DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY

CIRCULAR NO.ACAD/SU/Sci./B.Sc. & M.Sc. Syll./5/2015

It is hereby notified for information to all the concerned that, on the recommendation of the Faculty of Science the Academic Council at its meeting held on 30-05-2015 has accepted the **revised semester-wise syllabi as mentioned against their names in the Faculty of Science as under** :-

Sr. No.	Name of the Subject	Semester
[1]	B.Sc. Computer Science Degree Course	III & IV
[2]	B.Sc. Information Technology Degree Course	III & IV
[3]	B.C.A. Science Degree Course	III & IV
[4]	B.Sc. Animation Degree Course	III & IV
[5]	B.Sc. Bioinformatics Degree Course	III & IV
[6]	B.Sc. Computer Science [Optional]	III & IV
[7]	B.Sc. Information Technology [Optional]	III & IV
[8]	B.Sc. Computer Applications [Optional]	III & IV
[9]	B.Sc. Computer Maintenance [Optional]	III & IV
[10]	B.Sc. Environmental Science [Optional]	V & VI
[11]	B.Sc. Bio-Chemistry [Optional]	V & VI
[12]	B.Sc. Forensic Science Degree Course	V & VI
[13]	B.Sc. Industrial Chemistry [Optional]	V & VI
[14]	B.Sc. Electronics [Optional]	V & VI
[15]	B.Sc. Zoology [Optional]	V & VI
[16]	B.Sc. Microbiology [Optional]	V & VI
[17]	B.Sc. Instrumentation Practice [Optional]	V & VI
[18]	B.Sc. Statistics [Optional]	V & VI
[19]	B.A. Statistics [Optional]	V & VI
[20]	B.A. / B.Sc. Mathematics [Optional]	V & VI
[21]	B.Sc. Home Science Degree Course	V & VI
[22]	B.Sc. Textile Interior Decoration Degree Course	V & VI
[23]	B.Sc. Fishery Science [Optional]	V & VI
[24]	B.Sc. Dairy Science & Technology [Optional]	V & VI
[25]	B.Sc. Botany [Optional]	V & VI
[26]	B.Sc. Physics [Optional]	V & VI
[27]	M.Sc. Computer Science	III & IV
[28]	M.Sc. I.T.	III & IV

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 the notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
REF.NO.ACAD/SU/SCI./
2015/3761-4160
Date:- 16-06-2015.

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Director,
Board of College and University Development.

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Copy forwarded with compliments to:-

1] The Principals, affiliated concerned colleges,
Dr. Babasaheb Ambedkar Marathwada University

Copy to :-

1] The Controller of Examinations,
2] The Director, [E-Suvidha Kendra], in-front of Registrar's Quarter,
Dr. Babasaheb Ambedkar Marathwada University,
3] The Superintendent, [B.Sc. Unit],
4] The Superintendent, [M.Sc. Unit],
5] The Programmer [Computer Unit-1] Examinations,
6] The Programmer [Computer Unit-2] Examinations,
7] The Record Keeper.

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S*/-160615/-

NAAC Re-accredited with Grade 'A'

Dr. Babasaheb Ambedkar Marathwada University

Aurangabad-431004

SYLLABUS

B.Sc. (Computer Application) (Optional)

Second Year

(effective from 2015-16)

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

Curriculum Structure and Scheme of Evaluation: B.Sc. (Computer Application) (Optional)

Semester III									
1	CAO7	Advance C Programming	3		3	50	-	2	50
2	CAO8	Data Structure	3		3	50	-	2	50
3	CAO9	Advance C Programming	-	3	3	-	50	3	50
4	CAO10	Data Structure	-	3	3	-	50	3	50
Total of Semester – III			6	3	9	100	100		200
Semester IV									
1	CAO11	Programming in CPP	3		3	50	-	2	50
2	CAO12	DBMS Using SQL	3		3	50	-	2	50
3	CAO13	Programming in CPP	-	3	3	-	50	3	50
4	CAO14	DBMS Using SQL							
Total of Semester – IV			6	3	9	100	100		200

B.Sc. (Computer Application) (Optional)
Semester III

Paper No.: CAO7 **B.Sc.(Comp. App.) (Opt.) Semester: III**

Paper title: Advance C Programming

Unit –I		
	Functions Introduction, types of functions. Defining functions, Arguments, Function prototype, actual parameters and formal parameters, Calling function, Returning function results, Call by value, Recursion. **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	
Unit –II		
	Pointers: Introduction, Memory organization. Declaration and initialization of pointers. The pointer operator * and &, De-referencing, Pointer expression and pointer arithmetic, Pointer to pointer. **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() **Preprocessor Directives:** File inclusion and conditional compiler directives, Macro substitution, #define, #if, #ifdef, #else, #elif, #endif	
Unit –III		
	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. **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.	

Books:

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

Paper No.: CAO8 **B.Sc.(Comp. App.) (Opt.) Semester : III**
Paper title: Data Structure

Unit –I		
	Introduction to Data Structure: Introduction, Basic Terminology : Data item, Fields, Records, Files, Entity, Attributes Data Organization and Data Structure **Arrays** Representation of Linear Arrays, Traversing, Insertion and Deletions, Sorting & Searching Algorithms, Multidimensional Arrays : 2D & M-D Concept, Record: Record Structures, Representation in Memory	
Unit –II		
	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.	
Unit –III		
	Stacks, Queues , Recursion Stack: Operation , Array Representation of Stack, linked representation of stack, Arithmetic Expression, POLISH & POSTFIX, Application of stacks: Quicksort, Recursion. Queue: Representation of queues & link, Types of Queues : Deques & Priority Queues	

Books:

1) Data Structures : By Seymour Lipschutz, Tata Mcgraw- Hill Publication.
2) Fundamentals of Data structures, by Horowitz and Sahani (Galgotia Publicaztions).
3) An introduction to data structures and application, by Jean Paul Tremblay & P al G. Sorenson (McGraw Hill).
4) Data Structures, by Tannenbaum, (PHI).

Course: B.Sc.(Comp. App.) **Semester : III**
Paper title: Practical Based on Adv. C Programming **Paper No.: CAO9**

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.

Course: B.Sc.(Comp. App.) **Semester : III**
Paper title: Practical Based on Data Structure **Paper No.: CAO10**

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

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.

B.Sc. (Computer Application) (Optional)
Semester IV

Paper No.: CAO11 **B.Sc.(Comp. App.) (Opt.) Semester : IV**
Paper title: Programming in C++

Unit –I

Introduction of OOPs

Procedural Vs Object Oriented Programming, Basic concepts of Object Oriented Programming, Class, Object, Data Abstraction, Encapsulation, Inheritance, Polymorphism, Dynamic Binding, Message Passing. Benefits and applications of OOP, History and overview of C++, C++ program structure. Reference variables, Scope resolution operator, Member de-referencing operators, new and delete, cin and cout, The endl and setw manipulator.

Functions in C++:

Function prototype, Call by reference (using reference variable), Return by reference, Inline function, Default arguments, Const arguments.

Unit –II

Function overloading:

Different numbers and different kinds of arguments

Objects and Classes:

Specifying a class, private and public, Defining member functions, Nesting of member function, Object as data types, Memory allocation for objects, static data members and member functions. Array of objects, Objects as function argument, returning objects, Friend function and its characteristics.

Unit –III

Constructors and Destructors:

Introduction, default and parameterized constructors, Multiple constructors in a class, Copy Constructor, Destructors

Operator Overloading:

Overloading unary operators, Rules for operator overloading, Overloading without friend function and using friend function, Overloading binary operators such as arithmetic and relational operators, Concatenating

Strings, Comparison operators.

Books:

1. Object Oriented Programming with C++ E. Balagurusamy, Tata McGraw-Hill Publishing
2. Object Oriented Programming In C + + Robert Lafore, Galgotia
3. Let us C++ YeshwantKanetkar; bpb publication

Paper No.: CAO12 **B.Sc.(Comp. App.) (Opt.) Semester : IV**
Paper title: DBMS Using SQL

Unit –I

Basic Concept

Data Definition, Types of Data, Record and File, File based System & Processing Database System Application, Purpose of Database System Abstraction & Data Integration Three level Architecture proposal for a DBMS. Component of a DBMS: Users, Facilities &Structure. Advantageous & Disadvantageous of DBMS.

Data Modeling & Design

Data Association – Entities , Attributes & Association, Relationship among Entities, Representation of Association & Relationships

Data Model: Importance of Data Model, Types of Data Model: Relational, E-R, Semi-structured, Object-Oriented, Network & Hierarchical Data Model. Advantageous & Disadvantageous of above model.

Unit –II

Entity-Relationship Data Model

Entity , Entity Set, Types of Entities, Strong & Weak Entity, Representation Attribute, Types of Attributes , Representation Relationship : Binary & Ternary , Representation Mapping Cardinality, Entity-Relationship Design Issues

Relational Data Model

Basic Structure of Relational Data Model, Database Schema Constraints : Integrity Rule 1 & 2

Normal Form: Anomalies, Functional Dependency, Dependency Diagram, First Normal Form, Second Normal Form, Third Normal Form, Conversion from Universal to 1 NF, 1NF to 2 NF and 2NF to 3NF.

Unit –III

Relational Algebra

Basic Operation – Union , Intersection, Difference and Cartesian Product Advance Operation- Projection, Selection, Join (Inner and Outer) & Division Examples based on above Operation. Relation Algebraic Queries.

Introduction to Oracle

Oracle Software : Versions of Oracles, Products of Oracle, Tools of Oracle

SQL: Logging to SQL/ iSQL, SQL plus worksheet.

Books:

1) Database System Concepts (Sixth Edition) AviSilberschatz, Henry F. Korth,S. Sudarshan
2) An Introduction to Database Systems byBipin C. Desai
3) Easy Oracle SQL: Get Started Fast Writing SQL Reports with SQL*Plus By John Garmany.
4) Mastering Oracle SQL By Sanjay Mishra, Alan Beaulieu

Course: B.Sc.(Comp. App.) **Semester : IV**
Paper title: Practical Based on Programming in C++ **Paper No.: CAO13**

Minimum 12 Practicals to be performed as per the guidelines of teaching Faculty depending upon all theory units of concerned subject.

Course: B.Sc.(Comp. App.) (Opt.) **Semester : IV**
Paper title: Practical Based on Database Management System **Paper No.: CS O14**

1) Design five schemas for any organization like: College, school, hospital, travel agency, company, bank etc.
2) Normalize the above five selected schemas as per 1NF,2NF and 3NF
3) Draw E-R Diagram for the same.
4) Solve at least ten Relational Algebraic Queries