

Proposed Syllabus

For

B.Sc. (Non-Honours) Programme with Computer
Science

Dibrugarh University

Under

Choice Based Credit System

**CHOICE BASED CREDIT
SYSTEM
B.Sc. (Non-Honours) Programme with
Computer Science**

DETAILS OF COURSES OF THE B.SC. (GENERAL) WITH COMPUTER SCIENCE PROGRAMMES IN CBCS

| Course | *Credits | |
|---|--------------------|-------------------|
| | Course + Practical | Course + Tutorial |
| <u>I. Core Course (6 Credits)</u> (12 Courses) | 12X (4+2) = 72 | 12X (5+1) += 72 |
| Two Courses – English | | |
| Two Courses – Hindi/MIL | | |
| Four Courses- Discipline 1. | | |
| Four Courses- Discipline 2. | | |

| | | |
|---|---------------|---------------|
| <u>II. Elective Course (6 Credits)</u> (6 Courses) | 6X (4+2) = 36 | 6X (5+1) = 36 |
| Two Courses- Discipline 1 specific | | |
| Two Courses- Discipline 2 specific | | |
| Two Courses- Inter disciplinary | | |

Two Courses from each discipline of choice and two Courses of interdisciplinary nature.

Elective Course Practical / Tutorials

Optional Dissertation or project work in place of one elective Course (6 credits) in 6th Semester

III. Ability Enhancement Courses

| AECC | | SEC | |
|--------------------------------|--------|-----------------|--------|
| Course Title | Credit | Course Title | Credit |
| Environmental Studies/ Science | 4 | SEC 1.1 | 2 |
| Multi-disciplinary Course | 4 | SEC 2.1 | 2 |
| | | SEC 1.2 | 2 |
| | | SEC 2.2 | 2 |
| Total= 8 Credit | | Total= 8 Credit | |

Total Credit Structure (Minimum)

| Core | DSE | GE | AECC | SEC | Total |
|--|--|-----------------------|-----------------------|---|------------|
| 12 Courses of 6 Credit (2 English + 2 Hindi / MIL / Alt. Eng. + 8 DSC) | 4 Courses of 6 Credit (2 Courses from 2 DSC) | 2 Courses of 6 Credit | 2 Courses of 4 Credit | 4 Courses of 2 Credits (two different skill subjects) | 24 Courses |
| 72 | 24 | 12 | 8 | 8 | 124 |

**SEMESTER-WISE COURSE STRUCTURE OF THE B.SC. (GENERAL) WITH
COMPUTER SCIENCE PROGRAMME IN CBCS**

| SEMESTER | CORE COURSE (12) | Ability Enhancement Compulsory Course (AECC) (2) | Skill Enhancement Course (SEC) (2) | Discipline Specific Elective DSE (4) | Generic Elective GE (2) |
|-----------------|--------------------------------|---|---|---|--------------------------------|
| 1 | General English 1.1 | Multi-disciplinary Course (4C) | | | |
| | DSC- 1 A | | | | |
| | DSC- 2 A | | | | |
| 2 | Comm. English- 1.2 | Environmental Science (4C) | | | |
| | DSC- 1 B | | | | |
| | DSC- 2 B | | | | |
| 3 | Comm. Hindi/MIL/ Alt. Eng. 1.1 | | SEC-1.1 (2C) | | |
| | DSC- 1 C | | | | |
| | DSC- 2 C | | | | |
| 4 | Comm. Hindi/MIL/ Alt. Eng. 1.2 | | SEC-2.1 (2C) | | |
| | DSC- 1 D | | | | |
| | DSC-2 D | | | | |
| 5 | | | SEC-1.2(2C) | DSE-1 A | GE-1 |
| | | | | DSE-2 A | |
| 6 | | | SEC-1.2(2C) | DSE-1 B | GE-2 |
| | | | | DSE-2 B | |

Core Papers: Computer Science (Credit: 06 each) (1 period / week for tutorials or 4 periods / week of practical)

1. Fundamentals of Computer (5+1 Tutorial)
2. Data Structures using C (4 + 4 Lab)
3. Database Management Systems (4 + 4 Lab)
4. Operating System (4 + 4 Lab)

Discipline Specific Elective Papers: (Credit: 06 each)

DSE-1: (Choose any One)

1. Computer Networks (4 + 4 Lab)
2. Computer System Architecture (4 + 4 Lab)

DSE -2: (Choose any One)

1. Internet Technologies (4 + 4 Lab)
2. Software Engineering (5 + 1 Tutorial)

Skill Enhancement Courses (any four) (Credit: 02 each) – SEC-1 to SEC7

Choose any 4:

1. Office Automation Tools (1+2 Lab)
2. HTML Programming (1+2 Lab)
3. System Administration and Maintenance (1+2 Lab)
4. Software Testing Concepts (1+2 Lab)
5. Android Programming (1+2 Lab)
6. XML Programming (1+2 Lab)
7. Photoshop (1+2 Lab)

Generic Elective Courses (any two) (Credit: 06 each)

GE-1: (Choose any One)

1. Programming in SCILAB (4 + 4 Lab)
2. R Programming (4 + 4 Lab)
3. FORTRAN Programming (4 + 4 Lab)

GE-2: (Choose any One)

1. Web Programming with PHP, MySQL (4 + 4 Lab)
2. Multimedia and Applications (4 + 4 Lab)
3. Programming in Visual Basic with Oracle (4 + 4 Lab)

Detailed Syllabus

Core Paper I: Semester-I:

| Paper Code: DSC – 1A | Paper Name: Fundamental of Computers | Credit: 6 | | |
|--|--|-----------|-------|-------|
| | | L = 5 | P = 0 | T = 1 |
| <p>Objective: The course is designed with an objective to</p> <ul style="list-style-type: none">➤ Discuss about computers and their applications,➤ Explain the concept of various number systems,➤ Explain fundamental concepts of computer hardware and software. | | | | |
| <p>Learning Outcome: On completion of the course, students will be able to</p> <ul style="list-style-type: none">➤ Identify computer hardware and peripheral devices,➤ Differentiate various number systems. | | | | |
| <p>Total Marks: 100 (In Semester Evaluation: 20 & End Semester Evaluation: 80)</p> | | | | |
| <p>Unit I: 10L Introduction: Basics of computer, Characteristics of computers, Classification of computers, Types of computers.</p> | | | | |
| <p>Unit II: 8L I/O & Storage: Input, output and storage devices.</p> | | | | |
| <p>Unit III: 18L Number System: Binary, Decimal, Hexadecimal, and Octal systems, Conversion from one system to the other, representation of characters, integers and fractions, Binary arithmetic, BCD, EBCDIC, ASCII, Unicode, XS-3, Grey Codes etc.</p> | | | | |
| <p>Unit IV: 14L Computer languages & Software: Introduction to machine language, assembly language, high level language, 4GL, Compiler, Interpreter, Assembler, System Software, Application Software.</p> | | | | |
| <p>Books Recommended:</p> <ol style="list-style-type: none">1. Sinha P.K., “Computer Fundamentals”, 6th Edition, BPB Publication, 2012.2. Rajaraman,V.,“Computer Fundamentals”, 6th Edition, PHI,2012.3. Thareja R., “Fundamentals of Computers”, Oxford University Press, 2014.4. Goel.A, “<i>Computer Fundamentals</i>”, Reprint, Pearson Education, 2011. | | | | |

Core Paper II: Semester-II:

| Paper Code: DSC – 1B | Paper Name: Data Structures using C | Credit: 6 | | |
|--|---|-----------|-------|-------|
| | | L = 4 | P = 2 | T = 0 |
| Objective: The course is designed with an objective to <ul style="list-style-type: none">➤ Developing programming logic using C.➤ Demonstrate the major algorithms in data structures.➤ Analyze performance of algorithms.➤ Discuss which algorithm or data structure to use in different scenarios.➤ Demonstrate the properties of various data structures such as stacks, queues, lists, trees.➤ Demonstrate various sorting algorithms, including bubble sort, insertion sort, selection sort, heap sort, merge sort, quick sort.➤ Demonstrate understanding of various searching algorithms. | | | | |
| Learning Outcome: On completion of the course, students will be able to <ul style="list-style-type: none">➤ Write programs using C as a language.➤ Design programs involving decision structures, loops and functions.➤ Distinguish between linear and non-linear data structure.➤ Apply non-linear data structure in appropriate areas.➤ Apply various sorting and searching algorithms in different problems. | | | | |
| Total Marks: 100 (In Semester Evaluation: 20 & End Semester Evaluation: 80) | | | | |
| Unit I: 20L Introduction: Introduction to C Language, Conditional Statements and Loops, Arrays & Functions | | | | |
| Unit II: 14L Basics of Data Structure: Data structure, algorithms, Primitive and Composite data types, Time and Space Complexity of Algorithms, Linked List, Stack, Queues implementation using Array and linked list, Insertion, Deletion and Traversal of linked list. Recursion and its implementation with reference to stack. | | | | |
| Unit III: 14L Sorting & Searching Algorithms: Introduction to Sorting and its practical use, Sorting Algorithms and its implementation Bubble sort, Insertion sort, Selection Sort, Quick sort, Merge sort and Radix Sort. Introduction to Searching algorithms, Linear search, Binary search, depth first search and breadth first search techniques. | | | | |
| Unit IV: 12L Introduction to Trees: Introduction to Trees, properties of Trees, Binary Tree, Complete Binary Trees, Binary search Trees, Tree traversal methods(pre order, in order, post order),Infix, Postfix and Prefix Notations. | | | | |

Books Recommended:

1. Balaguruswami, D "*Programming with ANSI-C*" 6th Edition, Tata McGraw Hill,2012
2. Tenenbaum A. M.,"*Data Structures Using C*",Pearson,2nd Edition,2009.
3. Baluja, G. S."*Data Structure through C++*", Dhanpat Rai Publication,2012.
4. Lipschutz, Seymour"*Data Structures*", T. M. Hill,2010.
5. Weiss, Mark Allen "*Data Structures and Algorithm Analysis in C++*",Pearson,4th Edition,2012

Computer Lab Based on Data Structures using C:

- Write basic C programs.
- Write programs to implement different operations on arrays.
- Write programs to implement stack, queue, and linked-lists.
- Write programs to implement sorting and searching algorithms.
- Write programs to implement BST.

Core Paper III: Semester-III:

| Paper Code: DSC – 1C | Paper Name: Database Management Systems | Credit: 6 | | |
|---|---|-----------|-------|-------|
| | | L = 4 | P = 2 | T = 0 |
| Objective: The course is designed with an objective to <ul style="list-style-type: none">➤ Construct simple and moderately advanced database queries using Structured Query Language (SQL)➤ Apply logical database design principles, including E-R diagrams and database normalization | | | | |
| Learning Outcome: On completion of the course, students will be able to <ul style="list-style-type: none">➤ Describe the principles of the relational database Access➤ Define and manipulate data using SQL➤ Construct and normalize conceptual data models. | | | | |
| Total Marks: 100 (In Semester Evaluation: 20 & End Semester Evaluation: 80) | | | | |
| Unit I: 10L Introduction to Database Management Systems: Characteristics of database approach, data models, DBMS architecture and data independence. | | | | |
| Unit II: 15L Entity Relationship and Enhanced ER Modeling: Entity types, relationships, SQL-99: Schema Definition, constraints, and object modeling. | | | | |
| Unit III: 15L Relational Data Model: Basic concepts, relational constraints, relational algebra, SQL queries. | | | | |
| Unit IV: 20L Database design: ER and EER to relational mapping, functional dependencies, normal forms up to third normal form. | | | | |
| Books Recommended: <ol style="list-style-type: none">1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems 6th Edition, Pearson Education, 2010.2. R. Ramakrishanan, J. Gehrke, Database Management Systems 3rd Edition, McGraw-Hill, 2002.3. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6th Edition, | | | | |

McGraw Hill, 2010.

4. R. Elmasri, S.B. Navathe Database Systems Models, Languages, Design and application Programming, 6th Edition, Pearson Education, 2013.

Computer Lab Based on Database Management Systems:

- Describe the principles of the relational database Access
- Define and manipulate data using SQL
- Construct and normalize conceptual data models.

Core Paper IV: Semester-IV:

| Paper Code: DSC – 1D | Paper Name: Operating Systems | Credit: 6 | | |
|--|---|------------|-------|-------|
| | | L = 4 | P = 2 | T = 0 |
| Objective: The course is designed with an objective to <ul style="list-style-type: none">➤ Discuss and explain the basic concepts of Operating System, process management, memory management, file management, Input / Output management and the potential problem of deadlocks. | | | | |
| Learning Outcome: On completion of the course, students will be able to <ul style="list-style-type: none">➤ Describe the general architecture of computers,➤ Describe, contrast and compare differing structures for operating systems,➤ Analyze theory of processes, resource control (concurrency etc.), physical and virtual memory, scheduling, I/O and files➤ Implementing shell programming | | | | |
| Total Marks: 100 (In Semester Evaluation: 20 & End Semester Evaluation: 80) | | | | |
| Unit I: | | 2L | | |
| Introduction: System Software, Resource Abstraction, OS strategies. | | | | |
| Unit II: | | 2L | | |
| Types of operating systems - Multiprogramming, Batch, Time Sharing, Single user and Multiuser, Process Control & Real Time Systems. | | | | |
| Unit III: | | 10L | | |
| Operating System Organization: Factors in operating system design, basic OS functions, implementation consideration; process modes, methods of requesting system services – system calls and system programs. | | | | |
| Unit IV: | | 15L | | |
| Process Management : System view of the process and resources, initiating the OS, process address space, process abstraction, resource abstraction, process hierarchy, Thread model | | | | |
| Unit V: | | 12L | | |
| Scheduling: Scheduling Mechanisms, Strategy selection, non-pre-emptive and pre-emptive strategies. | | | | |

Unit VI:**12L**

Memory Management: Mapping address space to memory space, memory allocation strategies, fixed partition, variable partition, paging, virtual memory

Unit VII:**7L**

Shell introduction and Shell Scripting

Books Recommended:

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8th Edition, John Wiley Publications 2008.
2. A.S. Tanenbaum, Modern Operating Systems, 3rd Edition, Pearson Education 2007.
3. G. Nutt, Operating Systems: A Modern Perspective, 2nd Edition Pearson Education 1997.
4. W. Stallings, Operating Systems, Internals & Design Principles, 5th Edition, Prentice Hall of India. 2008.
5. M. Milenkovic, Operating Systems- Concepts and design, Tata McGraw Hill 1992.

Computer Lab Based on Operating Systems:

- Introduction to Linux
- File systems
- Simple Linux commands
- Shell programming
- Programming on process management

Discipline Specific Elective Papers:

| Paper Code: DSE-1A.1 | Paper Name: Computer Networks | Credit: 6 | | |
|---|---|-----------|-------|-------|
| | | L = 4 | P = 2 | T = 0 |
| <p>Objective: The course is designed with an objective to</p> <ul style="list-style-type: none"> ➤ Introduce Data Communications and Computer Networks. ➤ Enable students to design and deployment of networks. <p>Learning Outcome: On completion of the course, students will be able to</p> <ul style="list-style-type: none"> ➤ Describe various concepts of data communication and computer networks. ➤ Illustrate the Layers of ISO/OSI and TCP/IP reference model. ➤ Design , install and deploy networks | | | | |
| <p>Total Marks: 100 (In Semester Evaluation: 20 & End Semester Evaluation: 80)</p> | | | | |
| <p>Unit I: 16L Basic concepts : Components of data communication, standards and organizations, Network Classification, Network Topologies ; network protocol; layered network architecture; overview of OSI reference model; overview of TCP/IP protocol suite.</p> | | | | |
| <p>Unit II: 6L Physical Layer: Cabling, Network Interface Card, Transmission Media Devices- Repeater, Hub, Bridge, Switch, Router, Gateway.</p> | | | | |
| <p>Unit III: 8L Data Link Layer: Framing techniques; Error Control; Flow Control Protocols; Shared media protocols - CSMA/CD and CSMA/CA.</p> | | | | |
| <p>Unit IV: 8L Network Layer : Virtual Circuits and Datagram approach, IP addressing methods – Subnetting; Routing Algorithms (adaptive and non-adaptive</p> | | | | |
| <p>Unit V: 6L Transport Layer: Transport services, Transport Layer protocol of TCP and UDP</p> | | | | |
| <p>Unit VI: 10L Application Layer: Application layer protocols and services – Domain name system, HTTP, WWW, telnet, FTP, SMTP.</p> | | | | |

Unit VII:

6L

Network Security : Common Terms, Firewalls, Virtual Private Networks**Books Recommended:**

1. B.A. Forouzan: Data Communication and Networking, 4th Edition, Tata McGraw Hill, 2007.
2. D.E. Comer, Internetworking with TCP/IP, Vol. I, Prentice Hall of India, 1998.
3. W. Stalling, Data & Computer Communication, 8th edition, Prentice Hall of India, 2006.
4. D. Bertsekas, R. Gallager, Data Networks, 2nd edition, Prentice Hall of India, 1992.

Computer Lab Based on Computer Networks:

- LAN setup
- Network Configuration and Settings
- Network Management

| | | | | |
|--|--|-----------|-------|-------|
| Paper Code: DSE-1A.2 | Paper Name: Computer System Architecture | Credit: 6 | | |
| | | L = 4 | P = 2 | T = 0 |
| <p>Objective: The course is designed with an objective to.</p> <ul style="list-style-type: none"> ➤ Describe the basic structure and operation of a digital computer. ➤ Describe the different ways of communicating with I/O devices and standard I/O interfaces. <p>Learning Outcome: On completion of the course, students will be able to</p> <ul style="list-style-type: none"> ➤ Describe different components of computer. ➤ Identify high performance architecture design. ➤ Develop independent learning skills and be able to illustrate more about different computer architectures and hardware. ➤ Create an assembly language program to program a microprocessor system. | | | | |
| <p>Total Marks: 100 (In Semester Evaluation: 20 & End Semester Evaluation: 80)</p> | | | | |
| <p>Unit I: 18L Introduction: Logic gates, Boolean algebra, combinational circuits, circuit simplification, flip-flops and sequential circuits, decoders, multiplexors, registers, counters and memory units. Data representation.</p> | | | | |
| <p>Unit II: 18L Basic Computer Organization and Design: Computer registers, bus system, instruction set, timing and control, instruction cycle, memory reference, input-output and interrupt.</p> | | | | |
| <p>Unit III: 10L Central Processing Unit: Register organization, arithmetic and logical micro-operations, stack organization, micro programmed control.</p> | | | | |
| <p>Unit IV: 10L Programming the Basic Computer: Instruction formats, addressing modes, instruction codes, machine language, assembly language, input output programming.</p> | | | | |
| <p>Unit V: 4L Input-output Organization: Peripheral devices, I/O interface, Modes of data transfer, direct memory access.</p> | | | | |
| <p>Books Recommended:</p> <ol style="list-style-type: none"> 1. M. Mano, Computer System Architecture, Pearson Education 1992. 2. A. J. Dos Reis, Assembly Language and Computer Architecture using C++ and JAVA, | | | | |

Course Technology, 2004

3. W. Stallings, Computer Organization and Architecture Designing for Performance, 8th Edition, Prentice Hall of India ,2009
4. Digital Design, M.M. Mano, Pearson Education Asia, 1979

Computer Lab Based on Computer System Architecture:

Write Assembly language programming of 8085

- Using arithmetic and logical instructions
- Memory related operations
- Data transfer operations

| | | | | |
|--|---|-----------|-------|-------|
| Paper Code: DSE -2A.1 | Paper Name: Internet Technologies | Credit: 6 | | |
| | | L = 4 | P = 2 | T = 0 |
| <p>Objective:</p> <p>The course is designed with an objective to</p> <ul style="list-style-type: none"> ➤ Design a webpage using HTML and CSS. ➤ Make an interactive webpage using JavaScript. ➤ Use Server side scripting language to make a dynamic webpage. <p>Learning Outcome:</p> <p>On completion of the course, students will be able to</p> <ul style="list-style-type: none"> ➤ Design dynamic and interactive web pages by embedding Java Script code in HTML and using Java Script to validate user input. ➤ Apply CSS in Webpages. ➤ Create website using Server Side Scripting language. ➤ Database connectivity to Webpages. | | | | |
| <p>Total Marks: 100 (In Semester Evaluation: 20 & End Semester Evaluation: 80)</p> | | | | |
| Unit I: | | 6L | | |
| <p>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, frames.</p> | | | | |
| Unit II: | | 4L | | |
| <p>Customized Features: Cascading style sheets, (css) for text formatting and other manipulations.</p> | | | | |
| Unit III: | | 6L | | |
| <p>JavaScript: Data types, operators, functions, control structures, events and event handling.</p> | | | | |
| Unit IV: | | 12L | | |
| <p>Java: Use of Objects, Array and Array List class, Designing classes, Inheritance, Input/Output, Exception Handling.</p> | | | | |
| Unit V: | | 8L | | |
| <p>JDBC: JDBC Fundamentals, Establishing Connectivity and working with connection interface, Working with statements, Creating and Executing SQL Statements, Working with Result Set Objects.</p> | | | | |
| Unit VI: | | 16L | | |
| <p>JSP: Introduction to JavaServer Pages, HTTP and Servlet Basics, The Problem with Servlets, The Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment, Implicit JSP Objects, Conditional Processing, Displaying Values</p> | | | | |

Unit VII:

8L

Using an expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests, and Users, Database Access.

Books Recommended:

1. Web Enabled Commercial Application Development Using Html, Dhtml, javascript, Perl Cgi by Ivan Bayross, BPB Publications, 2009.
2. BIG Java Cay Horstmann, Wiley Publication , 3rd Edition., 2009
3. Java 7, The Complete Reference, Herbert Schildt, 8th Edition, 2009.
4. The Complete Reference J2EE, TMH, Jim Keogh, 2002.
5. Java Server Pages, Hans Bergsten, Third Edition, O'Reilly Media December 2003.

Computer Lab Based on Internet Technologies:

- Design dynamic and interactive web pages to validate user input.
- Apply CSS, JSP in Webpages.
- Apply database connectivity in a Webpage.

| | | | | |
|---------------------------------|--|-----------|-------|-------|
| Paper Code: DSE -2A.2 | Paper Name: Software Engineering | Credit: 6 | | |
| | | L = 5 | P = 0 | T = 1 |

Objective:

The course is designed with an objective to

- Demonstrate software process models such as the waterfall and evolutionary models.
- Discuss the role of project management including planning, scheduling, risk management, etc.
- Define software engineering and explain its importance.

Learning Outcome:

On completion of the course, students will be able to

- Design software from the root level starting from requirement gathering to maintenance with the appropriate SDLC.
- Define software engineering and explain its importance.
- Identify the processes to be followed in the software development life cycle.
- Explain testing approaches such as unit testing and integration testing.

Total Marks: 100
(In Semester Evaluation: 20 & End Semester Evaluation: 80)

Unit I:

8L

Software Process: Introduction ,S/W Engineering Paradigm , life cycle models (water fall, incremental, spiral, evolutionary, prototyping, object oriented) , System engineering, computer based system, verification, validation, life cycle process, development process, system engineering hierarchy.

Unit II:

10L

Software requirements: Functional and non-functional , user, system, requirement engineering process, feasibility studies, requirements, elicitation, validation and management, software prototyping, prototyping in the software process, rapid prototyping techniques, user interface prototyping, S/W document. Analysis and modeling, data, functional and behavioral models, structured analysis and data dictionary.

Unit III:

12L

Design Concepts and Principles: Design process and concepts, modular design, design heuristic, design model and document, Architectural design, software architecture, data design, architectural design, transform and transaction mapping, user interface design, user interface design principles. Real time systems, Real time software design, system design, real time executives, data acquisition system, monitoring and control system.

Unit IV:

8L

Software Configuration Management: The SCM process, Version control, Change control, Configuration audit, SCM standards.

Unit V:

8L

Software Project Management: Measures and measurements, S/W complexity and science measure, size measure, data and logic structure measure, information flow measure. Estimations for Software Projects, Empirical Estimation Models, Project Scheduling.

Unit VI:

8L

Testing: Taxonomy of software testing, levels, test activities, types of s/w test, black box testing, testing boundary conditions, structural testing, test coverage criteria based on data flow, mechanisms, regression testing, testing in the large. S/W testing strategies, strategic approach and issues, unit testing, integration testing, validation testing, system testing and debugging.

Unit VII:

6L

Trends in Software Engineering: Reverse Engineering and Re-engineering – wrappers – Case Study of CASE tools.

Books Recommended:

1. Roger S.Pressman, Software engineering- A practitioner's Approach, McGraw-Hill
2. Ian Sommerville, Software engineering, Pearson education Asia, 6th edition, 2000.
3. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
4. James F Peters and Witold Pedrycz, "Software Engineering – An Engineering Approach", John Wiley and Sons, New Delhi, 2000.
5. Ali Behforooz and Frederick J Hudson, "Software Engineering Fundamentals", Oxford University Press, New Delhi, 1996.
6. Pfleeger, "Software Engineering", Pearson Education India, New Delhi, 1999.
7. Carlo Ghezzi, Mehdi Jazayari and Dino Mandrioli, "Fundamentals of Software Engineering", Prentice Hall of India, New Delhi, 1991.

Skill Enhancement Courses:

| Paper Code: SEC 1 | Paper Name: Office Automation Tools | Credit: 2 | | |
|---|---|-----------|-------|-------|
| | | L = 1 | P = 1 | T = 0 |
| Objective: The course is designed with an objective to introduce the various features of Office suite. | | | | |
| Learning Outcome: On completion of the course, students will be able to <ul style="list-style-type: none">➤ Perform documentation using various Office suite.➤ Perform accounting operation using various Office suite.➤ Design PowerPoint presentation using various Office suite. | | | | |
| Total Marks: 100 (In Semester Evaluation: 20 & End Semester Evaluation: 80) | | | | |
| Unit I: Introduction to open office / MS office / Libre office 2L | | | | |
| Unit II: Word Processing: Formatting Text, Pages, Lists, Tables 5L | | | | |
| Unit III: Spreadsheets: Worksheets, Formatting data, creating charts and graphs, using formulas and functions, macros, Pivot Table 5L | | | | |
| Unit IV: Presentation Tools: Adding and formatting text, pictures, graphic objects, including charts, objects, formatting slides, notes, hand-outs, slide shows, using transitions, animations 4L | | | | |
| Books Recommended: <ol style="list-style-type: none">1. Sushila Madan , Introduction to Essential tools,JBA,2009.2. Anita Goel, Computer Fundamentals, Pearson, 2012 | | | | |
| Computer Lab Based on Office Automation: <ul style="list-style-type: none">➤ Various Office package (Word processing, Spreadsheet and Presentation) | | | | |

| | | | | |
|---|--|-----------|-------|-------|
| Paper Code: SEC 2 | Paper Name: HTML Programming | Credit: 2 | | |
| | | L = 1 | P = 1 | T = 0 |
| <p>Objective: The course is designed with an objective to</p> <ul style="list-style-type: none"> ➤ Introduce Web, Website designing and HTML. ➤ Enable students to use different HTML tags. ➤ Enable students to design and deploy web-sites. <p>Learning Outcome: On completion of the course, students will be able to</p> <ul style="list-style-type: none"> ➤ Demonstrate competency in using basic HTML codes. ➤ Develop efficient web pages and web sites. ➤ Develop interactive web pages using forms. ➤ Understand and use CSS in styling the web pages. | | | | |
| <p>Total Marks: 100 (In Semester Evaluation: 20 & End Semester Evaluation: 80)</p> | | | | |
| Unit I: | | | | 1L |
| Introduction: Introduction to WWW, Internet, Browser, HTTP, HTML. | | | | |
| Unit II: | | | | 2L |
| The Basics: The Head, the Body, Colors, Attributes, Lists, ordered and unordered | | | | |
| Unit III: | | | | 3L |
| Links: Introduction, Relative Links, Absolute Links, Link Attributes, Using the ID Attribute to Link Within a Document | | | | |
| Unit IV: | | | | 2L |
| Images: Putting an Image on a Page, Using Images as Links, Putting an Image in the Background | | | | |
| Unit V: | | | | 4L |
| Tables: Creating a Table, Table Headers, Captions, Spanning Multiple Columns, Styling Table | | | | |
| Unit VI: | | | | 3L |
| Forms: Basic Input and Attributes, Other Kinds of Inputs, Styling forms with CSS, Where To Go From Here | | | | |
| Books Recommended: | | | | |
| <ol style="list-style-type: none"> 1. Introduction to HTML and CSS -- O'Reilly , 2010 2. Jon Duckett, HTML and CSS, John Wiley, 2012 3. HTML QuickStart Guide: The Simplified Beginner's Guide To HTML --ClydeBank | | | | |

Technology, 2015.

4. A Smarter Way to Learn HTML & CSS (Volume 2)-- Mark Myers ,2015

Computer Lab Based on HTML Programming:

- Design HTML pages using various tags
- Implement CSS to HTML

| | | | | |
|--|---|------------------|-------|-------|
| Paper Code: SEC 3 | Paper Name: System Administration and Maintenance | Credit: 2 | | |
| | | L = 1 | P = 1 | T = 0 |
| <p>Objective: The course is designed with an objective to</p> <ul style="list-style-type: none"> ➤ To give an overview of operating systems(OS) and how OS works with other hardware in a computer system ➤ To provide an overview of the tasks involved in OS installation, configuration and maintenance. ➤ To differentiate between different types of OS ➤ To introduce basic knowledge of shell script <p>Learning Outcome: On completion of the course, students will be able to</p> <ul style="list-style-type: none"> ➤ Perform installation of DOS, Windows and Linux OS ➤ Perform basic configuration and maintenance of Windows and Linux OS. ➤ Write the simple shell scripts | | | | |
| <p>Total Marks: 100 (In Semester Evaluation: 20 & End Semester Evaluation: 80)</p> | | | | |
| <p>Unit I: Linux/Unix</p> <p>Basics of operating system, services, Installation and configuration, maintenance, linux/unix Operating systems, Kernel, API, CLI, GUI, difference between linux/unix and other operating systems, Features and Architecture, Linux features, advantages, disadvantages</p> | | <p>8L</p> | | |
| <p>Unit II: Linux/Unix</p> <p>Windows as operating system, history, versions, PC hardware, BIOS, Devices and drivers, Kernel Configuration and building, Application installation, configuration and maintenance, Server services and Client services, Difference between Windows XP/windows7 and windows server 2003/2008</p> | | <p>8L</p> | | |
| <p>Books Recommended:</p> <ol style="list-style-type: none"> 1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8th Edition, John Wiley Publications 2008. 2. A.S. Tanenbaum, Modern Operating Systems, 3rd Edition, Pearson Education 2007. 3. W. Stallings, Operating Systems, Internals & Design Principles, 5th Edition, Prentice Hall of India. 2008 | | | | |
| <p>Computer Lab Based on System Administration and Maintenance:</p> <ul style="list-style-type: none"> ➤ Windows, Linux: Desktop tour. Configuring desktop environment and desktop settings. Shell script | | | | |

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|--|---|-----------|-------|-------|
| Paper Code: SEC 4 | Paper Name: Software Testing Concepts | Credit: 2 | | |
| | | L = 1 | P = 1 | T = 0 |
| <p>Objective: The course is designed with an objective to</p> <ul style="list-style-type: none"> ➤ Explain different concepts related to software testing ➤ Explain different method of testing a software product <p>Learning Outcome: On completion of the course, students will be able to</p> <ul style="list-style-type: none"> ➤ Apply different testing methods to software to find any software defects ➤ And to prevent these defects | | | | |
| <p>Total Marks: 100 (In Semester Evaluation: 20 & End Semester Evaluation: 80)</p> | | | | |
| <p>Unit I: 4L Introduction: Strategic Approach to Software testing, Test Strategies for Conventional Software, Validation Testing, System Testing, Basic Terminologies, V Shaped Life Cycle Model</p> | | | | |
| <p>Unit II: 5L Functional Testing/Black Box Testing: Boundary value analysis, Equivalence Class testing, Decision Table Based Testing</p> | | | | |
| <p>Unit III: 6L Structural Testing / White Box Testing: Basic Path Testing: Program Graph, DD path Graph, Cyclomatic Complexity, Graph Matrices, Control Flow Testing: Statement Coverage, Branch Coverage, Condition Coverage, Path Coverage.</p> | | | | |
| <p>Books Recommended:</p> <ol style="list-style-type: none"> 1. Roger S. Pressman, Software Engineering: A practitioner's Approach, Seventh Edition, Mc. Grow Hill Edition, 2009 2. Yogesh Singh, Software Testing, Cambridge University Press, 2011 3. Rajib Mall, Fundamentals of Software Engineering, Prentice-Hall India 4. R.E. Fairley, Software Engineering Concepts, Tata McGraw-Hill | | | | |
| <p>Computer Lab Based on Software Testing Concepts:</p> <ul style="list-style-type: none"> ➤ Boundary Value Analysis ➤ Equivalence Class Partitioning ➤ Decision Table Testing ➤ Basic Path Testing. ➤ Use of code coverage tool ➤ Use of load testing tool | | | | |

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|--|---|-----------|-------|-------|
| Paper Code: SEC 5 | Paper Name: Android Programming | Credit: 2 | | |
| | | L = 1 | P = 1 | T = 0 |
| <p>Objective: The course is designed with an objective to</p> <ul style="list-style-type: none"> ➤ Introduce Android Operating System. ➤ Discuss Android based programming language. <p>Learning Outcome: On completion of the course, students will be able to</p> <ul style="list-style-type: none"> ➤ Explain Android based Technologies. ➤ Design and Develop Android Applications | | | | |
| <p>Total Marks: 100 (In Semester Evaluation: 20 & End Semester Evaluation: 80)</p> | | | | |
| <p>Unit I: 2L Introduction: History of Android, Introduction to Android Operating Systems, Android Development Tools, Android Architecture.</p> | | | | |
| <p>Unit II: 4L Overview of object oriented programming using Java: OOPs Concepts: Inheritance, Polymorphism, Interfaces, Abstract class, Threads, Overloading and Overriding, Java Virtual Machine.</p> | | | | |
| <p>Unit III: 4L Development Tools: Installing and using Eclipse with ADT plug-in, Installing Virtual machine for Android sandwich/Jelly bean (Emulator), configuring the installed tools, creating an android project – Hello Word, run on emulator, Deploy it on USB-connected Android device.</p> | | | | |
| <p>Unit IV: 2L User Interface Architecture: Application context, intents, Activity life cycle, multiple screen sizes.</p> | | | | |
| <p>Unit V: 2L User Interface Design: Form widgets, Text Fields, Layouts, Button control, toggle buttons, Spinners (Combo boxes), Images, Menu, and Dialog.</p> | | | | |
| <p>Unit VI: 2L Database: Understanding of SQLite database, connecting with the database.</p> | | | | |
| <p>Books Recommended:</p> <ol style="list-style-type: none"> 1. Android application development for java programmers. By James C. Sheusi. Publisher: Cengage Learning, 2013 | | | | |

Computer Lab Based on Android Programming:

ANDROID APPLICATION DEVELOPMENT USING TOOLS LIKE

- JAVA
- HTML5
- XML
- ANDROID STUDIO
- SQLite

| | | | | |
|-----------------------------|---------------------------------------|-----------|-------|-------|
| Paper Code: SEC 6 | Paper Name: XML Programming | Credit: 2 | | |
| | | L = 1 | P = 1 | T = 0 |

Objective:

The course is designed with an objective to

- Introduce programming in XML
- Enhance programming skills as a developer with competitive advantage in the market of web services

Learning Outcome:

On completion of the course, students will be able to

- Design , implement and develop smart web services
- Enhance programming skills which is highly in demand

Total Marks: 100

(In Semester Evaluation: 20 & End Semester Evaluation: 80)

Unit I:

2L

Overview of XML: Introduction to XML and its goals, XML fundamentals, understanding of Markup language, structure of XML Data, characteristics of XML, Introduction to XML tools

Unit II:

4L

Quality Control with XML Document Schema: Basic Concepts, Document Type Declaration (DTD), namespaces, introduction to XML schema, XML Tree structure, Data Object Model (DOM), Programming Models, and XML database.

Unit III:

3L

Advance XML Concepts: Scripting XML, XML as Data, Linking with XML, Introduction to Encoding, character encodings, encoding types (UTF-8, UTF-16), text declarations, character sets, validation

Unit IV:

4L

XML with Style: Stylesheets basics , XML on the Web, XSL Basics, Rule Matching, Properties and examples, Querying and Transformation, XPath and XPointer, Nodes and trees, finding nodes, XPath, XPath expressions, XPointer, XLinks, XInclude, XSL style sheets, XQuery, transformation with XSLT.

Unit V:

2L

Application Program Interfaces to XML: Storage of XML data, relational databases, tree representation, XML applications.

Books Recommended:

1. William J. Pardi , “XML in action web technology”, Microsoft Press, 1999
2. Michael J. Young , “Step by Step XML” , Microsoft Press, 2002
3. Elliotte Harold, W. Means “XML in a Nutshell, A Desktop Quick Reference”, 3rd Edition, O’Reilly Media, June 2009
4. Erik Ray, “Learning XML, Creating Self-Describing Data”, 2nd Edition, O’Reilly Media, June 2009

Computer Lab Based on XML Programming:

- XML Basics
- DTD Basics
- Reading Configuration Files
- XML Schemas
- XSLT Functions
- XML Namespaces
- Introduction to XML programming using Java

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|-----------------------------|---------------------------------|-----------|-------|-------|
| Paper Code: SEC 7 | Paper Name: Photoshop | Credit: 2 | | |
| | | L = 1 | P = 1 | T = 0 |

Objective:

The course is designed with an objective to

- Describe how to use photo shop
- Navigate Photoshop's Workspace, create & setup documents
- Work with effects, filters and adjustments.
- Describe typography, color, layout, photo editing, composition, graphics, vector & raster application
- Describe Layers and Masking

Learning Outcome:

On completion of the course, students will be able to

- Identify and describe the major functions of Photoshop.
- Work and manipulate images
- Work with basic selections.

Total Marks: 100

(In Semester Evaluation: 20 & End Semester Evaluation: 80)

Unit I: 2L

Introduction to Adobe Photoshop: About Photoshop, Navigating Photoshop, Menus and panels, Opening new files ,Opening existing files , Exploring the Toolbox

Unit II: 4L

Working with Images: Zooming & Panning an Image, Working with Multiple Images, Rulers, Guides & Grids Undoing Steps with History, Adjusting Color with the New Adjustments Panel, Cropping images.

Unit III: 4L

Working with Basic Selections: Selecting with the Elliptical Marquee Tool, Using the Magic Wand & Free Transform Tool Selecting with the Regular & Polygonal Lasso Tools, Combining Selections, Using the Magnetic Lasso Tool, Using the Quick Selection Tool & Refine Edge, Modifying Selections

Unit IV: 4L

Getting started with Layers: Understanding the Background Layer, Creating, Selecting, Linking & Deleting Layers Locking & Merging Layers, Copying Layers, Using Perspective & Layer Styles, Filling & Grouping Layers, Introduction to Blending Modes, Modifying Text

Unit V: 2L

Painting and Pen Tool: Using different Tools, Painting with Selections, photo retouching, Color Spaces & Color Modes, Saving & Removing a Selection from the Background, creating different path, add effects.

Books Recommended:

1. Jennifer Smith and AGI Creative Team ,Adobe Photoshop CS6 Digital Classroom, Wiley; Pap/Dvdr edition , 2012
2. Andrew Faulkner & Conrad Chavez , Adobe Photoshop CC Classroom in a Book, Adobe, 2017
3. Toni Toland, Best Practice: The Pros on Adobe Photoshop Delmar Cengage Learning; Pap/Cdr edition, 2006
4. Philip Andrews, Adobe Photoshop Elements 4.0 A to Z: Tools and features illustrated ready reference Paperback Focal Press; 1 edition 2006

Computer Lab Based on Photoshop:

- Practical exercise based on concept listed in theory using Adobe Photoshop and other photo editing tool.

Generic Elective Courses:

| | | | | |
|--|---|-----------|-------|-------|
| Paper Code: GE-1.1 | Paper Name: Programming in SCILAB | Credit: 6 | | |
| | | L = 4 | P = 2 | T = 0 |
| <p>Objective: The course is designed with an objective to</p> <ul style="list-style-type: none"> ➤ Familiarize the student in introducing and exploring MATLAB & LABVIEW softwares. ➤ Enable the student on how to approach for solving Engineering problems using simulation tools. ➤ Prepare the students to use MATLAB/LABVIEW in their project works. ➤ Provide a foundation in use of this softwares for real time applications <p>Learning Outcome: On completion of the course, students will be able to</p> <ul style="list-style-type: none"> ➤ Implement simple mathematical functions/equations in SCILAB. ➤ Interpret and visualize simple mathematical functions and operations thereon using plots/display | | | | |
| <p>Total Marks: 100 (In Semester Evaluation: 20 & End Semester Evaluation: 80)</p> <p>Unit I: 15L Introduction to Programming and Programming Environment: working with numbers, Machine code, Software hierarchy. SCILAB Environment, Workspace, Working Directory, Expressions, Constants, Variables and assignment statement, Arrays.</p> <p>Unit II: 10L Control Statements: Conditional statements: If, Else, Else-if, Repetition statements: While, for loop.</p> <p>Unit III: 15L Matrices: Some Simple Matrix Operations addition, subtraction, multiplication, Sub- Matrices.</p> <p>Unit IV: 10L Procedures and Functions: Arguments and return values</p> <p>Unit V: 15L Graph Plots and Manipulating Text: Basic plotting, Built in functions, Generating waveforms, Sound replay, load and save. Writing to a text file, Reading from a text file, Randomising and sorting a list, searching a list.</p> | | | | |

Books Recommended:

1. M.Affouf, SCILAB by Example , CreateSpace Independent Publishing Platform,2012
2. H. Ramchandran, A.S. Nair, SCILAB , S.Chand, 2011

Computer Lab Based on Programming in SCILAB:

- Programming using Functions , Loops, Conditional statement

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|---|-------------------------------------|-------------------|-------|-------|
| Paper Code: GE-1.2 | Paper Name: R Programming | Credit: 6 | | |
| | | L = 4 | P = 2 | T = 0 |
| <p>Objective:</p> <p>The course is designed with an objective to</p> <ul style="list-style-type: none"> ➤ Introduce R programming language ➤ Discuss different features of R programming language ➤ Describe how to write R programming language <p>Learning Outcome:</p> <p>On completion of the course, students will be able to</p> <ul style="list-style-type: none"> ➤ Write R scripts in R studio ➤ Apply R program in real life example ➤ Perform Simulation using R Program | | | | |
| <p>Total Marks: 100 (In Semester Evaluation: 20 & End Semester Evaluation: 80)</p> | | | | |
| <p>Unit I:</p> <p>Introduction: Overview and History of R, Getting Help, Data Types, Subsetting, Vectorized Operations, Reading and Writing Data.</p> | | <p>15L</p> | | |
| <p>Unit II:</p> <p>Control Structures, Functions, lapply, tapply, split, mapply, apply, Coding Standards.</p> | | <p>15L</p> | | |
| <p>Unit III:</p> <p>Scoping Rules, Debugging Tools, Simulation, R Profiler.</p> | | <p>10L</p> | | |
| <p>Unit IV:</p> <p>Statistical Data analysis: Measures of Central Tendency and Dispersion, Probability distributions, Correlation and regression etc.</p> | | <p>20L</p> | | |
| <p>Books Recommended:</p> <ol style="list-style-type: none"> 1. W. N. Venables, D. M. Smith, An Introduction to R, R-core team, 2015 | | | | |
| <p>Computer Lab Based on R Programming:</p> <ul style="list-style-type: none"> ➤ Introduction and basic structure ➤ Data types, Variable declarations ➤ Looping and Branching ➤ Sorting of Data ➤ Data Analysis in R | | | | |

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|--|---|-----------|-------|-------|
| Paper Code: GE-1.3 | Paper Name: FORTRAN PROGRAMMING | Credit: 6 | | |
| | | L = 4 | P = 2 | T = 0 |
| <p>Objective: The course is designed with an objective to</p> <ul style="list-style-type: none"> ➤ Describe the fundamentals of Fortarn programming. ➤ Demonstrate coding. ➤ Explain the skills for Mathematical programming. <p>Learning Outcome: On completion of the course, students will be able to</p> <ul style="list-style-type: none"> ➤ Design algorithms to solve numerical problems. ➤ Solve problems through Fortran programs. ➤ Develop advance Fortran program to solve real life problems. ➤ Introduce numerical techniques that can be used on computers. ➤ Interpret the reliability of numerical results. ➤ Develop codes for numerical methods. | | | | |
| <p>Total Marks: 100 (In Semester Evaluation: 20 & End Semester Evaluation: 80)</p> | | | | |
| <p>Unit I : 10L Introduction to Fortran, History of Fortran, Algorithms and Flowcharts, Constants and Variables, Expressions and Statements.</p> | | | | |
| <p>Unit II: Functions and Loops 12L Control Statements, Do Loops, Arrays, Function and Subroutine, File Processing.</p> | | | | |
| <p>Unit III: 14L Searching and Sorting, Numerical Methods: Bisection Method, False Position Method, Newton-Raphson Method.</p> | | | | |
| <p>Unit IV: 12L Matrix and Linear Equations: System of Linear Equation, Gauss Elimination Method, Matrix Inversion, Eigen values.</p> | | | | |
| <p>Unit V: 12L Interpolation: Linear interpolation, Lagrange's Interpolation, Finite Differences.</p> | | | | |
| <p>Books Recommended:</p> <ol style="list-style-type: none"> 1. Chivers I.,Sleightholme J. "Introduction to Programming with Fortran" Springer, 2 Edition (2015). 2. Salaria R. S., "A Modern Approach to Programming in Fortran", Khanna Book Publishing, 4 Edition(2015). 3. Marcotty M., Ledgard H., "The World of Programming Languages", Springer. | | | | |

4. Cwiakala M., Mayo W., "Schaum's Outline of Programming With Fortran 77 (Schaum's Outlines)", McGraw-Hill Education (31 March 1995).

Computer Lab Based on FORTRAN PROGRAMMING:

- Solving Mathematical Problems using Fortran

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|------------------------------|---|-----------|-------|-------|
| Paper Code: GE-2.1 | Paper Name: Web Programming with PHP, MySQL | Credit: 6 | | |
| | | L = 4 | P = 2 | T = 0 |

Objective:

The course is designed with an objective to

- Understand basic PHP programming elements, variables, data types, operations, functions and control structures.
- Use PHP for handling user input from web forms.
- Create a database and access data using MySQL.
- Use PHP to interface with a MySQL database via web forms.
- Create database driven web applications with PHP and MySQL

Learning Outcome:

On completion of the course, students will be able to

- Design web applications using PHP.
- Demonstrate the ability to use MySQL as a back end database for web applications.
- Design database driven web application with PHP and MySQL.

Total Marks: 100

(In Semester Evaluation: 20 & End Semester Evaluation: 80)

Unit I:

5L

Introduction to PHP: What is PHP, Basics of PHP, Benefits Of Using PHP MYSQL, Server Client Environment, Web Browse Web Server Installation & Configuration.

Unit II:

10L

Development Concept: How PHP Script Work, PHP Syntax, Embed PHP In HTML/HTML in PHP, PHP Data Type, Variable in PHP, Contents in PHP , Operators in PHP, If Statement, If.....Else Statement, Nested If Statement, Switch Statement.

Unit III:

15L

Looping structure, array and functions: While loop, do-while loop, for loop, what is array, syntax of array, multidimensional array, What is function, Syntax of function, User Defined Function, System Defined Function, Parameterized Function, some string functions of PHP.

Unit IV:

20L

Working with MYSQL: Working with phpMyAdmin, Types of Data Type, Creating Database & Tables, Dropping Database & Tables, Adding Fields, Selecting Table, Database Connections, Managing Database Connections, Performing Queries, Closing Connection, Create Database & Table.

Books Recommended:

1. Holzner S. ,”*The Complete Reference PHP*”– McGraw Hill Education,2017
2. Welling L.,Thomson L, *PHP and MySQL Web Development*”, Pearson Education,2017.
3. Vaswani V, “*The Complete Reference MySQL*”, McGraw Hill Education, 2017.

4. Powell T., "The Complete Reference HTML & CSS", McGraw Hill Education, 2017.

Computer Lab Based on Web Programming with PHP, MySQL:

- HTML Form data handling with PHP
- Design web application using PHP and MYSQL

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|--|---|-----------|-------|-------|
| Paper Code: GE-2.2 | Paper Name: Multimedia and Applications | Credit: 6 | | |
| | | L = 4 | P = 2 | T = 0 |
| Objective: The course is designed with an objective to <ul style="list-style-type: none"> ➤ Introduce the fundamental elements of multimedia. ➤ Describe how still images, sound, and video can be digitized on the computer. | | | | |
| Learning Outcome: On completion of the course, students will be able to <ul style="list-style-type: none"> ➤ Summarize the key concepts in current multimedia technology. ➤ Create quality multimedia software titles. | | | | |
| Total Marks: 100 (In Semester Evaluation: 20 & End Semester Evaluation: 80) | | | | |
| Unit I: | | 8L | | |
| Multimedia: Introduction to multimedia, Components, Uses of multimedia. | | | | |
| Unit II: | | 15L | | |
| 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. | | | | |
| Unit III: | | 7L | | |
| Text: Fonts & Faces, Using Text in Multimedia, Font Editing & Design Tools, Hypermedia & Hypertext. | | | | |
| Unit IV: | | 6L | | |
| Images: Still Images – Bitmaps, Vector Drawing, 3D Drawing & rendering, Natural Light & Colors, Computerized Colors, Color Palletes, Image File Formats. | | | | |
| Unit V: | | 6L | | |
| Sound: Digital Audio, MIDI Audio, MIDI vs Digital Audio, Audio File Formats. | | | | |
| Unit VI: | | 8L | | |
| Video: How Video Works, Analog Video, Digital Video, Video File Formats, Video Shooting and Editing. | | | | |
| Unit VII: | | 10L | | |
| Animation: Principle of Animations. Animation Techniques, Animation File Formats. | | | | |
| Books Recommended: <ol style="list-style-type: none"> 1. Tay Vaughan, "Multimedia: Making it work", TMH, Eighth edition. 2006 2. Ralf Steinmetz and Klara Naharstedt, "Multimedia: Computing, Communications | | | | |

Applications”, Pearson,1995.

3. Keyes, “Multimedia Handbook”, TMH. 2000.

4. K. Andleigh and K. Thakkar, “Multimedia System Design”, PHI,2000

Computer Lab Based on Multimedia and Applications:

➤ Practical exercises using Flash.

FLASH: Concept of Frame, Key frames, Frame rate, Timeline, Tween, Layers, Symbols, Embedding audio/video and embedding on the web page

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|--|---|-----------|-------|-------|
| Paper Code: GE-2.3 | Paper Name: Programming in Visual Basic with Oracle | Credit: 6 | | |
| | | L = 4 | P = 2 | T = 0 |
| <p>Objective: The course is designed with an objective to</p> <ul style="list-style-type: none"> ➤ Introduce programming concept in Visual basics and oracle. ➤ Enable students to design database. ➤ Enable students to design new techniques for software development. ➤ Enable students to learn database connectivity using Visual Basic as front-end tool. <p>Learning Outcome: On completion of the course, students will be able to</p> <ul style="list-style-type: none"> ➤ Analyze and manipulate data from a large database ➤ Formulate new and better data accessing techniques ➤ Develop better user friendly software ➤ Student can use SQL for storing and retrieving data from the RDBMS. | | | | |
| <p>Total Marks: 100 (In Semester Evaluation: 20 & End Semester Evaluation: 80)</p> | | | | |
| <p>Unit I: 10L GUI Environment: Introduction to graphical user interface (GUI), programming language (procedural, object oriented, event driven), the GUI environment, compiling, debugging, and running the programs.</p> | | | | |
| <p>Unit II: 12L Controls: Introduction to controls textboxes, frames, check boxes, option buttons, images, setting borders and styles, the shape control, the line control, working with multiple controls and their properties, designing the user interface, keyboard access, tab controls, default & cancel property, coding for controls.</p> | | | | |
| <p>Unit III: 6L Operations: Data types, constants, named & intrinsic, declaring variables, scope of variables, val function, arithmetic operations, formatting data.</p> | | | | |
| <p>Unit IV: 9L Decision Making : If statement, comparing strings, compound conditions (and, or, not), nested if statements, case structure, using if statements with option buttons & check boxes, displaying message in message box, testing whether input is valid or not.</p> | | | | |
| <p>Unit V: 8L Forms and Iteration Handling : Multiple forms creating, adding, removing forms in project, hide, show method, load, unload statement, me keyword, referring to objects on a different forms, Do/loops, for/next loops, using msgbox function, using string function</p> | | | | |
| <p>Unit VI: 15L Oracle: Approach and advantages, PL/SQL blocks variable, manipulating data, Input and</p> | | | | |

Output Parameters and Return values, Exception handling, procedure, function, package, triggers.

Books Recommended:

1. Bradley, J. C., Millispangh A. C. .: “Programming in Visual Basic 6.0” , Tata Mcgraw Hill Edition 2000 (Fourteenth Reprint 2004).
2. Bayross, I. : “SQL, PL/SQL the Programming Language of Oracle”, Paperback – 1 Dec 2010.
3. Petroustos, E. : “Mastering Visual Basic 6 ” , BPB , ISBN: 9788126523085, Edition: 6th, 2009.
4. Jerke, N.: “Visual Basic 6: The Complete Reference” 1st Edition.

Computer Lab Based on Visual Basic with Oracle:

- Practical exercises based on concepts listed in theory using VB.

Discussion:

- Hands on practice on installation, connection ,SDLC
- Table definition (The table must include constraints)