Dr.Babasaheb Ambedkar Marathwada University, Aurangabad

Revised Syllabus of

Information Technology (optional)

Semester wise

(with Credit System)

[Effective from 2009-10]

Information Technology (Optional)

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

Information Technology (Optional)

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.

SUBJECT : Info.Tech.(opt.) **Semester : I** **Hours/week : 3**
Code : IT101 **Credit : 3**

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 , IVth 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.

SUBJECT : Info.Tech.(opt.) **Semester : I** **Hours/week : 3**
Code : IT102 **Credit : 3**

Programming in 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** • An Overview of C , History of C language, • C as a Structured Language, Features of C.	2/1, 1/1,	**3**
2.	**Basic Elements & Operators** • Character set, C Token, Identifier & Keywords, Variables • Constant and its types. Integer constant, floating point constant, character constant, string constants. • Operators: Arithmetic, Relational, Logical, Unary operators: Increment & decrement Assignment and Conditional operator. • Precedence & Associatively of Operators	2/2,3, 1/1	**6**
3.	**Data Types** • Data Types: *int, char, float, double.* Declaration & Initialization. • Type modifiers: long, short, signed and unsigned	2/2, 1/1, 1/6	**3**
4.	**C Program & I/O statements** • Structure of C Program, Compilation & Execution of C program I/O: Introduction, Formatted Input/Output function: *scanf & printf*, Escape sequence characters. • Library functions: General used & Mathematical.	2/4, 2/3, 1/1	**3**
5.	**Control and Iterative Statements :** • Simple if, nested if, if-else, else if ladder • Switch-case statement • The conditional expression (? : operator) • *while* and *do-while* loop, and *for* loop • *break* & *continue* statement, *goto* statement	2/5, /6, 1/3, 1/4	**12**
6.	**Arrays:** • Introduction, Declaration and initialization Accessing array elements, Memory representation of array. • 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.

SUBJECT : Info.Tech.(opt.) **Semester : I** **Hours/week : 3**
Code : IT103 **Credit : 1.5**

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).

SUBJECT : Info.Tech.(opt.) **Semester : II** **Hours/week : 3**
Code : IT202 **Credit : 3**

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** • Structure: Introduction, Declaration and initializing structure, Accessing structure members, Nested structures, Arrays of structure, *typedef* statement. • Unions: Declaration, Difference between structure and union	2/10, 1/10,	4
2.	**Pointers:** • 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:** • 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:** • Storage classes, Scope, visibility and lifetime of variable, block and file scope, auto, extern, static and register storage classes. • **String handling functions**: strcpy(), strcmp(), strcat(), strlen(), strupr(), strlwr(), gets(), puts() • **Data conversion functions from stdlib.h**: atoi(), atol(), atof(), itoa(), ltoa(), random(), calloc(),malloc(),exit(), abs(), toupper(), tolower()	2	6
5.	**Preprocessor Directives:** • File inclusion and conditional compiler directives, Macro substitution, #define, #if, #ifdef, #else, #elif, #endif,	2/14, 1/7	5
6.	**Miscellaneous Features:** • Bitwise Operators: Introduction, Masking, Internal representation of data, Bit fields, Enumerated data types, Type casting.	2/App-I, 1/15,	3

7.	**File Handling** • **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(). • **Command line arguments**: use of argc and argv.	2/12, 1/12,13	9
8.	**Graphics in C:** • 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.