



**GULBARGA UNIVERSITY, KALABURAGI**

**DEPARTMENT OF COMPUTER SCIENCE**

**SYLLABUS FOR BACHELOR OF ARTS (B.A.)**

**B.A. (COMPUTER APPLICATIONS)**

**(CBCS SCHEME)**

**(REVISED SYLLABUS WITH EFFECT FROM ACADEMIC YEAR 2018-19 & ONWARDS)**

**Approved the Syllabus by BOS(UG) on dated 06-06-18 & 07-06-18**

**GULBARGA UNIVERSITY**

**B.A. (COMPUTER APPLICATIONS) CBCS SYLLABUS**

**( CBCS Scheme)**

**(With effect from the academic year 2018-19 and onwards)**



**SCHEME OF STUDY AND EXAMINATION FOR B.A IN COMPUTER APPLICATIONS UNDER  
CBCS SCHEME W.E.F. ACADEMIC YEAR 2018-19 AND ONWARDS**

Paper Code	Title of the Course	Marks			Duration of Theory / Practical Exam. Hrs.	Teaching Hours/Week			Credits
		Semester	IA	Total		L	T	P	
<b>FIRST SEMESTER 2018-19 &amp; ONWARDS</b>									
AECC-1a	Kannada/MIL-1	80	20	100	3 Hrs	3	-	-	3
AECC-1b	English-1	80	20	100	3 Hrs	3	-	-	3
AECC-1c	Environmental Studies	40	10	50	2 Hrs	2	-	-	2
DSC-1A		80	20	100	3 Hrs	5	1	-	6
DSC-2A		80	20	100	3 Hrs	5	1	-	6
DSC-3A	Information Technology	80	20	100	3 Hrs	4	-	-	4
<b>PRACTICALS</b>									
DSC-3A	Practical-I:Information Technology Lab	40	10	50	2 Hrs	-	-	4	2
<b>TOTAL MARKS FOR FIRST SEMESTER</b>				<b>600</b>					<b>26</b>
<b>SECOND SEMESTER 2018-19 &amp; ONWARDS</b>									
AECC-2a	Kannada/MIL-1	80	20	100	3 Hrs	3	-	-	3
AECC-2b	English-1	80	20	100	3 Hrs	3	-	-	3
AECC-2c	Indian Constitution	40	10	50	2 Hrs	2	-	-	2
DSC-1B		80	20	100	3 Hrs	5	1	-	6
DSC-2B		80	20	100	3 Hrs	5	1	-	6
DSC-3B	Office Automation Tools	80	20	100	3 Hrs	4	-	-	4
<b>PRACTICALS</b>									
DSC-3B	Practical-II: Office Automation Tools Lab	40	10	50	2 Hrs	-	-	4	2
<b>TOTAL MARKS FOR SECOND SEMESTER</b>				<b>600</b>					<b>26</b>
<b>THIRD SEMESTER 2019-20 &amp; ONWARDS</b>									
AECC-3a	Kannada/MIL-1	80	20	100	3 Hrs	3	-	-	3
AECC-3b	English-1	80	20	100	3 Hrs	3	-	-	3
GE-1	Computer Fundamentals	40	10	50	2 Hrs	2	-	-	2
DSC-1C		80	20	100	3 Hrs	5	1	-	6
DSC-2C		80	20	100	3 Hrs	5	1	-	6
DSC-3C	Problem Solving using C	80	20	100	3 Hrs	4	-	-	4
<b>PRACTICALS</b>									
DSC-3C	Practical-III: Problem Solving using C Lab	40	10	50	2 Hrs	-	-	4	2
<b>TOTAL MARKS FOR THIRD SEMESTER</b>				<b>600</b>					<b>26</b>

<b>FOURTH SEMESTER 2019-20 &amp; ONWARDS</b>									
AECC-4a	Kannada/MIL-1	80	20	100	3 Hrs	3	-	-	3
AECC-4b	English-1	80	20	100	3 Hrs	3	-	-	3
GE-2	E-Commerce Technologies	40	10	50	2 Hrs	2	-	-	2
DSC-1D		80	20	100	3 Hrs	5	1	-	6
DSC-2D		80	20	100	3 Hrs	5	1	-	6
DSC-3D	Database Management Systems	80	20	100	3 Hrs	4	-	-	4
<b>PRACTICALS</b>									
DSC-3D	Practical-IV: Database Management Systems Lab	40	10	50	2 Hrs	-	-	4	2
<b>TOTAL MARKS FOR FOURTH SEMESTER</b>				<b>600</b>					<b>26</b>
<b>FIFTH SEMESTER 2020-21 &amp; ONWARDS</b>									
SEC-1	(a) Computer Oriented Statistical Methods (b) System Administration & Maintenance	40	10(Pr)	50	2 Hrs	1	-	2	2
DSE-1		80	20	100	3 Hrs	5	1	-	6
DSE-2		80	20	100	3 Hrs	5	1	-	6
DSE-3	(a) Dot Net Programming (b) Computer Networks and Internet Technologies (c) Multimedia Systems and Application	80	20	100	3 Hrs	4	-	-	4
<b>PRACTICALS</b>									
DSE-3	Practical-V: (a) Dot Net Programming Lab (b) Computer Networks and Internet Technologies Lab (c) Multimedia Systems and Application Lab	40	10	50	2 Hrs	-	-	4	2
<b>TOTAL MARKS FOR FIFTH SEMESTER</b>				<b>400</b>					<b>20</b>
<b>SIXTH SEMESTER 2020-21 &amp; ONWARDS</b>									
SEC-2	(a) Information Security (b) XML Programming	40	10(Pr)	50	2 Hrs	1	-	2	2
DSE-4		80	20	100	3 Hrs	5	1	-	6
DSE-5		80	20	100	3 Hrs	5	1	-	6
DSE-6	(a) Object Oriented Programming in C++ (b) Java Programming (c) Web Technologies	80	20	100	3 Hrs	4	-	-	4
<b>PRACTICALS</b>									
DSE-6	Practical-VI: (a) Object Oriented Programming in C++ Lab (b) JAVA Programming Lab (c) Web Technologies Lab	40	10	50	2 Hrs	-	-	4	2
<b>TOTAL MARKS FOR SIXTH SEMESTER</b>				<b>400</b>					<b>20</b>
<b>TOTAL MARKS &amp; CREDITS FOR THE COURSE</b>				<b>3200</b>					<b>144</b>

Note: Course = Paper, AECC: Ability Enhance Course, DSE: Discipline Specific Core Course, SEC=Skill Enhancement Course, DSE= Discipline Specific Elective, L=Lecture, T=Tutorial, P=Practical Additional 2 credits shall be given for the successful completion of two years of NSS/NCC (144+2=146) AECC-1C and AECC-2C shall be approved by the BOS of Environmental Science and Political Science Tutorial/Batch = 20 Students, Practical/Batch = 10 Students, AECC-a, AECC-b paper cover communicative skills. For SEC theory 40 marks, Practical IA 10 marks awarded by the concerned course teacher based on the Practical.

**GULBARGA UNIVERSITY, KALABURAGI**  
**DEPARTMENT OF COMPUTER SCIENCE**  
**B.Sc./B.C.A./B.A**

**Blue print for the DSC paper and DSE paper setting**

UNIT	2 Marks Questions	5 marks Questions	10 Marks Questions
I	2	1	2
II	2	1	2
III	3	2	1
IV	3	2	1

**Question Papers contains 3 sections:**

**Section A :** 10 Questions of 2 marks, Answer All Questions X 2 = 20 Marks

**Section B :** 6 Questions of 5 marks, Answer any 4 Questions X 5 = 20 Marks

**Section C :** 6 Questions of 10 marks, Answer any 4 Questions X 10 = 40 Marks

**Total=80 Marks**

**Distribution of Marks for Practical:**

- |                                      |                   |
|--------------------------------------|-------------------|
| 1. Writting 2 programs X 10 marks    | = 20Marks.        |
| 2. Execution of single program 1 X10 | = 10 Marks.       |
| 3. Record Book                       | = 05 Marks.       |
| 4. Viva-voce                         | = 05 Marks.       |
| <b>Total</b>                         | <b>= 40 Marks</b> |

**Distribution of Marks for Project work for BCA VI Semester Course**

- |                       |                    |
|-----------------------|--------------------|
| 1. Project Evaluation | = 90 Marks.        |
| 2. Viva-voce          | = 30 Marks.        |
| 3. Internal Marks     | = 30 Marks         |
| <b>Total</b>          | <b>= 150 Marks</b> |

**Blue print for SEC paper setting and G.E.( B.A. Course only)**

**B.Sc./B.C.A./B.A**

UNIT	2 Marks Questions	5 marks Questions	10 Marks Questions
I	2	1	2
II	3	2	1

**Question Papers contains 3 sections:**

**Section A:** 5 Questions of 2 marks, Answer All Questions X 2= 10 Marks

**Section B :** 3 Questions of 5 marks, Answer any 2 Questions X 5= 10 Marks

**Section C :** 3 Questions of 10 marks, Answer any 2 Questions X 10= 20 Marks

**Total=40 Marks**

## DSC 3A: Information Technology

**Teaching: 4 Hrs./ Week**

**Credits: 04**

**Max Marks: 80, Cont. Assessments. 20**

**Total Teaching Hrs: 60**

### UNIT I

**15 Hrs**

Introduction: Introduction to computer system, uses, types.

Data Representation: Number systems and character representation, binary arithmetic.

### UNIT II

**15 Hrs**

**Human Computer Interface:** Types of software, Operating system as user Interface, utility programs.

**Devices:** Input and output devices (with connections and practical demo),

Keyboard, mouse, joystick, scanner, OCR, OMR, bar code reader, web camera, monitor, printer, plotter.

### UNIT-III

**15 Hrs**

**Memory:** Primary, secondary, auxiliary memory, RAM, ROM, cache memory, hard disks, optical disks.

**Computer Organization and Architecture:** C.P.U., registers, system bus, main memory UNIT, cache memory, Inside a computer, SMPS, Motherboard, Ports and Interfaces, expansion cards, ribbon cables, memory chips, processors.

### UNIT-IV

**15 Hrs**

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

**Use of Computers in Education and Research:** Data analysis, Heterogeneous. Storage, e-Library, Google Scholar, Domain specific packages such as SPSS, Mathematical etc.

### References:

1. A. Goel, Computer Fundamentals, Pearson Education, 2010.
2. P. Aksoy, L. DeNardis, Introduction to Information Technology, Cengage Learning, 2006
3. P. K.Sinha, P. Sinha, Fundamentals of Computers, BPB Publishers, 2007

### Practical-I: DSC 3A: Information Technology Lab

**Practical: 4 Hrs./ Week**

**Credits: 02**

**Max Marks: 40**

**Cont. Assessments. 10**

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper **DSC 3A Information Technology**.

NOTE: The practical assignment must include connecting parts of a computer and assembling it to an extent, media formatting and installation of some software & Simple exercises Using SPSS.

## DSC 3B: Office Automation tools

**Teaching: 4 Hrs./ Week**

**Credits: 04**

**Max Marks: 80, Cont. Assessments. 20**

**Total Teaching Hrs: 60**

### Unit-I

**15 Hrs**

**MS-Word:** Introduction to word processor, Features of word XP, Special features of word processing software, Getting into Microsoft word XP, Creating new document, Editing the document, Opening existing document, Saving the document, Print the document, File operation in word XP, Creation of tables in word, Create the header or footer, Graphics, Introduction to mail merge, Creating and working with web page, Editing equations, Keyboard shortcut keys.

### Unit-II

**15 Hrs**

**MS-Excel:** Introduction, feature of MS-Excel includes, spreadsheet basics, getting started with Microsoft Excel, Part of MS-Excel window, Cell and Cell address, Components of an excel workbook, Navigate worksheet, Moving through cells, Adding worksheets, Rows and columns, Resize rows and columns, Selecting cells, Moving and copying cell content, Enter and edit data in worksheet, Entering and copying the formula, Inserting cells columns and rows, Functions in excel, Auto sum, Auto fill, Custom list, Alignment, Changing the column width, Changing the height of the row, formatting the values in cells, Database, Charts in excel, Macros in excel.

### Unit-III

**15 Hrs**

**MS-Power Point:** Introduction, Different uses of power point, creating a presentation slide, Open an existing presentation, Auto layout, Components of power point window, Different views of a slide, Different operations on slide, Adding clip art to a presentation, Slide animation, Slide master, Slide number, Printing a presentation, Charts in power point, List of shortcut keys

### Unit-IV

**15 Hrs**

**MS-Access:** Introduction to Microsoft access, Blank access database, Access database wizards, Opening an existing database, viewing data, Creating an access database and tables, Creating forms, Entering and updating data using forms, Editing and deleting data in a form, creating and printing reports.

### References:

1. C. V. Uppin and Veeru Uppin, Computer Applications.
2. Sushila Madan , Introduction to Essential tools,JBA,2009.
3. Anita Goel, Computer Fundamentals, Pearson, 2012

## Practical-II: DSC 3B: Office Automation Tools Lab

**Practical: 4 Hrs./ Week**

**Credits: 02**

**Max Marks: 40**

**Cont. Assessments. 10**

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper **DSC 3B Office Automation tools.**

## GE-1: Computer Fundamentals

Teaching: 2 Hrs./ Week

Credits: 02

Max Marks: 40 Cont. Assessments. 10

Total Teaching Hrs: 30

### UNIT I

15 Hrs

**Introduction:** computers, characteristics and limitations of computer, Block diagram of computer, types of computers, uses of computers, computer generations. Number systems: binary, hexa and octal numbering system.

**Input and output devices:** Keyboard and mouse, inputting data in other ways, Types of Software: system software, Application software, commercial, open source, domain and free ware Software,

### UNIT –II

15 Hrs

**Memories:** primary, secondary and cache memory. **Windows basics:** desk top, start menu, icons. System Software, Compilers, assemblers, loaders, Operating Systems fundamentals, Introduction to Algorithms, Flowcharting and Programming Languages.

### References:

1. Fundamentals Of Computers” by REEMA THAREJA from OXFORD UNIVERSITY

## DSC 3C: Problem Solving Using C

Teaching: 4 Hrs./ Week

Credits: 04

Max Marks: 80 Cont. Assessments. 20

Total Teaching Hrs: 60

### UNIT I

15 Hrs

Programming Concepts: Algorithm and its characteristics, pseudo code / flow chart, program, identifiers, variables, constants, primitive data types, expressions, structured data types, arrays, compilers and interpreters.

### UNIT II

15 Hrs

**Basics of C:** Overview of C, Developing Programs in C, Parts of Simple C Program, Structure of a C Program, Comments, Program Statements, C Tokens, Keywords, Identifiers, Data Types, Variables, Constants, Operators and Expressions, Expression Evaluation–precedence and associativity, Type Conversions. Input-Output: Non-formatted and Formatted Input and Output Functions, Escape Sequences.

**Control Statements:** Selection Statements – if, if-else, nested if, nested if-else, comma operator, conditional operator, switch; Iterative Statements–while, for, do-while; Special Control Statement–goto, break, continue, return, exit.

### UNIT III

15 Hrs

**Arrays and Strings:** One-dimensional Arrays, Character Arrays, Functions from ctype.h, string.h, Multidimensional Arrays. **Functions:** Concept of Function, Using Functions, Call-by-Value Vs Call-by-reference, Passing Arrays to Functions, Scope of Variables, Storage Classes, Inline Functions, and Recursion. **Pointers:** Introduction, Address of Operator (&), Pointer, Uses of Pointers, Arrays and Pointers, Pointers and Strings, Pointers to Pointers, Array of Pointers, Pointer to Array, Dynamic Memory Allocation.

## UNIT IV

15 Hrs

**User-defined Data Types:** Declaring a Structure (Union) and its members, Initialization Structure (Union), Accessing members of a Structure (Union), Array of Structures (Union), Structures verses Unions, Enumeration Types.

**Files:** Introduction, Using Files in C, Working with Text Files, Working with Binary Files, Files of Records, Random Access to Files of Records, Other File Management Functions.

### References

1. M.T.Somashekara ,Problem Solving with C, 2E, PHI Learning.
2. Balagurusamy, Programming in ANSI C, McGraw Hill Education India Private Limited; 7/e.
3. Byron Gottfried, Programming with C (Schaum's Outlines Series), McGraw Hill Education; 3/e

### Practical-III: DSC 3C: Problem Solving Using C Lab

**Practical: 4 Hrs./ Week**

**Credits: 02**

**Max Marks: 40**

**Cont. Assessments. 10**

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper **DSC 3C Problem Solving Using C.**

### GE-2: E-Commerce Technologies

**Teaching: 2 Hrs./ Week**

**Credits: 02**

**Max Marks: 40 Cont. Assessments. 10**

**Total Teaching Hrs: 30**

## UNIT I

15 Hrs

**An introduction to Electronic commerce:** What is E-Commerce (Introduction And Definition), Main activities E-Commerce, Goals of E-Commerce, Technical Components of E-Commerce, Functions of E-Commerce, Advantages and disadvantages of E-Commerce, Scope of Ecommerce, Electronic Commerce Applications, Electronic Commerce and Electronic Business (C2C)(C2G,G2G, B2G, B2P, B2A, P2P, B2A, C2A, B2B, B2C) .

**The Internet and WWW:** Evolution of Internet, Domain Names and Internet Organization (.edu, .com, .mil, .gov, .net etc.) , Types of Network, Internet Service Provider.

## UNIT II

15 Hrs

World Wide Web, Internet & Extranet, Role of Internet in B2B Application, building own website, Cost, Time, Reach, Registering a Domain Name, Web promotion, Target email, Baner, Exchange, Shopping Bots.

**Internet Security:** Secure Transaction, Computer Monitoring, Privacy on Internet, Corporate Email privacy, Computer Crime( Laws , Types of Crimes), Threats, Attack on Computer System, Software Packages for privacy, Hacking, Computer Virus( How it spreads, Virus problem, virus protection, Encryption and Decryption, Secret key Cryptography, DES, Public Key Encryption, RSA, Authorizations and Authentication, Firewall, Digital Signature( How it Works).

### References:

1. G.S.V.Murthy, E-Commerce Concepts, Models, Strategies- :- Himalaya Publishing House, 2011.



2. Kamlesh K Bajaj and Debjani Nag , E- Commerce , 2005.
3. Gray P. Schneider , Electronic commerce, International Student Edition, 2011,
4. Henry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang E-Commerce, Fundamentals And Applications, Wiely Student Edition, 2011

## **DSC 3D: Database Management Systems**

**Teaching: 4 Hrs./ Week**

**Credits: 04**

**Max Marks: 80 Cont. Assessments. 20**

**Total Teaching Hrs: 60**

### **UNIT I**

**15 Hrs**

**Introduction to Databases:** Introduction, Traditional File-Based Systems, Database Approach, Roles in the Database Environment, Advantages and Disadvantages of DBMSs, The Three-Level ANSI-SPARC Architecture, Database Languages, Data Models, Functions of a DBMS, Components of a DBMS.

**Relational Model:** Introduction, Terminology, Integrity Constraints, Views. The Relational Algebra: Unary Operations, Set Operations, Join Operations, Division Operation, Aggregation and Grouping Operations.

### **UNIT II**

**15 Hrs**

**Entity–Relationship Modeling:** Entity Types, Relationship Types, Attributes, Keys, Strong and Weak Entity Types, Attributes on Relationships, Structural Constraints, Problems with ER Models–Fan Traps, Chasm Traps.

**Enhanced Entity–Relationship Modeling:** Specialization/Generalization, Aggregation and Composition.

**Functional–Dependencies:** Anomalies, Partial Functional Dependency, Transitive Functional Dependency, Multi Valued Dependency, Join Dependency.

**Normalization:** The Purpose of Normalization, How Normalization Supports Database Design, Data Redundancy and Update Anomalies, Functional Dependencies in brief, The Process of Normalization, 1NF, 2NF, 3NF, BCNF. The Database Design Methodology for Relational Databases.

### **UNIT III**

**15 Hrs**

**SQL:** Introduction, Data Manipulation–Simple Queries, Sorting Results, Using the SQL Aggregate Functions, Grouping Results, Sub-queries, ANY and ALL, Multi-table Queries, EXISTS and NOT EXIST, Combining Result Tables, Database Updates.

**SQL:** The ISO SQL Data Types, Integrity Enhancement Feature–Domain Constraints, Entity Integrity, Referential Integrity, General Constraints, Data Definition–Creating a Database, Creating a Table, Changing a Table Definition, Removing a Table, Creating an Index, Removing an Index, Views–Creating a View, Removing a View, View Resolution, Restrictions on Views, View Updatability, WITH CHECK OPTION, Advantages and Disadvantages of Views, View Materialization, Transactions, Discretionary Access Control–Granting Privileges to Other Users, Revoking Privileges from Users.

**Advanced SQL:** The SQL Programming Language–Declarations, Assignments, Control Statements, Exceptions, Cursors, Subprograms, Stored Procedures, Functions, and Packages, Triggers, Recursion.

## UNIT IV

15 Hrs

**Transaction Management:** Transaction Support–Properties of Transactions, Database Architecture, Concurrency Control–The Need for Concurrency Control, Serializability and Recoverability, Locking Methods, Deadlock, Time Stamping Methods, Multi-version Timestamp Ordering, Optimistic Techniques, Granularity of Data Items, Database Recovery–The Need for Recovery, Transactions and Recovery, Recovery Facilities, Recovery Techniques, Nested Transaction Model.

**Security:** Database Security–Threats, Computer-Based Controls–Authorization, Access Controls, Views, Backup and Recovery, Integrity, Encryption, RAID.

### References :

1. Thomas M. Connolly, Carolyn E. Begg, Database Systems–A Practical Approach to Design, Implementation, and Management (6e)
2. Sharon Allen, Evan Terry, Beginning Relational Data Modeling
3. Jeffrey A. Hoffer, V. Ramesh, Heikki Topi, Modern Database Management
4. Raghuram Ramakrishna, Johannes Gehrke, Database Management Systems
5. Ramez Elmasri, Shamkant B. Navathe, Fundamentals of Database Systems
6. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts
7. C. Coronel, S. Morris, Peter Rob, Database Systems: Design, Implementation, and Management

## Practical-IV: DSC 3D: Database Management Systems Lab

**Practical: 4 Hrs./ Week**

**Credits: 02**

**Max Marks: 40**

**Cont. Assessments. 10**

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper **DSC 3D Database Management Systems.**

## SEC- 1(a) : Computer Oriented Statistical Methods

**Teaching: 1 Hrs./ Week**

**Credits: 02**

**Max Marks: 30 Cont. Assessments.00**

**Total Teaching Hrs: 15**

### UNIT I

**08 Hrs**

Nature and scope of statistical methods and their limitations: Classification, Tabulation - Diagrammatic representation of various types of statistical data -Frequency curves and Lorenz curve.

### UNIT II

**07 Hrs**

Measures of Central tendency: Arithmetic means, Median, Mode – Merits and demerits - graphical solution of Median and Mode.

### References:

1. Pillai, R.S.N, Bagavathi, V. (2009), Statistics, Theory and Practice, 7<sup>th</sup> Edition, S.Chand Ltd, New Delhi.
2. Gupta, S.P. (2011), "Applied Statistical Methods", 4<sup>th</sup> Edition, Sultan Chand Sons, New Delhi.
3. Ken Black, (2013), "Business Statistics for Contemporary Decision Making", 7<sup>th</sup> Edition, John Wiley

Publications

4. Gupta S.P. and Kapoor, V.K., Fundamentals of Applied statistics, Sultan Chand & Sons 1996.
5. Gupta S.P. and Kapoor, V.K., Fundamentals of Mathematical statistics, Sultan Chand and Sons, 1995.
6. Graybill, Introduction to Statistics, McGraw.
- 7.. Anderson, Statistical Modelling, McGraw.

### **Practical IA: SEC -1(a): Computer Oriented Statistical Methods Lab**

**Practical: 2 Hrs./ Week**

**Cont. Assessments. 10**

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper **SEC 1(a) Computer Oriented Statistical Methods** Using C / SPSS .

### **SEC- 1(b): System Administration and Maintenance**

**Teaching: 1 Hrs./ Week**

**Credits: 02**

**Max Marks: 30 Cont. Assessments. 00**

**Total Teaching Hrs: 15**

#### **UNIT-I**

**7 Hrs**

**Linux:** Basics of operating system, services. Installation and configuration, maintenance. What is a Linux Operating system, Kernel, API, cli, gui. Difference between Linux/Unix and other operating systems. Features and Architecture Linux features, advantages, disadvantages.

#### **UNIT-II**

**8 Hrs**

**Windows:** Windows as operating system, history, versions. PC hardware, BIOS, Devices and drivers. Kernal Configuration and building. Application installation, configuration and maintenance, Server services and Client services, Difference between Windows XP/windows7 and windows server 2003/2008.

#### **References:**

1. Linux Administration: A Beginner&apos Guide 6th Edition by Wale Soyinka Publisher: Mcgraw Higher Ed
2. Microsoft Windows Operating System Essentials by Tom Carpenter

### **Practical IA : SEC- 1(b): System Administration and Maintenance Lab**

**Practical: 2 Hrs./ Week**

**Cont. Assessments. 10**

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper **SEC 1(b) System Administration and Maintenance.**

## **DSE 3(a): Dot Net Programming**

**Teaching: 4 Hrs./ Week**

**Credits: 04**

**Max Marks: 80 Cont. Assessments. 20**

**Total Teaching Hrs: 60**

### **UNIT I**

**15 Hrs**

Overview of .NET framework, problems with the earlier languages and .NET solution. Overview of .NET binaries and .NET architecture. The role of Microsoft Intermediate Language and Metadata. Understanding Common Language Runtime, Common Type System and Common Language Specification. .NET base classes, overview of .NET Assemblies, .NET memory management.

### **UNIT II**

**15 Hrs**

Introduction to Visual Studio .NET, Visual Studio .NET IDE. Building Visual Basic .NET application. VB.NET language fundamentals, object oriented Programming with VB.NET, cross language inheritance, Namespaces, accessing the registry. Interfaces and collections – Understanding interface-based Programming, building a custom enumerator, building a clone able object, comparable objects

### **UNIT III**

**15 Hrs**

Introducing Windows Forms, GDI+ namespaces, Windows Form controls. Data access with ADO.NET – The need for ADO.NET, ADO.NET namespaces, ADO.NET managed providers, OLEDB managed providers, SQL managed providers, Accessing XML through ADO.NET.

### **UNIT IV**

**15 Hrs**

Web development and ASP.NET – Problems with classic ASP. Benefits of ASP.NET, ASP.NET namespaces, architecture of ASP.NET web application. Building and understanding web services, anatomy of a web service, overview of web service namespaces, building a simple web service, Web Service Description Language (WSDL), generating a proxy with VB.NET. Deployment of a VB.NET application.

#### **References:**

1. Visual Basic .NET and the .NET platform – An Advanced Guide – Andrew Troelsen.
2. Programming Visual Basic .NET – Dave Grundgiger.
3. Teach Yourself Visual Basic .NET in 21 days – Duncan Mackenzie and Kent Sharkey
4. Introducing Microsoft .NET – David S. Platt
5. Database Access with Visual Basic .NET – Jeffrey P. McManus, Jackie goldstein and Kevin T. Price.
6. ASP.NET Projects – Building 10 Enterprise Projects – Eric A. Smith

## **Practical-V(a): DSE 3(a): Dot Net Programming Lab**

**Practical: 4 Hrs./ Week**

**Credits: 02**

**Max Marks: 40**

**Cont. Assessments. 10**

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper **DSE 3(a) Dot Net Programming.**

## DSE 3(b): Computer Networks and Internet Technologies

Teaching: 4 Hrs./ Week

Credits: 04

Max Marks: 80 Cont. Assessments. 20

Total Teaching Hrs: 60

### UNIT-I

15 Hrs

**Computer Networks:** Introduction to computer network, data communication, components of data communication, data transmission mode, data communication measurement, LAN, MAN, WAN, wireless LAN, internet, intranet, extranet.

**Network Models:** Client/ server network and Peer-to-peer network, OSI, TCP/IP, layers and functionalities.

### UNIT-II

15 Hrs

**Transmission Media:** Introduction, Guided Media: Twisted pair, Coaxial cable, Optical fiber. Unguided media: Microwave, Radio frequency propagation, Satellite. LAN Topologies: Ring, bus, star, mesh and tree topologies.

**Network Devices:** NIC, repeaters, hub, bridge, switch, gateway and router.

### UNIT-III

15 Hrs

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

**Internet Applications:** www, telnet, ftp, e-mail, social networks, search engines, Video Conferencing, e-Commerce, m-Commerce, VOIP, blogs.

### UNIT-IV

15 Hrs

**Introduction to Web Design:** Introduction to hypertext markup language (html) Document type definition, creating web pages, lists, hyperlinks, tables, web forms, Inserting images, frames, hosting options and domain name registration. Customized Features: Cascading style sheet (css) for text formatting and other manipulations.

### References:

1. Andrew S. Tanenbaum, David J. Wetherall Computer Networks (5th Edition),PHI, 2010
- 2.B. A. Forouzan, Data Communication and Networking , TMH,2003.
3. D.R. Brooks, An Introduction to HTML and Javascript for Scientists and Engineers, Springer
4. HTML A Beginner's Guide, Tata McGraw-Hill Education, 2009.
5. J. A. Ramalho, Learn Advanced HTML 4.0 with DHTML, BPB Publications, 2007

## Practical-V(b): DSE 3(b): Computer Networks and Internet Technologies Lab

Practical: 4 Hrs./ Week

Credits: 02

Max Marks: 40

Cont. Assessments. 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 3(b) Computer Networks and Internet Technologies.

Note: Networking exercises in a trial lab, where effects of different connectors, topologies in practical could be demonstrated & Practical exercises based on concepts listed in theory using HTML.

## DSE 3(c): Multimedia Systems and Applications

**Teaching: 4 Hrs./ Week**

**Credits: 04**

**Max Marks: 80 Cont. Assessments. 20**

**Total Teaching Hrs: 60**

### UNIT-I

**15 Hrs**

**Multimedia:** Introduction to multimedia, components, uses of multimedia, Multimedia applications, virtual reality.

**Text:** Fonts & Faces, Using Text in Multimedia, Font Editing & Design Tools, Hypermedia & Hypertext.

### UNIT-II

**15 Hrs**

**Images:** Still Images – bitmaps, vector drawing, 3D drawing & rendering, natural light & colors, computerized colors, color palettes, image file formats.

**Sound:** Digital Audio, MIDI Audio, MIDI vs Digital Audio, Audio File Formats.

### UNIT-III

**15 Hrs**

**Video:** How video works, analog video, digital video, video file formats, video Shooting and editing.

**Animation:** Principle of animations, animation techniques, animation file formats. Internet and Multimedia: www and HTML, multimedia on the web – web servers, Web browsers, web page makers and site builders.

### UNIT-IV

**15 Hrs**

**Making Multimedia:** Stages of a multimedia project, Requirements to make good Multimedia, Multimedia Hardware - Macintosh and Windows production Platforms, Hardware peripherals - Connections, Memory and storage devices, Multimedia Software and Authoring tools.

### References:

1. Tay Vaughan, "Multimedia: Making it work", TMH, Eighth edition, 2011
2. Ralf Steinmetz and Klara Naharstedt, "Multimedia: Computing, Communications Applications", Pearson, 1996.
3. Keyes, "Multimedia Handbook", TMH, 2000
4. K. Andleigh and K. Thakkar, "Multimedia System Design", PHI, 2000

## Practical-V(c): DSE 3(c): Multimedia Systems and Applications Lab

**Practical: 4 Hrs./ Week**

**Credits: 02**

**Max Marks: 40**

**Cont. Assessments. 10**

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper **DSE 3(c) Multimedia Systems and Applications.**

Note: Practical exercises based on concepts listed in theory using Presentation tools in office automation tool/ GIMP/Blender / Audacity/ Animation Tools/ Image Editors/ Video Editors.

## SEC- 2(a): Information Security

Teaching: 1 Hrs./ Week

Credits: 02

Max Marks: 30 Cont. Assessments. 00

Total Teaching Hrs: 15

### UNIT I

8 Hrs

**Overview of Security:** Protection versus security; aspects of security–data integrity, data availability, privacy; security problems, user authentication.

**Security Threats:** Program threats, worms, viruses, Trojan horse, trap door, stack and buffer overflow; system threats- intruders; communication threats- tapping and piracy.

### UNIT II

7 Hrs

**Cryptography:** Substitution, transposition ciphers, symmetric-key algorithms Data Encryption Standard, advanced encryption standards, public key encryption -RSA; Diffie-Hellman key exchange, Message Authentication MAC, hash functions.

#### References:

1. W. Stallings, Cryptography and Network Security Principles and Practices, 4<sup>th</sup> Ed., Prentice-Hall of India, 2006.
2. C. Pfleeger and SL. Pfleeger, Security in Computing, 3rd Ed., Prentice-Hall of India, 2007.
3. D. Gollmann, Computer Security, John Wiley and Sons, NY, 2002.
4. J. Piwprzyk, T. Hardjono and J. Seberry, Fundamentals of Computer Security, Springer-Verlag Berlin, 2003.
5. J.M. Kizza, Computer Network Security, Springer, 2007.
6. M. Merkow and J. Breithaupt, Information Security: Principles and Practices, Pearson Education, 2006.

## Practical IA : SEC -2(a): Information Security

Practical: 2 Hrs./ Week

Cont. Assessments.10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper SEC 2(a) Information Security.

## SEC- 2(b): XML Programming

Teaching: 1 Hrs./ Week

Credits: 02

Max Marks: 40 Cont. Assessments. 00

Total Teaching Hrs: 15

### UNIT-I

07 Hrs

**XML Programming introduction:** Understanding Mark-up Languages, Introduction to XML and its Goals.

**XML Basics:** XML Structure and Syntax, Document classes and Rules.

### UNIT-II

08 Hrs

**Other XML Concepts:** Scripting XML, XML as Data, Linking with XML.

XML with Style: XSL –Style Sheet Basics, XSL basics, XSL style sheets.

## References:

1. William J. Pardi , XML in action web technology, Microsoft Press, 1999
2. Michael J. Young, Step by Step XML , Microsoft Press, 2002
3. XML in a Nutshell by Harold, Elliotte Rusty and W. Scott Means. 2004. , 3rd Edition.O'Reilly & Associates. 689 p. ISBN 0596007647.
4. Beginning XML by Danny Ayers, Joe Fawcett, and Liam R. E. Quin, 5th Edition,Wrox Publication, January 2012.
5. Learning XML by Erik T. Ray O'Reilly Media 1<sup>st</sup> edition 2001.

## Practical IA : SEC -2(b): XML programming Lab

**Practical: 2 Hrs./ Week**

**Cont. Assessments.10**

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper **SEC 2 (b) XML Programming.**

## DSE 6(a): Object Oriented Programming in C++

**Teaching: 4 Hrs./ Week**

**Credits: 04**

**Max Marks: 80 Cont. Assessments. 20**

**Total Teaching Hrs: 60**

**UNIT I**

**15 Hrs**

**Introduction:** Object Oriented Programming Paradigm, OOP Principles, Advantages of OOP, Silent features of C++ Language, The Structure of a C++ Program, Sample C++ Programs, Execution of a C++ program, Errors, Tokens, Keywords and Identifiers, Constants, Variables, Data types, Operators and Expressions, Selection statements, Iterative Statements, Functions, Arrays, Structures and Unions, Pointers.

**UNIT II**

**15 Hrs**

**Classes and Objects:** Class Definition and Access Specifiers Private. Public, Passing Objects as Arguments, Returning Objects from Functions, Arrays of Objects , Arrays as Member Data, Static Member Data, Static Member Functions, Friend Functions, Friend Class, Const Member Functions, Const Objects, this pointer, Nesting of Member Functions Constructors and Destructors: Constructors and their Characteristics, Types of Constructors, Default Constructor, Parameterized Constructors, Copy Constructor, Dynamic Constructor, Destructor and its Characteristics Operator Overloading: Syntax of Operator Overloading Function, Overloading Unary operators, Overloading Binary operators, Overloading Array subscript operator [], Overloading Function call Operator () , Overloading new and delete Operators, Overloading operators using Friend Functions, Overloading >> and << operators, Type Casting, Conversion from Basic type to Derived type and Vice-versa Conversion from one Derived type to another Derived type and Vice-versa.



## UNIT III

15 Hrs

**Inheritance:** Single Level Inheritance, Multiple Inheritance, Multilevel Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Class, Pointer to Objects, Pointers to Derived Classes and Virtual Functions, Pure Virtual Functions and Abstract Class, Constructors and Destructors in Derived Classes, Constructors and Destructors in Multiple Inheritance, Virtual Destructor, Private Inheritance, Protected Inheritance, Containers I/O Streams: Built-in Classes Supporting I/O, Unformatted I/O Operations, Formatting of Outputs, IOS Class Functions and Flags, Manipulators, Built-in Manipulators, User-Defined Manipulators. File Handling: Built-in Classes for File I/O Operations, Types of Data Files (Text Files and Binary Files), Opening and Closing a File, Detecting End of File, Text Files, Character I/O - put(), get() Member Functions, String I/O – The << operator and the getline() Member Function, Mixed Data I/O – The << and >> Operators, Binary Files, Objects I/O – write() and read() Member Functions, Random accessing of a Binary File (seekg(), seekp(), tellg(), tellp() Member Functions), Error Handling During File I/O Operations- fail(), bad(), good(), Command Line Arguments.

## UNIT-IV

15 Hrs

**String Handling:** String class and its Constructors, The Assignment Operator, The Extraction Operator >> and the Insertion Operator <<, The Relational Operators, Concatenation, Member Functions of String Class. Exception Handling: Exception Handling Mechanism, Throwing in one function and catching in the other, Single Try Block -Multiple Catch Blocks, Catching all exceptions in a single catch block, Rethrowing an Exception, Specification of Exceptions. Templates: Class Templates, Class Templates with Multiple Parameters, Function Templates, Function Templates with Multiple Parameters, Member Function Templates, Overloading Template functions, Non-type Template Arguments.

### References:

1. M.T. Somashekara, Object Oriented Programming with C++ (2nd Edition), PHI Learning, 2012
2. E. Balagurusamy, Object Oriented Programming with C++, McGrawHill Publications,
3. Herbert Schildt, C++ The Complete Reference, Tata McGraw Hill Publication.
4. Al Stevens, C++ Programming, Wiley Publications. S. B. Lippman & J. Lajoie, C++ Primer, 3rd Edition, Addison Wesley

## Practical-VI(a): DSE 6(a): Object Oriented Programming in C++ Lab

Practical: 4 Hrs./ Week

Credits: 02

Max Marks: 40

Cont. Assessments. 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 6(a) Object Oriented Programming in C++.

## **DSE 6(b): Java Programming**

**Teaching: 4 Hrs./ Week**

**Credits: 04**

**Max Marks: 80 Cont. Assessments. 20**

**Total Teaching Hrs: 60**

### **UNIT I**

**15 Hrs**

Introduction to Java - Features of Java - Object Oriented Concepts - Data Types - Variables - Arrays -Operators - Control Statements-Input and output-Scanner and System class-print(),println(), and printf() methods.

### **UNIT II**

**15 Hrs**

Classes - Objects - Constructors - Overloading method - Access Control - Static and fixed methods -Inner Classes - String Class - Inheritance - Overriding methods - Using super- Abstract class – Type Wrapper classes for primitive types – Auto boxing and auto Unboxing --Recursion.

### **UNIT III**

**15 Hrs**

GUI components – Common GUI Event types and Listener Interfaces- JoptionPane – JLabel,Jtextfield, JButton,JCheckBox,JTextarea, JComboBox, JList, JPanel. – Mouse Event Handling -Adapter Classes- Key Event Handling.

Mouse Event Handling - Adapter Classes- Key Event Handling. Layout Managers – FlowLayout, BorderLayout, GridLayout.- Graphics contexts and graphics objects – color control – font control –Drawing lines, rectangles and ovals –jslider-using menus with frames.

### **UNIT IV**

**15 Hrs**

Packages - Access Protection - Importing Packages - Interfaces - Exception Handling - Throw and Throws - Thread - Synchronization - Runnable Interface - Inter thread Communication – Multithreading.- file streams-Sequential file , Random file.

### **References:**

1. Object Oriented Programming with JAVA, By Dr.M,T.Somashekara, PHI Learning 2017.
2. Programming in Java – 2nd Edition by C.Muthu, TMH Publication.
3. Java How to Program by Deitel & Deitel – 6 th Edition- PHI Publication 2005..

## **Practical-VI(b): DSE 6(b): Java Programming Lab**

**Practical: 4 Hrs./ Week**

**Credits: 02**

**Max Marks: 40**

**Cont. Assessments. 10**

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper **DSE 6(b) Java Programming.**

## **DSE 6(c): Web Technologies**

**Teaching: 4 Hrs./ Week**

**Credits: 04**

**Max Marks: 80 Cont. Assessments. 20**

**Total Teaching Hrs: 60**

### **UNIT I**

**15 Hrs**

**Introduction to Web Design:** Introduction to hypertext markup language (HTML) document type definition, creating web pages, graphical elements, lists, hyperlinks, tables, web forms, inserting images, Divisions, Sections.

### **UNIT II**

**15 Hrs**

**Customized Features:** Cascading style sheets, (CSS) for text formatting and other manipulations, Types, Introduction to DHTML.

### **UNIT III**

**15 Hrs**

JavaScript: Data types, operators, functions, control structures, events and event handling.

Query: Introduction, Basics, Selectors, Attributes.

### **UNIT – IV**

**15 Hrs**

**Bootstrap:** Introduction, Environment, a simple web page using bootstrap template, Designing tables, forms, buttons.

### **References:**

1. Ivan Bayross, “Web Enabled Commercial Application Development Using Html, Dhtml, javascript”, Perl CGI, BPB Publications, 2009.
2. Ivan Bayross, “Web Enabled Commercial Application Development Using Html, Dhtml, javascript”, Perl CGI, BPB Publications, 2009.
3. “BIG Java Cay Horstmann”, Wiley Publication , 3rd Edition., 2009.

## **Practical-VI(c): DSE 6(c): Web Technologies Lab**

**Practical: 4 Hrs./ Week**

**Credits: 02**

**Max Marks: 40**

**Cont. Assessments. 10**

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper **DSE 6(c) Web Technologies.**