



CIRCULAR NO.SU/B.Sc./CBC&GS /69/2023

It is hereby inform to all concerned that, the syllabi prepared by the Board of Studies, Ad-hoc Boards and recommended by the Dean, Faculty of Science & Technology, the Hon'ble Vice-Chancellor has accepted the **following syllabi of Bachelor of Science with Practical Pattern of Question Paper under the scheme of Choice Based Credit & Grading System** in his emergency powers under section 12(7) of the Maharashtra Public Universities Act, 2016 on behalf of the Academic Council as appended herewith.

Sr.No.	Courses	Semester
1.	B.Sc. Biotechnology (Optional)	IIIrd & IVth semester
2.	B.Sc. Microbiology (Optional)	IIIrd & IVth semester
3.	B.Sc. Information Technology (Optional)	IIIrd & IVth semester
4.	Bachelor of Computer Application (Optional)	IIIrd & IVth semester
5.	B.Sc.Polymer Chemistry (Optional)	IIIrd & IVth semester
6.	B.Sc.Computer Science (Degree)	IIIrd & IVth semester
7.	Honors Degree of Computer Science	IIIrd & IVth semester
8.	Honors Degree of Biotechnology	IIIrd & IVth semester

This is effective from the Academic Year 2023-24 and onwards.

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

University Campus,
Aurangabad-431 004.

REF.NO.SU/2023/ 1241-49

Date:- 12.06.2023.

★
★
★
★

*Deputy Registrar,
Academic Section*

Copy forwarded with compliments to :-

- 1] **The Principal of all concerned Colleges,**
Dr. Babasaheb Ambedkar Marathwada University,
- 2] **The Director, University Network & Information Centre, UNIC, with a request to upload this Circular on University Website.**

Copy to :-

- 1] **The Director, Board of Examinations & Evaluation, Dr.BAMU,A'bad.**
- 2] The Section Officer,[B.Sc.Unit] Examination Branch,Dr.BAMU,A'bad.
- 3] The Programmer [Computer Unit-1] Examinations, Dr.BAMU,A'bad.
- 4] The Programmer [Computer Unit-2] Examinations, Dr.BAMU,A'bad.
- 5] The In-charge,[E-Suvidha Kendra], Rajarshi Shahu Maharaj Pariksha Bhavan, Dr.BAMU,A'bad.
- 6] The Public Relation Officer, Dr.BAMU,A'bad.
- 7] The Record Keeper, Dr.BAMU,A'bad.

Dr. Babasaheb Ambedkar Marathwada University
Aurangabad- 431004(MS) India.



Undergraduate Bachelor Degree Program
In Science (B.Sc.)
Computer Applications (Optional Subject)

Course Structure and Curriculum
(Outcome based Curriculum)
Choice Based Credit System
(Effective from Academic Year 2022-23)

Second Year (III and IV Semester)


Dean
Faculty of Science & Technology
Dr. Babasaheb Ambedkar Marathwada
University, Aurangabad

Dr. Babasaheb Ambedkar Marathwada University
Aurangabad – 431004 (MS) India

1. Eligibility:

- He/ She must have passed the higher secondary (multipurpose) examination conducted by H.S.C. board Government of Maharashtra with science / 0technical 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.
- 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.

2. Duration

The undergraduate program in Computer Science is offered through the courses designed for granting the following B.Sc. degrees. All the courses are of 3-year duration spread over six semesters.

3. Medium of Instructions

The medium of instruction for this course is English.

4. Attendance:

This course is the practical course so, student should need minimum 40 % attendance for appearing the examination.

5. Program Educational Objectives:

Program Educational Objectives (PEOs) are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve. These objectives describe the expected accomplishments of our graduates during the several years following graduation.

Objective 1: Our graduates will apply their knowledge and skills to succeed in their careers and/or obtain advanced degrees.

Objective 2: Our graduates will behave ethically and responsibly, and will remain informed and involved as full participants in their profession and society.

Objective 3: Our graduates will creatively solve problems, communicate

6. Program Outcomes (POs) and Program Specific Outcomes:

Program Outcomes (POs)

S.No.	Program Outcomes (POs)
1	Engineering knowledge: Apply the knowledge of algorithm, data structure and programming to the solution of real time problems.
2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
5	Project management: Demonstrate knowledge and understanding of the science principles and apply these for real time applications.

Program Specific Outcomes (PSOs)

S.No	Program Specific Outcomes (PSOs)
1	Model computational problems by applying mathematical concepts and design solutions using suitable data structures and algorithmic techniques
2	Design and develop solutions by following standard software engineering principles and implement by using suitable programming languages and platforms
3	Develop system solutions involving both hardware and software modules

Structure and Curriculum for
Bachelor of Science (B. Sc.) Computer Application
(Optional Subject)
(Choice Based Credit System)

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

Choice Based Credit System (CBCS) Curriculum

For

Faculty of Science and Technology

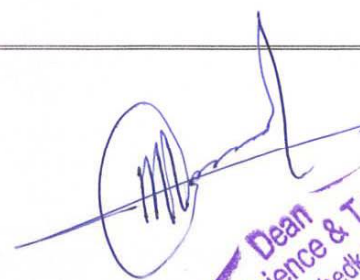
Course Structure and Scheme of Examination

B.Sc. Three Year Undergraduate Degree Program

Semester I

	Course Code	Course Title	Teaching time/week	Credits	Scheme of Examination			
					Max Marks	CIA	UA	Min Marks
Optional I (DSC-1A) Core Courses	CA-111	Fundamentals of Computer	2 hours	2	50	10	40	20
	CA-112	Operating System	2 hours	2	50	10	40	20
	CA-121	Lab course I (based on CA-111 and CA-112)	3 hours	1.5	50	10	40	20
Ability Enhancement compulsory courses (AECC-I)	CA-131	Communication skills in English-I	3 hours	3	50	10	40	20
	CA-132	Marathi/Hindi/Urdu/Sanskrit A student can opt for any one of these languages (SL-I)	3 hours	3	50	10	40	20
Non-Credit Course	CA-113	Constitution of India	2 hours					
			15	11.5	250	50	200	100

Total Credits for Semester I : 11.5 (Theory : 10 ; Laboratory : 1.5)


Dean
Faculty of Science & Technology
Dr. Babasaheb Ambedkar Marathwada University, Aurangabad



Bachelor of Science (B. Sc.) Computer Application (Optional Subject)

(Choice Based Credit System)

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

Choice Based Credit System (CBCS) Curriculum

For

Faculty of Science and Technology

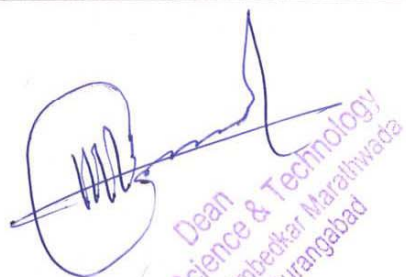
Course Structure and Scheme of Examination

B.Sc. Three Year Undergraduate Degree Program

Semester II

	Course Code	Course Title	Teaching time/week	Credits	Scheme of Examination			
					Max Marks	CIA	UA	Min Marks
Optional I (DSC-1B) Core Courses	CA-211	Digital Electronic	2 hours	2	50	10	40	20
	CA-212	C Programing- I	2 hours	2	50	10	40	20
	CA-221	Lab course 2 (based on CA-211 and CA-212)	3 hours	1.5	50	10	40	20
Ability Enhancement compulsory courses (AECC-2)	CA-231	Communication skills in English-II	3 hours	3	50	10	40	20
	CA-232	Marathi/Hindi/Urdu/Sanskrit A student can opt for any one of these languages (SL-II)	3 hours	3	50	10	40	20
Non-Credit Course								
			17	11.5	250	50	200	100

Total Credits for Semester II : 11.5 (Theory : 10 ; Laboratory : 1.5)


Dean
Faculty of Science & Technology
Dr. Babasaheb Ambedkar Marathwada University, Aurangabad



Bachelor of Science (B. Sc.) Computer Application (Optional Subject)

(Choice Based Credit System)

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

Choice Based Credit System (CBCS) Curriculum

For

Faculty of Science and Technology

Course Structure and Scheme of Examination

B.Sc. Three Year Undergraduate Degree Program

Semester III

	Course Code	Course Title	Teaching time/week	Credits	Scheme of Examination			
					Max Marks	CIA	UA	Min Marks
Optional I (DSC-1D) Core Courses	CA -311	Data Structure	2 hours	2	50	10	40	20
	CA -312	Advance C Programming	2 hours	2	50	10	40	20
	CA -321	Lab course 3 (based on CA -311)	3 hours	1.5	50	10	40	20
	CA -322	Lab course 4 (based on CA -312 -)	3 hours	1.5	50	10	40	20
Skill Enhancement course (SEC-2)	(Select any one from CA 313(A) and CA 313(B)		2 hours	2	50	10	40	20
	CA -313(A)	Office Automation Tool						
	CA 313(B)	HTML Programming						
Ability Enhancement compulsory courses (AECC-4)	CA -331	Communication skills in English-III	3 hours	3	50	10	40	20
	CA -332	Marathi/Hindi/Urdu/Sanskrit A student can opt for any one of these languages (SL-III)	3 hours	3	50	10	40	20
Non-Credit Course	Non-Credit Course							

Total Credits for Semester III : 15 (Theory : 12 ; Laboratory : 3)

Bohat

Bachelor of Science (B. Sc.) Computer Application (Optional Subject)

(Choice Based Credit System)

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

Choice Based Credit System (CBCS) Curriculum

For

Faculty of Science and Technology

Course Structure and Scheme of Examination

B.Sc. Three Year Undergraduate Degree Program

Semester IV

	Course Code	Course Title	Teaching time/week	Credits	Scheme of Examination			
					Max Marks	CIA	UA	Min Marks
Optional I (DSC-1D) Core Courses	CA -411	DBMS	2 hours	2	50	10	40	20
	CA -412	Object Oriented Programming using C++	2 hours	2	50	10	40	20
	CA -421	Lab course 4 (based on CA -411)	3 hours	1.5	50	10	40	20
	CA -422	Lab course 5 (based on CA -412)	3 hours	1.5	50	10	40	20
Skill Enhancement course (SEC-2)	CA -413	Select any one from CMP413(A) and CMP413(B) CA 413(A): E-Commerce and Applications CA 413(B):- PHP Programing	2 hours	2	50	10	40	20
Ability Enhancement compulsory courses (AECC-4)	CA-431	Communication skills in English- IV	3 hours	3	50	10	40	20
	CA-432	Marathi/Hindi/Urdu/Sanskrit A student can opt for any one of these languages (SL-IV)	3 hours	3	50	10	40	20
Non-Credit Course	CA-423	Environment Science	2 hours					
			20	15	350	70	280	140

Total Credits for Semester IV : 15 (Theory : 12 ; Laboratory : 3)

Bhart

Curriculum for Semester III

Course Code: **CA-311**

Course Title: **Data Structure**

Total Credits: 02

Contact Hours: 30 (Clock Hours)

Marks: 50

Periods: 45 (45 minutes each)

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.

UNIT-1: Introduction (10 period)

Data and Information, Data Structure, Classification of Data Structures, Primitive Data Types, Abstract Data Types, Data structure vs. File Organization, Operations on Data Structure, Algorithm, Importance of Algorithm Analysis, Complexity of an Algorithm

Array: Introduction, One Dimensional Array, Memory Representation of One Dimensional Array, Traversing, Insertion, Deletion, Searching, Sorting, Merging of Arrays, Multidimensional Arrays

UNIT-2: Stack: (10 period)

Introduction, Operations on the Stack Memory Representation of Stack, Array Representation of Stack, Applications of Stack, Evaluation of Arithmetic Expression, Matching Parenthesis, infix and postfix operations, Recursion

UNIT-3: Queue: (10 period)

: Introduction, Queue, Operations on the Queue, Memory Representation of Queue, Array representation of queue, Linked List Representation of Queue, Circular Queue, Some special kinds of queues, Deque, Priority Queue, Application of Priority Queue, Applications of Queues

UNIT-4: Linked List:

(10 period)

Linked List, One-way Linked List, Traversal of Linked List, Searching, Memory Allocation and De-allocation, Insertion in Linked List, Deletion from Linked List.

Sorting and Searching Techniques

Bubble, Selection, Insertion, Merge Sort. Searching: Sequential, Binary, Binary Search.

UNIT-5: Tutorial and Assignment (05 period)

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 (McGrawHill)
-
-

Course Code: **CA-312**

Course Title: **Advance C Programming**

Total Credits: 02

Contact Hours: 30 (Clock Hours)

Marks: 50

Periods: 45 (45 minutes each)

Objective: 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.

Unit-I: Function: (05 periods)

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.

Unit-II: Pointers (10 periods)

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 Pointers to Pointers ,Practice with Pointers , Function Pointers.

Unit-III: Error & Exception handling (10 periods)

Exception Handling, The NS Exception Class ,Generating Exception, Catching Exception, Throwing Exception, Error Handling, Error Domain, Capturing Error

File Handling

Introduction to file handling, read, write operation, example on file handling

Unit-IV: Graphics in C (15 periods)

Graphics header file, drawing shapes, functions of graphics, functions of color background and foreground. Color codes.

UNIT-5: Tutorial and Assignment (05 periods)

Core References:

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 Code: **CA-321**

Course Title: **Lab course 3 (Based on CA-311)**

Total Credits: 1.5

Contact Hours: 03 Hours (Week)

Marks: 50

Practical based on CA-311

This practical can be executed in C programming.

1. Write a program for matrix addition, subtraction, multiplication and division.
2. Write a program for insertion, deletion elements of array.
3. Write a program for searching element in array using binary search.
4. Write a program for insertion of element in stack.
5. Write a program for deletion and searching of element in stack.
6. Write a program for infix, prefix and postfix expression solving.
7. Write the programs for push and pop operation using the stacks.
8. Write the programs for insertion and deletion of n item from the queues.
9. Write the programs for traversing of n item using the array.
10. Write a program for insertion sort.

Minimum three practical on each unit

Course Code: **CA-322**

Course Title: **Lab course 4 (Based on CA-312)**

Total Credits: 1.5

Contact Hours: 03 Hours (Week)

Marks: 50

Practical based on CA-312

1. Write a function which accepts a character array as argument from the user. The function should print the ASCII equivalent of all the characters in the string
2. Write a function which accepts a character array as argument from the user. The function should convert all the lowercase characters into uppercase case
3. Write a user-defined function to perform
 - Square of a number
 - Area of a square
 - Reverse the number.
4. Write a program that uses a function to check whether an entered three digit number is palindrome or not.
5. Write a program to create and display singly link list using pointers.
6. Write a program to insert new record at last position in the singly link list
7. Write a program to find size of the file.
8. Write a program to count number of lines, words and characters in a file
9. Write a program to draw a circle
10. Write a program to draw a rectangle

Minimum three practical on each unit of syllabus.

Course Code: **CA-313(A)**

Course Title: **Office Automation Tool**

Total Credits: 02

Contact Hours: 30 (Clock Hours)

Marks: 50

Periods: 45 (45 minutes each)

Objective: This course provides students an opportunity to utilize the basic resources for the real time applications. Various government examination are having the similar pattern of syllabus , which is useful for student for preparation of government examination.

UNIT-1: Introduction to MS Office - MS Word (10 period)

Opening & Saving files, Editing text documents, Inserting, Deleting, Cut, Copy, Paste, Undo, Redo, Find, Search, Replace, Formatting page & setting Margins, Converting files to different formats, Importing & Exporting documents, Sending files to others, Using Tool bars, Ruler, Using Icons, using help, Formatting Documents - Setting Font styles, Font selection- style, size, colour etc,

Tools – Word Completion, Spell Checks, Mail merge, Templates, Creating contents for books, Creating Letter/Faxes, Creating Web pages, Using Wizards, Tracking Changes, Security, Digital Signature. Printing Documents – Shortcut keys

UNIT-2: Introduction to MS Office – MS Excel: (10 period)

MS Excel: Spread Sheet & its Applications, Opening Spreadsheet, Menus - main menu, Formula Editing, Formatting, Toolbars, Using Icons, Using help, Shortcuts, Spreadsheet types. Working with Spreadsheets- opening, Saving files, setting Margins, Converting files to different formats (importing, exporting, sending files to others), Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys.

UNIT-3: Introduction to MS Office-MS Access (10 period)

MS Access: Introduction, Planning a Database, Starting Access, Access Screen, Creating a New Database, Creating Tables, Working with Forms, Creating queries, Finding Information in Databases, Creating Reports, Types of Reports, Printing & Print Preview – Importing data from other databases viz. MS Excel etc

UNIT-4: Introduction to MS Office-MS Power Point: (10 period)

MS Power point: Introduction to presentation – Opening new presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts. Creating a presentation – Setting Presentation style, Adding text to the Presentation. Formatting a Presentation - Adding style, Colour, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout.

Adding Graphics to the Presentation- Inserting pictures, movies, tables etc into presentation, Drawing Pictures using Draw.

UNIT-5: Tutorial and Assignment (05 period)

References

1. Sushila Madan , Introduction to Essential tools, JBA, 2009.
2. Anita Goel, Computer Fundamentals, Pearson, 2012

Course Code: **CA-313(B)**

Course Title: **HTML Programming**

Total Credits: 02

Contact Hours: 30 (Clock Hours)

Marks: 50

Periods: 45 (45 minutes each)

Objective: Upon successful completion of this course, student will understand the basic Concept of html based web development.

- The student will elaborate their programming knowledge for web design and development.
- The HTML subject will support to student for designing and development of large scale websites for real time application.

UNIT-1: Introduction to HTML (10 period)

Internet, Internet Domains world wide web, Protocols definition, Overview of TCP/IP, Telnet. Web page, Web site , web browser , Web server ,web Client, Communication between browser and web server, Web site architecture.

Structure of HTML program HTML paired tags,Text formatting: paragraph, line break, headings , drawing lines.Text styles: Bold, italics,underline. Lists: types of lists viz. unordered, ordered, definition lists

UNIT-2: Links and Image: (10 period)

Linking documents (Links) : External document references, internal document references. Introduction to frames: frameset and frame tag. Putting an Image on a Page ,Using Images as Links ,Putting an Image in the Background.

UNIT-3: Tables and Forms (10 period)

Creating a Table , Table Headers ,Captions, Spanning Multiple Columns ,Styling Table . Introduction to forms, form design and form tag

UNIT-4: Introduction to DHTML: (10 period)

Overview of dynamic HTML. Cascading Style Sheets, font ,color ,background, Text,border.

UNIT-5: Tutorial and Assignment (05 period)

References

Web Enabled commercial Application Development Using HTML, DHTML, JavaScript by -Ivon Bayross.

2. Complete reference HTML, Narosa Publication

3. Cassidy Williams, Camryn Williams Introduction to HTML and CSS, O'Reilly, 2015

Curriculum for Semester IV

Course Code: **CA-411**
Course Title: **DBMS**
Total Credits: 02
Contact Hours: 30 (Clock Hours)
Marks: 50
Periods: 45 (45 minutes each)

Objective: Students successfully completing this course should be able to:

- To understand the different issues involved in the design and implementation of a database system.
- To study the physical and logical database designs, database modeling, relational, hierarchical, and network models.
- To understand and use data manipulation language to query, update, and manage a database.
- To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

Unit-I: Introduction: (10 periods)

General introduction to database systems; Database - DBMS distinction, approaches for building a database, data models, database management system, three- schema architecture of a database, challenges in building a DBMS, various components of a DBMS

Unit-II: Data Models (10 periods)

E/R Model - Conceptual data modeling - motivation, entities, entity types, various types of attributes, relationships, relationship types, E/R diagram notation, examples

Unit-III: Structured Query Language (SQL) (10 periods)

Introduction, data definition in SQL, table, key and foreign key definitions, update behaviors. Querying in SQL - basic select-from-where block and its semantics, nested queries - correlated and uncorrelated, notion of aggregation, aggregation functions group

by and having clauses, embedded SQL.

Unit-IV Data Normalization:(10 periods)

Dependencies and Normal forms - Importance of a good schema design, problems encountered with bad schema designs, motivation for normal forms, definitions of 1NF, 2NF.

UNIT-5: Tutorial and Assignment (05 periods)

Core Reference:

1. An Introduction to Database System By Bipin C Desai
2. H Garcia-Molina, JD Ullman and Widom, Database Systems: The Complete Book, 2nd Ed., Prentice-Hall, 2008.
3. A Silberschatz, H Korth and S Sudarshan, Database System Concepts, 6th Ed., McGraw-Hill, 2010.

Additional Reference:

1. R Elmasri, S Navathe, Fundamentals of Database Systems, 6th edition, Addison-Wesley, 2010.
2. R Ramakrishnan, J Gehrke, Database Management Systems, 3rd Ed., McGraw-Hill, 2002

Course Code: **CA-412**

Course Title: **Object Oriented Programming using C++**

Total Credits: 02

Contact Hours: 30 (Clock Hours)

Marks: 50

Periods: 45 (45 minutes each)

Objective: Students successfully completing this course should be able to:

- To expose students to concept of object oriented programming using C++.
- Student will elaborate the algorithmic thinking and problem solving and impart moderate skills in programming using C++ Language in an industry-standard.
- Introduce students to learn basic features of C++ language, design and execute the C++ program dynamically.

Unit-I: Introduction of OOPs (10 periods)

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

Unit-II : Introduction to C++ (10 periods)

History and overview of C++, C++ program structure. Reference variables, Scope resolution operator, Member de-referencing operators, new and delete, cin and cout.

Unit-III: Functions in C++ (10 periods)

Function prototype, Call by reference (using reference variable), Return by reference, Inline function, Default arguments, Const arguments. Function overloading, Different numbers and different kinds of arguments.

Unit-IV: Objects and Classes (10 periods)

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-5: Tutorial and Assignment (05 periods)

References

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++ Yeshwant Kanetkar; bpb publication

Course Code: **CA-421**

Course Title: **Lab course 5 (based on CA-411)**

Total Credits: 1.5

Contact Hours: 03 Hours (Week)

Marks: 50

Objective: student understands the practical and logical application of DBMS and SQL language.

Practical based on CA-411

1. Write a Sql commands for creation of database and table.
2. Write a sql commands for insertion of data in created table
3. Write a sql commands for deletion and updating of data in table
4. Draw an E-R diagram of the any dataset.
5. Write a sql command to create a customer table, inert name, address, account and balance parameter.
6. Write a sql query to insert, delete , and update the data in customer table.
7. Write a sql query for drop the table.
8. Write a sql query for grant the table
9. Write a sql query for revoke the table
10. Write a sql query for ddl, dml and dcl command example on any new created table.

Minimum three practical's on each unit.

Course Code: **CA-422**

Course Title: **Lab course 5 (based on CA-412)**

Total Credits: 1.5

Contact Hours: 03 Hours (Week)

Marks: 50

Objective: student should utilize the knowledge of C++ programming in real time application development and problem solving.

Practical based on CA-412

1. Write a program to find Area, Perimeter of Triangle & Rectangle.
2. Write a program to find maximum amongst 3 numbers.
3. Write a Program for nested loops.
4. Write a program to solve the algebraic equation
5. Write a program to check Prime Number, Program reverse of digit.
6. Write a program to find Armstrong Number.
7. Write a program to print the Fibonacci Series
8. Write a program for searching and element from array.
9. Write a program for Transpose of matrices
10. Write a program for Multiplication of matrices
11. Write a program for factorial of number.

Minimum three practical's on each unit.

Course Code: **CA-413(A)**
Course Title: **E-Commerce and Applications**
Total Credits: 02
Contact Hours: 30 (Clock Hours)
Marks: 50
Periods: 45 (45 minutes each)

Objective: Upon successful completion of the course, a student will be able to:

- To apply in an integrative and summative fashion the students' knowledge in all fields of business studies by drafting a website presence plan.
- To understand the factors needed in order to be a successful in ecommerce
- To gain the skills to bring together knowledge gathered about the different components of building a web presence
- To critically think about problems and issues that might pop up during the establishment of the web presence

Unit-I: Introduction: (10 periods)

1.1 Introduction to E- commerce:

1.2 Meaning and concept – E- commerce

1.3 E- commerce v/s Traditional Commerce

1.4 E- Business & E- Commerce – History of E- Commerce

1.5 EDI – Importance, features & benefits of E- Commerce

1.6 Impacts, Challenges & Limitations of E- Commerce

Unit-II: Buisness Models (10 periods)

2.1 Business models of E – Commerce: Business to Business

2.1.2 Business to customers

2.1.3Customers to Customers

2.1.4 Business to Government

2.1.5 Business to Employee

2.2 Influencing factors of successful E- Commerce

2.3 Architectural framework of Electronic Commerce

Unit-III: Electronic Data Interchange (EDI) (SQL) (10 periods)

- 3.1 Electronic data Interchange
- 3.2 EDI Technology
- 3.3 EDI- Communications
- 3.4 EDI Agreements
- 3.5 E- Commerce payment system.
- 3.6 Digital Economy

Unit-IV Website Development:(10 periods)

- 4.1 Logging in to Your Word press Site
- 4.2 word press dash board
- 4.3 creating your first post
- 4.4 adding photos and images
- 4.5 creating hyper link
- 4.6 adding categories and tags

UNIT-5: Tutorial and Assignment (05 periods)

Reference Books

- 1.Turban, Rainer, and Potter, Introduction to E-Commerce, second edition, 2003
2. H. M. Deitel, P. J. Deitel and T. R. Nieto, E-Business and E-Commerce: How to Programe, Prentice hall, 2001
3. WordPress All-in-One For Dummies -written by Lisa Sabin Wilson with contributions by Michael Torbert, Andrea Rennick, Cory Miller, and Kevin Palmer

Course Code: **CA-413(B)**
Course Title: **PHP Programming**
Total Credits: 02
Contact Hours: 30 (Clock Hours)
Marks: 50
Periods: 45 (45 minutes each)

Objective: Upon successful completion of this course, student will understand the basic concept of PHP based web development.

- The student will elaborate their programming knowledge for web design and development.
- The PHP subject will support to student for designing and development of large scale websites for real time application

Unit-I: Introduction: (10 periods)

PHP introduction, inventions and versions, important tools and software requirements (like Web Server, Database, Editors etc.) ,PHP with other technologies, scope of PHP ,Basic Syntax, PHP variables and constants ,Types of data in PHP , Expressions, scopes of a variable (local,global) ,PHP Operators : Arithmetic, Assignment, Relational , Logical operators, Bitwise , ternary and MOD operator, PHP operator Precedence and associativity

Unit-II: Conditional events and Loops (10 periods)

PHP IF Else conditional statements (Nested IF and Else) Switch case, while ,For and Do While Loop, Goto , Break ,Continue and exit

Unit-III: Functions (10 periods)

Function, Need of Function , declaration and calling of a function ,PHP Function with arguments, Default Arguments in Function ,Function argument with call by value, call by reference, Scope of Function Global and Local

Unit-IV HTML Form with PHP:(10 periods)

Capturing Form Data ,GET and POST form methods ,Dealing with multi value fields, Redirecting a form after submission

UNIT-5: Tutorial and Assignment (05 periods)

Reference Books

1. Steven Holzner, "PHP: The Complete Reference Paperback", McGraw Hill Education (India), 2007.
2. Timothy Boronczyk, Martin E. Psinas, "PHP and MYSQL (Create-Modify-Reuse)", Wiley India Private Limited, 2008.
3. Robin Nixon, "Learning PHP, MySQL, JavaScript, CSS & HTML5", 3rd Edition Paperback, O'reilly, 2014

Course Code: **CA-423**

Course Title: **Environmental Studies**

Total Credits: **NA(Non Credit)**

Contact Hours: 30 (Clock Hours)

Periods: 45 (45 minutes each)

Objective: The objective of this paper is to introduce the environment science concept for students.

Unit-I: : (10 periods)

Multidisciplinary nature of environmental studies (02 Lectures)

Definition, scope and importance, Need for public awareness.

Natural Resources : (08 lectures)

Renewable and non-renewable resources : Natural resources and associated problems.

a) Forest resources : Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people.

b) Water resources : Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

c) Mineral resources : Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

d) Food resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

e) Energy resources : Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.

f) Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
 - Equitable use of resources for sustainable lifestyles.
 - Concept of an ecosystem.
 - Structure and function of an ecosystem.
 - Producers, consumers and decomposers.
 - Energy flow in the ecosystem.
 - Ecological succession.
 - Food chains, food webs and ecological pyramids.
 - Introduction, types, characteristic features, and function of the following ecosystem
 - a. Forest ecosystem
 - b. Grassland ecosystem
 - c. Desert ecosystem
 - d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit-II: Ecosystems and Biodiversity and Its conservation (10 periods)

Ecosystem (05 lectures)

Biodiversity and Its conservation(05 lectures)

- Introduction – Definition : genetic, species and ecosystem diversity.
- Biogeographical classification of India
- Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values
 - Biodiversity at global, National and local levels.
 - India as a mega-diversity nation
 - Hot-spots of biodiversity.
- Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India
- Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity.

Unit-III: (15 periods)

Environmental Pollution (08 lectures)

Definition

- Cause, effects and control measures of :-
 - a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution
 - e. Noise pollution f. Thermal pollution g. Nuclear hazards
- Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management: floods, earthquake, cyclone and landslides.

Social Issues and the Environment (07 lectures)

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case Studies
- Environmental ethics : Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies.
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation.
- Public awareness.

Unit-IV :Human Population and the Environment (06 lectures)

- Population growth, variation among nations.
- Population explosion – Family Welfare Program.
- Environment and human health.
- Human Rights.
- Value Education.
- HIV/AIDS.
- Women and Child Welfare.
- Role of Information Technology in Environment and human health.
- Case Studies.

UNIT-5: Field Work (05 periods)

Visit to a local area to document environmental assets-
river/forest/grassland/hill/mountain

- Visit to a local polluted site-Urban/Rural/Industrial/Agricultural
- Study of common plants, insects, birds.
- Study of simple ecosystems-pond, river, hill slopes, etc. (Field work Equal to 5 lecture hours)