**Appendix : A**

# Dr.Babasaheb Ambedkar Marathwada University, Aurangabad

Revised Syllabus of

## **Information Technology (optional)**

Semester wise

[Effective from 2009-10]

# Dr.Babasaheb Ambedkar Marathwada University, Aurangabad

## Curriculum Structure and Scheme of Evaluation: Information Technology (Optional)

| Sr. No. | Course Code | Name of the Subject | Scheme of Teaching | | | | Scheme of Evaluation(Marks) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | T Hrs/ Week | P Hrs/ Week | Total Hrs/ Week | Total Credit | University Theory Exam. | University Practical Exam. | Duration | Total Marks |
| **Semester I** | | | | | | | | | | |
| 1 | IT101 | Computer Fundamentals | 3 | - | 3 | 3 | 50 | - | 3 | 50 |
| 2 | IT102 | Fundamental of C | 3 | - | 3 | 3 | 50 | - | 3 | 50 |
| 3 | IT103 | Office Suite | - | 3 | 3 | 1.5 | - | 50 | 3 | 50 |
| 4 | IT104 | Practical on C Prog. | - | 3 | 3 | 1.5 | - | 50 | 3 | 50 |
| **Total of Semester – I** | | | 6 | 6 | 12 | 9 | 100 | 100 | | 200 |
| **Semester II** | | | | | | | | | | |
| 5 | IT201 | Data Structures | 3 | | 3 | 3 | 50 | - | 3 | 50 |
| 6 | IT202 | Adv. Prog. in C | 3 | | 3 | 3 | 50 | - | 3 | 50 |
| 7 | IT203 | Practical of D.S. | - | 3 | 3 | 1.5 | - | 50 | 3 | 50 |
| 8 | IT204 | Practical of Adv. C | - | 3 | 3 | 1.5 | - | 50 | 3 | 50 |
| **Total of Semester – II** | | | 6 | 6 | 12 | 9 | 100 | 100 | | 200 |
| **Semester III** | | | | | | | | | | |
| 9 | IT301 | Operating System | 3 | | 3 | 3 | 50 | - | 3 | 50 |
| 10 | IT302 | IT tools & Application | 3 | | 3 | 3 | 50 | - | 3 | 50 |
| 11 | IT303 | Practical based on O.S. | - | 3 | 3 | 1.5 | - | 50 | 3 | 50 |
| 12 | IT304 | Practical based on IT302 | - | 3 | 3 | 1.5 | - | 50 | 3 | 50 |
| **Total of Semester – III** | | | 6 | 6 | 12 | 9 | 100 | 100 | | 200 |
| **Semester IV** | | | | | | | | | | |
| 13 | IT401 | DBMS Using SQL | 3 | | 3 | 3 | 50 | - | 3 | 50 |
| 14* | IT402 | ASP & JSP | 3 | | 3 | 3 | 50 | - | 3 | 50 |
| 14* | IT402 | Linux | 3 | | 3 | 3 | 50 | - | 3 | 50 |
| 15 | IT403 | Practical based on IT401 | - | 3 | 3 | 1.5 | - | 50 | 3 | 50 |
| 16 | IT404 | Practical based on IT402 | - | 3 | 3 | 1.5 | - | 50 | 3 | 50 |
| **Total of Semester – IV** | | | 6 | 6 | 12 | 9 | 100 | 100 | | 200 |
| **Semester V** | | | | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **17** | **IT501** | **Soft.Project Mgmt.** | **3** | | **3** | **3** | **50** | **-** | **3** | **50** |
| **18*** | **IT502** | **E-Business** | **3** | | **3** | **3** | **50** | **-** | **3** | **50** |
| **18*** | **IT502** | **Multimedia Tech.** | **3** | | **3** | **3** | **50** | **-** | **3** | **50** |
| **19** | **IT503** | **Practical based on IT501 ( Case Study )** | **-** | **3** | **3** | **1.5** | **-** | **50** | **3** | **50** |
| **20** | **IT504** | **Practical based on IT502 ( Case Study )** | **-** | **3** | **3** | **1.5** | **-** | **50** | **3** | **50** |
| **Total of Semester – V** | | | **6** | **6** | **12** | **9** | **100** | **100** | | **200** |
| **Semester VI** | | | | | | | | | | |
| **21** | **IT601** | **S/w. Testing & Q.A.** | **3** | | **3** | **3** | **50** | **-** | **3** | **50** |
| **22*** | **IT602** | **Internet Prog. Using PHP** | **3** | | **3** | **3** | **50** | **-** | **3** | **50** |
| **22*** | **IT602** | **Ethics & Cyber Law** | **3** | | **3** | **3** | **50** | **-** | **3** | **50** |
| **23** | **IT603** | **Project** | **-** | **5** | **5** | **2** | **-** | **80** | **3** | **80** |
| **24** | **IT604** | **Seminar** | **-** | **1** | **1** | **1** | **-** | **20** | **3** | **20** |
| **Total of Semester – VI** | | | **6** | **6** | **12** | **9** | **100** | **100** | | **200** |

Note : * : Select Any one of the subject as paper No. 14 , 18 and 22.

## Computer Fundamentals

**Objective:** *To impart basic introduction to computer hardware components, computer numbering, how the CPU works, fundamental about algorithms and flowchart as well as different type of software.*

| Sr. No | Topic | Ref. | No. of Lect. |
|---|---|---|---|
| **1.** | **Fundamentals of Computer System** | | **3** |
| | • Introduction. | 1/1 | |
| | • Characteristics & features of Computers. | | |
| | • Components of Computers. | | |
| | • Organization of Computer. | | |
| **2.** | **Data Representation** | | **12** |
| | • Introduction to Number System | 1/3 | 4 |
| | o Decimal Number System | | |
| | o Binary Number System | | |
| | o Hexadecimal Number System | | |
| | • Conversion within Numbers Systems | 1/3 | 4 |
| | • Arithmetic Operation on Binary and Hexadecimal Numbers | | |
| | • Normalized Floating point Number | 2/2 | 4 |
| | • Representation of Character in Computers | | |
| | • Representation of Integer Numbers | | |
| | • Representation of Fraction Numbers | | |
| | • Hexadecimal Representation of Number | | |
| **3.** | **Algorithm and Flowcharts** | | **6** |
| | • Algorithm | 2/1 | 3 |
| | o Definition | | |
| | o Characteristics | | |
| | o Advantages and disadvantages | | |
| | o Examples | | |
| | • Flowchart | 3/3 | 3 |
| | o Definition | | |
| | o Define symbols of flowchart | 3/ 4 | |
| | o Advantages and disadvantages | | |
| | o Examples | | |
| **4.** | **Computer Generation & Classification** | | **3** |
| | • Generation of Computers : First to Fifth | 2/12 | |
| | • Classification of Computers | | |
| | • Distributed & Parallel computers | | |
| **5.** | **Computer Languages** | | **3** |
| | • Types of Programming Languages | 2/9 | |
| | o Machine Languages | | |
| | o Assembly Languages | | |
| | o High Level Languages | | |
| | • Assembler, Linker, Loader, Interpreter & Compiler. | 2/9 | |
| **6.** | **Computer Memory** | | **3** |

- Memory Cell & Organization 2/4
- Types of Memory (Primary And Secondary) 2/4
  - RAM
  - ROM
  - PROM
  - EPROM
  - Secondary Storage Devices ( FD, CD, HD, Pen drive, DVD, Tape Drive, DAT )

**7. I/O Devices** **3**

- Input Devices : 1/4
  - Touch screen , OMR, OBR , OCR, Light pen
- Output Devices : 1/4
  - Scanners, Digitizers, Plotters, LCD
  - Plasma Display, Printers

**8. Processor** **6**

- Structure of Instruction 2/5
- Description of Processor
- Processor Features
- RISC & CISC

**9. Operating system Concepts** **6**

- Why Operating System 2/10 2
- Functions of Operating System
- Types of Operating System 2/10 4
  - Batch O.S.
  - Multiprogramming O.S.
  - Time Sharing O.S
  - Personal Computers O.S.
  - Network O.S.

**Core Reference:**


1. Fundamentals of Information Technology
   By Chetan Srivastava, Kalyani Publishers
2. Fundamentals of Computers
   By V.Rajaraman, PHI Publication , IV$^{th}$ Edition.
3. Fundamentals of Programming
   By Raj K.Jain, S.Chand Publication


**Additional Reference:**


1. Computer Today
   By Suresh K. Basandra, Galgotia Publication,Updated Edition
2. Computer Fundamental
   By B.Ram, BPB Publication.

## Fundamental of C

**Objective:** *To expose students to algorithmic thinking and problem solving and impart moderate skills in programming using C Language in a industry-standard. Introduce students to learn basic features, Create, execute simple C programs using conditional statements, loops and arrays.*

| Sr. No | Topic | Ref. | No. of Lect. |
|---|---|---|---|
| **1.** | **Introduction**<br>• An Overview of C , History of C language,<br>• C as a Structured Language, Features of C. | 2/1, 1/1, | **3** |
| **2.** | **Basic Elements & Operators**<br>• Character set, C Token, Identifier & Keywords, Variables<br>• Constant and its types. Integer constant, floating point constant, character constant, string constants.<br>• Operators: Arithmetic, Relational, Logical, Unary operators: Increment & decrement Assignment and Conditional operator.<br>• Precedence & Associatively of Operators | 2/2,3, 1/1 | **6** |
| **3.** | **Data Types**<br>• Data Types: *int, char, float, double*. Declaration & Initialization.<br>• Type modifiers: long, short, signed and unsigned | 2/2, 1/1, 1/6 | **3** |
| **4.** | **C Program & I/O statements**<br>• Structure of C Program, Compilation & Execution of C program<br>I/O: Introduction, Formatted Input/Output function: *scanf & printf*, Escape sequence characters.<br>• Library functions: General used & Mathematical. | 2/4, 2/3, 1/1 | **3** |
| **5.** | **Control and Iterative Statements :**<br>• Simple if, nested if, if-else, else if ladder<br>• Switch-case statement<br>• The conditional expression (? : operator)<br>• *while* and *do-while* loop, and *for* loop<br>• *break* & *continue* statement, *goto* statement | 2/5, /6, 1/3, 1/4 | **12** |
| **6.** | **Arrays:**<br>• Introduction, Declaration and initialization Accessing array elements, Memory representation of array.<br>• One dimension and multidimensional arrays, character array, Introduction to string | 2/7, 2/8, 1/8, 3 | **9** |

**7. Functions** 2/9, 1/5, 3 **9**

- Introduction, types of functions. Defining functions, Arguments, Function prototype, actual parameters and formal parameters, Calling function, Returning function results, Call by value, Recursion.

**Core Reference:**

1. Let us C : Y.P. Kanetkar [bpb publication]
2. Programming in C : E. Balaburuswamy [Tata macgraw hill]
3. Programming in C : Goterfried [Shaums' Series]

**Additional References:**

1. Spirit of "C" : Moolish Kooper.

## Office Lab

**Objective:** To impart the student hands on practice so that students should be able to: *Create, Save, Copy, Delete, Organize various types of files and manage the desk top in general, use a standard word and spread-sheet processing package exploiting popular features.*

- **GUI Operating System :** Mouse Practice, Starting, Login, Shutdown, Exploring Directories, Resizing, Moving, Minimizing, closing of software windows, familiarization with file icons, Launching Applications, Deleting, Renaming files, Managing Directories, Searching for files, Using Accessories.
- **Web Browser:** Basic Browsing, Buttons: forward, backward, home, adding to favorites, stop, save, save as, Saving an Image from the Web, printing, Specifying a Home Page, **Browsing**: Using Web URLs, Anatomy of a URL, Membership Websites: Signing up for email service, **Searching:** Academic Search on the web**.**
- **Word Processing Tool**: Menus, Shortcut menus, Toolbars, Customizing toolbars, Creating and opening documents, Saving documents, Renaming documents, Working on multiple documents, Close a document ; **Working With Text** :Typing and inserting text, Selecting text, Deleting text, Undo, Formatting toolbar, Format Painter, Formatting Paragraphs: Paragraph attributes, Moving, copying, and pasting text, The clipboard, Columns, Drop caps; **Styles** : Apply a style, Apply a style from the style dialog box, Create a new styles from a model, Create a simple style from the style dialog box, Modify or rename a style, Delete a style; **Lists** : Bulleted and numbered lists, Nested lists, Formatting lists **Tables** :Insert Table button, Draw a table, Inserting rows and columns, Moving and resizing a table, Tables and Borders toolbar, Table properties **Graphics** :Adding clip art, Add an image from a file, Editing a graphic, AutoShapes; **Spelling and Grammar**: AutoCorrect, Spelling and grammar check, Synonyms, Thesaurus; **Page Formatting**: Page margins, Page size and orientation, Headers and footers, Page numbers, Print preview and printing.
- **Spreadsheet Basics**: Screen elements, Adding and renaming worksheets, The standard toolbar - opening, closing, saving, and more; **Modifying A Worksheet**, Moving through cells, Adding worksheets, rows, and columns, Resizing rows and columns, Selecting cells, Moving and copying cells,, Freeze panes; **Formatting Cells:** Formatting toolbar, Format Cells dialog box, Dates and times; **Formulas and Functions:** Formulas, Linking worksheets, Relative, absolute, and mixed referencing, Basic functions, Function Wizard, Autosum, **Sorting and Filling:** Basic ascending and descending sorts, Complex sorts, Autofill; Alternating text and numbers with Autofill, Autofilling functions; Graphics; Adding clip art; Add an image from a file; Editing a graphics; AutoShapes; **Charts:** Chart Wizard; Resizing a chart; Moving a chart, Chart formatting toolbar; **Page Properties and Printing:** Page breaks, Page orientation, Margins, Headers, footers, and page numbers, Print Preview, Print; Keyboard Shortcuts.

- **Presentation Tool**: AutoContent Wizard, Create a presentation from a template, Create a blank presentation, Open an existing presentation, AutoLayout, Presentation Screen: Screen layout, Views, Working with Slides: Insert a new slide, Applying a design template, Changing slide layouts, Reordering slides, Hide slides, Create a custom slide show, Edit a custom slide show Adding Content: Resizing a text box, Text box properties, Delete a text box, Bulleted lists, Numbered lists, Adding notes, Video and Audio Working with Text: Adding text, Editing options, Formatting text, Replace fonts, Line spacing, Change case Spelling check Color & Background: Color schemes, Backgrounds, Graphics, Adding clip art, Adding an image from a file, Editing a graphic, AutoShapes, WordArt Slide Effects: Action buttons, Slide animation, Animation preview, Slide transitions, Slide show options, Master Slides, Slide master, Header and footer, Slide numbers, Date and time Saving and Printing, Save as a web page, Page setup, Print

- **Integrating Programs** Word, spreadsheet and Presentation.

**Note:**

**The above practical is to be conducted using the either Microsoft-Office or OpenOffice.**

**SUBJECT : Info.Tech.(opt.) Semester : I Hours/week : 3**
**Code : IT104 Credit : 1.5**

## Lab for Programming in 'C'

***List of Experiments:***

1. Find Area, Perimeter of Triangle & Rectangle.
2. Find maximum amongst 3 numbers.
3. Program for nested loops.
4. Program to Calculate $x^y$
5. Program to check Prime Number.
6. Program to find Armstrong Number.
7. Program to print the Fibonacci Series
8. Searching and element from array.
9. Transpose of matrices
10. Multiplication of matrices
11. Sorting array using bubble sort technique
12. Program for recursion e.g. factorial, reverse of digit
13. Program for structure initialization
14. Array of Structure e.g. student result, Employee pay slip , Phone bill
15. Function with parameter & return values

**SUBJECT : Info.Tech.(opt.)** **Semester : II** **Hours/week : 3**
**Code : IT201** **Credit : 3**

## Introduction to Data Structure

**Objective:** *This course provides students an opportunity to develop and refine their programming skills. In particular, the emphasis of this course is on the organization of information, the implementation of linear data structures such as arrays, lists, stacks, queues, and techniques of data abstraction, including searching and sorting.*

| Sr. No | Topic | Ref | No. of Lect. |
|---|---|---|---|
| **1.** | **Introduction to Data Structure:** | | **6** |
| | • Introduction | | 1 |
| | • Basic Terminology : Data item, Fields, Records, Files, Entity, Attributes | | 3 |
| | • Data Organization and Data Structure | | 2 |
| **2.** | **Arrays** | | **9** |
| | • Representation of Linear Arrays | | 1 |
| | • Traversing, Insertion and Deletions | | 3 |
| | • Sorting & Searching Algorithms | | 2 |
| | • Multidimensional Arrays : 2D & M-D Concept | | 1 |
| | • Record : Record Structures, Representation in Memory | | 2 |
| **3** | **Linked List** | | **15** |
| | • Concept of Linked List | | 1 |
| | • Representation of linked List in memory | | 1 |
| | • Traversing a linked list | | 3 |
| | • Searching a linked list : sorted and unsorted | | 3 |
| | • Insertion & Deletion in Linked List | | 7 |
| | • Header Linked List & Two way List | | 2 |
| **4** | **Stacks, Queues , Recursion** | | **15** |
| | • Stack: Operation , Array Representation of Stack, linked representation of stack, Arithmetic Expression POLISH & POSTFIX, | | 9 |
| | • Application of stacks: Quicksort, Recursion. | | |
| | • Queue : Representation of queues, linked representation of queues | | 3 |
| | • Types of Queues : Deques & Priority Queues | | 3 |

**Core References:**

1. Data Structures : By Seymour Lipschutz, Tata Mcgraw- Hill Publication.

**Advance Reference:**

1. Fundamentals of Data structures, by Horowitz and Sahani (Galgotia publications).
2. An introduction to data structures and application, by Jean Paul Tremblay & Pal G. Sorenson (McGraw Hill).
3. Data Structures, by Tannenbaum, (PHI).

## Advance Programming in C

**Objective**: After working through this paper the students should be able to

1) Learn some advance features of C language.
2) Write programs using pointers, file handling.
3) Aware of graphics functions of C.

| Sr. No | Topic | References | No. of Lectures |
|---|---|---|---|
| 1. | **Structure & Union**<br>• Structure: Introduction, Declaration and initializing structure, Accessing structure members, Nested structures, Arrays of structure, *typedef* statement.<br>• Unions: Declaration, Difference between structure and union | 2/10, 1/10, | 4 |
| 2. | **Pointers:**<br>• Introduction, Memory organization. Declaration and initialization of pointers. The pointer operator * and &, De-referencing, Pointer expression and pointer arithmetic, Pointer to an array, Pointer to pointer, Constant pointers. | 2/11, 1/5 | 6 |
| 3. | **Functions & Pointers:**<br>• Call by reference, Passing array and structure to function, functions returning pointers, character pointer, Two dimensional array of string, array of pointer to string, passing structure pointer to function, arrow (->) operator. | 2/9,11, 1/5 | 6 |
| 4. | **Storage Class & Library Functions:**<br>• Storage classes, Scope, visibility and lifetime of variable, block and file scope, auto, extern, static and register storage classes.<br>• **String handling functions**: strcpy(), strcmp(), strcat(), strlen(), strupr(), strlwr(), gets(), puts()<br>• **Data conversion functions from stdlib.h**: atoi(), atol(), atof(), itoa(), ltoa(), random(), calloc(),malloc(),exit(), abs(), toupper(), tolower() | 2 | 6 |
| 5. | **Preprocessor Directives:**<br>• File inclusion and conditional compiler directives, Macro substitution, #define, #if, #ifdef, #else, #elif, #endif, | 2/14, 1/7 | 5 |
| 6. | **Miscellaneous Features:**<br>• Bitwise Operators: Introduction, Masking, Internal representation of data, Bit fields, Enumerated data types, Type casting. | 2/App-I, 1/15, | 3 |

| | | | |
|---|---|---|---|
| **7.** | **File Handling**<br>• **File handling**: Introduction, Opening & closing a file, Input/Output operations on files, text and binary files, getc(), putc() function. File copy program, fprintf() and fscanf(). fread() and fwrite() function. Writing and reading records from binary file, Appending, modifying and deleting a record from file, Random access functions fseek(), rewind(), flushall(), remove(), rename().<br>• **Command line arguments**: use of argc and argv. | 2/12, 1/12,13 | 9 |
| **8.** | **Graphics in C:**<br>• Introduction: initgraph() and detectgraph() function, Drawing object in C, Line, Circle, Rectangle, Ellipse, Changing foreground & background colors, Filling object by color, outtextx() function. | 4 | 5 |

**Core Reference:**


1. Let us C Solutions : Y.P. Kanetkar [bpb publication]
2. Programming in C : E. Balagurusamy. [Tata macgraw hill]
3. Programming in C : Goterfried [Shaums Series]
4. Graphics Under C : Y. Kanetkar


**Additional References:**


1. Spirit of "C" : Moolish Kooper.
2. Test your Skills in C : Y.Kanetkar

**SUBJECT : Info.Tech.(opt.)** **Semester : II** **Hours/week : 3**
**Code : IT203** **Credit : 1.5**

**Data Structure:**

1. Write a program using DIV(J,K) which reads a positive integer N>10 and determines whether or not N is a prime number.
2. Write a program which counts the number of particular character/word in the String.
3. Write a program which reads words WORD1 and WORD2 and then replaces each occurrence of word1 in text by word2
4. Write the programs for traversing of n item using the array.
5. Write the programs for insertion and deletion of n item using the array.
6. Implement Linear and binary search algorithm using C.
7. Implement Bubble sort using C.
8. Write the programs for traversing of n item from the linked list.
9. Write the programs for push and pop operation using the stacks.
10. Write the programs for insertion and deletion of n item from the queues.

**SUBJECT : Info.Tech.(opt.)** **Semester : II** **Hours/week : 3**
**Code : IT204** **Credit : 1.5**

**Advance Programming in C**

1. Swapping of numbers by using call by reference
2. Program to pass array to function.
3. Program for passing structure pointer to function.
4. String manipulation function e.g. string copy, concatenation, compare, string length, reverse
5. Program for reading/writing text file.
6. Program for reading/writing binary file
7. File copy program.
8. Program to modify a record from binary file
9. Program to delete a record from binary file
10. Program on conditional compiling
11. Program on macro substitution.
12. Program for data conversion
13. Program to draw simple pictures (human face, clock, hut, etc.) using graphics functions.
14. Program using command line arguments.
15. Program to demonstrate the storage class.
16. Program to sort names.

# B.Sc. (Information Technology-Opt.)
# Semester III

| Sr. No | Topic | Ref | No. of Lect. |
|---|---|---|---|
| **1.** | **Device Management**<br>• Introduction<br>Dedicated Devices, shared devices and virtual devices<br>• Generalized strategies | | **10** |
| **2.** | **Device Characteristics**<br>• Input and Output devices<br>• Storage devices<br>• **Device allocations**<br>• Concept of I/O Traffic controller<br>• I/O scheduler<br>• Introduction to Virtual Devices | | **15** |
| **3** | **Information Management**<br>• Concept of File system<br>• Symbolic file systme<br>• Access control verification<br>Logical and physical file system | | **15** |
| **4** | **Case study**<br>• IBM system : Memory , processor, Device and Information Management. | | **05** |

**Core Reference:**

1. "Operating System", By S.R.Sathe & Anil S.Mokhade , MacMillan Publication.
2. "Operating System", By Stuart E.Madnick, John J.Donovan.

Books Recommended:

• Operating System Concepts- A. Silberzchaz & P.B. Galvin, Addison – Wesley Publishing Company.

## IT Tools And Application

| Sr. No | Topic | No. of Lect. |
|---|---|---|
| **Unit I** | **Basic concepts** | **15** |
| | • Basic web designing: Introduction to web browser, architecture of web browser, web page, , web-site. Web-servers & clients. www<br>• Internet, Internet Domains, world wide web<br>• Protocols definition, Overview of TCP/IP, Telnet.<br>• Web page, Web site , web browser, architecture of web browser<br>• Web server ,web client<br>• Communication between browser and web server<br>• Web site architecture, Static & dynamic web pages, home page | |
| **2.** | **Introduction to HTML** | **15** |
| | • Structure of HTML program<br>• HTML paired tags<br>• Text formatting: paragraph, line break, headings , drawing lines.<br>• Text styles: Bold, italics, underline.<br>• Lists: types of lists viz. unordered, ordered, definition lists<br>• Adding graphics: image, background, border, using width and height attributes.<br>• Tables : creation and setting attributes of table.<br>• Linking documents (Links) : External document references, internal document references.<br>• Introduction to frames: frameset and frame tag. | |
| **3.** | **Introduction to DHTML** | **15** |
| | • Overview of dynamic HTML.<br>• Cascading Style Sheets, font ,color ,background, Text, border.<br>• Introduction to javascript. Java Script Objects Introduction<br>• Working with java script style sheets.<br>• Adding form and controls ,Event handling.<br>• Decision making statements, loops.<br>• Built-in functions, user defined functions.<br>• Java Script Array, Java Script Boolean, Java Script Math | |

**Core Reference:**

1. **Web Enabled commercial Application Development Using HTML, DHTML, JavaScript by -Ivon Bayross.**
2. **Complete reference HTML**
3. **JavaScript Bible.**

| **Course :** | **B.Sc. (I.T) (Optional)** | **Semester :** | **III** | **Hours/week :** | **3** |
|---|---|---|---|---|---|

| Code : | IT303 | Pre-requisite : |
|---|---|---|

## Practical :Operating System II

1. 5-2 from “Operating System”, By Stuart E.Madnick, John J.Donovan.
2. 5-5 from “Operating System”, By Stuart E.Madnick, John J.Donovan.
3. 5-7 from “Operating System”, By Stuart E.Madnick, John J.Donovan.
4. 6-1 from “Operating System”, By Stuart E.Madnick, John J.Donovan.
5. 6-5 from “Operating System”, By Stuart E.Madnick, John J.Donovan.
6. 6-9 from “Operating System”, By Stuart E.Madnick, John J.Donovan.
7. Prepare a short report on the case study given in the syllabus.

| Course : | B.Sc. (I.T) (Optional) | Semester : | III | Hours/week : | 3 |
|---|---|---|---|---|---|
| Code : | IT303 | | | Pre-requisite : | |

## Practical : I.T. tools & Application

1. Design a web page which gives information of your college and course. (Use various effects like alignment font heading etc).
2. Design a web page using 3 image files give various effects on each.

Create a web page giving following details of students using table and use cell padding to present data with clarity. Roll number, Name, Date of birth, Blood group, Mobile, E-mail address

Give proper title to the data and the web page

3. Design a web page which give links to various mailing sites(viz. Gmail, Yahoo, Rediff etc.)
4. Refer hand on exercise of reference book * page no. 155
5. Refer hand on exercise 1 of reference book * page no. 182
6. Refer hand on exercise 2 of reference book * page no. 182
7. Refer hand on exercise 1,2,3 of reference book * page no. 335
8. Refer hand on exercise 1 of reference book * page no. 537
9. Refer hand on exercise 2 of reference book * page no. 538

* Reference Book : Web Enabled commercial Application Development Using HTML, DHTML, JavaScript by -Ivon Bayros

| Course : | B.Sc.(I.T.) | Semester : | IV | Hours/week : | 3 |
|---|---|---|---|---|---|

# B.Sc. (Information Technology-Opt.)
# Semester IV

| | | | |
|---|---|---|---|
| **Code** | **:** | **Optional IT401** | **Prerequisite :** |

## Database Using SQL

| Sr.No. | Topics in Details | No. of Lect. |
|---|---|---|
| **Unit–I** | | **15** |
| **1.** | **Introduction to SQL :**<br>SQL Environment<br>**Data Definition Language :**<br>Naming Rules and Conventions, Data types, Constraints, Creating Table, Displaying Table Information, Altering an Existing Table, Dropping a Table, Renaming a Table | |
| **Unit–II** | **Data Management and Retrieval** | **15** |
| **2.** | 1. Data Manipulation Language : Adding a New rows/records, Updating Existing records, Deleting records, Retrieving Data from a Table,<br>2. Working with Tables: Function & Grouping<br>3. Multiple Tables : Joins and Set Operators<br>4. Subqueries: Nested Queries<br>5. Objects, Transactions and Data Control | |
| **Unit–III** | **PL/SQL: An Introduction** | **15** |
| **3.** | **PL/SQL**: Syntax overview, block structure. Variables, program flow, procedures, functions, triggers, cursors. | |

**TextBooks:**


1. Database Systems Using Oracle: A simplified Guide to SQL & PL/SQL Nilesh Shah, PHI Publication , Second Edition.
2. Teach Yourself SQL in 21 Days: Ryan K. Stephens, Ronald R. Plew, Bryan Morgan, Jeff Perkins: SAMS Publication


**Reference Website:**

http://www.dmc.fmph.uniba.sk/public_html/doc/sql/index.htm

| Course : | B.Sc.(I.T.) Optional | Semester : | IV | Hours/week : | 3 |
|---|---|---|---|---|---|
| Code : | IT402 | | | Prerequisite : | - |

# Linux

| Sr.No. | Topics in Details | No. of Lect. |
|---|---|---|
| **Unit-I** | **Introduction to Linux :** | **15** |
| **1.** | • What is Linux, Linux's & Unix , Features of Linux, Advantage of Linux, Open Source and the Philosphy of Linux ,Version of Linux, What is Red Hat Linux, Why Red Hat Linux.<br>• Getting Started with Desktop : Logging in to Red Hat Linux, Getting started with Desktop, Using GNOME and KDE Desktop Environment | |
| **Unit-II** | **Using Linux :** | **15** |
| **2.** | • Linux Commands : Understanding Red hat Linux Shell, Using the shell , Working with the Red Hat Linux file System, Using Vi text editor<br>• Accessing and Running Application: Running X Windows Application, Starting application from a menu, starting application from a run program window, starting application from a Terminal Window, Running remote X Application.<br>• Tools for using the Internet and Web: Understanding Internet tools, browsing the web, communicating via e-mails. | |
| **Unit-III** | **Administrating Linux :** | **15** |
| **3.** | • Understanding System Administrator : Using the Root login, Becoming the Super User, Role of Linux System Administrator, Configuring Hardware, Managing File System and Disk Space, Mounting file systems<br>• Creating User Account, Setting user defaults, Creating portable desktops, Deleting user accounts<br>• Setting up a LAN : wired and wireless LAN<br>• Connecting to the internet. | |

**Reference:**


1. *Red Hat Linux 9 Bible*: Christopher Negus, Wiley dreamtech Pub.
2. *Learning Red Hat Linux :* Bill McCarty, O'Reilly Media Publication
3. *Running Linux :* Matt Welsh; Matthias Kalle Dalheimer; O'Reilly Media Publication


| Course : | B.Sc.(IT) Optional | Semester : | IV | Hours/week : | 2 |
|---|---|---|---|---|---|

| Code : IT403 | Prerequisite : - |
|---|---|

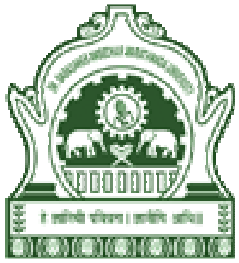
**ASP and JSP Practical**

10 Practical each based on Unit 1, Unit 2 and Unit 3.

| Course : B.Sc.(IT) Optional | Semester : IV | Hours/week : 2 |
|---|---|---|
| Code : IT404 | | Prerequisite : - |

**LINUX Practical**

10 Practical each based on Unit 1, Unit 2 and Unit 3



# B.Sc. (Information Technology-Opt.)
# Semester V

**Course:** B.Sc.(I.T.Optional) – V Seme. **Paper Code:** IT501

## Software Project Management

| Sr. No. | Topics in Details | No. of Lect. |
|---|---|---|
| **Unit I** | | **15** |
| | Introduction to Software Project Management Software project versus other types of project. Problems, Requirement specifications. Introduction to step wise project planning - Select - identify scope and objectives - identify project infrastructure - Analyse project characteristics - products and activities. | |
| **Unit II** | | **15** |
| | Project evaluation - Introduction to Strategic assessment - technical assessment - cost benefit analysis - cash flow forecasting - cost benefit evaluation techniques - risk evaluation. | |
| **Unit III** | | **15** |
| | Selection of an appropriate project approach - choosing technologies - technical plan contents list - choice of process models - structured methods - rapid application development - waterfall model - spiral model - software prototyping - ways of categorizing prototypes - tools - incremental delivery. | |

**Books for Study:**

- **Software project management** : Bob Hughes and Mike Cotterell - - Fourth edition - McGraw Hill
- **Software Project Management** : Walker Royce - - Addison Wesley.

**Course:** B.Sc.(I.T. Optional) – V Seme. **Paper Code:** IT502

## E-Business

| Sr. No. | Topics in Details | No. of Lect. |
|---|---|---|
| **UNIT I** | | **15** |
| **1** | Introduction, IT and business, E-commerce: Concepts Electronic Communication, PCs and Networking, E-mail, Internet and intranets. EDI to E-commerce, EDI, UN/EDIFACT | |
| **UNIT II** | | **14** |
| **2** | Concerns for E-commerce Growth, Internet bandwidth, Technical issues, Security issues. India E-commerce Readiness, Legal issues.<br>**Security Technologies:** Cryptography, Public Key Algorithms, Private Key Algorithms, Hashing techniques, Certification and key Distribution, Cryptographic | |
| **UNIT III** | | **15** |
| **3** | **Applications, Encryption, Digital Signature**<br>Protocols for Transactions. SSL-Secure Socket Layer, SET-Secure Electronic Transaction, Credit Card Business Electronic Commerce providers. CyberCash, Digicash, VeriSign Software Package: PGP e-mail encryption software | |

TEXT BOOK :

E-Commerce: The Cutting Edge of Business, Kamlesh K. Bajaj & Debjani Nag, Tata McGraw Hill

**Course:** B.Sc.(I.T.) – V Seme. **Paper Code:** IT331AT

# Multimedia Technology

| Sr.No. | Topics in Details | No. of Lect. |
|---|---|---|
| **Unit-I** | | **15** |
| **1.** | 1. **Introduction to Multimedia Technology** | **[Ref. 1/1]** |
| | 1. Multimedia Elements<br>2. Multimedia Application<br>3. Multimedia System Architecture<br>4. Object for Multimedia Systems<br>5. Data Compression & its types | |
| **2.** | **Multi-media Authoring System** | |
| | 1. Designing issue for Multimedia Authoring<br>2. Design Approached to Authoring<br>3. Types of Multimedia Authoring system: Dedicated, Timeline-Based, Structured, Programmable and Telephone Authoring System. | **[Ref. 1/..]** |
| **Unit-II** | | **15** |
| **3.** | **Gaphics & Image Data Represntation** | **[Ref. 2/2]** |
| | 1. Graphics / Image Data Types<br>2. Popular File Formats: GIF, JPEG, PNG, TIFF, BMP, WMF. | |
| **4.** | **Introduction to anima8or software**: | **[Mannual]** |
| | 1. Basics,<br>2. Object Editor - Basics and Object/Edit Mode,<br>3. Object Editor - Object/Point Mode,<br>4. Figure Editor | |
| **Unit-III** | | **15** |
| | 5. Sequence Editor,<br>6. Scene Editor,<br>7. Animation | **[Mannual]** |

**Reference:**


1. **Multimedia Technology :** Prabhat & thakker
2. **Fundamental of Multimedia :** Ze-Nian Li & Mark S.Drew (Pearson)


**Manual of Anim8or Software: Free download Manual & Software from the website :**
http://www.anim8or.com/main/index.html

**Course:** B.Sc.(I.T. optional) – V Seme. **Paper Code:** IT503

## Software Project Management : Case Study

Case Study based on Software Development Models.

**Course:** B.Sc.(I.T. optional) – V Seme. **Paper Code:** IT504

## E-Business : Case Study

Case Study : As per directive of the Concerned Faculty.

**Course:** B.Sc.(I.T. optional) – V Seme. **Paper Code:** IT503

## Multimedia Technology

Development of modules given in the Manual at least 10 different.

# B.Sc. (Information Technology-Opt.)
# Semester VI

**Course:** B.Sc.(I.T.Optional) – VI Seme. **Paper Code:** IT601

## Software Testing and Quality Assurance

| Sr.No. | Topics in Details | No. of Lect. |
|---|---|---|
| **Unit-I** | | **15** |
| | **Introduction:** Software Quality, Role of testing, verification and validation, objectives and issues of testing, Testing activities and levels, Sources of Information for Test Case Selection, White-Box and Black-Box Testing , Test Planning and Design, Monitoring and Measuring Test Execution, Test Tools and Automation | |
| **Unit-II** | | **15** |
| | **Unit Testing:** Concept of Unit Testing , Static Unit Testing ,Dynamic Unit Testing , Outline of Control Flow Testing, Overview of Dynamic Data Flow Testing, Data Flow Graph, Data Flow Terms, Data Flow Testing Criteria, Comparison of Data Flow Test Selection Criteria, Feasible Paths and Test Selection Criteria, Comparison of Testing Techniques. | |
| **Unit-III** | | **15** |
| | System Integration Testing: Concept of Integration Testing, Different Types of Interfaces and Interface Errors, Test Plan for System Integration, System Test Categories: Basic Tests, Functionality Tests, Robustness Tests, Interoperability Tests, Performance Tests, Reliability Tests, and Documentation Tests. | |

Text Book


1. **"Effective methods for Software Testing"** William Perry, Wiley.
2. **"Software Testing and Quality Assurance: Theory and Practice",** Sagar Naik, University of Waterloo, Piyu Tripathy, Wiley , 2008


**References:**


1. "Software Testing - A Craftsman's Approach", Paul C. Jorgensen, CRC Press, 1995.
2. "The Art of Creative Destruction", Rajnikant Puranik, SPD.

**Course:** B.Sc.(I.T.Optional) – VI Seme. **Paper Code:** IT602

## Ethics & Cyber Law

| Sr.No. | Topics in Details | No. of Lect. |
|---|---|---|
| **Unit-I** | | **15** |
| | Basic Concepts of Technology and Law , Understanding the Technology of Internet, Scope of Cyber Laws , Cyber Jurisprudence | |
| **Unit-II** | | **15** |
| | Law of Digital Contracts The Essence of Digital Contracts The System of Digital Signatures The Role and Function of Certifying Authorities The Science of Cryptography<br>E-Governance Cyber Crimes and Cyber Laws | |
| **Unit-III** | | **15** |
| | **Information Technology Act 2000 Cyber Law:**<br>Issues in E-Business Management Major issues in Cyber Evidence Management Cyber Law Compliancy Audit,<br>The Ethics of Computer Security | |

**Text books:**


1. Godbole," Information Systems Security", Willey
2. Merkov, Breithaupt," Information Security", Pearson Education
3. Yadav, "Foundations of Information Technology", New Age, Delhi
4. Schou, Shoemaker, " Information Assurance for the Enterprise", Tata McGraw Hill
5. Sood,"Cyber Laws Simplified", Mc Graw Hill
6. Furnell, "Computer Insecurity", Springer

**Course:** B.Sc.(I.T.Optional) – VI Seme. **Paper Code:** IT602

# Internet Programming Using PHP

| Sr.No. | Topics in Details | No. of Lect. |
|---|---|---|
| **Unit-I** | | **15** |
| | 1. Introduction to PHP,<br>2. Configuring Apache,<br>3. Configuring PHP,<br>4. The building Block of PHP | |
| **Unit-II** | | **15** |
| | 5. Decision and loops,<br>6. functions in PHP, types of functions<br>7. Arrays in PHP,<br>8. Objects in PHP, | |
| **Unit-III** | | **15** |
| | 9. Working with String,<br>10. Date and Time,<br>11. Handling Forms (HTML). | |

**Reference Books:**


1. **"BEGINNING PHP 5.3"** by MATT DOYLE WROX publication
2. **"PHP, MySQL and Apache All in One"** by Juliea C. Meloni, SAMS series

**Course:** B.Sc.(I.T. Optional) – VI Seme. **Paper Code:** IT603

## Major Project Work

**PROJECT:-**

- Students of semester VI will have to perform ONE project of 80 marks. ( A group of maximum 3 candidates [ Exceptionally 4] will allow working on one project work).
- Each Faculty must have at the max. 5-6 Projects.
- Distribution of project marks will as follows:-
    - Review 1 Report
    - Review 2 Report
    - Project work (certified)
    - Project work Presentation.
    - Viva/ Oral.

**Course:** B.Sc.(I.T.Optional) – VI Seme. **Paper Code:** IT604

## SEMINAR

**SEMINAR:-**

- **Every Student will have to have to submit one seminar report based on current trends and technology and will have to present the same in the front of external examiner along with the students of practical examination batch as an open viva.**