डॉ. बाबासाहेब आंबेडकर मराठवाडा विद्यापीठ, औरंगाबाद

परिपत्रक क्रमांक/एस.यु./विज्ञान/अभ्यासक्रम/७४/२०१४

या परिपत्रकाद्वारे सर्व संबंधीतांना सुचित करण्यात येते की, विज्ञान विद्याशाखेने शिफारस केल्यानुसार बी. एस्सी. / एम. एस्सी. प्रथम व द्वितीय वर्षाच्या सुधारित अभ्यासक्रमास आणि बी. एस्सी. प्रथम वर्षाच्या अभ्यासक्रमात किरकोळ बदल करण्यास विद्यापरिषदेच्या वतीने मा. कुलगुरु यांनी, त्यांना प्राप्त असलेल्या विशेष अधिकार महाराष्ट्र विद्यापीठ अधिनियम-१९९४ कलम १४(७) अन्वये मान्यता दिलेली आहे. त्या अनुषंगाने सुधारीत तयार केलेल्या अभ्यासक्रमाची प्रत या परिपत्रकासोबत आपल्या पुढील कार्यवाहीसाठी पाठविण्यात येत आहे.

[1]	B.Sc. Physics	Semester-III & IV,
[2]	B.Sc. Chemistry	Semester-III & IV,
[3]	B.Sc. Botany	Semester-III & IV,
[4]	B.Sc. Zoology with minor changes	Semester-I & II,
[5]	B.Sc. Zoology	Semester-III & IV,
[6]	B.Sc. Fisheries	Semester-III & IV,
[7]	B.Sc. Electronics (Opt.)	Semester-III & IV,
[8]	B.A./B.Sc. Mathematics	Semester-III & IV,
[9]	B.Sc. Computer Science	Semester-I & II,
[10]	B.Sc. Information Technology	Semester-I & II,
[11]	B.C.A.	Semester-I & II,
[12]	B.Sc. Computer Science(Opt.)	Semester-I & II,
[13]	B.Sc. Information Technology(Opt.)	Semester-I & II,
[14]	B.Sc. Computer Application(Opt.)	Semester-I & II,
[15]	B.Sc. Computer Maintenance(Opt.)	Semester-I & II,
[16]	B.Sc. Biotechnology (Progressively)	Semester-I to VI,
[17]	B.Sc. Biotechnology (Opt.) (Progressively)	Semester-I to IV,
[18]	B.Sc. Sericulture Technology	Semester-I & II,
[19]	B.Sc. Networking Multimedia	Semester-III & IV,
[20]	B.Sc. Bioinformatics	Semester-I & II,
[21]	B.Sc. Hardware & Networking	Semester-I & II,
[22]	B.Sc. Animation	Semester-I & II,
[23]	B.Sc. Dairy Science & Technology	Semester-III & IV,
[24]	B.Sc. Biochemistry	Semester-III & IV,
[25]	B.Sc. Analytical Chemistry	Semester-III & IV,
[26]	B.Sc. Textile & Int. Decoration with minor changes	Semester-I & II,
[27]	B.Sc. Textile & Int. Decoration	Semester-III & IV,
[28]	B.Sc. Home Science with minor changes	Semester-I & II,
[29]	B.Sc. Home Science	Semester-III & IV,
[30]	B.Sc. Agro.Chem. & Fertilizers	Semester-III & IV,

..2..

5-29 Nov., 2013 AC after Circulars from Cirular No.55 & onwards

:: [2] ::

[31]	B.Sc. Geology	Semester-III & IV,
[32]	B.A. Statistics with minor changes	Semester-I & II,
[33]	B.A. Statistics	Semester-III & IV,
[34]	B.Sc. Statistics with minor changes	Semester-I & II,
[35]	B.Sc. Statistics	Semester-III & IV,
[36]	B.Sc. Industrial Chemistry	Semester-III & IV,
[37]	B.Sc. Horticultural	Semester-I & II,
[38]	B.Sc. Dry land Agriculture	Semester-I & II,
[39]	B.Sc. Microbiology	Semester-III & IV,
[40]	M.Sc. Computer Science	Semester-I to IV,
[41]	M.Sc. Information Technology	Semester-I to IV.

हा सुधारीत व नवीन तयार केलेल्या अभ्यासक्रमाचा आराखडा शैक्षणिक वर्ष २०१४-१५ करिता मर्यादित असेल व विद्यापरिषदेच्या अंतिम मान्यतेनंतर हे परिपत्रक नियमित ठेवण्याबाबत या कार्यालयाद्वारे नवीन परिपत्रक पारीत करण्यात येईल. तसेच सुधारीत व नवीन तयार केलेल्या अभ्यासक्रमाची प्रत विद्यापीठाच्या संकेतस्थळावर उपलब्ध आहे.

करिता, या परिपत्रकाची सर्व संबंधितांनी नोंद घ्यावी.

विद्यापीठ प्रांगण,
औरंगाबाद-४३१ ००४.
संदर्भ क्र.एस.यु./सा.शा./सबवि /२०१३-१४/
६५९९-७०२
दिनांक :- २७-०५-२०१४.

संचालक,
महाविद्यालये व विद्यापीठ
विकास मंडळ.

****

या परिपत्रकाची एक प्रत :-

१) मा. परिक्षा नियंत्रक, परिक्षा विभाग,

२) मा. प्राचार्य, सर्व संलग्नीत महाविद्यालये,

३) संचालक, युनिक यांना विनंती करण्यात येते की, सदरील अभ्यासक्रम विद्यापीठाच्या
    संकेतस्थंळावर उपलब्ध करुण देण्यात यावेत.

४) संचालक, ई-सुविधा केंद्र, विद्यापीठ परिसर,

५) जनसंपर्क अधिकारी, मुख्य प्रशासकीय इमारत,

६) कक्ष अधिकारी, पात्रता विभाग, मुख्य प्रशासकीय इमारत,

७) कक्ष अधिकारी, बी.ए. / बी.एस्सी./ बी.सी.एस./एम.एस्सी. विभाग, परीक्षा भवन,

८) अभिलेख विभाग, मुख्य प्रशासकीय इमारती मागे,

    डॉ. बाबासाहेब आंबेडकर मराठवाडा विद्यापीठ, औरंगाबाद.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

Revised Syllabus of
B.Sc. First Year
Computer Science (Optional)
Semester-I & II

[Effective for June 2014-15]

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Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

Curriculum Structure and Scheme of Evaluation: B.Sc. (Computer Science) (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	University Theory Exam.	University Practical Exam.	Duration	Total Marks
Semester I									
1	CSO1	Computer Fundamentals	3	-	3	50	-	2	50
2	CSO2	Digital Electronics	3	-	3	50	-	2	50
3	CSO3	Office Suite & Digital Electronics	-	3	3	-	50	3	50
Total of Semester – I			6	3	9	100	50		150
Semester II									
4	CSO4	Operating System I	3		3	50	-	2	50
5	CSO5	Programming in C	3		3	50	-	2	50
6	CSO6	Operating System & Programming in C	-	3	3	-	50	3	50

Total of Semester – II	6	3	9	100	50		150

SUBJECT: Comp. Sci. (opt.)   Semester: I   Hours/week: 3

Code   : CSO1

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.	**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		
3.	**Computer Generation & Classification**		3
	• Generation of Computers : First to Fifth	2/12	
	• Classification of Computers		
	• Distributed & Parallel computers		
4.	**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

5.   **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)

6.   **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

7.   **Processor**   6

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

8.   **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.

Digital Electronics.

Objective: To impart basic knowledge in digital logic and circuits and to introduce basic concepts of data communications. Student will be able to learn basic concepts of digital logic and the design of basic logic circuits using commonly used combinational and sequential circuits

Sr. No	Topic	Ref.	No. of Lect.
1	**Number Systems and Arithmetic**	1/1	**10**
	Decimal Number System & Binary Number System		1
	Decimal to Binary conversion(Double-dabble method only)		1
	Binary to Decimal Conversion		1
	Binary Arithmetic : Binary addition, subtraction, multiplication & division		2
	Hexadecimal number system , Hexadecimal to binary, binary to Hexadecimal, Hexadecimal to decimal conversion		2
	Hexadecimal arithmetic: Addition, subtraction, multiplication & division		2
	Binary subtraction using 1' complement, 2's complement method		1
2	**Boolean Algebra and Logic Gates**	1/3	**7**
	Postulates of Boolean Algebra		1
	Theorems of Boolean Algebra: Complementation , commutative, AND, OR, Associative, Distributive, Absorption laws , De morgan's theorems		2
	Reducing Boolean expressions		1
	Logic Gates : AND, OR, NOT, Ex-OR, Ex-NOR		1

	NAND as Universal building block		1
	Logic diagrams of Boolean expressions Boolean expressions for logic diagrams		1
3	**Minimization Techniques**	1/5	**5**
	Introduction , Minterms and Maxterms		1
	K-Map, K-map for 2 variables		1
	K-map for 3 variables		1
	K-map for 4 variables		2
4	**Combinational and Arithmetic Logic Circuits**	1/6	**7**
	Half Adder & Full Adder		1
	Binary parallel Adder		1
	Half Subtractor, Full Subtractor		1
	Adder/Subtractor in 2's complement system		1
	BCD to Decimal decoder		1
	2 : 4 demultiplexer		1
	4 line to 1 line multiplexer		1
5	**Flip Flops**	1/7	**6**
	Introduction : RS FF		1
	Clocked RS FF, D FF		1
	Triggering, preset and clear		1
	JK FF , T FF , Race around condition		2
	Master slave FF		1
6	**Counters**	1/8	**7**
	Introduction : Asynchronous/ ripple counter		1
	Modulus Counter , MOD-12 counter		1
	Synchronous counter : Synchronous serial & synch parallel counter		2
	BCD counter		1
	Ring counter		1
	Johnson counter		1
7	**Shift Registers**	1/9	**3**

Introduction, Buffer register	1
Serial- in serial –out, Serial-in parallel-out	1
Parallel-in serial-out, parallel-in parallel-out	1

Core Reference:

1. Digital Electronics and Micro-Computers – R. K. Gaur, Dhanpat Rai
   Publication

Additional Reference:

1. Digital Electronics and Logic Design – N. G. Palan, Technova
Publication

SUBJECT: Comp. Sci. (opt.)   Semester: I   Hours/week: 3

Code   : CSO3

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.

Digital Electronics Lab

Objective: *To provide hands-on practice of the basic knowledge in digital logic and   circuits and to provide hands-on practice in some commonly used combinational and sequential circuits*

Instruction: The Laboratory work will have to be performed during the semester consisting of any of the 8 experiments from the given list below:

List of Experiments:

1. Study and Testing of measuring instruments: Digital and Analog multimeters, CROs and Signal Generators – measurement of AC & DC voltages, measurement of frequency.

2. Study of Components: Identification and testing of resistors, capacitors, inductors, diodes, LEDs & transistors

3. Study of Logic Gates: Study of truth table of basic gates, realization of Boolean functions

4. Study of Half adder and Full Adder

5. Study of Half Subtractor and Full Subtractor

6. Study of Implementation of a 3:8 decoder,

7. Study of 4-line to 16 bit decoder

8. Study of BCD to 7-segment decoder

9. Study of Generating a Boolean expression with a multiplexer

10. Study of Clocked JK Flip Flop

11. Study of 4-bit ripple counter

12. Study of Parallel-in, serial-out, 4-bit shift register

Operating Systems

Objectives: To introduce students the basic functioning *of operating systems as resource manager and its Salient features. Also to study about process states, scheduling, Memory and I/O Management techniques.*

Sr. No	Topic	Ref	No. of Lect.
I	**Introduction to Software:**		2
	• **Software:** Definition, classification and components of software, operating system as the main component of system software;		2
II	**Operating System Fundamental**	2/1	7
	• **Operating Systems**: OS as a resource manager, Structure of OS, OS functions, Characteristics of modern OS.		2
	• **Types of O.S.:** Early systems, simple batch systems, multi-programmed batch systems, Time sharing system, Personal Computer systems, Parallel systems, Distributed systems, Real time systems		3
	• **OS Structures:** Components of OS: Process management, Memory management, Storage management, File management, I/O management.		2
III	**Process Management**	1/2	18
	• **Concept of Process**: Process State, Operation on Processes, thread.		3
	• **CPU Scheduling**: Types of Schedulers, Criteria for scheduling, Scheduling Algorithms.		5
	• **Process Synchronization:** Need for synchronization, Critical Section, Hardware Synchronization, Semaphores, Monitors, Problem of synchronization.		5
	• **Deadlocks:** Concept of Deadlock, Deadlock Modeling, Methods		5

for Handling Deadlock

IV	Storage Management	1/3	12

- **Memory Management**: Address Binding, Logical vs. Physical Address space, Memory Allocation, Paging, Segmentation, Segmentation and paging of Intel Pentium.   4

- **Virtual Memory:** Demand Paging, Page replacement Algorithms (FIFO, Optimal, LRU), Virtual Memory in windows Xp.   4

- **File System Interface**: Files, File Access, Directory Structure, Protection   2

- Implementation of File System: Allocation Methods, Free space Management   2

V	I/O System	1/4	6

- I/O System Components : I/O Devices , I/O Hardware , Application I/O interface   3

- Secondary Storage Structure : Disk fundamental, Disk Scheduling , Disk Management   3

Core References:

1. "Operating System", By S. R. Sathe & Anil S. Mokhade , MacMillan Publication.

2. "Operating System", By Stuart E. Madnick, John J. Donovan.

Additional References:

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

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	2/4, 2/3, 1/1	3

function: *scanf & printf*, Escape sequence

characters.

- Library functions: General used &

  Mathematical.

5.	**Control and Iterative Statements :**	2/5, /6, 1/3, 1/4	12

- 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

6.	**Arrays:**	2/7, 2/8, 1/8, 3	9

- Introduction, Declaration and initialization

  Accessing array elements, Memory

  representation of array.

- One dimension and multidimensional arrays,

  character array, Introduction to string

7.	**Functions**	2/9, 1/5, 3	6

- 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 McGraw hill]

3. Programming in C   : Goterfried   [Shaums' Series]

Additional References:

1.   Spirit of "C"   : Moolish Kooper.

Operating System

Assignments: Write the Program using C (if applicable):

Operating System:

1. Study of DOS Commands.
2. Study of Unix/Linux Commands.
3. Write a program to implement the FCFS Scheduling Algorithm.
4. Write a program to implement the SJF Scheduling Algorithm.
5. Write a program to implement the Priority Scheduling Algorithm.
6. Write a program to implement the Round Robin Scheduling Algorithm.

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

PATTERN OF QUESTION PAPERS

Note : 1) All questions carry equal marks.

2) All questions are compulsory.

Q. No.	Format	Marks
1.	Multiple Choice/Fill in the blank/Match the pair/ one line answer. 1) 2) . . 10)	1 x 10 = 10
2.	a) b) OR a)	5 * 2 =10 10
3.	a) b) OR a)	5 * 2 =10 10
4.	a) b) OR a)	5 * 2 =10 10
5.	Write Short Notes On: (Any Two) a) b) c)	5 * 2 =10
	Total	**50**

* Not More than 3 bits should be asked in each question of 10 Marks.

(Only for Paper Setter)