14(E1/E2)	J2EE / Python Programming and Mobile Web	5	20	80	100	5		5
4.5	SDC4IT15	Advanced Computer Networks	4	20	80	100	4		4
4.6	SDC4IT16(P) (E1/E2)	J2EE/Networking & Python Programming	5	20	80	100		5	5
4.7	SDC4IT17(Pr)	Project	4	0	100	100		4	4
Semester 4 - Total			30			700	21	9	30

				MARKS			Hrs/wk		
COURSE NUMBER	SUBJECT CODE	SUBJECT/ TITLE	CREDITS	Int	Ext	Tot	TH	PRA	Tot
5.1	GEC5HR12	BCM3C03Human Resource Management	4	20	80	100	4		4
5.2	GEC5LS13	BPS5D02 Life Skill Development	4	20	80	100	4		4
5.3	SDC5IT18	.Net and Database Administration	5	20	80	100	5		5
5.4	SDC5IT19	Operating Systems	4	20	80	100	4		4
5.5	SDC5IT20 (E3/E4)	Mobile Software Development using Android / Programming Mobile Application	4	20	80	100	4		4
5.6	SDC5IT21(P)	.Net and Database Lab	5	20	80	100		5	5
5.7	SDC5IT22(P) (E3/E4)	Android Programming/Programming Mobile Application	4	20	80	100		4	4
		Semester 5 - Total	30			700	21	9	30

Semester 5 (title spanning above)

				MARKS			Hrs/wk		
COURSE NUMBER	SUBJECT CODE	SUBJECT/ TITLE	CREDITS	Int	Ext	Tot	TH	PRA	Tot
6.1	SDC6IT23(Pr)	Internship & Project (900 hrs)	30	0	100	100		900	900
	Semester 6 - Total		30			100			900

Semester 6 (title spanning above)

				MARKS			Hrs/wk		
COURSE NUMBER	**SUBJECT CODE**	**SUBJECT/ TITLE**	**CREDITS**	**Int**	**Ext**	**Tot**	**TH**	**PRA**	**Tot**
1.1	GEC1EG01	BEN1A01: Transactions: Essential English Language Skills	4	20	80	100	4		4
1.2	GEC1ML02 GEC1AR02 GEC1HD02	BML1A07(3): Bhashayum Sahithyavum-1 BAR1A03: Communicative skill in Arabic BHN1A07(3): Prose and one act plays	4	20	80	100	4		4
1.3	GEC1DM03	BCA1CO2-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 1 Total			**30**			**700**	**21**	**9**	**30**

Semester 1

GEC1DM03 (BCA1CO2) Discrete Mathematics

Course No: 1.3

Course Code: GEC1DM03

Course Name: Discrete Mathematics

Credits: 4

Hours: 60

Objectives

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

Prerequisites

☐ Background of the basic science at +2 level

Course Outcome

☐ To equip the students with basic principles of Discrete Mathematics.

Course Outline

Unit 1 (12 Hours)

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 2 (12 Hours)

Boolean Algebra and its properties, Algebra of propositions & examples, De• Morgan's Laws, Partial order relations, greatest lower bound , least upper bound.

Unit 3 (12 Hours)

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 4 (12 Hours)

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 5 (12 Hours)

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

SDC1IT01 Fundamentals of Computer and Programming in C

Course No: 1.4

Course Code: SDC1IT01

Course Name: Fundamentals of Computer and Programming in C

Credits: 5

Hours: 75

Objectives

- 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 Outcome**

- Acquire the basic knowledge about Computer system and Programming

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. Yashwant Kanithkar, 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
- Get an exposure to develop and design simple web applications .
- Create Websites using open source software.

Prerequisites

- Basic knowledge of Computer and Internet.

Course Outcome
- Learn the basics of creating webpages using HTML.
- Understand the basics of creating client side scripts using JavaScript in a HTML page.
- Learn content management using Joomla.

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 boxesAccepting 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)

Website development using Joomla: Joomla Basics., Joomla FrontEnd: Understanding Basic Joomla Template. Working with and Creating Content for Joomla: Defining Content, Managing Content, Managing Categories, Menus and Menu Items, Working with Parameters and Options, Editing Layout.

Unit 5 (12 Hours)

Joomla BackEnd: Joomla Global Configuration, Article Manager, Archive Manager, Frontpage Manager, Section Manager, Category Manager, Media Manager, Menu Manager, Component Manager, Content Manager, Extensions Manager, Module Manager.

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 & Atul Kahate, 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. Thomno A. Powell, The Complete Reference HTML and XHTML, fourth   edition, Tata McGraw Hill, 2003.
9. The official Joomla Book, Jennifer Marriott and Elin Waring, Addison Wesley.
10. www.w3schools.com
11. www.html-5-tutorial.com

SDC1IT03 (P) Programming in C Lab

Course No: 1.6

Course Code: SDC1IT03 (P)

Course Name: Programming in C Lab

Credits: 5

Hours: 75

Objectives

- Understand and practice the computer programming.

- Solve mathematical or scientific problems using C.

Prerequisites

- Theoretical knowledge of C Programming Language.

Course Outcome

- To learn programming in C language.

Course Outline
1. C Programs for solving basic mathematical problems.
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 Internet Programming Lab

Course No: 1.7

Course Code: SDC1IT04 (P)

Course Name: Internet Programming Lab

Credits: 4

Hours: 60

Objectives

- Understand and Practice web development ☐   Get hands on interactive web, JavaScript and CSS
- Learn Content Management Joomla.

Prerequisites

- Theoretical knowledge of Internet Programming .

Course Outcome

- To create webpage using open source content management system.

Course Outline

1. Web pages involving features of Html and CSS
2. Programs involving JavaScript
3. Programs involving features of DHTML, JQuery 4. Website development using Joomla.

COURSE NUMBER	SUBJECT CODE	SUBJECT/ TITLE	CREDITS	MARKS			Hrs/wk		
				Int	Ext	Tot	TH	PRA	Tot
2.1	GEC2EG04	BEN1A02 Ways with Words: Literatures in English	4	20	80	100	4		4
2.2	GEC2ML05	BML2A08(3) Bhashayum Sahithyavum-II	4	20	80	100	4		4
	GEC2AR05	BAR2A06 Literature in Arabic							
	GEC2HD05	BHN2A08(3) Poetry and Short Stories							
2.3	GEC2MT06	BCS3A11 Numerical 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 2 Total			30			700	21	9	30

The table above is titled **Semester 2**.

GEC2MT06 (BCS3A11) NUMERICAL SKILLS

Course No: 2.3

Course Code: GECMT06

Course Name: Numerical Skills

Credits: 4

Hours: 60

Objectives
- Acquire knowledge of fundamental statistics.
- Develop competence in Combinational Logic Problem formulation and Logic Optimization

Prerequisites

- Basic Mathematical Skills.

Course Outcome
- Acquire knowledge about the ideas and techniques of fundamental statistics, and to illustrate of their applications.
- Develop competence in Combinational Logic Problem formulation and Logic Gates.
- Develop design capability in the field of combinational logic using gates Objectives of the Course.

Course Outline

Unit 1 (12 Hours)

Basic Statistics - definition of statistics, characteristics of statistics, uses, scope and limitation of statistics; Frequency distribution: Classification, discrete and continuous series, formation of frequency distribution. Measures of Central Tendency: Mean, Median, Mode, Geometric mean, Harmonic mean, Meaning and simple problems.

Unit 2 (12 Hours)

Number Systems and Codes, Decimal numbers, Binary numbers, Binary arithmetic, 1's and 2's complements, Octal numbers, Hexadecimal numbers, inter conversions of number systems, Digital codes: Binary coded decimal(BCD), Gray code, ASCII code, error detection and error correction codes, Hamming code.

Unit 3 (12 Hours)

Boolean Algebra : Boolean Algebra: Boolean operations, logic expressions, rules and laws of Boolean algebra, DeMorgan's theorems, minterms, maxterms, SOP and POS form of Boolean expressions for gate network, simplification of Boolean expressions using Boolean algebra and Karnaugh map techniques (up to 4 variables).

Unit 4 (10 Hours)

Logic Gates Positive and negative logic, NOT gate, OR gate, AND gate, NAND gate, NOR gate, EX-OR and EX-NOR gates, Universal gates.

Unit 5 (14 Hours)

Arithmetic and Combinational Logic Circuits Half adder, full adder, parallel binary adder, decoders, BCD to 7-segment decoder, multiplexers and de-multiplexers, multiplexer and de- multiplexer trees.Introduction to Sequential Circuits: SR latch, SR flip flop, JK flip flop, Master Slave JK flip flop, D type flip flop, T type flip flop.

References:

1. Fundamentals of Statistics, S.C Gupta, Himalaya Publishing House.
2. Thomas L Floyd, Digital Fundamentals, PHI. 3. Malvino & Leach, Digital Principles & Applications, TMH.

SDC2IT05 DATA STRUCTURES

Course No: 2.4

Course Code: SDC2IT05

Course Name: Data Structures

Credits: 4

Hours: 60

Objectives

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

Course Outcome

- Choose the appropriate data structure and algorithm design method for a specific   problem.
- Able to evaluate how the choice of data structures and algorithm design   methods impacts the performance of programs.
- Solve problems using various data structures such as arrays, linked lists, stacks, and queues; implementing programs for solving these problems.

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

- 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 Outcome
- Implementing OOPS concepts using Java programming language to solve the given problem.
- Prepare, test, document professional looking software package for business project using the Java programming language.
- Develop GUI based applications in Java.

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. Java2 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

- 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 Outcome
- Acquire deep knowledge in java. Expert in java programming.

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

Hours: 60

Objectives
- 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.

Course Outcome
- Develop mini projects using learned knowledge.

		Semester 3								
COURSE NUMBER	SUBJECT CODE	SUBJECT/ TITLE	CREDITS	MARKS				Hrs/wk	
				Int	Ext	Tot	TH	PRA	Tot
3.1	GEC3EG07	BEN2A03: Writing for Academic and Professional Success	4	20	80	100	4		4
3.2	GEC3FM08	BCA2C03: Financial and Management Accounting	4	20	80	100	4		4
3.3	GEC3ED09	BCM4A13: Entrepreneurship Development	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 3 Total			30			700	21	9	30

SDC3IT09 BASIC NETWORKING CONCEPTS

Course No: 3.4

Course Code: SDC3IT09

Course Name: Basic Networking Concepts

Credits: 4

Hours: 60

Objectives

* Understand the basics of data communication and exchange.
* Understand various techniques and rules for device communication.

Prerequisites

☐ Basic understanding of Data structures and digital Fundamentals..

Course Outcome

* Differentiate the functionalities of each layers of OSI Reference Model.
* Describe the protocols comes under each layer of TCP/IP Protocol Suite.

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:**

Data Communications and Networking, Fourth Edition by Behrou A Forouzan, McGraw-Hill reprint, 2011.

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 Outcome

- Design and normalize databases for real life applications.
- Develop and deploy databases for different applications using MySQL.

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

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

Prerequisites

- Theoretical knowledge of Computer Networking concept.

Course outcome

- To know basic network administration.

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
- Learn data base administration.
- Expertise SQL programming.
- Create and manipulate database object.

Prerequisites

- Theoretical knowledge in DBMS & SQL.

Course outcome
- To familiar with database.

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.

COURSE NUMBER	SUBJECT CODE	SUBJECT/ TITLE	CREDITS	MARKS			Hrs/wk		
Semester 4									
				Int	Ext	Tot	TH	PRA	Tot
4.1	GEC4EG10	BEN2A04: Zeitgeist: Readings on Contemporary Culture	4	20	80	100	4		4
4.2	GEC4SE11	BCS4A14 Principles of Software Engineering	4	20	80	100	4		4
4.3	SDC4IT13	Internet of things (IOT)	4	20	80	100	4		4
4.4	SDC4IT14(E1/E2)	J2EE / Python Programming and Mobile Web	5	20	80	100	5		5
4.5	SDC4IT15	Advanced Computer Networks	4	20	80	100	4		4
4.6	SDC4IT16(P) (E1/E2)	J2EE/Networking & Python Programming	5	20	80	100		5	5
4.7	SDC4IT17(Pr)	Project	4	0	100	100		4	4
Semester 4 Total			**30**			**700**	**21**	**9**	**30**

GEC4SE11 (BCS4A14) PRINCIPLES OF SOFTWARE ENGINEERING

Course No: 4.2

Course Code: GEC4SE11

Course Name: Principles of Software Engineering

Credits: 4

Hours: 60

Objectives
- To learn engineering practices in Software development
- To learn various software development methodologies and practices.
- To learn various Evaluation methods in Software Development

Course Outcome

Realize the importance of Software Engineering in Software development.

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,PHI Publicatio n.

6. Pankaj Jalote, Software Engineering, Narosa Publication.

SDC4IT13- INTERNET OF THINGS (IOT)

Course No: 4.3

Course Code: SDC4IT13

Course Name: Internet of Things

Credits: 4

Hours: 60

Objectives

- Learner will be able to design projects based of Arduino.
- Learner will be able to Implement projects based of Raspberry pi.
- Learner will be able to Identify and use different types of sensors which are compatible with Arduino and Raspberry pi.

Prerequisites

- Basic knowledge in any programming language

Course Outcome

- To implement `simple IOT Systems.

Module 1(12 hours)

Introduction to Internet of things-Embedded Systems - Product designing - Development Boards - Introduction to Arduino - Basic Arduino structure - void setup (), void loop () - Char & int declaration for analog & digital pins - Pin modes, digital/analog pin writing - Delay generation - Increment/decrement & basic arithmetic functions - Different loops [if, for, while, do while] - Arduino blink using LEDs - Loop functions and LED controlling - Delay generation and controlling - LED blinking using Push button.

Module 2(12 hours)

Serial data transmission - Serial data communication - Serial port selection - Serial data pins [Tx & Rx] - Serial data transmission commands - Serial monitor & serial plotter - Basic arithmetic problem and displaying data - Plotting serial values - Interfacing Ultrasonic sensor - Calibration and range setting - Ultrasonic distance measurement - Displaying and plotting real time reading - Interfacing LED circuits with distance monitor.

Module 3(12 hours)

Sensors - Interfacing basic sensors to Arduino and coding - Interfacing IR LED pairs - Obstacle detection and blinking LEDs - Developing an obstacle detection Application - Temperature Sensor - Basic circuit setup - Displaying temperature measured - Over temperature / lower temperature monitoring using LEDs – LDR - Automatic lamp design - LDR projects - Interfacing servo motors - Servo motor - Basic servo theory - Servo motor rotation (0, 90, 180) - Motor rotation with delay - Projects using servo motor and other sensors - Android app-based Bluetooth controlled robot - Basic Bluetooth working - Bluetooth connection to Arduino - Serial data transmission basics - Connecting android phone to Arduino - Controlling Arduino with smartphone.

Module 4(12 hours)

Introduction to Raspberry pi - Why Raspberry pi? - Features of Raspberry pi - Different uses & versions of Raspberry pi – Raspberry Pi Comparisons – Raspberry Pi Pinout – Install and Configure NOOBS – Opening the Terminal - First time boot & configurations - Time setting, keyboard layout, disk expand - Playing around shell – Connecting to a network – Checking IP address - Introduction to programming - Python - Getting started with python programming – Running Python Scripts – Running Script at Start up.

Module 5(12 hours)

Blink an LED – Dim an LED – Ultrasonic Sensor – Ultrasonic and Buzzer – Digital Input – Control LED Brightness using 2 Buttons – Servo Motor – Setting up webserver on a raspberry Pi – Bottle – Installing Bottle – Running a simple Bottle app – Rendering Templates – Control an LED from Web – Dim an LED from web – Display the distance in web – Web page modifications.

References

1. Honbo Zhou, The Internet of Things in the Cloud:A Middleware Perspective-CRC Press 2012.

2. Dieter Uckelmann; Mark Harrison; Florian Michahelles- (Eds.), Architecting the Internet of Things -– Springer – 2011

3. David Easley and Jon Kleinberg, Networks, Crowds, and Markets: Reasoning About a Highly Connected World, Cambridge University Press - 2010.

4. Olivier Hersent, Omar Elloumi and David Boswarthick , The Internet of Things: Applications to the Smart Grid and Building Automation, Wiley -2012

5. Olivier Hersent, David Boswarthick, Omar Elloumi , "The Internet of Things – Key applications and Protocols", Wiley, 2012.

SDC4IT14(E1/E2) Elective 1

E1: J2EE

Course No: 4.4

Course Code: SDC4IT14 (E1)

Course Name: Elective 1

Credits: 5

Hours: 75

Objectives:

- 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 Outcome

- Describe distributed enterprise applications.
- To get knowledge in database management and sserver side 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 (12 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

E2: PYTHON PROGRAMMING AND MOBILE WEB

Course No: 4.5

Course Code: SDC4IT14 (E2)

Course Name: Elective 2 - Python Programming and Mobile Web

Credits: 5

Hours: 75

Objectives

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

Prerequisites

- Basic Knowledge of Programming.
- Knowledge of HTML and JavaScript.

Course Outcome

- Describe various statements, data types and functions in Python.
- Interpret Object oriented programming in Python.

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

SDC4IT15 ADVANCED COMPUTER NETWORKS

Course No: 4.5

Course Code: SDC4IT15

Course Name: Advanced Computer Networks

Credits: 4

Hours: 60

Objectives

- 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 Outcome

- To learn advanced knowledge in networking.
- To learn Mobile Technologies.

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, Mc Graw 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.

SDC4IT16(P)(E1/E2) - Elective Lab

Course No: 4.6

Course Code: SDC4IT16 (P)

Course Name: Elective Lab

Credits: 5

Hours: 75

Objectives

- Develop distributed enterprise applications using java.
- Develop web development and server side programming using java Learn and develop database managements and spring frameworks.

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OR

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- Learn to set up intranet Services, wireless networks and web servers
- Get a basic idea of router configuration and LAN interconnections Learn socket programming.
- To learn Python programming
- To learn decision making, looping and functions in Python
- Understand Object Oriented Programming using Python

Prerequisites

- Basic knowledge in java

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OR

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- Theoretical knowledge of Advanced computer networking Knowledge of C Language

Course Outcome

- To learn J2EE Programming

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OR

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- To know networking in advance.
- Expertise in python

Course Outline

E1 J2EE

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.

E2 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)

Python Lab:

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.

SDC4IT17 (Pr) Project

Course No: 4.7

Course Code: SDC4IT17 (Pr) Course

Name: Project

Credits: 4

Hours: 60

Prerequisites

▪ Software Engineering Concepts
▪ Programming/ Web developing skills

Course Outcome

☐   Develop projects using learned knowledge.

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								
COURSE NUMBER	**SUBJECT CODE**	**SUBJECT/ TITLE**	**CREDITS**	**MARKS**				**Hrs/wk**	
				Int	**Ext**	**Tot**	**TH**	**PRA**	**Tot**
5.1	GEC5HR12	BCM3C03Human Resource Management	4	20	80	100	4		4
5.2	GEC5LS13	BPS5D02 Life Skill Development	4	20	80	100	4		4
5.3	SDC5IT18	.Net and Database Administration	5	20	80	100	5		5
5.4	SDC5IT19	Operating Systems	4	20	80	100	4		4
5.5	SDC5IT20 (E3/E4)	Mobile Software Development using Android / Programming Mobile Application	4	20	80	100	4		4
5.6	SDC5IT21(P)	.Net and Database Lab	5	20	80	100		5	5
5.7	SDC5IT22(P) (E3/E4)	Android Programming/Programming Mobile Application	4	20	80	100		4	4
colspan=3	**Semester 5 - Total**	30			700	21	9	30

SDC5IT18 .Net and Database Administrator

Course No: 5.5

Course Code: SDC5IT18

Course Name: .Net and Database Administrator

Credits: 5

Hours: 75

Objectives
☐   Learn the basic of .NET technology Expertise web development.

Prerequisites

☐   Basic concepts of OOPS, RDBMS and Programming skills.

Course Outcome

☐   Deep knowledge in .NET Technologies.

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 visual studio, . 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, 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.

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 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 - Administering the Scheduler.

References:

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

SDC5IT19 Operating Systems

Course No: 5.4

Course Code: SDC4IT19
Course Name: Operating Systems
Credits: 4

Hours: 60

Objectives

- 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 Outcome

- Realize the importance of Operating System.

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.

SDC5IT20 (E3/E4) - ELECTIVE 2

E3: MOBILE SOFTWARE DEVELOPMENT USING ANDROID

Course No: 5.5

Course Code: SDC5IT20 (E3)

Course Name: Mobile Software Development using Android

Credits: 4

Hours: 60

Objectives

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

Prerequisites

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

Course Outcome

- Design, develop and debug android applications.
- Design and implement applications with databases and content providers.

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, Onur Cinar, Apress Publication
2. Professional Android 4 Application Development, Reto Meier

E4: Programming Mobile Application

Course No: 5.5

Course Code: SDC5IT19 (E4)

Course Name: Programming Mobile Application.

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 Outcome
• To famililiar with AngularJS.
• Learn to develop Mobile web Application**.**

Course Outline

Unit 1 (15 Hours)

Html5 & CSS3: 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,

SDC5IT21 (P): .NET Database Lab

Course No: 5.6

Course Code: SDC5IT21

Course Name: .NET Database Lab

Credits: 5
Hours: 75

Objectives

- Practice and implement the theoretical knowledge acquired.

- Develop industry standard applications with real life implications

Prerequisites

▪ Theoretical knowledge in the topic.

Course Outcome
☐   Deep leaning in .NET Technology.

Course Outline

13. Simple C# programs
14. Create and populate Windows Forms.
15. Create and use user controls in a Windows Forms application
16. Create menus in a Windows Forms application
17. Add code to form and control event procedures in a Windows Forms application
18. Validate user input in a Windows Forms application
19. Bind Windows Forms applications to various data sources by using Microsoft   ADO.NET
20. Debug a Windows Form Application (try/catch)

SDC5IT22 (P) (E3/E4) Elective 2 Lab

Course No: 5.5

Course Code: SDC5IT22

Course Name: Elective 2

Credits: 4

Hours: 60

Objectives

- 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

☐ To develop mobile Application using Android

E3: Android Programming

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. PreferenceActivity
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. Data Storage
16. Simulating Sensors

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 Angularajs.
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 semester 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 of the seminar and shall present it in the class. Proper presentation aid can be used. Every student shall participate in the seminar. The students should undertake 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									
COURSE NUMBER	SUBJECT CODE	SUBJECT/ TITLE	CREDITS	MARKS			Hrs/wk		
				Int	Ext	Tot	TH	PRA	Tot
6.1	SDC6IT23(Pr)	Internship & Project (900 hrs)	30	0	100	100		900	900
Semester 6 Total			30			100			900

SDC6IT23(Pr)-Industrial Training and Project

Course No: 6.1

Course Code: SDC6IT23 (Pr)

Course Name: Industrial Training and Project.

Credits: 30

Hours: 900

Objectives

- 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 projects and make him work ready.   **Prerequisites**

- Software Engineering concepts
- Programming skills
- Knowledge of OS, Data structure and Database concepts.   **Course Outcome**

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.

Course Outline

The student shall undergo Industrial training and a 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.