S-30th May, 2015 AC after Circulars from Circular No.1 & onwards+++ - 93 -

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY

CIRCULAR NO.SU/Sci./Syllabi/Model Coll.Sem.-I & II/86/2016

It is hereby inform to all concerned that, on the recommendation of the Committee, the Hon'ble Vice-Chancellor has accepted the **"Syllabi of B.Sc. Honors degree courses in [1] Biotechnology, [2] Bio-Chemistry & [3] Computer Science Ist & IInd Semester under Credit Based System"** on behalf of the Academic Council under Section-14[7] of the Maharashtra Universities Act, 1994 run **at Model College, Ghansawangi, Dist-Jalna**.

The admission criteria for the courses as per U.G.C. norms.

This is effective from the Academic Year 2015-16 & onwards as appended herewith.

All concerned are requested to note the contents of the circular and bring notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
REF.NO.SU/SCI./MODEL COLL./
2016/15975-84
Date:- 16-02-2016.

******

Director,
Board of College and
University Development.

Copy forwarded with compliments to:-

1] The Principal, Model College, Ghansawangi, Dist-Jalna.

Copy to :-

1] The Controller of Examinations,
2] The In-Charge, E-Suvidha Kendra, [Professional Unit], Rajarshi Shahu Maharaj Pariksha Bhavan, Dr. Babasaheb Ambedkar Marathwada University,
3] The Section Officer, [B.C.S. Unit],
4] The Programmer [Computer Unit-1] Examinations,
5] The Programmer [Computer Unit-2] Examinations,
6] The Record Keeper.

-=**=-

S*/-150216/-

NAAC 'A' Accreditation

Dr.Babasaheb Ambedkar Marathwada University

Aurangabad-431004

Affiliated

Model College, Ghansavangi,

Jalna

Syllabus of

B. Sc. (Honors) Degree Course (Computer Science)

(Effective from 2015-16 and onwards)

Dr. Babasaheb Ambedkar Marathwada University.

A Candidate shall be admitted to the I year of the **B.Sc. (Computer Science)** degree course only if he/she satisfies the following condition:

1. He/ She must have passed the higher secondary (multipurpose) examination conducted by H.S.C. board Government of Maharashtra with science / technical subjects Or an Examination of any statutory University and Board recognized as equivalent thereto.

OR

He/She must have passed examination prescribed at the end of second year of the junior college conducted by the H.S.C. board, Government of Maharashtra with English, Second language, Physics, Chemistry, Mathematics and or Biology or one of the technical subjects prescribed at the said examination as the optional or elective subjects or an examination recognized as equivalent thereto.

2. He/ She must have passed at qualifying examination.

A candidate who has passed the B.Sc.(Computer Science) examination of this university may be allowed to present himself subsequently at the degree examination in a subject or subjects other than those he has taken earlier provided that he puts in three years of attendance as a regular candidate for First, Second and Third year in the subject or subjects concerned excluding compulsory English, Second Language and remaining optional subject(s).

A candidate shall not be allowed to appear for such examination if he has passed the higher examination.

PATTERN OF QUESTION PAPERS

A) Internal Class Test :

- A class tests is to be conducted after completion of 15-20 Lecturers.

B) THEORY :-

- Each theory paper will carry Maximum 30 marks; duration of examination of theory paper will be 2 hours.

C) PRACTICALS: - Total marks 50 marks

- Each Practical paper will carry Maximum 50 marks, duration of examination of each practical paper will be 1.5 hours.
- Internal Distribution of marks for each practical paper will be as follows.
  - Journal/ Record book (certified) 10 marks.
  - Oral/ viva 10 marks.
  - Practical Test 30 marks.

D) PROJECT:-

- Students of semester VI will have to perform ONE project of 150 marks. (A group of maximum 3 candidates will allow working on one project work)
- Internal Distribution of project marks will as follows.
  - Review 1 Report : 25
  - Review 2 Report : 25
  - Project work (certified) 25 marks.
  - Project work Presentation. 50marks.
  - Viva/ Oral. 25 marks.

Model College, Ghansawangi, Dr.Babasaheb Ambedkar Marathwada University, Aurangabad.

Curriculum Structure and Scheme of Evaluation: B.Sc(C.S.)

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	Class Tests + Tutorial	Univ. Th. Exam.	Uni. Pract. Exam.	Uni.Exam Duration (in hrs.)	Total Marks
I Semester											
1	CSC-E101	English-I	4	-	4	4	40	60	-	3	100
2	CSC-IL102	Second Language	4	-	4	4	40	60	-	3	100
3	Core-A CSC103T(A)	Fundamentals of computer	5	-	5	5	10+10 (20)	30	-	2	50
4	Core-B CSC103T(B)	Basic Operating System	5	-	5	5	10+10 (20)	30	-	2	50
5	Supportive CSC104T	Introduction to Data Structure	3	-	3	2	10+10 (20)	30	-	2	50
8	Supportive CSC104P	Lab: Data Structure & O.S.	-	2	2	2	-		50	2	50
6	Applied CSC105T	Basic Programming in C	3	-	3	2	10+10 (20)	30	-	2	50
7	Applied CSC105P	Lab: Programming in C	-	2	2	2	-		50	2	50
8	CSC106	Life Skill Curriculum (Job Oriented Soft Skill)	2	-	2	2	10+10 (20)	30	-	2	50
9	CSC107	Life Skill Curriculum (Value Oriented Courses)	2	-	2	2	10+10 (20)	30	-	2	50

Model College, Ghansawangi, Dr.Babasaheb Ambedkar Marathwada University, Aurangabad.

Curriculum Structure and Scheme of Evaluation: B.Sc.(C.S.)

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	Class Tests + Tutorial	Univ. Th. Exam.	Uni. Pract. Exam.	Uni.Exam Duration (in hrs.)	Total Marks
II Semester											
1	CSC-E201	English-II	4	-	4	4	40	60	-	3	100
2	CSC-IL202	Second Language	4	-	4	4	40	60	-	3	100
3	Core-A CSC203T(A)	Computer System Architecture	5	-	5	5	10+10 (20)	30	-	2	50
4	Core-B CSC203T(B)	Advance Operating System	5	-	5	5	10+10 (20)	30	-	2	50
5	Supportive CSC204T	Advance Data Structure and algorithm	3	-	3	2	10+10 (20)	30	-	2	50
8	Supportive CSC204P	Lab: Advance Data Structure and algorithm & O.S.	-	2	2	2	-		50	2	50
6	Applied CSC205T	Advance Programming in C	3	-	3	2	10+10 (20)	30	-	2	50
7	Applied CSC205P	Lab: Advance Programming in C	-	2	2	2	-		50	2	50
8	CSC206	Life Skill Curriculum (Job Oriented Soft Skill)	2	-	2	2	10+10 (20)	30	-	2	50

9	**CSC207**	**Life Skill Curriculum (Value Oriented Courses)**	**2**	**-**	**2**	**2**	**10+10 (20)**	**30**	**-**	**2**	**50**

B.Sc. (Computer Science)
Semester I

Course: B.Sc.(C.S.) – I Sem. (Core –A)			Paper Code: CSC103T(A)
Fundamentals of Computer			
Objective: To impart basic introduction to computer hardware, components, computer number system, how the CPU works, fundamental about algorithms and flowchart as well as different type of software.			
Sr. No	**Topic**	**Ref**	**No. of Lect.**
Unit-I			
	Fundamentals of Computer System Introduction, Characteristics & features of Computers, Components of Computers, Organization of Computer.	*1*	**15**
	Computer Generation & Classification Generation of Computers : First to Fifth, Classification of Computers, Distributed & Parallel Computers	*2*	
Unit-II			
	Computer Memory Memory Cell & Organization, Types of Memory (Primary And Secondary)	*2*	
	I/O Devices Input Devices, Output Devices	*1*	
Unit-III			
	Algorithm and Flowcharts Algorithm: Definition, Characteristics, Advantages and disadvantages,Examples Flowchart: Definition, Define symbols of flowchart, Advantages and disadvantages,Examples	*2*	**10**
Unit-IV			
	Number Systems and Arithmetic Decimal Number System & Binary Number System, Decimal to Binary conversion, Binary to Decimal Conversion,. Binary Arithmetic : Binary addition, subtraction, Multiplication & division Hexadecimal number system , Hexadecimal to binary,Binary to Hexadecimal, Hexadecimal to decimal conversion Binary subtraction using 1' complement, 2'scomplement method.	*4*	**10**
Unit-V			
	Software Types of software, Application software System, Software, Application and example of software	*1*	**5**
	Practical based on Office Suite GUI Operating System, Web Browser, Word Processing Tool, Spreadsheet Basics, Presentation Tool	*1*	**5**

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

Additional Reference:

1. Computer Today By Suresh K. Basandra, Galgotia Publication,Updated Edition
2. Computer Fundamental By B.Ram, BPB Publication.
3. Digital Electronics and Logic Design – N.G.Palan, Technova Publication

Course: B.Sc.(C.S.) – I Sem (Core –B)			Paper Code: CSC103T(B)
Basic Operating System			
Objective: 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.**
Unit-I			
	Introduction to Software Software: Definition, classification of software, operating system as the main component of system software	*1*	**5**
Unit-II			
	Operating System Fundamental Operating Systems: OS as a resource manager, Structure of OS, Evolution of OS, OS functions, Characteristics of modern OS, Types of O.S.: Early systems, simple batch systems, multiprogrammed batch systems, Time sharing system, Personal Computer systems, Parallel systems, Distributed systems, Real time systems.	*2*	**10**
Unit-III			
	DOS Operating System Introduction of DOS Operating System, Structure of DOS operating System, Working of DOS operating system, Internal and External Command of DOS, Advantages and Limitation of DOS operating System	*3*	**5**
Unit-IV			
	Windows Operating System Introduction of Windows Operating System, Structure of Windows operating System, Graphical user based windows operating system, Advantages and limitation of windows operating system	*2*	**10**
Unit-V			
	I/O Management I/O System Components : I/O Devices , I/O, Hardware , Application I/O interface, Secondary Storage Structure : Disk fundamental, Disk Scheduling , Disk Management	*2*	**5**

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 Reference

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

Course: B.Sc.(C.S.) – I Sem.	Supportive	Paper Code: CSC104T

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.
Unit-I			
	Introduction to Data Structure Introduction, Basic Terminology : Data item, Fields, Records, Files, Entity, Attributes, Data Organization and Data Structure	*1*	**10**
Unit-II			
	Arrays Representation of Linear Arrays, Traversing, Insertion and Deletions, Sorting & Searching Algorithms, Multidimensional Arrays : 2D & M-D Concept, Record: Record Structures, Representation in Memory	*1*	**10**
Unit-III			
	Stack Concept of stack, Representation of stack in memory, Traversing a stack, Searching a stack : sorted and unsorted, Insertion & Deletion in stack.	*2*	**10**
Unit-IV			
	Queues Concept of queues, Representation of queue in memory, Traversing a queue, Searching a queue : sorted and unsorted,Insertion & Deletion in queue, Types of Queues : Deques & Priority Queues. Arithmetic Expression POLISH & POSTFIX, Application of stacks: Quicksort, Recursion. Queue: Representation of queues & link	*2*	**10**
Unit-V			
	Searching and Sorting Introduction, searching, binary search tree, Sorting, Insertion sort, Selection sort, Merging, Merge-Sort, Radix Sort.	*1*	**5**

Core References:

1. Data Structures : By Seymour Lipschutz, Tata Mcgraw- Hill Publication.
2. Yedidyan Langsam, Moshe J. Augenstein, and Aaron M. Tenenbaum, "Data Structures Using C",Pearson Education., New Delhi
3. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", AddisonWesley, (AnImprint of Pearson Education), Mexico City

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).

Course: B.Sc.(C.S.) – I Sem. Supportive			Paper Code: CSC105P
Lab:Data Structure & Operating System			
Objective: student understands the practical application of data structure and operating system.			
Sr. No	**Topic**	**Ref**	**No. of Practical**
Data Structure			
1	**List of Program**		**5**
	• Write a program using DIV(J,K) which reads a positive integer • N>10 and determines whether or not N is a prime number. • Write a program which counts the number of particular • character/word in the String. • Write a program which reads words WORD1 and WORD2 and then • replaces each occurrence of word1 in text by word2 • Write the programs for traversing of n item using the array. • Write the programs for insertion and deletion of n item using the array. • Implement Linear and binary search algorithm using C. • Implement Bubble sort using C. • Write the programs for push and pop operation using the stacks. • Write the programs for insertion and deletion of n item from the queues.		
2 Operating System			
	List of Practical		
	• Study the DOS Command • Case study on Unix Operating System • Write a program to implement the FCFS Scheduling Algoithms. • Write a program to implement the SJF Scheduling Algoithms. • Write a program to implement the Priority Scheduling Algoithms. • Write a program to implement the Round Robin Scheduling • Algoithms.Program for factorial.		

Course: B.Sc.(C.S.) – I Sem.	Applied	Paper Code: CSC106T

Basic Programming in C

Objective: To expose students to algorithmic thinking and problem solving and impart moderate skills in programming using C Language in an 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.
Unit-I			
	Introduction An Overview of C , History of Programing language type, C as a Structured Language, Features of C.	*1/2*	**5**
	Data Types Data Types: int, char, float, double. Declaration & Initialization, Example.	*1/2*	**5**
Unit-II			
	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.	*1*	**10**
Unit-III			
	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.	*1*	**10**
Unit-IV			
	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**
Unit-V			
	Arrays Introduction, Declaration and initialization Accessing array elements, Memory representation of array. One dimension and multidimensional arrays, character array, Introduction to string.	*1*	**10**

Core Reference:

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

Additional References:

1. Spirit of “C” : Moolish Kooper.

Course: B.Sc.(C.S.) – I Sem.	Applied		Paper Code: CSC106P
Lab: Programming in C			
Objective: student understands the practical and logical application of programming language. The use of C logical statement in real time example solving.			
Sr. No	**Topic**	**Ref**	**No. of Practical**
Unit-I			
1	**Installation of C Program**		**5**
	Download and installation of C programming software. Discussion on available c software and use of each individually.		
2	**Input Output program**		**5**
	Minimum 10 program on input and output statement, data type and constant..		
3	**List of Program**		**5**
	• Find Area, Perimeter of Triangle & Rectangle. • Find maximum amongst 3 numbers. • Program for nested loops. • Program to Calculate x^y • Program to check Prime Number, Program reverse of digit. • Program to find Armstrong Number. • Program to print the Fibonacci Series • Searching and element from array. • Transpose of matrices • Multiplication of matrices • Sorting array using the bubble sort technique • Program for factorial of number.		

Note: minimum five programs covering the each unit of the syllabus.

B.Sc. (Computer Science)
Semester II

Course: B.Sc.(C.S.) – II Sem. (Core-A)			Paper Code: CSC203T(A)
Computer System Architecture (CSA)			
Objective: To convey basic introduction of computer system architecture, the structure of computer, working gates and its functionality. 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.**
Unit-I			
	Number Systems and Arithmetic Decimal Number System & Binary Number System, Decimal to Binary conversion, Binary to Decimal Conversion. Binary Arithmetic : Binary addition, subtraction, multiplication & division, Hexadecimal number system , Hexadecimal to binary, binary to Hexadecimal, Hexadecimal to decimal conversion Hexadecimal arithmetic: Addition, subtraction, multiplication & division Binary subtraction using 1' complement, 2'scomplement method.	*1*	**10**
Unit-II			
	Boolean Algebra and Logic Gates Postulates of Boolean Algebra Theorems of Boolean Algebra: Complementation , commutative, AND, OR, Associative,Distributive,Absorption laws , DE Morgan's theorems, Reducing Boolean expressions Logic Gates : AND, OR, NOT, Ex-OR, Ex-NOR, NAND as Universal building block Logic diagrams of Boolean expressions Boolean expressions for logic diagrams	*1*	**10**
Unit-III			
	Minimization Techniques Introduction , Minterms and Maxterms, K-Map, K-Map for 2,3 and 4 variable	*1*	**5**
	Combinational and Arithmetic Logic Circuit Half Adder & Full Adder, Binary parallel Adder,Half Subtractor, Full Subtractor,Adder/Subtractor in 2's complement system,BCD to Decimal decoder 2 : 4 demultiplexer,4 line to 1 line multiplexer	*1*	**5**
Unit-IV			
	Flip Flops Introduction : RS FF,Clocked RS FF, D Flip Flops,Triggering, preset and clear,JK FF , T FF,Race around Condition	*1*	**10**
Unit-V			
	Counters Introduction : Asynchronous/ ripple counter Modulus Counter , MOD-12 counter, Synchronous counter : Synchronous serial & synch parallel counterbid counter, Ring counter.	*1*	**5**

Core Reference:

1. Digital Electronics and Micro-Computers – R.K.Gaur , Dhanpat Rai Publication
2. Digital fundamentals –Floyd & Jain –Pearson Education
3. Introduction to computers –Norton –McGraw Hill
4. Digital fundamentals –Floyd & Jain –Pearson Education

Additional Reference:

1. Digital Electronics and Logic Design – N.G.Palan , Technova Publication
2. Computer fundamentals –B.Ram –New Age International.

Course: B.Sc.(C.S.) – II Sem. Core-B			Paper Code: CSC203T(B)
Advance Operating System			
Objective: To introduce students the basic functioning of Advance operating systems as resource manager and its Salient features. Also to study about file system in real time operating system.			
Sr. No	**Topic**	**Ref**	**No. of Lect.**
Unit-I			
	Device Characteristics Input and Output devices, Storage devices, Device allocations, I/O scheduler, Introduction to Virtual Devices,	*2*	**10**
Unit-II			
	Device Management Introduction : Dedicated Devices, shared devices and virtual devices, Generalized strategies	*2*	**5**
Unit-III			
	Process Management Concept of Process: Process State, Operation on Processes, thread.CPU Scheduling: Types of Schedulers, Criteria for scheduling, Scheduling Algorithms. Process Synchronization: Need for synchronization, Critical Section, Hardware Synchronization, Semaphores, Monitors, Problem of synchronization. Deadlocks: Concept of Deadlock, Deadlock Modeling, Methods for Handling Deadlock	*2*	**10**
Unit-IV			
	Memory Management **Memory Management**: Address Binding, Logical Vs. Physical Address space, Memory Allocation, Paging, Segmentation, Segmentation and paging	*2*	**10**
Unit-V			
	Information Management Concept of File system, Symbolic file system, Access control verification, Logical and physical file system	*3*	**10**

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.

Course: B.Sc.(C.S.) – II Sem.	Supportive	Paper Code: CSC204T

Advance Data Structure and Algorithm

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 advance data structure and its real time application.

Sr. No	Topic	Ref	No. of Lect.
Unit-I			
	Linked List Concept of Linked List, Representation of linked List in memory, Traversing a linked list, Searching a linked list : sorted and unsorted, Insertion & Deletion in Linked List, Header Linked List & Two way List	1	**10**
Unit-II			
	Binary Trees: Representing Binary, Trees in Memory, Traversing Binary Trees, Traversal Algorithms using Stacks, Header Nodes; Threads, Binary Search Trees Searching and Inserting in Binary Search Trees, Deleting in Binary Search Tree	*1*	**10**
Unit-III			
	AVL Search Trees AVL Search Trees, Insertion in an AVL Search Tree,Deletion in an AVL Search Tree, *m*-way Search Trees, Searching, Insertion and Deletion in an *m*-way Search, B Trees, Searching, Insertion and Deletion in a Btree	*1*	**5**
Unit-IV			
	Graph Theory Terminology, Sequential Representation of Graphs;Adjacency matrix, Path Matrix, Warshall's Algorithm, Shortest Paths, Linked Representation of a Graph, Operations on Graphs, Traversing a Graph, Posets.	*1*	**10**
Unit-V			
	Searching & Sorting Introduction, Sorting, Insertion sort, Selection sort, Merging, Merge-Sort, Radix Sort, Searching and Data Modification, Hashing.	*2*	**10**

Core References:

1. Data Structures : By Seymour Lipschutz, Tata Mcgraw- Hill Publication.
2. Yedidyan Langsam, Moshe J. Augenstein, and Aaron M. Tenenbaum, "Data Structures Using C",Pearson Education., New Delhi
3. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", AddisonWesley, (AnImprint of Pearson Education), Mexico City.

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).

Course: B.Sc.(C.S.) – II Sem. Supportive			**Paper Code: CSC204P**
Lab: Data Structure & Advance Operating System			
Objective: student understands the practical application of data structure and operating system.			
Sr. No	**Topic**	**Ref**	**No. of Practical**
Data Structure			
1	**List of Program**		**5**
	• Write a program which prints the nodes of T in (a) preorder (b) inorder (c) postorder. • Write a program which prints the terminal nodes of T in (a) preorder (b) inorder (c) postorder. (note: all three lists should be the same). • Translate heapsort into a subprogram HEAPSORT (A, N) which sorts the array A with N elements. Test the program using 44,33,11,55,77,90,40,60,99,22,88,66 • Write a program which prints the list of employee records in alphabetical order (Hint: print the records in inorder) • Write a subprogram RANDOM (DATA, N, K) which assigns N random integers between 1 and K to the array DATA • Translate insertion sort into a subprogram INSERTSORT (A, N) which sorts the array A with N elements. Test the program using: (a) 44,33,11,55,77,90,40,60,99,22,88,66		
2 Advance Operating System			
	List of Practical		
	• Study the windows Command • Prepare the comparative report on windows and DOS operating system. .		

Course: B.Sc.(C.S.) – II Sem. Applied Paper Code: CSC205T

Advance Programming in C

Objective: Upon successful completion of this course, you will have demonstrated the following skills:

- An understanding of all the components of C, including the C Language, The C Preprocessor and the C Standard Library.
- An understanding of advanced practical issues, including memory management, complex declarations and expression evaluation.
- The ability to write C code and to create and manipulate linked lists.

Sr. No	Topic	Ref	No. of Lect.
Unit-I			
	Function What is function, why use function, passing values between functions, scope rule of functions, Advance features of function: function declaration and prototypes, call by value, and call by reference, back to function calls, macro verses function, Recursion, need of recursion, types of recursion.	*1/2*	**10**
Unit-II			
	Pointers Dynamic Storage Allocation – malloc, Functions Returning a Pointer, Initialization of Pointers, gets - a Function Returning a Pointer, An Array of Character Pointers,Two Dimensional Arrays vs. Array of Pointers, Command Line Arguments o Pointers to Pointers ,Practice with Pointers , Function Pointers		
Unit-III			
	Error & Exception handling Exception Handling, The NSException Class ,Generating Exception, Catching Exception, Throwing Exception, Error Handling, Error Domain, Capturing Error	*2*	**10**
Unit-IV			
	File Handling Introduction to file handling, read, write operation, example on file handing.	*2*	**10**
Unit-V			
	Graphics in C Graphics as of Now, Device Independent Drawing, Hello Windows, Drawing Shapes, Types of Pens, Types of Brushes, Code and Resources, Freehand Drawing, the Paintbrush Style Capturing the Mouse, Device Context, a Closer Look , Displaying a Bitmap	*2*	**10**

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.

Course: B.Sc.(C.S.) – II Sem.	**Applied**		**Paper Code: CSC20P**
Lab: Advance C Programing			
Objective: student understands the practical and logical application of programming language. The use of advance C concepts such has file handling, pointer and graphics for real time programming.			
Sr. No	**Topic**	**Ref**	**No. of Practical**
Unit-I			
1	**Error Handling**		**5**
	Any 10 program on each error handling concept.		
2	**Pointer**		**5**
	Minimum 10 program on pointer in c program		
3	**Graphics**		**5**
	10 programs on graphics function to draw the shape and animation.		

Note: minimum five programs covering the each unit of the syllabus.