

**A.S.D.GOVERNMENT DEGREE COLLEGE FOR
WOMEN AUTONOMOUS, KAKINADA**



**1.1.3 Details of courses offered by
the institution that focus on
**employability/ entrepreneurship/
skill development** during the year
2023-24**



Indicates skill development based topics in syllabus



Indicates Employability based topics in syllabus



Indicates entrepreneurship topics in syllabus

**A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS) KAKINADA**




(Under the jurisdiction of Adikavi Nannaya University)

Reaccredited by NAAC with B Grade (3rd Cycle)

**1.1.2 Details of courses offered by the institution that focus on Employability/
Entrepreneurship/ Skill development during the year.**



**DEPARTMENT OF COMPUTER SCIENCE AND
COMPUTER APPLICATIONS**

Colour	Focusses on
	Skill
	Employability
	Entrepreneurship

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
ACADEMIC YEAR: 2023-24
B.Sc.(MPCS) – I Semester
Course: ESSENTIALS AND APPLICATIONS OF MATHEMATICAL, PHYSICAL
AND CHEMICAL SCIENCES

Course Code: BSCM23101

No. of Hours/Week: 5

Paper : I

Course Objective:

The objective of this course is to provide students with a comprehensive understanding of the essential concepts and applications of mathematical, physical, and chemical sciences. The course aims to develop students' critical thinking, problem-solving, and analytical skills in these areas, enabling them to apply scientific principles to real-world situations.

Course Outcomes:

1. Apply critical thinking skills to solve complex problems involving complex numbers, trigonometric ratios, vectors, and statistical measures.
2. To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations
3. To Explain the basic principles and concepts underlying a broad range of fundamental areas of chemistry and to Connect their knowledge of chemistry to daily life.
4. Understand the interplay and connections between mathematics, physics, and chemistry in various applications.
5. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.
6. To explore the history and evolution of the Internet and to gain an understanding of network security concepts, including threats, vulnerabilities, and countermeasures.

UNIT I: ESSENTIALS OF MATHEMATICS

Complex Numbers: Introduction of the new symbol i – General form of a complex number – Modulus- Amplitude form and conversions, Trigonometric Ratios: Trigonometric Ratios and their relations – Problems on calculation of angles Vectors: Definition of vector addition – Cartesian form – Scalar and vector product and problems Statistical Measures: Mean, Median, Mode of a data and problems

UNIT II: ESSENTIALS OF PHYSICS:

Definition and Scope of Physics- Measurements and Units - Motion of objects: Newtonian Mechanics and relativistic mechanics perspective - Laws of Thermodynamics and Significance-Acoustic waves and electromagnetic waves - Electric and Magnetic fields and their interactions-Behaviour of atomic and nuclear particles - Wave-particle duality, the uncertainty principle-Theories and understanding of universe.

UNIT III: ESSENTIALS OF CHEMISTRY:

Definition and Scope of Chemistry- Importance of Chemistry in daily life -Branches of chemistry and significance- Periodic Table- Electronic Configuration, chemical changes, classification of matter, Biomolecules- carbohydrates, proteins, fats and vitamins.

UNIT IV: APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY:

Applications of Mathematics in Physics & Chemistry: Calculus , Differential Equations & Complex Analysis

Application of Physics in Industry and Technology: Electronics and Semiconductor Industry, Robotics and Automation, Automotive and Aerospace Industries, Quality Control and Instrumentation, Environmental Monitoring and Sustainable Technologies.

Application of Chemistry in Industry and Technology: Chemical Manufacturing, Pharmaceuticals and Drug Discovery, Materials Science, Food and Beverage Industry.

UNIT V: ESSENTIALS OF COMPUTER SCIENCE:

Milestones of computer evolution -Internet, history, Internet Service Providers, Types of Networks, IP, Domain Name Services, applications. Ethical and social implications: Network and security concepts- Information Assurance Fundamentals, Cryptography-Symmetric and Asymmetric, Malware, Firewalls, Fraud Techniques- Privacy and Data Protection

Additional Inputs: Probability, Chemical bonding, Octet rule, VB theory, MO theory, Drug development , Food adulteration, Computer Architecture

Note: Concepts from Additional inputs must be excluded from Examinations

Text books:

1. Functions of one complex variable by John.B.Conway, Springer- Verlag.
2. Elementary Trigonometry by H.S.Hall and S.R.Knight
3. Vector Algebra by A.R.Vasishtha, Krishna Prakashan Media(P)Ltd. 4.Basic Statistics by B.L.Agarwal, New age international Publishers
4. University Physics with Modern Physics by Hugh D. Young and Roger A. Freedman
5. Fundamentals of Physics by David Halliday, Robert Resnick, and Jearl Walker

Reference Books:

1. Physics for Scientists and Engineers with Modern Physics" by Raymond A. Serway and John W. Jewett Jr.
2. Physics for Technology and Engineering" by John Bird
3. Chemistry in daily life by Kirpal Singh
4. Chemistry of bio molecules by S. P. Bhutan
5. Fundamentals of Computers by V. Raja Raman
6. Cyber Security Essentials by James Graham, Richard Howard, Ryan Olson

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
ACADEMIC YEAR: 2023-24
B.Sc.(MPCS) – I Semester

Course: ADVANCES IN MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

Course Code: BSCM23102
Paper : II

No. of Hours/Week: 5

Course Objective:

The objective of this course is to provide students with an in-depth understanding of the recent advances and cutting-edge research in mathematical, physical, and chemical sciences. The course aims to broaden students' knowledge beyond the foundational concepts and expose them to the latest developments in these disciplines, fostering critical thinking, research skills, and the ability to contribute to scientific advancements.

Course Outcomes:

1. Explore the applications of mathematics in various fields of physics and chemistry, to understand how mathematical concepts are used to model and solve real-world problems.
2. To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations. Understand the different sources of renewable energy and their generation processes and advances in nanomaterials and their properties, with a focus on quantum dots.
3. To study the emerging field of quantum communication and its potential applications.
4. To gain an understanding of the principles of biophysics in studying biological systems.
5. Explore the properties and applications of shape memory materials. Understand the principles and techniques used in computer-aided drug design and drug delivery systems, to understand the fabrication techniques and working principles of nanosensors.
6. Explore the effects of chemical pollutants on ecosystems and human health. Understand the interplay and connections between mathematics, physics, and chemistry in various advanced applications.
7. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.
8. Understand and convert between different number systems, such as binary, octal, decimal, and hexadecimal.
9. Differentiate between analog and digital signals and understand their characteristics. Gain knowledge of different types of transmission media, such as wired (e.g., copper cables, fiber optics) and wireless (e.g., radio waves, microwave, satellite).

UNIT I: ADVANCES IN BASICS MATHEMATICS

Straight Lines: Different forms – Reduction of general equation into various forms –Point of intersection of two straight lines Limits and Differentiation: Standard limits – Derivative of a function –Problems on product rule and quotient rule

Integration: Integration as a reverse process of differentiation – Basic methods of integration Matrices: Types of matrices – Scalar multiple of a matrix – Multiplication of matrices – Transpose of a matrix and determinants

UNIT II: ADVANCES IN PHYSICS:

Renewable energy: Generation, energy storage, and energy-efficient materials and devices. Recent advances in the field of nanotechnology: Quantum dots, Quantum Communication- recent advances in biophysics- recent advances in medical physics- Shape Memory Materials.

UNIT III: ADVANCES IN CHEMISTRY:

Computer aided drug design and delivery, nano sensors, Chemical Biology, impact of chemical pollutants on ecosystems and human health, Dye removal - Catalysis method

UNIT IV: ADVANCED APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY

Mathematical Modelling applications in physics and chemistry Application of Renewable energy: Grid Integration and Smart Grids, Application of nanotechnology: Nanomedicine, Application of biophysics: Biophysical Imaging, Biomechanics, Neurophysics, Application of medical physics: Radiation Therapy, Nuclear medicine Solid waste management, Environmental remediation- Green Technology, Water treatment.

UNIT V: ADVANCED APPLICATIONS OF COMPUTER SCIENCE

Number System-Binary, Octal, decimal, and Hexadecimal, Signals- Analog, Digital, Modem, Codec, Multiplexing, Demultiplexing, Transmission media, error detection and correction- Parity check and CRC, Networking devices- Repeater, hub, bridge, switch, router, gateway.

Additional Inputs: Methods in Matrix, Nanomaterials in drug delivery, Metal organic frame works and their role in dye removal, Nanotechnology, Principles of Green Chemistry, Demultiplexing

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Coordinate Geometry by S.L.Lony, Arihant Publications
2. Calculus by Thomas and Finny, Pearson Publications
3. Matrices by A.R.Vasishtha and A.K.Vasishtha, Krishna Prakashan Media(P)Ltd.
4. "Renewable Energy: Power for a Sustainable Future" by Godfrey Boyle
5. "Energy Storage: A Nontechnical Guide" by Richard Baxter
6. Digital Logic Design by Morris Mano

Reference Books:

1. "Nanotechnology: Principles and Applications" by Sulabha K. Kulkarni and Raghvendra A. Bohara
2. "Biophysics: An Introduction" by Rodney Cotterill
3. "Shape Memory Alloys: Properties and Applications" by Dimitris C. Lagoudas
4. Nano materials and applications by M.N.Borah
5. Environmental Chemistry by Anil.K.D.E.
6. Data Communication & Networking by Bahrouz Forouzan

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. – II Semester
ACADEMIC YEAR: 2023-24
Course: PROBLEM SOLVING IN C

Course Code: CS23201
Paper : III

No. of Hours/Week: 3

Course Objective:

1. To explore basic knowledge on computers
2. Learn how to solve common types of computing problems.
3. Learn to map problems to programming features of C.
4. Learn to write good portable C programs.

Course Outcomes

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

1. Understand the working of a digital computer and Fundamental constructs of Programming
2. Analyze and develop a solution to a given problem with suitable control structures
3. Apply the derived data types in program solutions
4. Use the 'C' language constructs in the right way
5. Apply the Dynamic Memory Management for effective memory utilization

UNIT-I

Introduction to computer and programming: Introduction, Basic block diagram and functions of various components of computer, Concepts of Hardware and software, Types of software, Compiler and interpreter, Concepts of Machine level, Assembly level and high-level programming, Flowcharts and Algorithms

Fundamentals of C: History of C, Features of C, C Tokens-variables and keywords and identifiers, constants and Data types, Rules for constructing variable names, Operators, Operator Precedence, Type Casting, Structure of C program, Input /output statements in C-Formatted and Unformatted I/O

UNIT-II

Control statements: Decision making statements: if, if else, Nested if else, else if ladder, switch statements. Loop control statements: while loop, for loop and do-while loop, Nested Loops. Jump Control statements: break, continue and goto.

UNIT-III

Derived data types in C: Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays -Declaration, Initialization and Memory representation, Multi-Dimensional Arrays

Strings: Declaring & Initializing string variables; String handling functions, Character handling functions

UNIT-IV

Functions: Function Prototype, definition and calling. Return statement. Nesting of functions. Categories of functions. Recursion, Parameter Passing by address & by value. Local and Global variables. **Storage classes:** automatic, external, static and register.

Pointers: Pointer data type, Pointer declaration, initialization, accessing values using pointers. Pointer arithmetic. Pointers and arrays, pointers and functions.

UNIT-V

Dynamic Memory Management: Introduction, Functions-malloc, calloc, realloc, free

Structures: Basics of structure, structure members, accessing structure members, nested structures, array of structures, structure and functions, structures and pointers.

Unions - Union definition; difference between Structures and Unions.

Additional Inputs:

C Pre-processor, Conditional Compilation, Header Files, Files

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. E Balagurusamy – Programming in ANSIC – Tata McGraw-Hill publications.
2. Brain W Kernighan and Dennis M Ritchie - The ‘C’ Programming language” - Pearson publications.
3. Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson Edition Publications.
4. YashavantKanetkar - Let Us ‘C’ – BPB Publications.

Reference Books:

1. Introduction to C programming by REEMA THAREJA, OXFORD UNIVERSITY PRESS.
2. Schaum's Outline of Programming with C, by Byron Gottfried, 2nd Edition, (Indian Adapted Edition), TMH publications, New Delhi, 2006.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. – II Semester
ACADEMIC YEAR: 2023-24
Course: PROBLEM SOLVING IN C

Course Code: CS23201P

No. of Hours/Week: 2

Course Objective:

To develop programming skills using the fundamentals of C Language and to enable effective usage of arrays, structures, functions, pointers and to implement the memory management concepts.

Course Outcomes:

At the end of the course the student will be able to

1. Implement programs using fundamental features of C Language.
2. Solve problems with the use of loops, decision making statements and functions.
3. Implement programs performing various Operations on Arrays.

List of Experiments

1. Write a program to calculate simple & compound interest
2. Find the biggest of three numbers using C.
3. Write a c program to find the sum of individual digits of a positive integer.
4. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.
5. Write a c program to check whether a number is Armstrong or not.
6. Write a c program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
7. Write a c program that implements searching of given item in given list
8. Write a c program that uses functions to perform the following: Addition of two matrices. Multiplication of two matrices.
9. Write a program for concatenation of two strings.
10. Write a program for length of a string with and without String Handling functions
11. Write a program to demonstrate Call by Value and Call by Reference mechanism
12. Write a Program to find GCD of Two numbers using Recursion
13. Write a c program to perform various operations using pointers.
14. Write a c program to read data of 10 employees with a structure of 1.employee id 2.aadar no, 3.title, 4.joined date, 5.salary, 6.date of birth, 7.gender, 8.department.
15. Write a Program to demonstrate dynamic arrays using Dynamic Memory Management functions

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
I B.Sc. – II Semester
Course: DIGITAL LOGIC DESIGN

Course Code: CS23202
Paper : IV

No. of Hours/Week: 4

Course Objectives

To familiarize with the concepts of designing digital circuits.

Course Outcomes

Upon successful completion of the course, the students will be able to

1. Understand how to Convert numbers from one radix to another radix and perform arithmetic operations.
2. Simplify Boolean functions using Boolean algebra and k- maps
3. Design adders and subtractors circuits.
4. Design combinational logic circuits such as decoders, encoders, multiplexers and demultiplexers.
5. Use flip flops to design registers and counters.

UNIT – I

Number Systems: Binary, octal, decimal, hexadecimal number systems, conversion of numbers from one radix to another radix, r 's, $(r-1)$'s complements, signed binary numbers, addition and subtraction of unsigned and signed numbers, weighted and unweighted codes.

UNIT – II

Logic Gates and Boolean Algebra: NOT, AND, OR, universal gates, X-OR and X-NOR gates, Boolean laws and theorems, complement and dual of a logic function, canonical and standard forms, two level realization of logic functions using universal gates, minimizations of logic functions (POS and SOP) using Boolean theorems, K-map (up to four variables), don't care conditions.

UNIT – III

Combinational Logic Circuits – 1: Design of half adder, full adder, half subtractor, full subtractor, ripple adders and subtractors, ripple adder / subtractor.

UNIT – IV

Combinational Logic Circuits – 2: Design of decoders, encoders, priority encoder, multiplexers, Demultiplexers, higher order decoders, demultiplexers and multiplexers, realization of Boolean functions using decoders, multiplexers.

UNIT – V

Sequential Logic Circuits: Classification of sequential circuits, latch and flip-flop, RS- latch using NAND and NOR Gates, truth tables, RS, JK, T and D flip-flops, truth and excitation tables, conversion of flip-flops, flip-flops with asynchronous inputs (preset and clear). Design of registers, shift registers, bidirectional shift registers, universal shift register, design of ripple counters, synchronous counters and variable modulus counters.

Additional Inputs: Johnson Counter, Ring Counter

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. M. Morris Mano, Michael D Ciletti, "Digital Design", 5th edition, PEA.

Reference Books

1. Kohavi, Jha, "Switching and Finite Automata Theory", 3rd edition, Cambridge.
2. Leach, Malvino, Saha, "Digital Principles and Applications", 7th edition, TMH.
3. Roth, "Fundamentals of Logic Design", 5th edition, Cengag

I B.Sc. – II Semester Course 4: DIGITAL LOGIC DESIGN Credits – 1

Course Code: CS23202P

No. of Hours/Week: 2

List of Experiments

The laboratory work can be done by using physical gates and necessary equipment or simulators. Simulators: <https://sourceforge.net/projects/gatesim/> or <https://circuitverse.org/> or any free open-source simulator.

1. Introduction to digital electronics lab- nomenclature of digital ICs, specifications, study of the data sheet, concept of Vcc and ground, verification of the truth tables of logic gates using TTL ICs.
2. Implementation of the given Boolean functions using logic gates in both SOP and POS forms.
3. Realization of basic gates using universal gates.
4. Design and implementation of half and full adder circuits using logic gates.
5. Design and implementation of half and full subtractor circuits using logic gates.
6. Verification of stable tables of RS, JK, T and D flip-flops using NAND gates.
7. Verification of stable tables of RS, JK, T and D flip-flops using NOR gates.
8. Implementation and verification of Decoder and encoder using logic gates.
9. Implementation of 4X1 MUX and DeMUX using logic gates.
10. Implementation of 8X1 MUX using suitable lower order MUX.
11. Implementation of 7-segment decoder circuit.
12. Implementation of 4-bit parallel adder.
13. Design and verification of 4-bit synchronous counter.
14. Design and verification of 4-bit asynchronous counter

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – III Semester
ACADEMIC YEAR: 2023-24
Course: DATA BASE MANAGEMENT SYSTEM

Course Code: CS203304

No. of Hours/Week: 4

Paper : III

Course Objective:

To present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS.

Course Outcomes:

At the end of the course the student will be able to

1. Understand DBMS concepts, data models and Architecture.
2. Understand ER concepts and ER mapping to relational model
3. Improve the database design by normalization.
4. Make use of SQL to retrieve and maintain relational database.
5. Illustrate various constructs in PL/SQL.

UNIT - I(Skill)

Overview of Database Management System: Introduction to data, information, database, database management systems, file-based system, Drawbacks of file-Based System, database approach, Classification of Database Management Systems, advantages of database approach, Various Data Models, Components of Database Management System, three schema architecture of data base, costs and risks of database approach.

UNIT - II

Entity-Relationship Model: Introduction, the building blocks of an entity relationship diagram, classification of entity sets, attribute classification, relationship degree, relationship classification, reducing ER diagram to tables, enhanced entity-relationship model (EER model), generalization and specialization, IS A relationship and attribute inheritance, multiple inheritance, constraints on specialization and generalization, advantages of ER modelling.

UNIT III Skill & Employability)

Relational Model: Introduction, CODD Rules, relational data model, concept of key, relational integrity, relational algebra, relational algebra operations, advantages of relational algebra, limitations of relational algebra, Joins in Relational Algebra, relational calculus, tuple relational calculus, domain relational Calculus (DRC), Functional dependencies and normal forms- 1NF, 2NF, 3NF,BCNF,4NF.

UNIT IV (Skill)

Structured Query Language: Introduction, History of SQL Standard, Commands in SQL, Data Types in SQL, Data Definition Language, Selection Operation, Projection Operation, Aggregate functions, Data Manipulation Language, Table Modification Commands, Join Operation, Set Operations, View, Sub Query.

UNIT V (Employability)

PL/SQL: Introduction, Shortcomings of SQL, Structure of PL/SQL, PL/SQL Language Elements, Data Types, Operators Precedence, Control Structure, Steps to Create a PL/SQL, Program, Iterative Control, Procedure, Function, Database Triggers, Types of Triggers.

Additional Inputs:

Transaction Management and Concurrency Control: What is transaction, ACID Properties

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Database System Concepts by Abraham Silberschatz, Henry Korth, and S. Sudarshan, McGrawhill, 2010.
2. Database Management Systems by Raghu Ramakrishnan, McGrawhill, 2002.
3. Fundamentals of Relational Database Management Systems by S. Sumathi, S. Esakkirajan, Springer Publications.
4. SQL: The Ultimate Beginners Guide by Steve Tale.

Reference Books:

1. An Introduction to Database Systems by Bipin C Desai
2. Principles of Database Systems by J. D. Ullman
3. Fundamentals of Database System by R. Elmasri and S. Navathe
4. Database Systems Design, Implementation and Management by Peter Rob, Carlos CoronelSeventh Edition, Thomson , 2007.

II B.Sc. – III Semester
Course: DATA BASE MANAGEMENT SYSTEMS LAB

Course Code : CS203304P

No. of Hours/Week: 2

Course Objective:

To provide a strong formal foundation in database concepts and emphasis is on practice to the students to groom them into well-informed database application developers.

Course Outcomes:

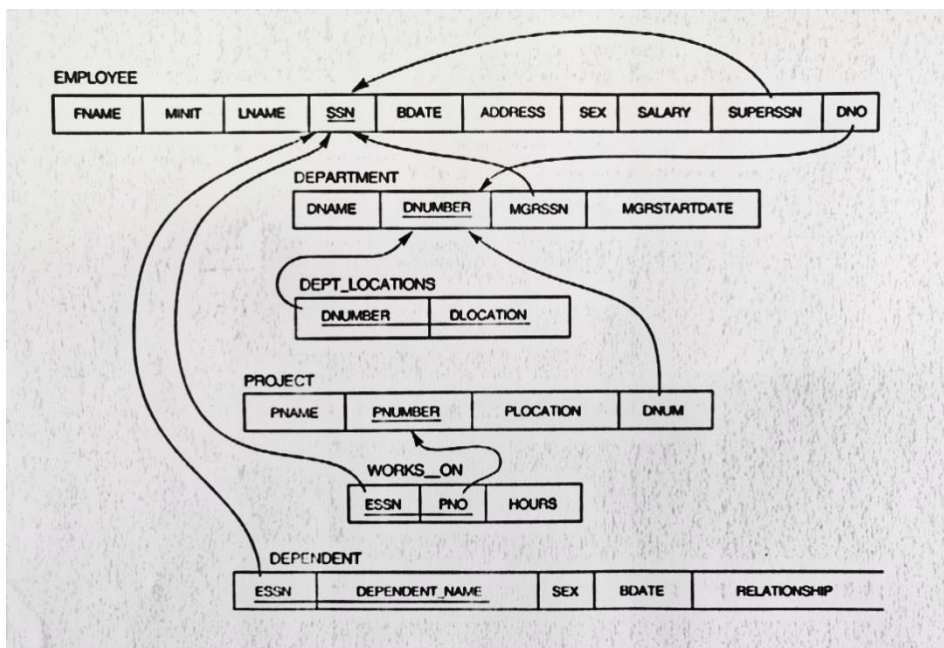
At the end of the course the student will be able to

1. Design database and ER diagrams for the real world scenarios
2. Understand ER concepts and ER mapping to relational model
3. Make use of SQL and PL/SQL to efficiently retrieve and maintain relational database.

List of Experiments

1. Draw ER diagram for hospital administration
2. Creation of college database and establish relationships between tables
3. Relational database schema of a company is given in the following figure.

Relational Database Schema – COMPANY



Questions to be performed on the previous schema

1. Create above tables with relevant **Primary Key, Foreign Key and other constraints**
2. Populate the tables with data
3. Display all the details of all employees working in the company.

4. Display *ssn, lname, fname, address* of employees who work in department no 7.
5. Retrieve the *Birthdate and Address* of the employee whose name is 'Franklin T. Wong'
6. Retrieve the name and salary of every employee
7. Retrieve all distinct salary values
8. Retrieve all employee names whose address is in 'Bellaire'
9. Retrieve all employees who were born during the 1950s
10. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000(inclusive)
11. Retrieve the names of all employees who do not have supervisors
12. Retrieve SSN and department name for all employees
13. Retrieve the name and address of all employees who work for the 'Research' department
14. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birth date.
15. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.
16. Retrieve all combinations of Employee Name and Department Name
17. Make a list of all project numbers for projects that involve an employee whose last name is 'Narayan' either as a worker or as a manager of the department that controls the project.
18. Increase the salary of all employees working on the 'ProductX' project by 15%. Retrieve employee name and increased salary of these employees.
19. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employee first name.
20. Select the names of employees whose salary does not match with salary of any employee in department 10.
21. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.
22. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary. Display with proper headings.
23. Find the sum of the salaries and number of employees of all employees of the 'Marketing' department, as well as the maximum salary, the minimum salary, and the average salary in this department.
24. Select the names of employees whose salary is greater than the average salary of all employees in department 10.
25. Delete all dependents of employee whose *ssn is '123456789'*.
26. Perform a query using alter command to drop/add field and a constraint in Employee table.

**A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE**

**II B.Sc. – IV Semester
ACADEMIC YEAR: 2023-24**

Course: OBJECT ORIENTED PROGRAMMING USING JAVA

Course Code: CS224307

No. of Hours/Week: 4

Paper : IV

Course Objective:

To impart knowledge on fundamentals of Object Oriented Programming, classes, inheritance, interfaces and packages and to make the students understand the concept of exception handling and multithreading.

Course Outcomes:

At the end of the course the student will be able to

1. Understand and Apply Object Oriented features and understand the basics of Java.
2. Develop problem-solving and programming skills using OOP concepts.
3. Apply the concepts of inheritance and to create arrays, strings.
4. Able to demonstrate Exception Handling and Multithreading.
5. Develop efficient Java applets and applications using OOP concepts.

UNIT- I I (Skill)

Introduction to Java: Features of Java, The Java virtual Machine, Parts of Java

Naming Conventions and Data Types: Naming Conventions in Java, Data Types in Java, Literals

Operators in Java: Operators, Priority of Operators

Control Statements in Java: if... else Statement, do... while Statement, while Loop, for Loop, switch Statement, break Statement, continue Statement, return Statement

Input and Output: Accepting Input from the Keyboard, Reading Input with Java.util.Scanner Class, Displaying Output with System.out.printf(), Displaying Formatted Output with String.format()

Arrays: Types of Arrays, Three Dimensional Arrays (3D array), arrayname.length, Command Line Arguments

UNIT-II (Skill & Entrepreneurship)

Introduction to OOPs: Problems in Procedure Oriented Approach, Features of Object-Oriented Programming System (OOPS)

Classes and Objects: Object Creation, Initializing the Instance Variables, Access Specifiers, Constructors

Methods in Java: Method Header or Method Prototype, Method Body, Understanding Methods, Static Methods, Static Block, The keyword 'this', Instance Methods, Passing Primitive Data Types to Methods, Passing Objects to Methods, Passing Arrays to Methods, Recursion, Factory Methods .

Inheritance: Inheritance, The keyword 'super', The Protected Specifier, Types of Inheritance

UNIT-III (Skill, Employability)

Polymorphism: Polymorphism with Variables, Polymorphism using Methods, Polymorphism with Static Methods, Polymorphism with Private Methods, Polymorphism with Final Methods, final Class, Polymorphism with Constructors, Comparison of Method Overloading and Method Overriding

Type Casting: Types of Data Types, Casting Primitive Data Types, Casting Referenced Data Types, The Object Class , **Abstract Classes:** Abstract Method and Abstract Class

Interfaces: Interface, Multiple Inheritance using Interfaces

Packages: Package, Different Types of Packages, The JAR Files, Interfaces in a Package, Creating Sub Package in a Package, Access Specifiers in Java, Creating API Document

Exception Handling: Errors in Java Program, Exceptions, throws Clause, throw Clause, Types of Exceptions, Re – throwing an Exception

UNIT-IV

Streams: Stream, Creating a File using FileOutputStream, Reading Data from a File using FileInputStream, Creating a File using FileWriter, Reading a File using FileReader, **Threads:** Single Tasking, Multi Tasking, Uses of Threads, Creating a Thread and Running it, Terminating the Thread, Single Tasking Using a Thread, Multi Tasking Using Threads, Multiple Threads Acting on Single Object, Thread Class Methods, Deadlock of Threads, Thread Communication, Thread Priorities, thread Group, Daemon Threads, Applications of Threads, Thread Life Cycle

UNIT-V (Skill)

Applets: Creating an Applet, Uses of Applets, <APPLET> tag, A Simple Applet, An Applet with Swing Components, Animation in Applets, A Simple Game with an Applet, Applet Parameters

Java Database Connectivity: Database Servers, Database Clients, JDBC (Java Database Connectivity), Working with Oracle Database, Working with MySQL Database, Stages in a JDBC Program, Registering the Driver, Connecting to a Database, Preparing SQL Statements,

Additional Inputs:

Vectors, Wrapper classes, Hiding classes, static Import, Event Handling in Java, Zipping and Unzipping Files, Serialization of Objects, Counting Number of Characters in a File, File Copy, File Class, Using jdbc-odbc Bridge Driver to Connect to Oracle Database, Retrieving Data from MySQL Database, Retrieving Data from MS Access Database, Stored Procedures and Callable Statements, Types of Result Sets

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Java - The Complete Reference by Herbert Schildt, 9th Edition, Oreilly Publications.
2. Introduction to Java Programming, by Y Daniel Liang, Seventh Edition, Pearson, 2017.

Reference Books:

1. Programming with JAVA, A primer by E.Balaguruswamy, 3e, TATA McGraw-Hill Company.
2. Programming with Java by John R. Hubbard, Second Edition, Schaum's outline Series, TATA McGraw-Hill.
3. Java TM: How to Program by Deitel&Deitel, PHI (2007).
4. Java Programming: From Problem Analysis to Program Design by D.S Mallik.
5. Core Java: An Integrated Approach, Authored by Dr. R. Nageswara Rao & Kogent Learning Solutions Inc.

II B.Sc. – IV Semester

Course: OBJECT ORIENTED PROGRAMMING USING JAVA LAB

(Skill, Employability, Entrepreneurship)

Course Code: CS224307P

No. of Hours/Week: 2

Course Objective:

To introduce various Object Oriented Concepts through which the students will be enabled to implement classes, inheritance, interface, package and multithreading concepts.

Course Outcomes:

At the end of the course the student will be able to

1. Apply OOP concepts to solve real time problems.
2. Make use of class, inheritance, interface and packages to develop solutions for complex problems.
3. Build java applications using Exception handling and Threads.

List of Experiments

1. Write a program to read *Student Name, Reg.No, Marks[5]* and calculate *Total, Percentage, Result*. Display all the details of students
2. Write a program to perform the following String Operations
 - a. Read a string
 - b. Find out whether there is a given substring or not
 - c. Compare existing string by another string and display status
 - d. Replace existing string character with another character
 - e. Count number of words in a string
3. Java program to implements Addition and Multiplication of two N X N matrices.
4. Java program to demonstrate the use of Constructor.
5. Calculate area of the following shapes using method overloading.
 - a. Triangle
 - b. Rectangle
 - c. Circle
 - d. Square
6. Implement inheritance between *Person (Aadhar, Surname, Name, DOB, and Age)* and *Student (Admission Number, College, Course, Year)* classes where *ReadData(), DisplayData()* are overriding methods.
7. Java program for implementing Interfaces
8. Java program on Multiple Inheritance.
9. Java program for to display *Serial Number from 1 to N* by creating two Threads
10. Java program to demonstrate the following exception handlings
 - a. Divided by Zero
 - b. Array Index Out of Bound
 - c. File Not Found
 - d. Arithmetic Exception
 - e. User Defined Exception
11. Create an Applet to display different shapes such as Circle, Oval, Rectangle, Square and Triangle.
12. Write a program to create *Book (ISBN, Title, Author, Price, Pages, Publisher)* structure and store book details in a file and perform the following operations
 - a. Add book details
 - b. Search a book details for a given ISBN and display book details, if available
 - c. Update a book details using ISBN
 - d. Delete book details for a given ISBN and display list of remaining Books

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc. – IV Semester
ACADEMIC YEAR: 2023-24
Course: OPERATING SYSTEMS

Course Code: CS224308

No. of Hours/Week: 4

Paper : V

Course Objective:

To provide knowledge about the services and functions rendered by operating systems and inculcate knowledge on Process Scheduling and Memory Management.

Course Outcomes:

At the end of the course the student will be able to

1. Interpret the basic structure of OS and architectural components.
2. Compare and contrast various Process scheduling algorithms.
3. Analyze various mechanisms of Synchronization and the principles of deadlock.
4. Make use of paging and segmentation in Memory management.
5. Discuss the issues related to file system interface, implementation and disk management.

UNIT - I

What is Operating System? History and Evolution of OS, Basic OS functions, Resource Abstraction, Types of Operating Systems– Multiprogramming Systems, Batch Systems, Time Sharing Systems; Operating Systems for Personal Computers, Workstations and Hand-held Devices, Process Control & Real time Systems.

UNIT - II

Processor and User Modes, Kernels, System Calls and System Programs, System View of the Process and Resources, Process Abstraction, Process Hierarchy, Threads, Threading Issues, Thread Libraries; Process Scheduling, Non-Preemptive and Preemptive Scheduling Algorithms.

UNIT – III (Skill)

Process Management: Deadlock, Deadlock Characterization, Necessary and Sufficient Conditions for Deadlock, Deadlock Handling Approaches: Deadlock Prevention, Deadlock Avoidance and Deadlock Detection and Recovery.

Concurrent and Dependent Processes, Critical Section, Semaphores, Methods for Inter-process Communication; Process Synchronization, Classical Process Synchronization Problems: Producer-Consumer, Reader-Writer.

UNIT - IV

(Skill & Entrepreneurship)

Memory Management: Physical and Virtual Address Space; Memory Allocation Strategies– Fixed and- Variable Partitions, Paging, Segmentation, Virtual Memory, Page Replacement Algorithms – FIFO, LRU, LFU..

UNIT – V (Employability)

File and I/O Management, OS Security : Directory Structure, File Operations, File Allocation Methods, Disk Scheduling: SCAN and CSCAN, Pipes, Protection, Authentication and Internal Access Authorization, Security Policy Mechanism. Introduction to Android Operating System, Android Development Framework, Android Application Architecture,

Additional Inputs:

Multithreading: Benefits, Multithreading Models, Device Management, Buffer, Shared Memory, Android Process Management and File System, Small Application Development using Android Development Framework

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Operating System Concepts - Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, 9th Edition, John Wiley and Sons Inc., 2012.
2. Operating Systems - Internals and Design Principles, William Stallings, 7th Edition, Prentice Hall, 2011.

Reference Books:

1. Modern Operating Systems, Andrew S. Tanenbaum, Second Edition, Addison Wesley, 2001.
2. Operating Systems: A Design-Oriented Approach, Charles Crowley, Tata McGraw Hill Education", 1996.
3. Operating Systems: A Concept-Based Approach, D M Dhamdhare, Second Edition, Tata McGraw-Hill Education, 2007.
4. Operating Systems by J. Archer Harris (Author), Jyoti Singh (Author) (TMH)
5. Online Resources for UNIT V

II B.Sc. – IV Semester
Course: OPERATING SYSTEMS LAB USING C/JAVA
(Skill, Employability, Entrepreneurship)

Course Code: CS224308P

No. of Hours/Week: 2

Course Objective:

To impart knowledge on Operating System design Principles and demonstrate Process Scheduling and Page Replacement Algorithms.

Course Outcomes:

At the end of the course the student will be able to

1. Implement Process Scheduling and Page Replacement Algorithms.
2. Implement Various File Organization schemes
3. Implement Deadlock Avoidance and prevention algorithms

List of Experiments

1. Write a program to implement Round Robin CPU Scheduling algorithm
2. Simulate SJF CPU Scheduling algorithm
3. Write a program the FCFS CPU Scheduling algorithm
4. Write a program to Priority CPU Scheduling algorithm
5. Simulate Sequential file allocation strategies
6. Simulate Indexed file allocation strategies
7. Simulate Linked file allocation strategies
8. Simulate MVT and MFT memory management techniques
9. Simulate Single level directory File organization techniques
10. Simulate Two level File organization techniques
11. Simulate Hierarchical File organization techniques
13. Write a program for Bankers Algorithm for Dead Lock Avoidance
14. Implement Bankers Algorithm Dead Lock Prevention.
15. Simulate all Page replacement algorithms.
 - a. FIFO
 - b. LRU
 - c. LFU
16. Simulate Paging Techniques of memory management

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
III B.Sc. – V Semester
ACADEMIC YEAR: 2023-24

Course: WEB INTERFACE DESIGNING TECHNOLOGIES

Course Code: CS205307-6A

No. of Hours/Week: 4

Paper : VI-A

Course Objective:

To provide knowledge about Web architecture and services and inculcate the competency of building a Website.

Course Outcomes:

At the end of the course the student will be able to

1. Understand and appreciate the web architecture and services.
2. Gain knowledge about various components of a website.
3. Demonstrate skills regarding creation of a static website and an interface to dynamic website.
4. Learn how to install word press and gain the knowledge of installing various plugins to use in their websites.

Unit - I

HTML: Introduction to web designing, difference between web applications and desktop applications, introduction to HTML, HTML structure, elements, attributes, headings, paragraphs, styles, colours, HTML formatting, Quotations, Comments, images, tables, lists, blocks and classes, HTML CSS, HTML frames, file paths, layout, symbols, HTML responsive.

Unit – II (Skill)

HTML forms: HTML form elements, input types, input attributes, HTML5, HTML graphics, HTML media – video, audio, plug INS, you tube.

HTML API'S: Geo location, Drag/drop, local storage, HTML SSE.

CSS: CSS home, introduction, syntax, colours, back ground, borders, margins, padding, height/width, text, fonts, icons, tables, lists, position, over flow, float, CSS combinators, pseudo class, pseudo elements, opacity, tool tips, image gallery, CSS forms, CSS counters, CSS responsive.

Unit – III (Employability)

Client side Validation: Introduction to JavaScript - What is DHTML, JavaScript, basics, variables, string manipulations, mathematical functions, statements, operators, arrays, functions. Objects in JavaScript - Data and objects in JavaScript, regular expressions, exception handling. **DHTML with JavaScript - Data validation, opening a new window, messages and confirmations, the status bar, different frames, rollover buttons, moving images.**

Unit – IV (Skill)

Word press: Introduction to word press, servers like wamp, bitnami etc, installing and configuring word press, understanding admin panel, working with posts and pages, using editor, text formatting with shortcuts, working with media-Adding, editing, deleting media elements, working with widgets, menus.

Unit – V Enterprenership)

Working with themes-parent and child themes, using featured images, configuring settings, user and user roles and profiles, adding external links, extending word press with plug-ins. Customizing the site

Additional Inputs: Changing the appearance of site using css, protecting word press website from hackers, Wordpress Security and Automated Backups in Wordpress

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Chris Bates, Web Programming Building Internet Applications, Second Edition, Wiley (2007)
2. Paul S.WangSanda S. Katila, an Introduction to Web Design plus Programming, Thomson (2007).

Reference Books:

1. Head First HTML and CSS, Elisabeth Robson, Eric Freeman, O'Reilly Media Inc.
2. An Introduction to HTML and JavaScript: for Scientists and Engineers, David R. Brooks. Springer, 2007
3. Schaum's Easy Outline HTML, David Mercer, Mcgraw Hill Professional.
4. Word press for Beginners, Dr.Andy Williams.
5. Professional word press, Brad Williams, David damstra, Hanstern.
6. Web resources:
 - a. <http://www.codecademy.com/tracks/web>
 - b. <http://www.w3schools.com>
 - c. <https://www.w3schools.in/wordpress-tutorial/>
 - d. <http://www.homeandlearn.co.uk>

III B.Sc. – V Semester

Course: WEB INTERFACE DESIGNING TECHNOLOGIES LAB

(Skill, Employability, Entrepreneurship)

Course Code: CS205307-6AP

No. of Hours/Week: 2

Course Objective:

To inculcate knowledge on web architecture, web services, client side and server side scripting technologies and to provide skills to design interactive and dynamic web sites.

Course Outcomes:

At the end of the course the student will be able to

1. Create a basic website with the help of HTML and CSS.
2. Acquire the skill of installing word press and various plugins of Word press.
3. Create a static website with the help of Word press.
4. Create an interface for a dynamic website.
5. Apply various themes for their websites using Word press.

List of Experiments

HTML and CSS:

1. Create an HTML document with the following formatting options:

(a) Bold, (b) Italics, (c) Underline, (d) Headings (Using H1 to H6 heading styles), (e) Font (Type, Size and Color), (f) Background (Colored background/Image in background), (g) Paragraph, (h) Line Break, (i) Horizontal Rule, (j) Pre tag

2. Create an HTML document which consists of:

(a) Ordered List (b) Unordered List (c) Nested List (d) Image

3. Create a Table with four rows and five columns. Place an image in one column.

4. Using “table” tag, align the images as follows:



5. Create a menu form using html.

6. Style the menu buttons using css.

7. Create a form using HTML which has the following types of controls:

(a) Text Box (b) Option/radio buttons (c) Check boxes (d) Reset and Submit buttons

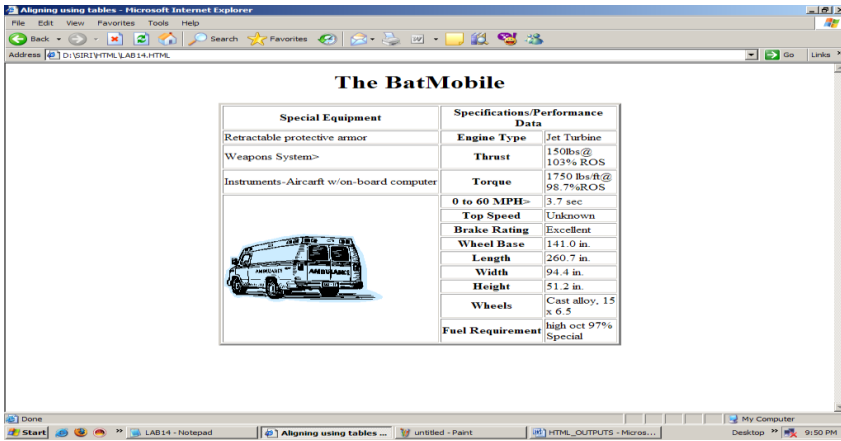
8. Embed a calendar object in your web page.

9. Create an applet that accepts two numbers and perform all the arithmetic operations on them.

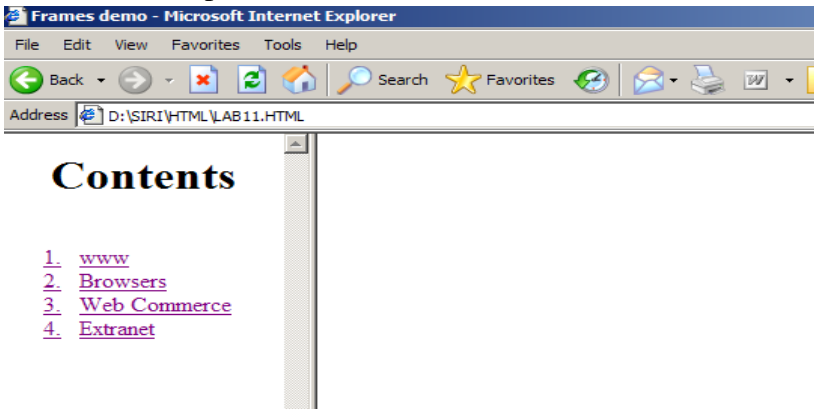
10. Create nested table to store your curriculum.

11. Create a form that accepts the information from the subscriber of a mailing system.

12. Design the page as follows:



13. Create a help file as follows:



14. Create a webpage containing your bio data (assume the form and fields).

15. Write a html program including style sheets.

16. Write a html program to layers of information in web page.

17. Create a static webpage.

Word press:

18. Installation and configuration of word press.

19. Create a site and add a theme to it.

20. Create a child theme

21. Create five pages on COVID – 19 and link them to the home page. .

22. Create a simple post with featured image.

23. Add an external video link with size 640 X 360.

24. Create a user and assign a role to him.

25. Create a login page to word press using custom links

26. Create a website for your college.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN(A)
DEPARTMENT OF COMPUTER SCIENCE
III B.Sc. – V Semester

Course: WEB APPLICATIONS DEVELOPMENT USING PHP & MYSQL

Course Code: CS205308-7A

No. of Hours/Week: 4

Paper : VII-A

Course Objective:

To provide knowledge about development of Web Applications

Course Outcomes:

At the end of the course the student will be able to

1. Write simple programs in PHP.
2. Understand how to use regular expressions, handle exceptions, and validate data using PHP.
3. Apply In-Built functions and Create User defined functions in PHP programming.
4. Write PHP scripts to handle HTML forms.
5. Write programs to create dynamic and interactive web based applications using PHP and MYSQL.
6. Know how to use PHP with a MySQL database and can write database driven web pages

Unit-I: (Skill & Entrepreneurship)

The Building blocks of PHP: Variables, Data Types, Operators and Expressions, Constants. Flow Control Functions in PHP:: Switching Flow, Loops, Code Blocks and Browser Output. Working with Functions: What is function?, Calling functions, Defining Functions, Returning the values from User-Defined Functions, Variable Scope, Saving state between Function calls with the static statement, more about arguments.

Unit-II: (Employability & Entrepreneurship)

Working with Arrays: What are Arrays? Creating Arrays, Some Array-Related Functions. Working with Objects: Creating Objects, Object Instance Working with Strings, Dates and Time: Formatting strings with PHP, Investigating Strings with PHP, Manipulating Strings with PHP, Using Date and Time Functions in PHP.

Unit-III: (Employability)

Working with Forms: Creating Forms, Accessing Form Input with User defined Arrays, Combining HTML and PHP code on a single Page, Using Hidden Fields to save state, Redirecting the user, Sending Mail on Form Submission, and Working with File Uploads. Working with Cookies and User Sessions: Introducing Cookies, Setting a Cookie with PHP, Session Function Overview, Starting a Session, Working with session variables, passing session IDs in the Query String, Destroying Sessions and Unsetting Variables, Using Sessions in an Environment with Registered Users.

Unit-IV: (Skill)

Working with Files and Directories: Including Files with include(), Validating Files, Creating and Deleting Files, Opening a File for Writing, Reading or Appending, Reading from Files, Writing or Appending to a File, Working with Directories, Open Pipes to and from Process Using popen(), Running Commands with exec(), Running Commands with system() or passthru()

Unit-V: (Skill, Employability, Entrepreneurship)

Interacting with MySQL using PHP: MySQL Versus MySQLi Functions, Connecting to MySQL with PHP, Working with MySQL Data. **Creating an Online Address Book:** Planning and Creating Database Tables, Creating Menu, Creating Record Addition Mechanism, , **Viewing Records**, Creating the Record Deletion Mechanism, Adding Sub-entities to a Record.

Additional Inputs: Working with Images: Understanding the Image-Creation Process, Necessary Modifications to PHP, Drawing a New Image, Getting Fancy with Pie Charts, Modifying Existing Images, Image Creation from User Input, Building a Web Application: Creating Pages to add and modify entries

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Julie C. Meloni, SAMS Teach yourself PHP MySQL and Apache, Pearson Education (2007).
2. Steven Holzner , PHP: The Complete Reference, McGraw-Hill

Reference Books:

1. Robin Nixon, Learning PHP, MySQL, JavaScript, CSS & HTML5, Third Edition O'reilly, 2014
2. Xue Bai Michael Ekedahl, The web warrior guide to Web Programming, Thomson (2006).
3. Web resources:
 - a. <http://www.codecademy.com/tracks/php>
 - b. <http://www.w3schools.com/PHP>
 - c. <http://www.tutorialpoint.com>



V. N. D.
PRINCIPAL
A.S.D. GOVT. DEGREE COLLEGE (W)
AUTONOMOUS
KAKINADA

III B.Sc. – V Semester
Course: WEB APPLICATIONS DEVELOPMENT USING
PHP & MYSQL LAB

Course Code: CS205308-7AP

No. of Hours/Week: 2

Course Objective:

To inculcate knowledge on web applications using PHP and MYSQL Lab.

Course Outcomes:

At the end of the course the student will be able to

1. Write, debug and implement the Programs by applying concepts and error handling techniques of PHP.
2. Create an interactive and dynamic website.
3. Create a website with reports generated from a database.
4. Write programs to create an interactive website for e-commerce sites like online shopping, etc.

List of Experiments

1. Write a PHP program to Display “Hello”
2. Write a PHP Program to display the today’s date.
3. Write a PHP program to display Fibonacci series.
4. Write a PHP Program to read the employee details.
5. Write a PHP program to prepare the student marks list.
6. Write a PHP program to generate the multiplication of two matrices.
7. Create student registration form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.
8. Create Website Registration Form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.
9. Write PHP script to demonstrate passing variables with cookies.
10. Write a program to keep track of how many times a visitor has loaded the page.
11. Write a PHP application to add new Rows in a Table.
12. Write a PHP application to modify the Rows in a Table.
13. Write a PHP application to delete the Rows from a Table.
14. Write a PHP application to fetch the Rows in a Table.
15. Develop an PHP application to implement the following Operations
 - i. Registration of Users.
 - ii. Insert the details of the Users.
 - iii. Modify the Details.
 - iv. Transaction Maintenance.
 - a) No of times Logged in
 - b) Time Spent on each login.
 - c) Restrict the user for three trials only.
 - d) Delete the user if he spent more than 100 Hrs of transaction.
16. Write a PHP script to connect MySQL server from your website.
17. Write a program to read customer information like cust-no, cust-name, item-purchased, and mob-no, from customer table and display all these information in table format on output screen.
18. Write a program to edit name of customer to “Kiran” with cust-no =1, and to delete record with cust-no=3.
19. Write a program to read employee information like emp-no, emp-name, designation and salary from EMP table and display all this information using table format in your website.
20. Create a dynamic web site using PHP and MySQL.

**A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS) KAKINADA**




(Under the jurisdiction of Adikavi Nannaya University)

Reaccredited by NAAC with B Grade (3rd Cycle)

**1.1.2 Details of courses offered by the institution that focus on Employability/
Entrepreneurship/ Skill development during the year.**



DEPARTMENT OF COMPUTER SCIENCE

Colour	Focusses on
	Skill
	Employability
	Entrepreneurship

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), KAKINADA
DEPARTMENT OF COMPUTER APPLICATIONS
ACADEMIC YEAR: 2023-2024

B.Com. (C.A.) I Year – I Semester

FUNDAMENTALS OF COMMERCE

Course Code: BCOM23101

No. of Hours/Week: 5

Course Objectives:

The objective of this paper is to help students to acquire conceptual knowledge of the Commerce, Economy and Role of Commerce in Economic Development. To acquire Knowledge on Accounting and Taxation.

Course Outcomes:

At the end of the course, the student will able to

1. Identify the role commerce in Economic Development and Societal Development. Equip with the knowledge of imports and exports and Balance of Payments.
2. Develop the skill of accounting and accounting principles.
3. Acquire knowledge on micro and micro economics and factors determine demand and supply.
4. Understand Indian Tax system and various taxes levied on in India.
5. Acquire skills on web design and digital marketing.

Unit 1: Introduction: Definition of Commerce – Role of Commerce in Economic Development - Role Commerce in Societal Development. Imports and Exports, Balance of Payments. World Trade Organization.

Unit 2: Economic Theory: Macro Economics – Meaning, Definition, Measurements of National Income, Concepts of National Income. Micro Economics – Demand and Supply. Elasticity of Demand and Supply. Classification of Markets -Perfect Competition – Characteristics – Equilibrium Price, Marginal Utility.

Unit 3: Accounting Principles: Meaning and Objectives Accounting, Accounting Cycle - Branches of Accounting - Financial Accounting, Cost Accounting, Management Accounting. Concepts and Conventions of Accounting – GAAP.

Unit 4: Taxation: Meaning of Tax, Taxation - Types of Tax- Income Tax, Corporate Taxation, GST, Customs & Exercise. Differences between Direct and Indirect Tax – Objectives of Tax- Concerned authorities – Central Board of Direct Taxes (CBDT) and Central Board of Excise and Customs (CBIC).

Unit 5: (Employability)

Computer Essentials: Web Design - Word Press Basics, Developing a Simple Website, Digital Marketing - Social Media Marketing, Content Marketing, Search Engine Optimization (SEO), E-mail Marketing. Data Analytics- Prediction of customer behavior, customized suggestions.

Reference Books:

1. S.P. Jain & K.L Narang, Accountancy - I Kalyani Publishers.
2. R.L. Gupta & V.K. Gupta, Principles and Practice of Accounting, Sultan Chand
3. Business Economics -S.Sankaran, Margham Publications, Chennai.
4. Business Economics - Kalyani Publications.
5. Dr. Vinod K. Singhania: Direct Taxes – Law and Practice, Taxmann Publications.
6. Dr. Mehrotra and Dr. Goyal: Direct Taxes – Law and Practice, SahityaBhavan Publications

B.Com.(C.A.) I Year – I Semester

BUSINESS ORGANISATION

Course Code: BCOM23102

No. of Hours/Week: 5

Course Objectives:

The course aims to acquire conceptual knowledge of business, formation various business organizations. To provide the knowledge on deciding plant location, plan layout and business combinations.

Course Outcomes:

After completing this course a student will have:

1. Ability to understand the concept of Business Organization along with the basic laws and norms of Business Organization.
2. Ability to understand the terminologies associated with the field of Business Organization along with their relevance and to identify the appropriate types and functioning of Business Organization for solving different problems.
3. Ability to apply Business Organization principles to solve business and industry related problems and to understand the concept of Sole Proprietorship, Partnership and Joint Stock Company etc.

Unit 1: Business: Concept, Meaning, Features, Stages of development of business and importance of business. Classification of Business Activities. Meaning, Characteristics, Importance and Objectives of Business Organization.. Difference between Industry & Commerce and Business & Profession, Modern Business and their Characteristics.

Unit 2: Promotion of Business: Considerations in Establishing New Business. Qualities of a Successful Businessman. Forms of Business Organization - Sole Proprietorship, Partnership, Joint Stock Companies & Co-operatives and their Characteristics, relative merits and demerits, Difference between Private and Public Company, Concept of One Person Company.

Unit 3: Plant Location and Layout: Meaning, Importance, Factors affecting Plant Location. Plant Layout - Meaning, Objectives, Importance, Types of Layout. Factors affecting Layout. Size of Business Unit - Criteria for Measuring the Size and Factors affecting the Size. Optimum Size and factors determining the Optimum Size.

Unit 4: Business Combination: Meaning, Characteristics, Objectives, Causes, Forms and Kinds of Business Combination. Rationalization: Meaning, Characteristics, Objectives, Principles, Merits and demerits, Difference between Rationalization and Nationalization.

Unit 5: (Skill)

Computer Essentials: Milestones of Computer Evolution – Computer, Block diagram, generations of computer . Internet Basics - Internet, history, Internet Service Providers, Types of Networks, IP, Domain Name Services, applications. Ethical and Social Implications - Network and security concepts- Information Assurance Fundamentals, Cryptography - Symmetric and Asymmetric, Malware, Firewalls, Fraud Techniques, privacy and data protection

Reference Books:

1. Gupta, C.B., “Business Organisation”, Mayur Publication, (2014).
2. Singh, B.P., Chhabra, T.N., “An Introduction to Business Organisation & Management”, Kitab Mahal, (2014).
3. Sherlekar, S.A. & Sherlekar, V.S, “Modern Business Organization & Management Systems Approach Mumbai”, Himalaya Publishing House, (2000)
4. Bhusan Y. K., “Business Organization”, Sultan Chand & Sons.

B.Com.(C.A.) II Year – II Semester
Course4: OFFICE AUTOMATION TOOLS

Course Code: OAT23202

No. of Hours/Week: 4

Course Objectives:

The objective of this paper is to help students to acquire knowledge on the environment of GUI in Ms-Word and its features. To introduce the fundamentals concepts of using Ms-Word and its features to make it more useful and provide hands on use of Word, Excel and PowerPoint.

Course Outcomes:

After the successful completion of the course, the students will be able:

1. To understand concept of Word Processor and use its features.
2. To use the advanced features of Ms-Word to make day to day usage easier.
3. To work comfortably with Ms-Excel Environment.
4. To create work sheets and user advanced feature of Excel.
5. To create make presentations and inserting multimedia in them.

Unit 1: Introduction to MS Office & MS Word: (Skill)

MS-Word: Features of MS-Word, MS-Word Window components, working with formatted text, Shortcut keys, Formatting documents: Selecting text, Copying & moving data, Formatting characters, changing cases, Paragraph formatting, Indents, Drop Caps, Using format painter, Page formatting, Header & footer, Bullets & numbering, Tabs, Forming tables. Finding & replacing text, go to(F5) command, proofing text (Spell-check, Auto correct).

Case Study:

1. Create a document to write a letter to the DM&HO of the district complaining about Hygienic conditions in your area.
2. Create a document to share your experience of your recent vacation with family.

Unit 2: MS Word Advanced features: (Skill)

Difference between Wizard and Template - Customize the Quick Access Tool Bar – Macros: Purpose – Creating Macro – Using Macro – Storing Macro - ,Inserting pictures: From Computer, Online Pictures – Insert 3d Models - Insert Shapes – Insert Text Box – Insert Equation, Hyperlinks, Tables Insert tables Mail merging, Printing documents, Tables : Insert tables, Mathematical calculations on tables data. Insert Text Box etc.

Case Study:

1. Create a document to send a holiday intimation to all the parents at time about Dasara Vacation.
2. Create a document to create Time Table of you class using tables.

Unit 3: Introduction to MS Excel & Its features: (Skill)

MS-Excel: Excel Features, Spreadsheets, workbooks, creating, saving & editing a workbook, Renaming sheet, cell entries (numbers, labels, and formulas), spell check, find and replace, Adding and deleting rows and columns Filling series, fill with drag, data sort, Formatting worksheet, Functions and its parts, Some useful Functions in Excel (SUM,AVERAGE,COUNT, MAX,MIN, IF),

Case Study:

1. Create a worksheet with you class marks displaying total, average, top marks in the class and least marks in the class.

Unit 4: Ms-Excel Advanced Features: (Skill)

Cell referencing (Relative, Absolute, Mixed), What-if analysis, Introduction to charts: types of charts, creation of charts, printing a chart, printing worksheet – Sort – Filters – View Menu

Case Study:

1. Prepare a chart with height and weights of you class mates in atleast 3 types of charts.
2. Demonstrate the use of Filter with the attendance data of your class.

Unit 5: Ms-PowerPoint and its Applications: (Skill)

MS-Power Point: Features of Power Point, Uses, components of slide, templates and wizards, using template, choosing an auto layout ,using outlines, adding sub headings, editing text, formatting text, using master slide, adding slides, changing color scheme, changing background and shading, adding header and footer, adding cliparts and auto shapes. Various presentation, Working in slide sorter view(deleting, duplicating, rearranging slides),adding transition and animations to slide show, inserting music or sound on a slide, viewing slide show ,Printing slides.

Case Study:

1. Prepare a presentation with your achievements and experiences in College

Additional Inputs:

Create and modify simple macros, Insert and configure form controls, Apply Custom Data Formats and Validation

Note: Concepts from Additional inputs must be excluded from Examinations

Text Books:

1. Computer Fundamentals–Pradeep.K.Sinha:BPBPublications.
2. Fundamentals of Computers -ReemaThareja, Oxford University Press India

References Books

1. Fundamentals of Computer – V . Rajaraman, Printice Hell of India.
2. Introduction to Computers–Peter Norton McGraw-Hill.

B.Com.(C.A.) I Year – II Semester
Course: Office Automation Tools Lab

(Skill, Employability,)

List of Experiments

Course Code: OAT23202P

No. of Hours/Week: 2

Course Objectives:

To provide hands on use of Microsoft Office applications Word, PowerPoint, Spreadsheet and Access databases.

Course Outcomes:

At the end of the course student will be able to

- to perform documentation using MS Word
- to enter and manipulate data in Excel
- to perform presentation skills

List of Experiments

1) Design a visiting card for Managing Director of a company as per the following specification.

- Size of visiting card is 3½×2
- Name of the company with big font
- Phone number, Fax number and E-mail address with appropriate symbols.
- Office and Residence address separated by a line

2) Create a table with following columns and display the result in separate cells for the following

- Emp Name, Basic pay, DA, HRA, Total salary.
- Sort all the employees in ascending order with the name as the key
- Calculate the total salary of the employee
- Calculate the Grand total salary of the employee
- Finding highest salary and
- Find lowest salary

3) Prepare an advertisement to a company requiring software professional with the following

- Attractive page border
- Design the name of the company using WordArt
- Use at least one clipart.
- Give details of the company (use bullets etc)
- Give details of the Vacancies in each category of employee's (Business manager, Software engineers, System administrators, Programmers, Data entry operators) qualification required.

4) Create a letter having following specifications

- Name of the company on the top of the page 2 with big font and good style
- Phone no, Fax no and E-mail address with symbols.
- Main products manufactured by the company
- Slogans if any should be specify in bold at the bottom

5) Create two pages of curriculum vitae of a graduate with the following specifications

- Table to show qualifications with proper headings
- Appropriate left and right margins
- Format ½pageusingtwo-columnapproachabout yourself
- Name on each page at the top right side
- Page no.in the footer on the right side.

6) Write a macro format documents below

- Linespacing“2”(double)
- Paragraphindentof0.1
- Justification formatting style
- Arial font andBoldof14pt-size

7) Create a letter as the main document and create 10 records for the 10 persons use mailmerge to create letter for selected persons among 10.

8) Create an electronic spread sheet in which you enter the following decimal numbers and convert the min to octal, Hexa decimal and binary numbers and vice-versa.

Decimal Numbers: 35,68,95,78,165,225,355,375,465

Binary Numbers: 101,1101,11101,11111,10001,11101111

9) Calculate the net pay of the employees following the conditions below

	A	B	C	D	E	F	G	H	I
1	Employee Number	Employee name	Basic Pay	DA	HRA	GPF	Gross Pay	Income tax	Net Pay
2									

DA :- 56%ofthebasicpayifBasicpayisgreaterthan20000 or else 44%.

HRA:-15%oftheBasicpaysubjecttomaximumofRs.4000.

GPF: -10%ofthebasicpay.

INCOMETAX:-10%ofbasicifBasicpayisgreaterthan20000. Find who is getting highest salary & who is get lowest salary?

10) The ABC Company shows the sales of different product For 5 years. Create BAR Graph, 3D and Pie chart for the following.

A	B	C	D	E	F
S.No.	Year	Pro1	Pro2	Pro3	Pro4
1	1989	1000	800	900	1000
2	1990	800	80	500	900
3	1991	1200	190	400	800
4	1992	400	200	300	1000
5	1993	1800	400	400	1200

11) Create a suitable examination data base and find the sum of the marks (total) of each student and respective, class secured by the student.

Pass: if marks in each subject ≥ 35

Distinction :if average ≥ 75

First class :if average ≥ 60 but < 75

Second class: if average ≥ 50 but less than 60

Third class: if average ≥ 35 but less than 50

Fail: if marks in any subject < 35

12) Enter the following data into the sheet.

Name	Department	Salary
Anusha	Accounts	12000
Rani	Engineering	24000
Lakshmi	Accounts	9000
Purnima	Marketing	20000
Bindu	Accounts	4500
Tejaswi	Accounts	11000
Swetha	Engineering	15000
Saroja	Marketing	45000
Sunitha	Accounts	5600
Sandhya	Engineering	24000
Harika	Marketing	8000

13. Enter the following data in to the sheet.

	Raju	Rani	Mark	Rosy	Ismail	Reshma
English	76	89	43	51	76	87
2ndLang	55	85	78	61	47	33
Maths	65	82	34	58	52	65
Computers	45	91	56	72	49	56
Human Values	51	84	54	64	32	64

Apply the conditional formatting for marks

- 35 below Red
- 35 to 50 Blue
- 51 to 70 Green
- 71 to 100 Yellow

14) Create a presentation using templates.

15) Create a Custom layout or Slide Master for professional presentation.

16) Create a presentation with slide transitions and animation effects.

17) Create a table in PPT and apply graphical representation.

B.Com.(C.A.) II Year – III Semester
Course: Programming with C & C++

Course Code: PC203204

No. of Hours/Week: 2

Course Objective:

To impart basic knowledge of C Programming language so that Students will be able to develop logics and applications to solve real time problems using C and To impart knowledge on fundamentals of Object Oriented Programming.

Course Outcomes:

At the end of the course, the student is expected to demonstrate the following abilities:

1. Develop programming skills in C and C++
2. Learn the syntax and semantics of programming languages C and C++
3. Ability to work with textual information (characters and strings) & arrays
4. Understand functional hierarchical code organization
5. Evaluate comparisons and limitations of the various programming constructs and choose correct one for the task in hand.

Unit I: Introduction and Control Structures (Employability,)

History of 'C' - Structure of C program – C character set, Tokens, Constants, Variables, Keywords, Identifiers – C data types - C operators - Standard I/O in C - Applying if, Nested If, Else-if ladder and Switch Statements.

Unit-II: Loops and Arrays (Employability,)

Use of While, Do While and For Loops - Use of Break and Continue Statements - Array Notation and Representation - Manipulating Array Elements - Using Multi-Dimensional Arrays.

Unit-III: Strings and Functions (Employability,)

Declaration and Initialization of String Variables - String Handling Functions - Defining Functions- Categories of Functions, Types of arguments, Function Call - Call By Value, Recursion

Unit-IV: Principles of Object Oriented Programming (Skill)

Procedure Oriented Programming, Object Oriented Programming, Basic concepts of Object Oriented Programming, Applications of C++, A simple C++ Program, An example with Class, Structure of C++ Program, Creating sourcefile, Compiling and Linking.

Unit V: Classes and Objects: (Skill)

Tokens, Keywords, Declaration of Variables, Dynamic initialization of variables, Specifying a Class, Defining member functions, Function overloading, Operator overloading, Constructors and Destructors, Inheritance and types of Inheritance.

Additional Inputs:

Constructor Overloading, Virtual functions-Advantages & Disadvantages, Structures

Note: Concepts from Additional inputs must be excluded from Examinations

References:

1. E. Balagurusamy "Object oriented programming with C++"
2. R.Ravichandran "Programming with C++"
3. Mastering C by K R Venugopal and Sudeep R Prasad, McGraw Hill
4. Expert C Programming: Deep Secrets Kindle Edition [Peter van der Linden](#)
5. Let Us C [Yashavant Kanetkar](#)
6. The C++ Programming Language [Bjarne Stroustrup](#)
7. C++ Primer [Stanley B. Lippman](#), [Josée Lajoie](#), [Barbara E. Moo](#)

Online Resources:

1. <https://www.tutorialspoint.com/cprogramming/index.html>
<https://www.learn-c.org/>
2. <https://www.programiz.com/c-programming>
3. <https://www.w3schools.in/c-tutorial/>
4. <https://www.tutorialspoint.com/cplusplus/index.html>
5. <https://www.programiz.com/cppprogramming>
6. <http://www.cplusplus.com/doc/tutorial/>
7. <https://www.learn-cpp.org/>
8. <https://www.javatpoint.com/cpp-tutorial>

B.Com.(C.A.) II Year – III Semester
Course: Programming with C & C++ LAB

Course Code: PC203204P

No. of Hours/Week: 2

Course Objective:

To develop programming skills using the fundamentals of C Language and to enable effective usage of arrays, functions and to introduce various Object Oriented Concepts through which the students will be enabled to implement classes, inheritance and operator overloading.

Course Outcomes:

At the end of the course the student will be able to

1. Implement programs using fundamental features of C Language.
2. Solve problems with the use of loops, decision making statements and functions.
3. Implement programs performing various Operations on Arrays
4. Implement programs using constructor.
5. Implement programs to implement inheritance
6. Implement programs for operator overloading

List of Experiments

1. Write C programs for
 - a. Fibonacci Series
 - b. Prime number
 - c. Palindrome number
 - d. Armstrong number.
2. 'C' program for multiplication of two matrices
3. 'C' program to implement string functions
4. 'C' program to swap numbers
5. 'C' program to calculate factorial using recursion
6. 'C++' program to perform addition of two complex numbers using constructor
7. Write a program to find the largest of two given numbers in two different classes using friend function
8. Program to add two matrices using dynamic constructor
9. Implement a class string containing the following functions:
 - a. Overload + operator to carry out the concatenation of strings.
 - b. Overload == operator to carry out the comparison of strings.
10. Program to implement inheritance.

B.Com.(C.A.) II Year – IV Semester
Course: Database Management Systems

Course Code: DBMS204207

No. of Hours/Week: 4

Course Objective:

To present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS.

Course Outcomes:

At the end of the course, the students is expected to demonstrate the following abilities (thinking skill) and psychomotor skills.

1. Understand the role of a database management system in an organization.
2. Understand basic database concepts, including the structure and operation of the relational data model.
3. Understand and successfully apply logical database design principles, including E-R diagrams and database normalization
4. To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS using SQL
5. Perform PL/SQL programming

Unit I: Overview of Database Management System (Skill)

Introduction, Data and Information, Database, Database Management System, Objectives of DBMS, Evolution of Database Management System, **Classification of Database Management System.**

Unit-II: File-Based System

File Based System. Drawbacks of File-Based System, DBMS Approach, Advantage of DBMS, Data Models, Components of Database System, Database Architecture, DBMS Vendors and their products.

Unit-III: Entity-Relationship Model (Skill, Employability)

Introduction, The Building Blocks of an Entity-Relationship, **Classification of Entity Set, Attribute Classification, Relationship Degree, Relationship Classification, Generalization and Specialization,** Aggregation and Composition, CODD's Rules, Relational Data Model, Integrity Constraints: General constraints, **Key Constraints,** Referential Integrity Constraints, Domain Constraints, Concept of Relational Integrity.

Unit-IV: Structured Query Language (Employability)

Introduction, History of SQL Standards, Commands in SQL, Data types in SQL, **Data Definition Language (DDL),** Selection Operation Projection Operation, Aggregate Functions, **Data Manipulation Language, Table Modification, Table Truncation,** Imposition of Constraints, Set Operations

Unit V:PL/SQL (Employability)

Introduction, Structure of PL/SQL,PL/SQL Language Elements, Data Types, Control Structure, Steps to Create a PL/SQL Program, Iterative Control Cursors, Steps to Create a Cursor, Exceptions Handling, Database Triggers, Types of triggers.

Additional Inputs:

Functional Dependencies, Loss-less Join, Dependency preserving decomposition, Normalization

Note: Concepts from Additional inputs must be excluded from Examinations

References:

1. David Kuklinski, Osborne, Data management system McGraw Hill Publication.
2. Paneerselvam:Database Management system,PHI.
3. Shgirley Neal And Kenneth LC Trunik Database management system in Business-PHI.
4. Godeon C. EVEREST, Database Management-McGraw Hill Book Company.
5. MARTIN,Database Management-Prentice Hall of India, New Delhi.
6. Bipin C.Desai ,`An Introduction to Database System`,Galgotia Publications
7. Korth, Database Management System.
8. Navathe, Database Management System.
9. S. Sumathi, S. Esakkirajan,Fundamentals of Relational Database Management System

Online resources:

1. <http://www.onlinegdb.com/>
2. <http://www.tutorialspoint.com/>
3. <http://learnsql.com>
4. <https://www.codecademy.com/learn/learn-sql/>
5. <https://www.w3schools.com/sql/default.asp>

B.Com.(C.A.) II Year – IV Semester
Course: Database Management Systems Lab

Course Code: DBMS204207P

No. of Hours/Week: 2

Course Objective:

To provide a strong formal foundation in database concepts and emphasis is on practice to the students to groom them into well-informed database application developers.

Course Outcomes:

At the end of the course the student will be able to

1. Design database for the real world scenarios
2. Make use of SQL and PL/SQL to efficiently retrieve and maintain relational database.

List of Experiments

1. Create tables department and employee with required constraints.
2. Initially only the few columns (essential) are to be added. Add the remaining columns separately by using appropriate SQL command.
3. Basic column should not be null
4. Add constraint that basic should not be less than 5000.
5. Calculate HRA, DA, Gross and net by using PL/SQL program.
6. The percentage of HRA and DA are to be stored separately.
7. When the DA becomes more than 100%, a message has to be generated and with user permission has to be merged with basic.

B.Com.(C.A.) III Year – V Semester
Course: MOBILE APPLICATION DEVELOPMENT

Course Code: MAD205207-6C

No. of Hours/Week: 4

Course Outcomes:

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

1. Identify basic terms ,tools and software related to android systems
2. Describe components of IDE, understand features of android development tools
3. Describe the layouts and controls and identify the significance of displays using the given view
4. Explain the features of services and able to publish android Application
5. Developing interesting Android applications using MIT App Inventor

Unit I: (Skill)

- 1.1 Introduction to Android ,open headset alliance, Android Ecosystem
- 1.2 Need of Android
- 1.3 Features of Android
- 1.4 Tools and software required for developing an Application

Unit-II: (Skill)

- 2.1 operating system, java JDK, Android SDK
- 2.2 Android development tools
- 2.3 Android virtual devices
- 2.4 steps to install and configure Android studio and sdk
- 2.5 Android activities

Unit-III: (Employability)

- 3.1 control flow, directory structure
- 3.2 components of a screen
- 3.3 fundamental UI design
- 3.4 linear layout, absolute layout , table layout
- 3.5 text view
- 3.6 edit text
- 3.7 button, image button, radio button
- 3.8 radio group, check box, and progress bar
- 3.9 list view, grid view, image view, scroll view
- 3.10 time and date picker
- 3.11 toast

Unit-IV:

- 4.1 android platform services
- 4.2 Android system Architecture
- 4.3 Android Security model

Unit V:

- 5.1 Introduction of MIT App Inventor
- 5.2 Application Coding
- 5.3 Programming Basics & Dialog

5.4 Audio& Video

5.5 File

Additional Inputs:

Android- Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings

Note: Concepts from Additional inputs must be excluded from Examinations

References:

1. Erik Hellman, “Android Programming – Pushing the Limits”, 1st Edition, Wiley India Pvt Ltd, 2014.
2. App Inventor: create your own Android apps by Wolber, David (David Wayne)

B.Com.(C.A.) III Year – V Semester

Course: CYBER SECURITY AND MALWARE ANALYSIS

Course Code: CMA2052087C

No. of Hours/Week: 3

Course Outcomes:

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

1. Understand the computer networks, networking tools and cyber security
2. Learn about NIST Cyber Security Framework
3. Understand the OWASP Vulnerabilities
4. Implement various Malware analysis tools
5. Understand about Information Technology act 2000

Unit I: Introduction to Networks & cyber security (Skill)

- a. Computer Network Basics
- b. Computer network types
- c. OSI Reference model
- d. TCP/IP Protocol suite
- e. Difference between OSI and TCP/IP
- f. What is cyber, cyber-crime and cyber-security
- g. All Layer wise attacks
- h. Networking devices: router, bridge, switch, server, firewall
- i. How to configure: router
- j. How to create LAN

Unit-II: NIST Cyber security framework

- k. Introduction to the components of the framework
- l. Cyber security Framework Tiers
- m. What is NIST Cyber security framework
- n. Features of NIST Cyber security framework
- o. Functions of NIST Cyber security framework
- p. Turn the NIST Cyber security Framework into Reality/ implementing the framework

Unit-III: OWASP

- q. What is OWASP?
- r. OWASP Top 10 Vulnerabilities
 - i. Injection
 - ii. Broken Authentication
 - iii. Sensitive Data Exposure
 - iv. XML External Entities (XXE)
 - v. Broken Access Control
 - vi. Security Misconfiguration
 - vii. Cross-Site Scripting (XSS)

- viii. Insecure Deserialization
- ix. Using Components with Known Vulnerabilities
- x. Insufficient Logging and Monitoring
- xi. Web Application Firewall**

Unit-IV: MALWARE ANALYSIS (Skill)

- s. What is malware
- t. Types of malware
 - i. Key loggers
 - ii. Trojans
 - iii. Ransomware
 - iv. Rootkits
- u. Antivirus**
- v. Firewalls**
- w. Malware analysis
 - i. VM ware
 - ii. How to use sandbox
 - iii. Process explorer
 - iv. Process monitor

Unit V: CYBER SECURITY: Legal Perspectives

- x. Cybercrime and the legal landscape around the world
- y. Indian IT ACT 2000 --Cybercrime and Punishments
- z. Challenges to Indian law and cybercrime scenario in India

Additional Inputs:

End Point device and Mobile phone, security, Password policy, Security patch management, Data backup, Downloading and management of third party software, Device security policy, Cyber Security best practices

Note: Concepts from Additional inputs must be excluded from Examinations

References:

1. Computer Networks | Fifth Edition | By Pearson (6th Edition)|Tanenbaum, Feamster & Wetherill
2. Computer Networking | A Top-Down Approach | Sixth Edition | By Pearson | Kurose James F. Ross Keith W.
3. Cyber Security by Sunit Belapure, Nina Godbole|Wiley Publications
4. TCP/IP Protocol Suite |Mcgraw-hill| Forouzan|Fourth Edition



V. N. D.
PRINCIPAL
A.S.D. GOVT. DEGREE COLLEGE (W)
AUTONOMOUS
KAKINADA

**A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS) KAKINADA**

(Under the jurisdiction of Adikavi Nannaya University)

Reaccredited by NAAC with B Grade (3rd Cycle)

**1.1.3 Details of courses offered by the institution that focus on employability/
entrepreneurship/ skill development during the year.**

Skill

Employability

Entrepreneurship



DEPARTMENT OF MICROBIOLOGY

A.S.D Govt. Degree College for Women (A), Kakinada

Course-Wise Syllabus: w.e.f 2023-24 AY

B.Sc CBMB	MICROBIOLOGY (Semester: II)	Credits: 3
	INTRODUCTION TO MICROBIOLOGY	Hrs/Wk: 3

Course Outcomes:

On successful completion of the course, the students will be able to

1. Understand the historical significance of microbiology and the contributions of key scientists.
2. Recognize the classification of microorganisms and their place in the living world.
3. Comprehend the scope and applications of microbiology, including the origin of microbial life and the distinction between eukaryotic and prokaryotic cells.
4. Describe the characteristics of bacteria, archaea, fungi, algae, and protozoa.
5. Describe viruses, including their nature, composition, and diversity in structure.
6. Develop practical skills in aseptic techniques, growth media preparation, isolation methods, and the identification of bacteria and fungi.

Unit - 1: History of Microbiology

No. of Hours: 10

1. Discovery of Microscope and microbial world by Anton von Leeuwenhoek; Aseptic techniques with reference to Charak Samhita, Sushruta Samhita and Ignaz Philipp Semmelweis
2. Golden era of Microbiology- Refutation of abiogenesis; Germ theory of Disease; Discovery of vaccination; Discovery of penicillin
3. Major contributions of Scientists: Edward Jenner, Louis Pasteur, Robert Koch, Joseph Lister, Ivanowsky, Martinus Beijerinck and Sergei Winogradsky

Unit - 2: Place of Microorganisms in the living world

No. of Hours: 10

1. Haeckel's three Kingdom concept, Whittaker's five kingdom concept, three domain concept of Carl Woese
2. Definition and scope of Microbiology; Applications of Microbiology; Diverse groups of Microorganisms
3. Origin of microbial life on earth- Timeline, Miller's Experiment, endosymbiosis (cyanobacteria), distinguishing features of eukaryotic and prokaryotic cell

Unit - 3: Prokaryotic microorganisms and Viruses

No. of Hours: 10

1. General characteristics of Bacteria (Morphology, metabolic diversity and reproduction)
2. General characteristics of Archaea differentiating them from Bacteria
3. General characteristics of viruses (Nature, composition, size, host specificity, diversity in structure)

Unit - 4: Eukaryotic microorganisms

No. of Hours: 10

1. **Fungi** - Habitat, nutrition, vegetative structure and modes of reproduction;
2. **Algae**- Habitat, thallus organization, photosynthetic pigments, storage forms of food, reproduction.
3. **Protozoa**–Habitat, cell structure, nutrition, locomotion, excretion, reproduction, encystment.

Unit - 5: Growing Microbes in Lab: Five I's No. of Hours: 05

1. **Inoculation**-Aseptic methods of introducing inoculum to growth media;Composition of basic growth media, solid and liquid
2. **Incubation and Isolation**- Ambient temperature for growth of microorganisms;Concept of **Pure culture, mixed culture and contaminated culture**
3. **Inspection and Identification** - Observation of colour, size and shape of colonies;Wet mount **and simple staining of bacteria and fungi**

Additional inputs:

- Principles of microscopy
- Sterilization and disinfection techniques: physical & chemical methods
- Cold sterilization

MBP- I: Introduction To Microbiology And Microbial Diversity

Skill & Employability

1. Microbiology Good Laboratory Practices and Biosafety.
2. Preparation of culture media for cultivation of bacteria- Nutrient broth & Nutrient agar
3. Preparation of culture media for cultivation of fungi – Sabourauds agar
4. Sterilization of medium using Autoclave
5. Sterilization of glassware using Hot Air Oven
6. Light compound microscope and its handling
7. Microscopic observation of bacteria (Gram +ve bacilli and cocci, Gram -ve bacilli), Algae and Fungi.
8. Simple staining
9. Gram's staining
10. Hanging-drop method& temporary wet mount (TWM) for observation of living microorganisms.
11. Isolation of pure cultures of bacteria by serial dilution and Streak/Spread/Pour Plate Method.
12. Preservation of bacterial cultures by Serial subculturing & Slant Preparation with mineral oil overlay.
13. Observation of electron micrographs of bacterial cells

BSc	MICROBIOLOGY (Semester: III)	Credits: 4
MBT: III	Molecular Biology And Microbial Genetics	Hrs/Wk: 4

Aim and objectives of Course

To understand different biomolecules, analytical techniques, bacterial nutrition, growth and metabolism

Learning outcomes of Course

Up on completion of this course students should able to:

1. Explain working principle and applications of Colorimetry, Chromatography, Spectrophotometry, Centrifugation and Gel Electrophoresis.
2. Knowledge on Microbial nutrition, bacterial growth, metabolism and Respiration.
3. The student will get first-hand experience on separation methods

UNIT- I: Nucleic acids Skill & Employability

No. of hours: 12

DNA and RNA - Role in heredity-The central dogma

Watson and Crick model of DNA

Types of RNA, structure, and functions

Organization of DNA in prokaryotes

UNIT- II : Genetic material and replication Skill & Employability

Experiments which established DNA as genetic material

RNA as genetic material

Mechanism of DNA Replication in Prokaryotes

Proof of semi conservative mechanism of replication (Meselson - Stahl Experiment)

UNIT- III: Gene expression and regulation Skill & Employability

Concept of gene - Muton, recon and cistron.

Genetic code

Protein synthesis - Transcription and translation in Prokaryotes

Regulation of gene expression in bacteria - *lac* operon

UNIT- IV: Mutations, damage and repair Skill & Employability

Outlines of DNA damage and repair mechanism

Mutations - spontaneous and induced

Chromosomal aberrations - deletions, inversions, tandem duplications, insertions

Point mutations- base pair changes, frame shifts

Mutagens - Physical and Chemical mutagens

Bacterial recombination - Transformation, Conjugation, Transduction (Generalized and specialized transductions)

UNIT- V: Genetic engineering: Entrepreneurship Skill & Employability

Basic principles of genetic engineering.

Restriction endonucleases, DNA ligases.

Vectors – plasmids (pBR322), Cosmids, Phagemids, lambda phage vector, M 13 vectors.

Outlines of gene cloning methods.

Polymerase chain reaction. Genomic and cDNA libraries.

General account on application of genetic engineering in industry, agriculture, and medicine.

MBP – III: MOLECULAR BIOLOGY AND MICROBIAL GENETICS

Entrepreneurship Skill & Employability

1. Study of different types of DNA and RNA using micrographs and model / schematic representations.
2. Study of semi-conservative replication of DNA through micrographs / schematic representations
3. Isolation of genomic DNA from *E. coli*
4. Estimation of DNA using UV spectrophotometer.
5. Resolution and visualization of DNA by Agarose Gel Electrophoresis.
6. Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS - PAGE).
7. Problems related to DNA and RNA characteristics, Transcription and Translation.
8. Induction of mutations in bacteria by UV light.
9. Instrumentation in molecular biology - Ultra centrifuge, Transilluminator, PCR

BSc	MICROBIOLOGY (Semester: IV)	Credits: 4
MBT: IV	Immunology And Medical Microbiology	Hrs/Wk: 4

Aim and objectives of Course

To study types of immunity, immune organs, cells, antibodies and antigen-antibody interactions.

To learn diagnostic and pathogenesis of various diseases. Antimicrobial defense and different toxins and vaccines.

Learning outcomes of Course

Up on completion of the course students able to

1. Explain Non-specific body defence and the immune response
2. Develop knowledge on disease transmission and control
3. Demonstrate on collection and handling of laboratory specimens
4. Develop an information making personal health decision in regard to infectious diseases.
5. Student can safeguard himself & society and can work diagnostics and hospitals.

UNIT-I: Immune System Skill & Employability

Concept of Innate and Adaptive immunity

Primary and secondary organs of immune system - thymus, bursa fabricus, bone marrow, spleen, lymph nodes.

Cells of immune system- Identification and function of B and T lymphocytes, null cells, monocytes, macrophages, neutrophils, basophils and eosinophils
Complement system (in brief)

UNIT-II : Immune response Skill oriented

Characteristics of antigen (Foreignness, Molecular size, Heterogeneity and solubility)
Haptens.

Antibodies - basic structure and types and functions (Immune complex formation and elimination - Agglutination, Precipitation, Neutralization, Complement fixation, Phagocytosis)

Generation of Humoral Immune Response (Plasma and Memory cells)

Generation of Cell Mediated Immune Response

MHC- Functions of MHC I & II molecules

Hypersensitivity- definition and types (in brief)

Autoimmunity (in brief)

UNIT- III: Microbes in Health and Disease Skill & Employability

Normal flora of human body.

Definitions - Infection, Invasion, Pathogen, Pathogenicity, Virulence, Toxigenicity, Opportunistic infections, Nosocomial infections.

General account on microbial diseases – causal organism, pathogenesis, epidemiology, diagnosis, prevention, and control of the following

Bacterial diseases - Tuberculosis, Typhoid.

Fungal diseases - Candidiasis.

Protozoal diseases - Malaria.

Viral Diseases – Corona virus and AIDS

UNIT- IV: Principles of Diagnosis Entrepreneurship Skill & Employability

General principles of diagnostic microbiology- Collection, transport of clinical samples

Identification by Culturing & Biochemical characteristics (IMViC)

Identification by molecular assays (PCR, RT-PCR, DNA probes)

Identification by serological tests (ELISA, Immunofluorescence, Agglutination based tests, Complement fixation)

UNIT- V: Prevention and Treatment Skill oriented & Employability

Vaccines

Monoclonal antibodies- Production and application

Antimicrobial agents- General modes of action of antibacterial (Penicillin), antifungal (Amphotericin), antiviral (Amantadine) agents

Interferons

Tests for antimicrobial susceptibility (Disc diffusion)

Antibiotic resistance in bacteria

MBP -V: IMMUNOLOGY AND MEDICAL MICROBIOLOGY

Skill & Employability

1. Identification of human blood groups.
2. Separate serum from the blood sample (demonstration).
3. Immunodiffusion by Ouchterlony method.
4. Identification of any of the bacteria (*E. coli*, *Pseudomonas*, *Staphylococcus*, *Bacillus*) using laboratory strains on the basis of cultural, morphological and biochemical characteristics: IMViC, urease production and catalase tests
5. Study of composition and use of important differential media for identification of bacteria: EMB Agar, McConkey agar, Mannitol salt agar
6. Antibacterial sensitivity by Kirby-Bauer method
6. Determination of Minimal Inhibitory Concentration (MIC) of an antibiotic
7. Study symptoms of the diseases with the help of photographs: Anthrax, Polio, Herpes, chicken pox, HPV warts, Dermatomycoses (ring worms)
8. Study of various stages of malarial parasite in RBCs using permanent mounts.
9. Phenol coefficient test
10. Isolation of Normal flora of human body (Hands, Feet, Nostrils, Teeth Surface) by swab method.
11. Evaluation of Hand Sanitizer Effectiveness by Filter Paper Disc Method & thumb impression method.

BSc	MICROBIOLOGY (Semester: IV)	Credits: 4
MBT: V	Microbial Ecology And Industrial Microbiology	Hrs/Wk: 4

Aim and objectives of Course

1. To study role of microorganisms in nutrient cycling, microorganism in waste treatment and degradation of xenobiotics
2. To determine the potability of drinking water
3. To study concepts of screening and strain improvement, media, Fermentation, assays with examples of industrially important processes

Learning outcomes of Course

Up on completion of the course students able to

1. Understand fundamental concept in soil microbial diversity, basic concept of biogeochemical cycles and plant growth promotion and plant diseases
2. Understands the role of microorganisms in treatment of solid and liquid waste.
3. Acquire knowledge on application of microorganisms in agro – environmental fields.
4. Get basic information design of fermenter, fermentation processes and Single cell proteins.
5. Self-reliance in the industrial application of Microbiology in life and industry.
6. Entrepreneurship can be established with the gained knowledge.

UNIT - I: Microbial Ecology Skill No. of hours: 12

Role of microorganisms in Biogeochemical cycles (Carbon, nitrogen, phosphorus)

Microbe-microbe interactions - Synergism, mutualism, commensalism, antagonism, competition, parasitism, predation

Plant- Microbe interactions - Plant growth promoting Microorganisms, Plant pathogens

UNIT - II : Microorganisms in Environment Employability, Skill oriented

Microbes in waste management- solid and liquid waste (aerobic and anaerobic)

Microbes in degradation of Xenobiotics

Microbes in drinking water- detection of potability by (a) standard qualitative procedure: presumptive test/MPN test, confirmed and completed tests for faecal coliforms (b) Membrane filter technique

Microbes in food - intrinsic and extrinsic parameters that affect microbial growth in food

UNIT - III: Industrial Microbiology No. of hours: 12

Industrial important Microorganisms- Yeasts & Moulds , Bacteria , Actinomycetes .

Screening techniques.

Strain improvement techniques.

UNIT -IV: Fermentation processes Skill, Employability & Enterpreneurship

Design of fermenter (for control of pH, temperature, dissolved oxygen, foaming and aeration)

Types of fermentation processes - solid state, liquid state, batch, fed-batch, continuous.

Fermentation media (Carbon source, nitrogen source, minerals, vitamins & growth factors, Buffers, Precursors, Antifoam agents, water, oxygen)

Examples of Crude media; molasses, corn- steep liquor, sulphite waste liquor, whey.

Downstream processing - filtration, centrifugation, cell disruption, solvent extraction.

UNIT-V:Microbialproductions:Enterpreneurship Microbial

production of Industrial products: Citric acid, Ethanol, Penicillin, Glutamic acid, vitamin B12, Amylase, Yogurt

Microbial cells as food- SCP

- a. **Additional Input:** Determination of quality of different water samples by MPN method and Mushroom cultivation

MBP - V: MICROBIAL ECOLOGY AND INDUSTRIAL MICROBIOLOGY

Skill, Employability & Entrepreneurship

1. Microbial fermentation for the production and estimation of ethanol
2. Isolation of amylase producing microorganisms from soil
3. Isolation of food spoilage microorganisms from spoiled food sample.
4. MPN test
5. Demonstration of fermenter
6. Production of wine from grapes
7. Growth curve and kinetics of any two industrially important microorganisms.
8. Microbial fermentation for the production and estimation of citric acid
9. Preparation of yoghurt.
10. Crowded plate technique
11. Isolation of microorganism from soil
12. Isolation of microorganism from different water samples



V. N. O.
PRINCIPAL
A.S.D. GOVT. DEGREE COLLEGE (W)
AUTONOMOUS
KAKINADA

A.S.D Govt. Degree College for Women (A), Kakinada

III BSc Microbiology Syllabus

BSc	Semester: V (Skill Enhancement Course- Elective)	Credits: 2
MB T A1 A- PAIR	Food, Agriculture And Environmental Microbiology	Total hours 40

Aim and objectives of Course

To provide knowledge on important microbes in food, Agriculture and Environmental Microbiology

Learning outcomes of Course

Up on completion of the course students able to

CO1: Demonstrate with the wide diversity of microbes and their spoilage food, food intoxication and food born infections

CO2: Able to understand principles of food preservation, fermented foods and microbes as food.

CO3: The student will acquire knowledge on application of microorganisms in agro – environmental fields

CO4: Get fundamental concepts in principles of plant disease control an industrial application of Microbiology

CO5: The student will have fundamental concepts in soil microbiology and soil water and aero microbial diversity and microbial interactions Basic concepts in treatment of drinking water.

Understands the role of microorganisms in treatment of solid and liquid waste.

UNIT – 1 Skill, Employability

Intrinsic and extrinsic parameters that affect microbial growth in food

Microbial spoilage of food - fruits, vegetables, milk, meat, egg, bread and canned foods

Food intoxication (botulism).

Food-borne diseases (salmonellosis) and their detection.

UNIT – II Skill, Employability & Entrepreneurship

Principles of food preservation - Physical and chemical methods.

Fermented Dairy foods – cheese and yogurt.

Microorganisms as food – SCP, edible mushrooms (white button, oyster and paddy straw).
Probiotics and their benefits.

UNIT – III Skill, Employability & Entrepreneurship

No. of Hours: 8

Soil Microbiology: Microbial groups in soil, microbial transformations of carbon, nitrogen, phosphorus and sulphur.

Biological nitrogen fixation.

Microflora of Rhizosphere and Philosopher microflora, microbes in composting.

Importance of mycorrhizal inoculums, types of mycorrhizae associated plants, mass inoculums. **Production of VAM, field applications** of Ectomycorrhizae.

UNIT - IV

No. of Hours: 8

Beneficial microorganisms in Agriculture: Biofertilizer (Bacterial Cyanobacterial and Fungal), microbial insecticides, Microbial agents for control of Plant diseases.

Plant – Microbe interactions.

Diseases caused by bacteria and fungi to various commercial crops: groundnut rust & Citrus canker and food crops: **Rice Blast** (*Pyriculariaoryzae*) Bacterial blight of rice (*Oryza sativa* and *O. glaberrima*)

UNIT – V Skill, Employability

No. of Hours: 12

Terrestrial Environment: Soil profile and soil microflora. Aquatic Environment: Microflora of fresh water and marine habitats. Atmosphere: Aeromicroflora and dispersal of microbes. Extremophiles.

Concept of single cell proteins, probiotics and their applications. Biodegradation, **Biogas production, Biodegradable plastics.**

MBP – FOOD, AGRICULTURE AND ENVIRONMENTAL MICROBIOLOGY

Skill, Employability & Entrepreneurship

1. Isolation of bacteria and fungi spoiled bread / fruits / vegetables
2. Preparation of yogurt / dahi
3. Determination of microbiological quality of milk sample by MBRT
4. Enumeration of bacteria, fungi and actinomycetes from soil
5. Enumeration and identification of rhizosphere micro flora
6. Isolation of rhizobium from root nodules.
7. Isolation of azatobacter from soil.
8. Observation description of any three bacterial and fungal plant diseases
9. Staining and observation of VAM.
10. Analysis of soil - pH, Moisture content and water holding capacity.
11. Study of air flora by petriplate exposure method.
12. Analysis of potable water: SPC, Presumptive, confirmed and completed test, determination of coli form count in water by MPN.
13. Determination of Biological Oxygen Demand (BOD) of waste water samples.

A.S.D Govt. Degree College for Women (A), Kakinada

III B.Sc Microbiology Syllabus

BSc	Semester: V (Skill Enhancement Course- Elective)	Credits: 4
MB T A2 A- PAIR: A2	Management Of Human Microbial Diseases And Diagnosis	Total hours 36

Aim and objectives of Course

To realize the principles of prevention and treatment of microbial diseases and to understand the concepts and development of microbial diseases in animals

Learning outcomes of Course

Up on completion of the course students able to

CO1: Develop knowledge and skills on microbiological laboratory skills for identification of pathogens

CO2: Students will demonstrate the collection of clinical samples

CO3: Students will get knowledge on staining techniques

CO4: Students able to perform diagnostic techniques

CO5: To understand drug resistance

UNIT – I Skill oriented

Definition and concept of health, disease, infection, and pathogen.

Bacterial Diseases: Cholera, Pneumonia, and Dysentery.

Viral Diseases: Poliomyelitis & Chicken pox

Fungal diseases: Dermatomycosis and Athletes foot.

UNIT- II Skill, Employability

Collection of clinical samples (oral cavity, throat, skin, blood, CSF, urine and faeces) and precautions required.

Method of transport of clinical samples to laboratory and storage.

UNIT- III: Skill, Employability

Mechanism of bacterial pathogenicity, colonization and growth, virulence, virulence factors, exotoxins, enterotoxins, endotoxins and neurotoxins.

Examination of sample by staining - Gram stain, Ziehl-Neelson staining for tuberculosis,

Giemsa-stained thin blood film for malaria.

Preparation and use of culture media - Blood agar, Chocolate agar, Lowenstein-Jensen medium, Mac Conkey agar. Distinct colony properties of various bacterial pathogens.

UNIT- IV

No. of hours: 6

Serological Methods - Agglutination, ELISA, immunofluorescence, Nucleic acid based methods - PCR, Nucleic acid probes.

Diagnosis of Typhoid, Dengue and HIV, Swine flu.

UNIT- V

No. of hours: 6

Importance, Determination of resistance/sensitivity of bacteria using disc diffusion method,

Determination of minimal inhibitory concentration (MIC) of an antibiotic by serial double dilution method. Problems of drug resistance and drug sensitivity.

Drug resistance in bacteria.

MB P A2: MANAGEMENT OF HUMAN MICROBIAL DISEASES AND DIAGNOSIS

Skill, Employability & Entrepreneurship

1. Collection transport and processing of clinical specimens (Blood, Urine, Stool and Sputum).
Receipts, Labelling, recording and dispatching clinical specimens.
2. Physical, Chemical & microscopic examination of clinical samples – urine, stool, puss, sputum.
3. Isolation and identification of following pathogens from clinical samples: *E.coli*, *Salmonella* and *Pseudomonas*.
4. Demonstration of permanent slides of the following parasites:
 - a) *Entamoeba histolytica*
 - b) *Ascaris spp.*
 - c) *Plasmodium spp.*
 - d) *Mycobacterium tuberculosis* & *Mycobacterium leprae*
5. Estimation of haemoglobin (Acid haematin and cyan methanoglobin method).
6. ESR and PCV determination.
7. Immuno hematology: Blood group typing by slide test & tube for ABO & Rh systems.
8. Isolation of bacteria in pure culture and Antibiotic sensitivity.



V. N. O.
PRINCIPAL
A.S.D. GOVT. DEGREE COLLEGE (W)
AUTONOMOUS
KAKINADA

A.S.D GOVT DEGREE COLLEGE FOR WOMEN (A)

(Re-Accredited by NAAC with 'B')

KAKINADA 533002, EASTGODAVARI, ANDHRA PRADESH

BOTANY SYALLABUS

2023 – 2024



**DEPARTMENT OF BOTANY &
HORTICULTURE**

I B.Sc., BOTANY Honors SYLLABUS
Semester – I For the Academic year 2023-2024
Course I INTRODUCTION TO CLASSICAL BIOLOGY

THEORY:

1.1.2 Employability /Entrepreneurship/skill development topics in course syllabi



Indicates skill development based topics in syllabus



Indicates Employability based topics in syllabus



Indicates entrepreneurship topics in syllabus

Unit 1: Introduction to Systematics, Taxonomy and Ecology.

- 1.1. Systematics – Definition and concept, Taxonomy – Definition and hierarchy.
- 1.2. Nomenclature – ICBN and ICZN, Binomial and trinomial nomenclature.
- 1.3. Ecology – Concept of ecosystem, Biodiversity and conservation.
- 1.4. Pollution and climate change.

Unit 2: Essentials of Botany.

- 2.1. The classification of plant kingdom.
- 2.2. Plant physiological processes(Photosynthesis,Respiration,Transpiration, Phytohormones).
- 2.3. Structure of flower – Micro and macro sporogenesis, pollination, fertilization and structure of mono and dicot embryos.
- 2.4 Mushroom cultivation, floriculture and landscaping.

Unit 3: Essentials of Zoology

- 3.1. The classification of Kingdom Animalia and Chordata.
- 3.2 Animal Physiology – Basics of Organ Systems & their functions, Hormones andDevelopmental Biology – Basic process of development (Gametogenesis, Fertilization,Cleavage and Organogenesis)
- 3.3 Economic Zoology – Sericulture, Apiculture, Aquaculture
- 3.4 Disorders

Unit 4: Cell biology, Genetics and Evolution

- 4.1. Cell theory, Ultrastructure of prokaryotic and eukaryotic cell, cell cycle.
- 4.2. Chromosomes and heredity – Structure of chromosomes, concept of gene.
- 4.3. Central Dogma of Molecular Biology.
- 4.4. Origin of life

Unit 5: Essentials of chemistry

- 5.1. Definition and scope of chemistry, applications of chemistry in daily life.
- 5.2. Branches of chemistry
- 5.3. Chemical bonds – ionic, covalent, noncovalent – Vander Waals, hydrophobic, hydrogen bonds.
- 5.4. Green chemistry

I B.Sc., BOTANY Honors SYLLABUS
Semester – I For the Academic year 2023-2024
Course:II INTRODUCTION TO APPLIED BIOLOGY

Unit 1: Essentials of Microbiology and Immunology

- 1.1. History and Major Milestones of Microbiology; Contributions of Edward Jenner, Louis Pasteur, Robert Koch and Joseph Lister.
- 1.2. Groups of Microorganisms – Structure and characteristics of Bacteria, Fungi, Archaea and Virus.
- 1.3. Applications of Microorganisms in – Food, Agriculture, Environment, and Industry.
- 1.4. Immune system – Immunity, types of immunity, cells and organs of immune system.

Unit 2: Essentials of Biochemistry

- 2.1. Biomolecules I – Carbohydrates, Lipids.
- 2.2. Biomolecules II – Amino acids & Proteins.
- 2.3. Biomolecules III – Nucleic acids - DNA and RNA.
- 2.4. Basics of Metabolism – Anabolism and Catabolism.

Unit 3: Essentials of Biotechnology

- 3.1. History, scope, and significance of biotechnology. Applications of biotechnology in Plant, Animal, Industrial and Pharmaceutical sciences.
- 3.2. Environmental Biotechnology – Bioremediation and Biofuels, Biofertilizers and Biopesticides.
- 3.3. Genetic engineering – Gene manipulation using restriction enzymes and cloning
- 3.4. vectors; Physical, chemical, and biological methods of gene transfer.
- 3.5. Transgenic plants – Stress tolerant plants (biotic stress – BT cotton, abiotic stress – salt tolerance).
Transgenic animals – Animal and disease models.

Unit 4: Analytical Tools and techniques in biology – Applications

- 4.1. Applications in forensics – PCR and DNA fingerprinting
- 4.2. Immunological techniques – Immuno blotting and ELISA.
- 4.3. Monoclonal antibodies – Applications in diagnosis and therapy.
- 4.4. Eugenics and Gene therapy

Unit 5: Biostatistics and Bioinformatics

- 5.1. Data collection and sampling. Measures of central tendency – Mean, Median, Mode.
- 5.2. Measures of dispersion – range, standard deviation and variance. Probability and tests of Significance.
- 5.3. Introduction, Genomics, Proteomics, types of Biological data, biological databases- NCBI, EBI, Gene Bank; Protein 3D structures, Sequence alignment
- 5.4. Accessing Nucleic Acid and Protein databases, NCBI Genome Workbench

I B.Sc. DEGREE EXAMINATION 2023-2024
Botany SEMESTER II - Course -III
NON-VASCULAR PLANTS (Algae, Fungi, Lichens and Bryophytes)

Unit-1: Introduction to Algae

8Hrs.

1. General Characteristics of algae: Occurrence and distribution, cell structure, pigments, flagella and reserve food material.
2. Classification of algae: F.E.Fritsch (1935) and Lee (2008)
3. Thallus organization and life cycles in algae.
4. Ecological and economic importance of algae.

Unit-2: Biology of selected Algae

10Hrs.

1. Occurrence, structure, reproduction and life cycle of:
(a) Chlorophyceae: *Spirogyra* (b) Phaeophyceae: *Ectocarpus*
(c) Xanthophyceae: *Vaucheria* (d) Rhodophyceae: *Polysiphonia*
2. A brief account of Bacillariophyceae
3. Culture and cultivation of *Chlorella*

Unit-3: Introduction to Fungi

8Hrs.

1. General characteristics of fungi and Ainsworth (1973) classification.
2. Thallus organization and nutrition in Fungi.
3. Reproduction in fungi (asexual and sexual); Heterothallism and parasexuality.
4. Ecological and economic importance of fungi

Unit-4: Biology of selected Fungi

10Hrs.

1. Occurrence, structure, reproduction and life cycle of:
(a) Mastigomycotina: *Phytophthora* (b) Zygomycotina : *Rhizopus*
(c) Ascomycotina: *Penicillium* (d) Basidiomycotina: *Puccinia*
2. Occurrence, structure and reproduction of lichens; ecological and economic importance of lichens.

Unit-5: Biology of Bryophytes

9Hrs.

1. General characteristics of Bryophytes; Rothmaler (1951) classification.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life cycle of
(a) Hepaticopsida: *Marchantia* (b) Anthocerotopsida: *Anthoceros*
(c) Bryopsida: *Funaria*
3. General account on evolution of sporophytes in Bryophyta.

Non-Vascular Plants (Algae, Fungi, Lichens and Bryophytes)

Practical

I. Laboratory/field exercises:

Study/ microscopic observation of vegetative, sectional/anatomical and reproductive structures of the following using temporary or permanent slides/ specimens/ mounts:

1. **Algae:** *Spirogyra*, *Ectocarpus*, *Vaucheria* and *Polysiphonia*; a centric and a pennate diatom.
2. Demonstration of culture and cultivation of *Chlorella*
3. Identification of some algal products available in local market.
4. **Fungi:** *Phytophthora*, *Rhizopus*, *Penicillium* and *Puccinia*
5. Identification of some fungal products available in the local market.
6. **Lichens:** Crustose, foliose and fruticose
7. **Bryophyta:** *Marchantia*, *Anthoceros* and *Funaria*.

I B.Sc. DEGREE EXAMINATION 2023-2024
Botany SEMESTER II - Course -IV

COURSE 4: ORIGIN OF LIFE AND DIVERSITY OF MICROBES

Credits -3

SYLLABUS

Unit-1: Origin of life and Viruses

10 Hrs.

1. Origin of life, concept of primary Abiogenesis; Miller and Urey experiment.; discovery of microorganisms, Pasteur experiments, germ theory of diseases.
2. Five kingdom classification of R.H. Whittaker
3. Shape and symmetry of viruses; structure of TMV and Gemini virus.
4. Multiplication of TMV; A brief account of prions, viroids and virusoids; Transmission of Plant viruses and their control.
5. Significance of viruses in vaccine production, bio-pesticides and as cloning vectors.

Unit-2: Special groups of Bacteria

7 Hrs.

1. General characteristics, outline classification and economic importance of following special groups of bacteria:

a) Archaeobacteria b) Chlamydiae c) Actinomycetes

d) Mycoplasma e) Phytoplasma f) Cyanobacteria

2. Culture and cultivation of *Spirulina*

Unit-3: Eubacteria

8 Hrs.

Occurrence, distribution and Cell structure of Eubacteria.

1. Classification of Eubacteria based on nutrition.
2. Reproduction- Asexual (Binary fission and endospores) and bacterial recombination (Conjugation, Transformation, Transduction).
3. Economic importance of Eubacteria with reference to their role in Agriculture and industry (fermentation and medicine).

Unit-4: Soil Microbes – Interactions**10Hrs.**

1. Distribution of Soil microorganisms in soil.
2. Factors influencing the Soil Microflora - Role of microorganisms in soil fertility.
3. Interactions among microorganisms, Mutualism, Commensalism, competition, Ammensalism, parasitism, predation.
4. Microorganisms of Rhizosphere, Phyllosphere and Spermosphere; Microbial interactions and their effect on plant growth.

Unit-5: Microbes in agriculture**10 Hrs.**

1. Mass production, mode of applications, advantages and limitations of bacterial inoculants (*Rhizobium*, *Azotobacter*, *Azospirillum*, Cyanobacteria).
2. Role of Frankia and VAM in soil fertility.
3. Microbial biopesticides: mode of action, factors influencing, target pests; Microbial herbicides

I B.Sc. DEGREE EXAMINATION 2023-2024
Botany SEMESTER II - Course -IV

ORIGIN OF LIFE AND DIVERSITY OF MICROBES

Practical syllabus

Credits -1

I. Laboratory/Field exercises:

1. Microbiology good laboratory practices and biosafety.
2. Study the principle and applications of important instruments (autoclave, hot air oven, incubator, Inoculation loop, Inoculation needle, membrane filter, laminar air flow system, colony counter, biological safety cabinets, BOD incubator, pH meter) used in the microbiology laboratory.
3. Study of Viruses (Gemini and TMV) using electron micrographs/ models.
4. Gram staining technique of Bacteria.
5. Microscopic study of Cyanobacteria using temporary/permanent slides.
6. Microscopic study of Eubacteria using temporary/permanent slides.
7. Study of Archaeobacteria and Actinomycetes using permanent slides/ electron micrographs/diagrams

II B.SC BOTANY SYLLABUS III Semester – Paper – III
For the Academic Year 2023-2024

Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity

UNIT – I: ANATOMY OF ANGIOSPERMS (12 hrs)

1. Organization of apical meristems: Tunica-carpus theory and Histogen theory.
2. Tissue systems–Epidermal, ground and vascular.
3. Anomalous secondary growth in *Boerhaavia* and *Dracaena*.
4. Study of timbers of economic importance - Teak, Red sanders and Rosewood

UNIT – II: EMBRYOLOGY OF ANGIOSPERMS (12 hrs)

1. Structure of anther, anther wall, types of tapetum. Microsporogenesis and development of male gametophyte.
2. Structure of ovule, megasporogenesis; monosporic (*Polygonum*), bisporic (*Allium*) and tetrasporic (*Peperomia*) types of embryo sacs.
3. Outlines of pollination, pollen – pistil interaction and fertilization.
4. Endosperm - Types and biological importance - Free nuclear, cellular, helobial and druminate. Development of Dicot (*Capsella bursa-pastoris*) embryo

UNIT –III: BASICS OF ECOLOGY (12 hrs)

1. Ecology: definition, branches and significance of ecology.
2. Ecosystem: Concept and components, energy flow, food chain, food web, ecological Pyramids.
4. Plants and environment: Climatic (light and temperature), edaphic and biotic factors.
5. Ecological succession: Hydrosere and Xerosere

UNIT – IV: POPULATION, COMMUNITY AND PRODUCTION ECOLOGY (12hrs)

1. Population ecology: Natality, mortality, growth curves, ecotypes, ecads
2. Community ecology: Frequency, density, cover, life forms, biological spectrum
3. Concepts of productivity: GPP, NPP and Community Respiration
4. Secondary production, P/R ratio and Ecosystems.

UNIT – V: BASICS OF BIODIVERSITY

(12hrs)

1. Biodiversity: Basic concepts, Convention on Biodiversity - Earth Summit.
2. Value of Biodiversity; types and levels of biodiversity and Threats to biodiversity
3. Biodiversity Hot spots in India. Biodiversity in North Eastern Himalayas and Western Ghats.
4. Principles of conservation: IUCN threat-categories, RED data book
5. Role of NBPGR and NBA in the conservation of Biodiversity.

II B.Sc. BOTANY SYLLABUS
IV Semester – For the Academic Year 2023-2024
PAPER –IV : PLANT PHYSIOLOGY AND METABOLISM

UNIT – 1: PLANT-WATER RELATIONS

10 HRS.

1. Importance of water to plant life, physical properties of water, diffusion, imbibition, osmosis. water potential, osmotic potential, pressure potential.
2. Absorption and lateral transport of water; Ascent of sap
3. Transpiration: stomata structure and mechanism of stomatal movements (K^+ ionflux).
4. Mechanism of phloem transport; source-sink relationships.

Unit – 2: Mineral nutrition, Enzymes and Respiration

14 Hrs.

1. Essential macro and micro mineral nutrients and their role in plants; symptoms of mineral deficiency
2. Absorption of mineral ions; passive and active processes.
3. Characteristics, nomenclature and classification of Enzymes. Mechanism of enzyme action, enzyme kinetics.
4. Respiration: Aerobic and Anaerobic; Glycolysis, Krebs cycle; electron transport system, mechanism of oxidative phosphorylation, Pentose Phosphate Pathway (HMP shunt).

Unit – 3: Photosynthesis and Photorespiration

12 Hrs.

1. Photosynthesis: Photosynthetic pigments, absorption and action spectra; Red drop and Emerson enhancement effect
2. Concept of two photosystems; mechanism of photosynthetic electron transport and evolution of oxygen; photophosphorylation
3. Carbon assimilation pathways (C_3 , C_4 and CAM);
4. Photorespiration - C_2 pathway

Unit – 4: Nitrogen and lipid metabolism

12 Hrs.

1. Nitrogen metabolism: Biological nitrogen fixation – asymbiotic and symbiotic nitrogen fixing organisms. Nitrogenase enzyme system.
2. Lipid metabolism: Classification of Plant lipids, saturated and unsaturated fatty acids.
3. Anabolism of triglycerides, β -oxidation of fatty acids, Glyoxylate cycle

Unit – 5: Plant Growth - development and stress physiology

12 Hrs.

1. Growth and Development: Definition, phases and kinetics of growth.
2. Physiological effects of Plant Growth Regulators (PGRs) - auxins, gibberellins, cytokinins, ABA, ethylene and brassinosteroids.
3. Physiology of flowering: Photoperiodism, role of phytochrome in flowering.
4. Seed germination and senescence; physiological changes

II B.Sc. Semester IV – For the Academic Year 2023-2024
BOTANY PRACTICAL – IV

PLANT PHYSIOLOGY AND METABOLISM

Practical Syllabus

1. Determination of osmotic potential of plant cell sap by plasmolytic method using *Rhoeo/ Tradescantia* leaves.
2. Calculation of stomatal index and stomatal frequency of a mesophyte and xerophyte.
3. Determination of rate of transpiration using Cobalt chloride method / Ganong's potometer (at least for a dicot and a monocot).
4. Effect of Temperature on membrane permeability by colorimetric method.
5. Study of mineral deficiency symptoms using plant material/photographs.
6. Demonstration of amylase enzyme activity and study the effect of substrate and Enzyme concentration.
7. Separation of chloroplast pigments using paper chromatography technique.
8. Demonstration of Polyphenol oxidase enzyme activity (Potato tuber or Apple fruit)
9. Anatomy of C₃, C₄ and CAM leaves
10. Estimation of protein by biuret method/Lowry method
11. Minor experiments – Osmosis, Arc-auxometer, ascent of sap through xylem, cytoplasmic streaming.

II B.Sc. DEGREE EXAMINATION 2023-2024
(At the End of IV Semester)
BOTANY SYLLABUS PAPER - V
CELL BIOLOGY, GENETICS AND PLANT BREEDING

Unit – 1: The Cell

12 Hrs.

1. Cell theory; prokaryotic vs eukaryotic cell; animal vs plant cell; a brief account on ultra-structure of a Plant cell.
2. Ultra-structure of Cell wall.
3. Ultra-structure of plasma membrane and various theories on its organization.
4. Polymorphic cell organelles (Plastids); ultra structure of chloroplast. Plastid DNA.

Unit – 2: Chromosomes

12 Hrs.

1. Prokaryotic vs eukaryotic chromosome. Morphology of a eukaryotic chromosome.
2. Euchromatin and Heterochromatin; Karyotype and ideogram.
3. Brief account of chromosomal aberrations - structural and numerical changes
4. Organization of DNA in a chromosome (solenoid and nucleosome models).

Unit – 3: Mendelian and Non-Mendelian genetics

14Hrs.

1. Mendel's laws of inheritance. Incomplete dominance and co-dominance; Multipleallelism.
2. Complementary, supplementary and duplicate gene interactions (plant based examples are to be dealt).
3. A brief account of linkage and crossing over; Chromosomal mapping - 2 point and 3 point test cross.
4. Concept of maternal inheritance (Corren's experiment on *Mirabilis jalapa*); Mitochondrial DNA.

Unit – 4: Structure and functions of DNA

12 Hrs.

1. Watson and Crick model of DNA. Brief account on DNA Replication (Semi-conservative method).
2. Brief account on Transcription, types and functions of RNA. Gene concept and genetic code and Translation.
3. Regulation of gene expression in prokaryotes - Lac Operon.

1. Plant Breeding and its scope; Genetic basis for plant breeding. Plant Introduction and acclimatization.
2. Definition, procedure; applications and uses; advantages and limitations of : (a) Mass selection,
(b) Pure line selection and (c) Clonal selection.
3. Hybridization – schemes, and technique; Heterosis (hybrid vigour).
4. A brief account on Molecular breeding – DNA markers in plant breeding. RAPD, RFLP.

II B.Sc. DEGREE EXAMINATION 2023-2024

Practical Syllabus of Botany Semester-IV

Paper-IV-Cell Biology, Genetics and Plant Breeding

(Total hours of laboratory exercises 30 Hrs. @ 02 Hrs. /Week)

Practical Syllabus:

1. Study of ultra structure of plant cell and its organelles using Electron microscopic Photographs/models.
2. Demonstration of Mitosis in *Allium cepa*/*Aloe vera* roots using squash technique; observation of various stages of mitosis in permanent slides.
3. Demonstration of Meiosis in P.M.C.s of *Allium cepa* flower buds using squash technique; observation of various stages of meiosis in permanent slides.
4. Study of structure of DNA and RNA molecules using models.
5. Solving problems monohybrid, dihybrid, back and test crosses.
6. Solving problems on gene interactions (at least one problem for each of the gene interactions in the syllabus).
7. Chromosome mapping using 3- point test cross data.
8. Demonstration of emasculation, bagging, artificial pollination techniques for hybridization.

III B.Sc. DEGREE EXAMINATION 2023-2024

(At the End of V Semester)

BOTANY PAPER - 6A : PLANT PROPAGATION

Unit – 1: Basic concepts of propagation (10h)

1. Propagation: Definition, need and potentialities for plant multiplication; asexual and sexual methods of propagation - advantages and disadvantages.
2. Propagation facilities: Mist chamber, humidifiers, greenhouses, glasshouses, cold frames, hot beds, poly-houses, phytotrons nursery - tools and implements.
3. Identification and propagation by division and separation: Bulbs, pseudobulbs, corms, tubers and rhizomes; runners, stolons, suckers and offsets.

Unit – 2: Apomictics in Plant Propagation (10h)

1. Apomixis: Definition, facultative and obligate; types – recurrent, non-recurrent, adventitious and vegetative; advantages and disadvantages.
2. Polyembryony: Definition, classification, horticultural significance; chimera and bud sport.
3. Propagation of mango, *Citrus* and *Allium* using apomictic embryos.

Unit – 3: Propagation by Cuttings (10h)

1. Cuttings: Definition, different methods of cuttings; root and leaf cuttings.
2. Stem cuttings: Definition of stem tip and section cuttings; plant propagation by herbaceous, soft wood, semi hard wood, hard wood and coniferous stem cuttings.
3. Physiological and bio chemical basis of rooting; factors influencing rooting of cuttings; Use of plant growth regulators in rooting of cuttings.

Unit – 4: Propagation by Layering (10h)

1. Layering: Definition, principle and factors influencing layering.
2. Plant propagation by layering: Ground layering – tip layering, simple layering, trench layering, mound (stool) layering and compound (serpentine layering).
3. Air layering technique – application in woody trees.

Unit – 5: Propagation by Grafting and Budding (10h)

1. Grafting: Definition, principle, types, graft incompatibility, collection of scion wood stick, scion-stock relationship, and their influences, bud wood certification; micrografting.
2. Propagation by veneer, whip, cleft, side and bark grafting techniques.
3. Budding: Definition; techniques of 'T', inverted 'T', patch and chip budding.

III B.Sc. DEGREE EXAMINATION 2023-2024 (At the End of V Semester)

Botany - Paper – VI A

Course -6A: Plant Propagation - Practical syllabus

I. Practical (Laboratory) syllabus: (30hrs):

The following experiments/practices shall be conducted by students in the lab.

1. Preparation of nursery beds – flat, raised and sunken beds.
2. Propagation through apomictic.
3. Propagation by separation and division technique.
4. Propagation by cuttings.
5. Propagation by layering
6. Propagation by grafting.
7. Propagation by budding.
8. Preparation of potting mixture, potting and repotting.

III B.Sc. DEGREE EXAMINATION 2023-2024 (At the End of V Semester)
Botany Syllabus Paper – VIIA SEED TECHNOLOGY

SYLLABUS

Unit - 1: Seed dormancy (10h)

1. Seed and grain: Definitions, importance of seed; structure of Dicot and Monocot seed.
2. Role and goals of seed technology; characteristics of quality seed material.
3. Dormancy: Definition, causes for seed dormancy; methods to break seed dormancy.

Unit – 2: Seed processing and storage (10h)

1. Principles of seed processing: seed pre-cleaning, precuring, drying, seed extraction; cleaning, grading, pre-storage treatments; bagging and labelling, safety precautions during processing.
2. Seed storage; orthodox and recalcitrant seeds, natural longevity of seeds.
3. Factors affecting longevity in storage; storage conditions, methods and containers.

Unit – 3: Seed testing (10h)

1. Definition of seed vigour, viability and longevity; seed sampling and equipment; physical purity analysis.
2. Seed moisture – importance – methods of moisture determination.
3. Seed germination tests using paper, sand or soil – standard germination test; TZ test to determine seed viability; seed health testing.

Unit – 4: Seed borne diseases (10h)

1. A brief account of different seed borne diseases and their transmission.
2. Different seed health testing methods for detecting microorganisms.
3. Management of seed borne diseases; seed treatment methods: spraying and dusting.

Unit – 5: Seed certification (10h)

1. Objectives - Indian seed Act; seed rules and seed order; new seed policy (1988).
2. Seed Inspector: Duties and responsibilities; classes of seeds, phases of certification standards (i.e., Land requirement, isolation distance) etc.
3. Issue of certificates, tags and sealing; pre and post control check: Genetic purity verification, certification, records and reporting

III B.Sc. DEGREE EXAMINATION 2023-2024 (At the End of V Semester)

Botany Syllabus Paper - VIIA

Course -7A: Seed Technology Practical syllabus

II. Practical (Laboratory) syllabus: (30hrs)

1. Determination of physical properties of seeds of 3 select local crops (1 each from cereals, millets, pulses and oil seeds).
2. Breaking seed dormancy in 3 select local crops.
3. Measurement of seed moisture content by O S W A or moisture meter or oven drying method.
4. Seed germination tests and evaluation.
5. Seed vigour - conductivity test.
6. Accelerated ageing tests.
7. Tetrazolium test.
8. Priming and invigoration treatments for improving germination and vigour.
9. Techniques of seed health testing - visual examination of seeds, washing test, incubation methods, embryo count method, seed soak method for the detection of certain seed borne pathogens.
10. Using various types of tools for dusting and spraying pesticides/insecticides.



V. N. O.
PRINCIPAL
A.S.D. GOVT. DEGREE COLLEGE (W)
AUTONOMOUS
KAKINADA

A.S.D GOVT DEGREE COLLEGE FOR WOMEN(A)

(Re-Accredited by NAAC with 'B')

KAKINADA 533002, EASTGODAVARI, ANDHRA PRADESH

HORTICULTURE

2023 – 2024



DEPARTMENT OF HORTICULTURE

A.S.D GOVT. DEGREE COLLEGE FOR WOMEN

(A)

(Re-Accredited by NAAC with 'B')

KAKINADA 533002 EASTGODAVARI, ANDHRA PRADESH
II B.Sc HORTICULTURE THEORY SYLLABUS for the Academic Year 2023-
2024
SEMESTER - III, COURSE – III
**BASICS OF VEGETABLE SCIENCE
(OLERICULTURE)**

**1.1.2 Employability /Entrepreneurship/skill development
topics in course syllabi**



Indicates skill development based topics in syllabus



Indicates Employability based topics in syllabus



Indicates entrepreneurship topics in syllabus

SYLLABUS

Unit – 1 : Introduction to Vegetable Crops **12 Hrs.**

1. Importance of vegetable cultivation in India and Andhra Pradesh.
2. Classification and Nutritive value of vegetables.
3. Area and production of vegetables in India and Andhra Pradesh.
4. Export and import potential of vegetables in India. Constraints in vegetable production and remedies to overcome them.

Unit – 2 : Solanaceous and Leafy Vegetables **12 Hrs.**

Importance, morphology and taxonomy, varieties, climate and soil, seeds and sowing, manuring, irrigation, intercultural operations, diseases and their control, harvesting and yield of following crops:

Cultivation of (a) Brinjal (b) Tomato (c) *Capsicum* (d) Spinach (e) Coriander and (d) *Mentha*

Unit – 3 : Root and Tuber Crops **16 Hrs.**

Importance, morphology and taxonomy, varieties, climate and soil, seeds and sowing, manuring, irrigation, intercultural operations, diseases and their control, harvesting and yield of following crops:

Cultivation of (a) Carrot (b) Beet root (c) Tapioca and (d) *Colocasia*

Unit – 4 : Cole Crops

08 Hrs.

Importance, morphology and taxonomy, varieties, climate and soil, seeds and sowing, manuring, irrigation, intercultural operations, diseases and their control, harvesting and yield of following crops:

Cultivation of (a) Cabbage and (b) Cauliflower

Unit – 5 : Leguminous Vegetables

12 Hrs.

Importance, morphology and taxonomy, varieties, climate and soil, seeds and sowing, manuring, irrigation, intercultural operations, diseases and their control, harvesting and yield of following crops:

Cultivation of (a) Cluster bean (b) Cow pea and (d) *Dolichos*

II Year B.Sc Degree Examinations at the end of II Semester 2023-2024

HORTICULTURE SEMESTER - III, COURSE – III

Practical Exams

BASICS OF VEGETABLE SCIENCE (OLERICULTURE)

1. Demonstration of seed germination test for a vegetable seed.
2. Demonstration of seed viability test.
3. Identification of vegetable seeds and vegetable crops at different growth stages.
4. Preparing vegetable nursery beds.
5. Raising vegetable seedlings in nursery bed and portrays.
6. Identification of major diseases and insect pests of vegetables.
7. Land preparation for sowing/ transplanting of vegetable crops.
8. Sowing/ transplanting of vegetables in main field.
9. Fertilizer application for vegetable growing.
10. Irrigation practices in a vegetable crop field.

II B.Sc HORTICULTURE THEORY SYLLABUS for the Academic Year 2023-2024

SEMESTER - IV, COURSE – IV

**BASICS OF FRUIT SCIENCE (POMOLOGY)
SYLLABUS**

Unit – 1 : Introduction to Fruit crops

12 Hrs.

1. Importance of fruit growing in India and Andhra Pradesh.
2. Nutritive value of fruits.
3. Area and production of India and Andhra Pradesh.
4. Export and import potential of fruits in India. Constraints in fruit production and remedial measures to overcome them.

Unit – 2 : Tropical Fruit Crops **12 Hrs.**

Origin, history, distribution, area and production, uses and composition, varieties, soil and climatic requirements, propagation, planting, training and pruning, manuring and fertilizer application, irrigation, intercropping, harvesting and yield, diseases and pests of the following tropical fruit crops:

(a) Mango (b) Guava and (c) Papaya

Unit – 3 : Sub-tropical and Temperate Fruit Crops **12 Hrs.**

Origin, history, distribution, area and production, uses and composition, varieties, soil and climatic requirements, propagation, planting, training and pruning, manuring and fertilizer application, irrigation, intercropping, harvesting and yield, diseases and pests of the following sub-tropical and temperate fruit crops:

(a) Grapes (b) Pomegranate (c) Citrus and (d) Apple

Unit – 4 : Arid and Minor Fruit crops **12 Hrs.**

Origin, history, distribution, area and production, uses and composition, varieties, soil and climatic requirements, propagation, planting, training and pruning, manuring and fertilizer application, irrigation, intercropping, harvesting and yield, diseases and pests of the following arid fruit crops:

(a) Amla (b) Dates and (c) Wood apple

Unit – 5 : Management Practices for Fruit Crops **12 Hrs.**

1. Sustainable Production Practices for Local Fruit Production.
2. Integrated Orchard Management/Principles of IPM.
3. Harvesting and Labor Concerns
4. Grading, packing, storage and marketing of fruits.

II B.Sc HORTICULTURE PRACTICAL SYLLABUS for the Academic Year

2023-2024

SEMESTER - IV, COURSE – IV

BASICS OF FRUIT SCIENCE (POMOLOGY)

1. Study of varieties of Mango, Papaya and Guava.
2. Study of varieties of Grape, Pomegranate, Citrus and Apple.
3. Study of varieties of Amla, Dates and Wood apple.
4. Manure and fertilizer application including Biofertilizers in different fruit crops.
5. Methods of application, calculation of the required quantity of manure and fertilizers based on the nutrient content.
6. Use of growth regulators in Fruit crops.
7. Identification and collection of important pests in fruit crops.
8. Identification and collection of important diseases in fruit crops and herbarium preparation.
9. Visit to a local fruit market/commercial Orchard.

II B.Sc HORTICULTURE THEORY SYLLABUS for the Academic Year 2023-2024

SEMESTER - IV, COURSE – V

PESTS AND DISEASES OF HORTICULTURE PLANTS AND THEIR MANAGEMENT

SYLLABUS

Unit – 1 : Basics of Entomology and Plant Pathology

12 Hrs.

1. Classification of Insects up to orders and families of economic importance; Study of insect pests (Distribution, host range, biology, nature of damage and management) in horticultural crops.

2. Disease triangle and disease pyramid; Plant Pathology : Definition

3. A general account on symptoms of plant diseases caused by Viruses and Bacteria.

4. A general account on symptoms of plant diseases caused by Fungi.

Unit – 2 : Pests and diseases of Vegetables Crops **12 Hrs.**

1. Bhendi : Spotted boll worms, Red cotton bug, Yellow vein mosaic.

2. Cucurbits : Fruit flies, Pumpkin beetles; Downy and powdery mildews.

3. Potato : Potato tuber moth, Golden cyst nematode; Late blight.

4. Sweet Potato : Sweet potato weevil, Vine borer; Mottled necrosis.

Unit – 3 : Pests and diseases of Fruit crops **12 Hrs.**

1. Coconut : Rhinoceros beetle, Burrowing nematode; Ganoderma root rot, Grey blight

2. Banana : Banana weevil, banana aphids; Panama wilt. Bunchy top

3. Cashew : Tea mosquito bug, Cashew stem borer; Anthracnose, 2. Pink disease

4. Custard apple : Mealy bug, Fruit boring caterpillar; Anthracnose, Glomerella fruit rots.

Unit – 4 : Pests and diseases of Commercial Flower Crops **12 Hrs.**

1. Rose : Rose aphid, Dieback, and black spot

2. Marigold : Aphids, leaf spot, and bud rot

3. Gerbera : Thrips, white flies and Blossom blight

4. Gladiolus : Cut worms, leaf eating caterpillar and corm rot.

Unit – 5 : Management of Pests and Diseases **12 Hrs.**

1. Principles and methods of plant disease management.

2. Integrated Plant disease management.

3. Fungicides classification based on chemical nature; commonly used insecticides, fungicides, bactericides and nematicides.

4. Preparation of fungicidal solutions, slurries, pastes and their application.

II B.Sc HORTICULTURE PRACTICAL SYLLABUS for the Academic Year

2023-2024

SEMESTER - IV, COURSE – V

PESTS AND DISEASES OF HORTICULTURE PLANTS AND THEIR MANAGEMENT

1. Study of characteristics of insect pests, microbial pathogens, nematodes causing diseases on different plants given in the theory syllabus.
2. Identification of disease symptoms on different plants given in the theory syllabus.
3. Observing and acquiring knowledge on pesticides, fungicides etc.,
4. Acquaintance with methods of application of common fungicides.
5. Field visit and acquaintance with disease of crops

A.S.D GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited by NAAC with 'B')
KAKINADA 533002 EASTGODAVARI, ANDHRA PRADESH
III Year B.Sc Degree Examinations at the end of V Semester 2024-2025
HORTICULTURE SEMESTER - V, COURSE – 6A Theory Syllabus
ORNAMENTAL HORTICULTURE
(Skill Enhancement Course (Elective))

SYLLABUS

- Unit -1: Introduction to Ornamental Horticulture** (10h)
1. History, Definition, scope of gardening, aesthetic values; types of gardens in India.
 2. Landscaping, basic principles and basic components.
 3. Principles of gardening, garden components and adornments.
 4. Lawn types, establishment and maintenance; methods of designing rockery and water garden.
- Unit -2: Types of Ornamental gardens** (10h)
1. Special types of gardens, trees, their design, their walk-paths, bridges, constructed features.
 2. Garden structures – greenhouse, glass house, net house.
 3. Values in landscaping; propagation-planting of shrubs and herbaceous perennials.
- Unit-3: Plants in Ornamental gardens** (10h)
1. Importance, design values, propagation, planting of following annuals, biennials and perennials:
(a) Climbers (b) Creepers (c) Palms (d) Ferns (e) Grasses (f) Cacti (g) Succulents
- Unit-4: Ornamental gardening – public utility** (10h)
1. Cultural operations in ornamental gardens.
 2. Bio-aesthetic planning, definition, need; round country planning; urban planning and planting - avenues, educational institutions, villages.
 3. Beautifying railway stations, dam sites, hydroelectric stations, colonies, river banks, Planting material for play grounds.
- Unit-5: Ornamental gardening in residences** (10h)
1. Bottle garden, terrariums.
 2. Vertical gardens, roof gardens.
 3. Culture of bonsai, art of making bonsai

A.S.D GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited by NAAC with 'B')
KAKINADA 533002 EASTGODAVARI, ANDHRA PRADESH
III Year B.Sc Degree Examinations at the end of V Semester 2024-2025
HORTICULTURE SEMESTER - V, COURSE – 6A Practical Syllabus
ORNAMENTAL HORTICULTURE
(Skill Enhancement Course (Elective))

Practical (Laboratory) Syllabus: (30 hrs)

1. Identification and description of various plants grown in ornamental gardens.
2. Tools, implements and containers used in ornamental gardening.
3. Planning, designing and establishment of garden features viz. lawn, hedge and edge, rockery etc.,
4. Demonstration of types and styles of gardens using photos or videos.
5. Planning, designing and establishment of water garden, carpet bedding, shade garden, roof garden.
6. Preparation of land for lawn and planting.
7. Exposure to CAD (Computer Aided Designing)
8. Demonstration of bonsai making.
9. Study and creation of terrariums, vertical garden.

A.S.D GOVT. DEGREE COLLEGE FOR WOMEN (A)

(Re-Accredited by NAAC with 'B')

KAKINADA 533002 EASTGODAVARI, ANDHRA PRADESH

III Year B.Sc Degree Examinations at the end of V Semester 2024-2025

HORTICULTURE SEMESTER - V, COURSE – 7A Theory Syllabus

COURSE 7A: COMMERCIAL FLORICULTURE

(Skill Enhancement Course (Elective))

SYLLABUS

Unit-1: Basic concepts of floriculture (10h)

1. Aesthetic, cultural and industrial importance of flowers; domestic and export marketing of flowers.
2. Floriculture - Importance, area and production in Andhra Pradesh and India.
3. Scope and importance of commercial floriculture in A.P., and India.

Unit-2: Production technology-1 (10h)

1. Production techniques of following flowering plants for domestic and export market:
(a) Rose (b) *Chrysanthemum* (c) Marigold (d) Tuberose (e) *Crossandra* (f) Jasmine

Unit-3: Production technology-2 (10h)

1. Production techniques of following flowering plants for domestic and export market:
(a) *Anthurium* (b) *Gerbera* (c) *Gladiolus* (d) *Dahlia* (e) *Heliconia* (f) Orchid

Unit-4: Plant breeding of flowering ornamentals (10h)

1. Objectives and techniques in ornamental plant breeding.
2. Introduction, selection, hybridization, mutation and biotechnological technique for improvement of following ornamental and flower crops.
(a) Carnation (b) *Petunia* (c) *Geranium* (d) *Cosmos* (e) *Hibiscus* (f) Snapdragon

Unit-5: Post-harvest practices in floriculture (10h)

1. Growing of flowering plants under protected environments such as glass house, plastic house, net house, etc.
2. Importance of flower arrangement; Ikebana - techniques, types, suitable flowers and cut foliage.
3. Post-harvest technology of cut and loose flowers in respect of commercial flower crops.
4. Dehydration techniques for drying of flowers, scope importance and status.

A.S.D GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited by NAAC with 'B')
KAKINADA 533002 EASTGODAVARI, ANDHRA PRADESH
III Year B.Sc Degree Examinations at the end of V Semester 2024-2025
HORTICULTURE SEMESTER - V, COURSE – 7A Practical Syllabus
COURSE 7A: COMMERCIAL FLORICULTURE
(Skill Enhancement Course (Elective))

Practical (Laboratory) Syllabus: (30 hrs)

1. Identification of commercially important floricultural crops.
2. Propagation technique in *Hibiscus/Rose/Chrysanthemum/tuberose*.
3. Propagation technique in *Gladiolus/carnation/Petunia*
4. Sowing of seeds and raising of seedlings of a flowering plant.
5. Training and pruning of rose/Jasminum.
6. Drying and preservation of flowers.
7. Use of chemicals and other compounds for prolonging the vase life of cut flowers.
8. Flower arrangement practices.
9. Preparation of bouquets, garland, veni and gajara.



V. N. O.
PRINCIPAL
A.S.D. GOVT. DEGREE COLLEGE (W)
AUTONOMOUS
KAKINADA

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re- Accredited by NAAC with B Grade)
Jagannaickpur, Kakinada, East Godavari, AP – 533002

DEPARTMENT OF ZOOLOGY & AQUACULTURE TECHNOLOGY

ZOOLOGY

2023-2024



Skill Development, Employability, Entrepreneurship

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)

(Re-Accredited by NAAC with 'B' Grade)
Jagannaickpur, Kakinada, East Godavari, AP – 533002.

ZOOLOGY SEMESTER-I, CORE 1: (2023-2024)

INTRODUCTION TO CLASSICAL BIOLOGY

Theory

Credits: 4

5 hrs./week

Syllabus:

Unit 1: Introduction to Systematics, Taxonomy and Ecology.

- 1.1. Systematics – Definition and concept, Taxonomy – Definition and hierarchy.
- 1.2. Nomenclature – ICBN and ICZN, Binomial and trinomial nomenclature.
- 1.3. Ecology – Concept of ecosystem, **Biodiversity and conservation.**
- 1.4. Pollution and climate change.

Unit 2: Essentials of Botany.

- 2.1. The classification of plant kingdom.
- 2.2. Plant physiological processes (Photosynthesis, Respiration, Transpiration, Phyto hormones).
- 2.3. Structure of flower – Micro and macro sporogenesis, pollination, fertilization and structure of mono and dicot embryos.
- 2.4 **Mushroom cultivation, floriculture and landscaping.**

Unit 3: Essentials of Zoology

- 3.1. The classification of Kingdom Animalia and Chordata.
- 3.2 Animal Physiology – Basics of Organ Systems & their functions, Hormones and Disorders
- 3.3 Developmental Biology – Basic process of development (Gametogenesis, Fertilization, Cleavage and Organogenesis)
- 3.4 **Economic Zoology – Sericulture, Apiculture, Aquaculture**

Unit 4: Cell biology, Genetics and Evolution

- 4.1. Cell theory, **Ultrastructure of prokaryotic and eukaryotic cell**, cell cycle.
- 4.2. Chromosomes and heredity – Structure of chromosomes, concept of gene.
- 4.3. Central Dogma of Molecular Biology.
- 4.4. Origin of life

Unit 5: Essentials of chemistry

- 5.1. Definition and scope of chemistry, **applications of chemistry in daily life.**
- 5.2. Branches of chemistry
- 5.3. Chemical bonds – ionic, covalent, non-covalent – Vander Waals, hydrophobic, hydrogenbonds.
- 5.4. Green chemistry

ADDITIONAL INPUTS:

1. **Scope of Biology** - For better understanding of importance of Biology in other sciences.
2. **Branches of Biology** - For systematic study of living things.
3. **Food chain & food web** – For better understanding the functional aspects of ecosystem
4. **Ecological pyramids** – To understand hierarchy of organisms in the ecosystem
5. **Development of endosperm** – To assess how germinating seed can get energy without leaves (photosynthesis)
6. **Propagation techniques – cutting & grafting** – For better understanding vegetative propagation.
7. **Nucleus** - A brief introduction of Nucleus is need to understand cell cycle
8. **Origin of earth** - To know the atmospheric conditions of earth at the time of life origin.
9. **Periodic Table**- For better understanding of applications of chemical elements in life.

References

1. Sharma O.P., 1993. Plant taxonomy. 2nd Edition. McGraw Hill publishers.
2. Pandey B.P., 2001. The textbook of botany Angiosperms. 4th edition. S. Chand publishers, New Delhi, India.
3. Jordan E.L., Verma P.S., 2018. Chordate Zoology. S. Chand publishers, New Delhi, India.
4. Rastogi, S.C., 2019. Essentials of animal physiology. 4th Edition. New Age International Publishers.
5. Verma P.S., Agarwal V.K., 2006. Cell biology, genetics, Molecular Biology, Evolution and Ecology. S. Chand publishers, New Delhi, India.
6. Sathyanarayana U., Chakrapani, U., 2013. Biochemistry. 4th Edition. Elsevier publishers.
7. Jain J.L., Sunjay Jain, Nitin Jain, 2000. Fundamentals of Biochemistry. S. Chand publishers, New Delhi, India.
8. Karen Timberlake, William Timberlake, 2019. Basic chemistry. 5th Edition. Pearson publishers.

9. Subrata Sen Gupta, 2014. Organic chemistry. 1st Edition. Oxford publishers.

ACTIVITIES:

1. Make a display chart of life cycle of nonflowering plants.
2. Make a display chart of life cycle of flowering plants.
3. Study of stomata
4. Activity to prove that chlorophyll is essential for photosynthesis
5. Study of pollen grains.
6. Observation of pollen germination.
7. Ikebana.
8. Differentiate between edible and poisonous mushrooms.
9. Visit a nearby mushroom cultivation unit and know the economics of mushroom cultivation.
10. Draw the Ultrastructure of Prokaryotic and Eukaryotic Cell
11. Visit to Zoology Lab and observe different types of preservation of specimens
12. Hands-on experience of various equipment – Microscopes, Centrifuge, pH Meter, Electronic Weighing Balance, Laminar Air Flow
13. Visit to Zoo / Sericulture / Apiculture / Aquaculture unit
14. List out different hormonal, genetic and physiological disorders from the society

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited by NAAC with 'B' Grade)
Jagannaickpur, Kakinada, East Godavari, AP – 533002.
ZOOLOGY SEMESTER-I, CORE II: (2023-2024)

INTRODUCTION TO APPLIED BIOLOGY

Syllabus:

Unit 1: Essentials of Microbiology and Immunology

- 1.1. History and Major Milestones of Microbiology; Contributions of Edward Jenner, Louis Pasteur, Robert Koch and Joseph Lister.
- 1.2. Groups of Microorganisms – Structure and characteristics of Bacteria, Fungi, Archaea and Virus.
- 1.3. Applications of microorganisms in – Food, Agriculture, Environment, and Industry.
- 1.4. Immune system – Immunity, types of immunity, cells and organs of immune system.

Unit 2: Essentials of Biochemistry

- 2.1. Biomolecules I – Carbohydrates, Lipids.
- 2.2. Biomolecules II – Amino acids & Proteins.
- 2.3. Biomolecules III – Nucleic acids -DNA and RNA.
- 2.4. Basics of Metabolism – Anabolism and catabolism.

Unit 3: Essentials of Biotechnology

- 3.1. History, scope, and significance of biotechnology. Applications of biotechnology in Plant, Animal, Industrial and Pharmaceutical sciences.
- 3.2. Environmental Biotechnology – Bioremediation and Biofuels, Bio-fertilizers and Bio-pesticides.
- 3.3. Genetic engineering – Gene manipulation using restriction enzymes and cloning vectors; Physical, chemical, and biological methods of gene transfer.
- 3.4. Transgenic plants – Stress tolerant plants (biotic stress – BT cotton, abiotic stress – salt tolerance). Transgenic animals – Animal and disease models.

Unit 4: Analytical Tools and techniques in biology – Applications

- 4.1. Applications in forensics – PCR and DNA fingerprinting
- 4.2. Immunological techniques – Immuno-blotting and ELISA.

4.3. Monoclonal antibodies – Applications in diagnosis and therapy.

4.4. Eugenics and Gene therapy

Unit 5: Biostatistics and Bioinformatics

5.1. Data collection and sampling. Measures of central tendency – Mean, Median, Mode.

5.2. Measures of dispersion – range, standard deviation and variance. Probability and tests of significance.

5.3. Introduction, Genomics, Proteomics, types of biological data, biological databases- NCBI, EBI, Gen Bank; Protein 3D structures, Sequence alignment

5.4. Accessing Nucleic Acid and Protein databases, NCBI Genome Workbench

ADDITIONAL INPUTS

1. Contribution of Yerrapragada Subba Rao to Microbiology - To appreciate the contributions of Indian scientists in the field of science.

2. Vaccines - To impart the basic knowledge of vaccination.

3. Life cell bank - stem cell treatments

4. Euphenics.

REFERENCES

1. Gerard J., Tortora, Berdell R. Funke, Christine L. Case., 2016. Microbiology: An Introduction. 11th Edition. Pearson publications, London, England.
2. Micale, J. Pelczar Jr., E.C.S. Chan., Noel R. Kraig., 2002. Pelczar Microbiology. 5th Edition. McGraw Education, New York, USA.
3. Sathyanarayana U., Chakrapani, U., 2013. Biochemistry. 4th Edition. Elsevier publishers.
4. Jain J.L., Sunjay Jain, Nitin Jain, 2000. Fundamentals of Biochemistry. S. Chand publishers, New Delhi, India.
5. R.C. Dubey, 2014. Advanced Biotechnology. S. Chand Publishers, New Delhi, India.
6. Colin Ratledge, Bjorn, Kristiansen, 2008. Basic Biotechnology. 3rd Edition. Cambridge Publishers.
7. U. Sathyanarayana, 2005. Biotechnology. 1st Edition. Books and Allied Publishers pvt. Ltd., Kolkata.
8. Upadhyay, Upadhyay and Nath. 2016. Biophysical Chemistry, Principles and Techniques. Himalaya Publishing House.
9. Arthur M. Lesk. Introduction to Bioinformatics. 5th Edition. Oxford publishers.

10. AP Kulkarni, 2020. Basics of Biostatistics. 2nd Edition. CBS publishers.

ACTIVITIES

1. Identification of given organism as harmful or beneficial.
2. Observation of microorganisms from house dust under microscope.
3. Finding microorganism from pond water.
4. Visit to a microbiology industry or biotech company.
5. Visit to a waste water treatment plant.
6. Retrieving a DNA or protein sequence of a gene'
7. Performing a BLAST analysis for DNA and protein.
8. Problems on biostatistics.
9. Field trip and awareness programs on environmental pollution by different types of wastes and hazardous materials.
10. Demonstration on basic biotechnology lab equipment.
11. Preparation of 3D models of genetic engineering techniques.
12. Preparation of 3D models of transgenic plants and animals.

[**NOTE:** In the colleges where there is availability of faculty for Microbiology and Biotechnology, those chapters need to be handled by microbiology and biotechnology faculty. In other colleges, the above topics shall be dealt by Botany and Zoology faculty]

A.S.D GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited by NAAC with 'B' Grade)
Jagannaickpur, Kakinada, East Godavari, AP – 533002.
ZOOLOGY SEMESTER-II CORE-3 / (Minor-1) (2023-2024)
ANIMAL DIVERSITY - BIOLOGY OF NON- CHORDATES
Theory Credits: 3 No. of Hrs./Week: 3

SYLLABUS:

UNIT-I

1.1 Whittaker's five kingdom concept and classification of Animal Kingdom.

1.2 Protozoa General Characters and classification up to classes with suitable examples

1.3 Protozoa Locomotion & nutrition

1.4 Protozoa reproduction

Activity: Assignment /Seminar on the above

Evaluation: Marks to be awarded for written and oral presentations

UNIT –II

2.1 Porifera General characters and classification up to classes with suitable examples

2.2 Canal system in sponges

2.3 Coelenterata General characters and classification up to classes with suitable examples

2.4 Polymorphism in coelenterates & Corals and coral reefs

Activity: Assignment /Seminar /Quiz/Project on the above

Evaluation: Evaluation of Written part + Evaluation of oral Presentation, Assessment of students in Quiz participation and Ranking - Evaluation of Project Report and oral presentation

UNIT – III

3.1 Platyhelminthes General characters and classification up to classes with suitable examples

3.2 Parasitic Adaptations in helminthes

3.3 Nematelminthes General characters and classification up to classes with suitable examples

3.4 Life cycle and pathogenicity of Ascaris lumbricoides

Activity: Assignment /Seminar /Quiz/Project/Peer teaching on the above

Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity

UNIT – IV

3.5. Annelida General characters and classification up to classes with suitable examples

3.6. Vermiculture - Scope, significance, earthworm species, processing, Vermicompost, economic importance of vermicompost

3.7. Arthropoda General characters and classification up to classes with suitable examples

3.8. Peripatus - Structure and affinities

Activity: Assignment /Seminar /Quiz/Project/Peer teaching on the above

Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity.

UNIT – V

4.1 Mollusca General characters and classification up to classes with suitable examples

4.2 Pearl formation in Pelecypoda

4.3 Echinodermata General characters and classification up to classes with suitable examples
Water vascular system in star fish

4.4 Hemichordata General characters and classification up to classes with suitable examples
Balanoglossus - Structure and affinities

Activity: Assignment /Seminar /Quiz/Project/Peer teaching on the above

Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity

ADDITIONAL INPUTS

1. Parasitic Protozoans
2. Systematic Position of Porifera
3. Wuchereria bancrofti,
4. Enterobius vermicularis
5. Organic Farming
6. Beneficial insects

Co-curricular activities (suggested)

- Preparation of chart/model of phylogenic tree of life, 5-kingdom classification
- Visit to Zoology Museum or Coral Island as part of Zoological tour
- Charts on polymorphism
- Clay models of canal system in sponges
- Plaster-of-Paris model of Peripatus
- Construction of a vermicompost in each college, manufacture of manure by students and donating to local farmers
- Chart on pearl forming layers using clay
- Visit to a pearl culture rearing industry/institute
- Live model of water vascular system
- Observation of Balanoglossus for its tubicolous habit

REFERENCE BOOKS:

- L.H. Hyman „The Invertebrates’ Vol I, II and V. – M.C. Graw Hill Company Ltd.
- Kotpal, R.L. 1988 - 1992 Protozoa, Porifera, Coelenterata, Helminthes, Arthropoda, Mollusca, Echinodermata. Rastogi Publications, Meerut.
- E.L. Jordan and P.S. Verma „Invertebrate Zoology’ S. Chand and Company.
- R.D. Barnes „Invertebrate Zoology’ by: W.B. Saunders CO., 1986.
- Barrington. E.J.W., „Invertebrate structure and Function’ by ELBS.
- P.S. Dhami and J.K. Dhami. Invertebrate Zoology. S. Chand and Co. New Delhi.
- Parker, T.J. and Haswell,, A text book of Zoology’ by, W.A., Mac Millan Co. London.
- Barnes, R.D. (1982). Invertebrate Zoology, V Edition”

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited by NAAC with 'B' Grade)
Jagannaickpur, Kakinada, East Godavari, AP – 533002.
ZOOLOGY SEMESTER-II CORE-3 / (Minor-1)

ANIMAL DIVERSITY - BIOLOGY OF NON- CHORDATES LAB (2023-2024)

LEARNING OBJECTIVES

- To understand the importance of preservation of museum specimens
- To identify animals based on special identifying characters
- To understand different organ systems through demo or virtual dissections
- To maintain a neat, labelled record of identified museum specimens

SYLLABUS:

Study of museum slides / specimens / models (Classification of animals up to orders)

1. Protozoa: Amoeba, Paramoecium, Paramoecium Binary fission and Conjugation, Vorticella, Entamoeba histolytica, Plasmodium vivax
2. Porifera: Sycon, Spongilla, Euspongia, Sycon- T.S & L.S, Spicules, Gemmule
3. Coelenterata: Obelia – Colony & Medusa, Aurelia, Physalia, Velella, Corallium, Gorgonia, Pennatula.
4. Platyhelminthes: Planaria, Fasciola hepatica, Fasciola larval forms – Miracidium, Redia, Cercaria, Echinococcus granulosus, Taenia solium, Schistosoma haematobium
5. Nematelminths: Ascaris (Male & Female), Dracunculus, Ancylostoma, Wuchereria
6. Annelida: Nereis, Aphrodite, Chaetopteurs, Hirudinaria, Trochophore larva
7. Arthropoda: Cancer, Palaemon, Scorpion, Scolopendra, Sacculina, Limulus, Peripatus,
8. Larvae - Nauplius, Mysis, Zoea, Mouth parts of male & female Anopheles and Culex, Mouthparts of Housefly and Butterfly.
9. Mollusca: Chiton, Pila, Unio, Pteredo, Murex, Sepia, Loligo, Octopus, Nautilus,
10. Glochidium larva
11. Echinodermata: Asterias, Ophiothrix, Echinus, Clypeaster, Cucumaria, Antedon,
12. Bipinnaria larva
13. Hemichordata: Balanoglossus, Tornaria larva

Dissections:

Pila – Digestive System, Nerve System, Radula.

Prawn – Appendages, Digestive System, Nerve System, Mounting of Statocyst.

An “Animal album” containing photographs, cut outs, with appropriate write up about the

above-mentioned taxa. Different taxa/ topics may be given to different sets of students for this purpose

REFERENCE WEB LINKS:

- <https://virtualmicroscopy.peabody.yale.edu/>
- <https://tnhm.in/category/assorted-gallery-for-vertebrates-and-invertebrates/invertebrates/>
- <http://www.nhc.ed.ac.uk/index.php?page=24.25.312>
- <https://biologyjunction.com/invertebrate-notes/>
- <https://lanwebs.lander.edu/faculty/rsfox/invertebrates/>
- <http://www.zoologyresources.com/uploadfiles/books/dc64b77d8769325515d17c945e461b45.pdf>

A.S.D GOVT. DEGREE COLLEGE FOR WOMEN (A)

(Re-Accredited by NAAC with 'B' Grade)

Jagannaickpur, Kakinada, East Godavari, AP – 533002.

ZOOLOGY SEMESTER-II COURSE 4: (2023-2024)

CELL & MOLECULAR BIOLOGY

Theory

Credits: 3

3 hrs/week

SYLLABUS:

UNIT – I Cell Biology-I

1.1 Definition, history, prokaryotic and eukaryotic cells, virus, viroids, mycoplasma

1.2 Electron microscopic structure of animal cell.

1.3 Plasma membrane –Models and Fluid mosaic model

1.4 Transport functions of plasma membrane-Active – passive- facilitated.

Activity: Model preparation of cell/Assignment /Students Seminar /Quiz/Project/Peer teaching on the above

Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity

UNIT – II Cell Biology-II

1.1 Structure and functions of Golgi complex & Endoplasmic Reticulum

1.2 Structure and functions of Lysosomes & Ribosomes

1.3 Structure and functions of Mitochondria & Centriole

1.4 Structure and functions of Golgi complex & Chromosomes

Activity: Model preparation of cell organelles/Assignment /Students Seminar

/Quiz/Project/Peer teaching on the above

Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity

UNIT – III Cell Biology-III

3.1 Cell Division- mitosis, meiosis

3.2 Cell cycle – stages- check points- regulation

3.3 Abnormal cell growth- cancer- apoptosis

3.4 Bio energetics- Glycolysis-Krebs cycle-ETS

Activity: Model preparation cell division /Assignment /Students Seminar /Quiz/Project/Peerteaching/Report writing after watching any video on the above

Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the

aboveactivity

UNIT IV: Molecular Biology-I

4.1 Central Dogma of Molecular Biology

4.2 Basic concepts of - DNA replication – Overview (Semi-conservative mechanism, Semi-discontinuous mode, Origin & Propagation of replication fork)

4.3 Transcription in prokaryotes – Initiation, Elongation and Termination, Post-transcriptional modifications (basics)

4.4 Translation – Initiation, Elongation and Termination

Activity: Model preparation of DNA/Assignment /Students Seminar /Quiz/Project/Peer teaching/Report writing after watching any video on the above

Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the aboveactivity

UNIT V: Molecular Biology-II

1.1 Gene Expression in prokaryotes (Lac Operon); Gene Expression in eukaryotes

1.2 Biomolecules- Carbohydrates (Glucose- structure-properties- biological importance only)

1.3 Biomolecules- Protein (Amino acid- structure- properties- biological importance only)

1.4 Biomolecules- Lipids (Fatty acid- structure - properties- biological importance only)

Activity: Assignment /Students Seminar /Quiz/Project/Peer teaching/Report writing after watching any video on the above

Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the aboveactivity

ADDITIONAL INPUTS

1. Vacuole, micro tubules cell organelles
2. Amitosis
3. Structure of DNA
4. Genetic code
5. Composition of cytoplasm

Co-curricular activities (Suggested)

- Model of animal cell
- Working model of mitochondria to encourage creativity among students
- Photo album of scientists of cell biology
- Charts on plasma membrane models/cell organelles
- Charts on central dogma/lac operon/genetic code
- Model of semi-conservative model of DNA replication
- Power point presentation of any of the above topics by students

REFERENCES:

- Lodish, Berk, Zipursky, Matsudaria, Baltimore, Darnell „Molecular Cell Biology“W.H. Freemanand company New York.
- Cell Biology by De Robertis
- Bruce Alberts, Molecular Biology of the Cell
- Rastogi, Cytology
- Varma & Aggarwal, Cell Biology

- C.B. Pawar, Cell Biology
- Molecular Biology by Frei fielder
- Instant Notes in Molecular Biology by Bios scientific publishers and Viva BooksPrivate Limited
- James D. Watson, Nancy H. Hopkins „Molecular Biology of the Gene“

A.S.D GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited by NAAC with ‘B’ Grade)
Jagannaickpur, Kakinada, East Godavari, AP – 533002.
ZOOLOGY SEMESTER-II CORE-4 (2023-2024)
CELL & MOLECULAR BIOLOGY LAB

Practical

Credits: 1

2 hrs./week

LEARNING OBJECTIVES

- Acquainting and skill enhancement in the usage of laboratory microscope
- Hands-on experience of different phases of cell division by experimentation
- Develop skills on human karyotyping and identification of chromosomal disorders
- To apply the basic concept of inheritance for applied research
- To get familiar with phylogeny ad geological history of origin & evolution of animals

SYLLABUS:

1. Preparation of temporary slides of Mitotic divisions with onion root tips
2. Observation of various stages of Mitosis with prepared slides
3. Observation of various stages of Meiosis with prepared slides
4. Mounting of salivary gland chromosomes of Chironomus
5. Test for carbohydrate in given biological sample (Benedicts test)
6. Test for Protein in given biological sample (Nitric acid test -white ring)
7. Test for lipid in the given biological sample (Saponification test)

REFERENCE WEB LINKS:

- <https://cbi-au.vlabs.ac.in/>
- <https://www.youtube.com/watch?v=xhnUZAyNdQk>
- https://www.youtube.com/watch?v=l8LXQq5_VL0
- <https://www.labster.com/simulations>

- <https://www.sciencecourseware.org/BiologyLabsOnline/protected/TranslationLab/index.php>
- <https://virtual-labs.github.io/exp-analysis-of-carbohydrates-au/procedure.html>
- https://www.labxchange.org/library/items/lb:LabXchange:f10fd7ad:lx_simulation:1
- <http://www.zoologyresources.com/uploadfiles/books/dc64b77d8769325515d17c945e461b45.pdf>

A.S.D GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited by NAAC with 'B' Grade)
Jagannaickpur, Kakinada, East Godavari, AP – 533002.

ZOOLOGY SYLLABUS – SEMESTER III 2023-2024

PAPER – III: CELL BIOLOGY, GENETICS, MOLECULAR BIOLOGY AND EVOLUTION

HOURS:60

Credits:4 Hrs/Wk:4

Max. Marks:100

Course Outcomes:

The overall course outcome is that the student shall develop deeper understanding of what life is and how it functions at cellular level. This course will provide students with a deep knowledge in Cell Biology, Animal Biotechnology and Evolution and by the completion of the course the graduate shall be able to –

- CO1** To understand the basic unit of the living organisms and to differentiate the organisms by their cell structure.
- CO2** Describe fine structure and function of plasma membrane and different cell organelles of eukaryotic cell.
- CO3** To understand the history of origin of branch of genetics, gain knowledge on heredity, interaction of genes, various types of inheritance patterns existing in animals
- CO4** Acquiring in-depth knowledge on various aspects of genetics involved in sex determination, human karyotyping and mutations of chromosomes resulting in various disorders
- CO5** Understand the central dogma of molecular biology and flow of genetic information from DNA to proteins.
- CO6** Understand the principles and forces of evolution of life on earth, the process of evolution of new species and apply the same to develop new and advanced varieties of animals for the benefit of the society.

Learning Objectives

- To understand the origin of cell and distinguish between prokaryotic and eukaryotic cell
- To understand the role of different cell organelles in maintenance of life activities
- To provide the history and basic concepts of heredity, variations and gene interaction
- To enable the students, distinguish between polygenic, sex-linked, and multiple allelic modes of inheritance.

- To acquaint student with basic concepts of molecular biology as to how characters are expressed with a coordinated functioning of replication, transcription and translation in all living beings
- To provide knowledge on origin of life, theories and forces of evolution To understand the role of variations and mutations in evolution.

Unit-I Cell Biology

- 1.1 Definition, history, prokaryotic and eukaryotic cells, virus, viroids, mycoplasma
- 1.2 Electron microscopic structure of animal cell.
- 1.3 Plasma membrane –Models and transport functions of plasma membrane.
- 1.4 Structure and functions of Golgi complex, Endoplasmic Reticulum and Lysosomes.
- 1.5 Structure and functions of Ribosomes, Mitochondria, Nucleus, Chromosomes

(Note: 1. General pattern of study of each cell organelle – Discovery, Occurrence, Number, Origin, Structure and Functions with suitable diagrams)
2. Need not study cellular respiration under mitochondrial functions)

Unit-II Genetics-I

- 2.1 Mendel's work on transmission of traits
- 2.2 Gene Interaction – Incomplete Dominance, Co-Dominance, Lethal Genes
- 2.3 Polygenes (General Characteristics & examples); Multiple Alleles (General Characteristics) and **Blood group inheritance.**
- 2.4 Sex determination (Chromosomal, Genic Balance, Hormonal, Environmental and Haplo-diploidy types of sex determination)
- 2.5 Sex linked inheritance (X-linked, Y-linked & XY-linked inheritance)

Additional Inputs: Role of Mendel's laws in the production of Hybrids, Bombay Blood Group.

Unit-III Genetics-II

- 3.1 Mutations & Mutagenesis
- 3.2 Chromosomal Disorders (Autosomal and Allosomal)
- 3.3 Human Genetics – Karyotyping, Pedigree Analysis (basics)
- 3.4 Basics on Genomics and Proteomics

Unit-IV Molecular Biology

4.1 Central Dogma of Molecular Biology

4.2 Basic concepts of -

- a. DNA replication – Overview (Semi-conservative mechanism, Semi-discontinuous mode, Origin & Propagation of replication fork)
- b. Transcription in prokaryotes – Initiation, Elongation and Termination, Post transcriptional modifications (basics)
- c. Translation – Initiation, Elongation and Termination

4.3 Gene Expression in prokaryotes (Lac Operon); Gene Expression in eukaryotes

Additional Inputs: Structure and types of DNA

Unit-V

5.1 Origin of life

5.2 Theories of Evolution: Lamarckism, Darwinism, Germ Plasm Theory, Mutation Theory

5.3 Neo-Darwinism: Modern Synthetic Theory of Evolution, Hardy-Weinberg Equilibrium

5.4 Forces of Evolution: Isolating mechanisms, Genetic Drift, Natural Selection, Speciation

Additional Inputs: Genetic Diseases

Co-curricular activities (Suggested):

- Model of animal cell
- Working model of mitochondria to encourage creativity among students
- Photo album of scientists of cell biology
- Charts on plasma membrane models/cell organelles
- Observation of Mendelian / Non-Mendelian inheritance in the plants of college botanical garden or local village as a student study project activity
- Observation of blood group inheritance in students, from their parents and grand parents
- Karyotyping and preparation of pedigree charts for identifying diseases in family history
- Charts on chromosomal disorders
- Charts on central dogma/lac operon/genetic code
- Model of semi-conservative model of DNA replication
- Model of tRNA and translation mechanism
- Power point presentation of transcription or any other topic by students

- Draw geological time scale and highlight important events along the time
- Chart on industrial melanism to teach directed selection, Darwin's finches to teach genetic drift, collection of data on weight of children born in primary health centres to teach stabilizing selection etc.
- Chart on industrial melanism to teach directed selection, Darwin's finches to teach genetic drift, collection of data on weight of children born in primary health centres to teach stabilizing selection etc.

REFERENCES:

1. Lodish, Berk, Zipursky, Matsudaria, Baltimore, Darnell „Molecular Cell Biology” W.H.Freeman and company New York.
2. Cell Biology by De Robertis
3. Bruce Alberts, Molecular Biology of the Cell
4. Rastogi, Cytology
5. Varma & Aggarwal, Cell Biology
6. C.B. Pawar, Cell Biology
7. Gardner, E.J., Simmons, M.J., Snustad, D.P. (2008). Principles of Genetics. VIII Edition. Wiley India.
8. Snustad, D.P., Simmons, M.J. (2009). Principles of Genetics. V Edition. John Wiley and Sons Inc.
9. Klug, W.S., Cummings, M.R., Spencer, C.A. (2012). Concepts of Genetics. X Edition. Benjamin Cummings.
10. Russell, P. J. (2009). Genetics- A Molecular Approach. III Edition. Benjamin Cummings.
11. Griffiths, A.J.F., Wessler, S.R., Lewontin, R.C. and Carroll, S.B. Introduction to Genetic Analysis. IX Edition. W. H. Freeman and Co.
12. Ridley, M. (2004). Evolution. III Edition. Blackwell Publishing
13. Molecular Biology by freifielder
14. Instant Notes in Molecular Biology by Bios scientific publishers and Viva Books Private Limited
15. Hall, B. K. and Hallgrimsson, B. (2008). Evolution. IV Edition. Jones and Bartlett Publishers
16. Campbell, N. A. and Reece J. B. (2011). Biology. IX Edition, Pearson, Benjamin, Cummings.
17. Douglas, J. Futuyma (1997). Evolutionary Biology. Sinauer Associates.
18. Minkoff, E. (1983). Evolutionary Biology. Addison-Wesley.

19. James D. Watson, Nancy H. Hopkins „Molecular Biology of the Gene“
20. Jan M. Savage. Evolution, 2nd ed, Oxford and IBH Publishing Co., New Delhi.
21. Gupta P.K.,Genetics

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited by NAAC with 'B' Grade)
Jagannaickpur, Kakinada, East Godavari, AP – 533002.

Semester-III, Paper-III

(CELL BIOLOGY, GENETICS, MOLECULAR BIOLOGY AND EVOLUTION) PRACTICAL SYLLABUS
(2023-2024)

Learning Objectives:

- Acquainting and skill enhancement in the usage of laboratory microscope Hands-on experience of different phases of cell division by experimentation
- Develop skills on human Karyotyping and identification of chromosomal disorders
- To apply the basic concept of inheritance for applied research
- To get familiar with phylogeny and geological history of origin & evolution of animals

I. Cell Biology

1. Preparation of temporary slides of Mitotic divisions with onion root tips
2. Observation of various stages of Mitosis and Meiosis with prepared slides
3. Mounting of salivary gland chromosomes of *Chironomus*

II. Genetics

1. Study of Mendelian inheritance using suitable examples and problems.
2. Problems on blood group inheritance and sex-linked inheritance.
3. Study of human Karyotypes (Down's syndrome, Edwards syndrome, Patau's Syndrome, Turner's syndrome and Klinefelter's syndrome).

III. Evolution

1. Study of fossil evidences.
2. Study of homology and analogy from suitable specimens and pictures.
3. Phylogeny of horse with pictures.
4. Study of Genetic Drift by using examples of Darwin's finches (pictures).
5. Visit to Natural History Museum and submission of report.

REFERENCE BOOKS:

1. Burns GW. 1972. *The Science of Genetics. An Introduction to Heredity*. Mac Millan Publ. Co. Inc.
2. Gardner EF. 1975. *Principles of Genetics*. John Wiley & Sons, Inc. New York.
3. Harth and Jones EW. 1998. *Genetics – Principles and Analysis*. Jones and BarHett Publ. Boston.
4. Levine L. 1969. *Biology of the Gene*. Toppan.
5. Pedder IJ. 1972. *Genetics as a Basic Guide*. W. Norton & Company, Inc.
6. Rastogi VB. 1991. *A Text Book of Genetics*. Kedar Nath Ram Nath Publications, Meerut, Uttar Pradesh, India.
7. Rastogi VB. 1991. *Organic Evolution*. Kedar Nath RamNath Publications, Meerut, Uttar Pradesh, India.
8. Stahl FW. 1965. *Mechanics of Inheritance*. Prentice-Hall.
9. White MJD. 1973. *Animal Cytology and Evolution*. Cambridge Univ. Press.

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited by NAAC with 'B' Grade)
Jagannaickpur, Kakinada, East Godavari, AP – 533002.

ZOOLOGY-Semester-IV, Paper-IV
(2023-2024)

ANIMAL PHYSIOLOGY, CELLULAR METABOLISM AND EMBRYOLOGY

Credits:4

Hrs/Wk:4

Course Outcomes:

This course will provide students with a deep knowledge in Physiology, Cellular metabolism and Molecular Biology and by the completion of the course the graduate shall able to –

- Understand the functions of important animal physiological systems including digestion, cardio- respiratory and renal systems.
- Understand the muscular system and the neuro-endocrine regulation of animal growth, development and metabolism with a special knowledge of hormonal control of human reproduction.
- Describe the structure, classification and chemistry of Biomolecules and enzymes responsible for sustenance of life in living organisms
- Develop broad understanding the basic metabolic activities pertaining to the catabolism and anabolism of various Biomolecules
- Describe the key events in early embryonic development starting from the formation of gametes up to gastrula ion and formation of primary germ layers.

Learning Objectives

- To achieve a thorough understanding of various aspects of physiological systems and their functioning in animals.
- To instill the concept of hormonal regulation of physiology, metabolism and reproduction in animals.
- To understand the disorders associated with the deficiency of hormones.
- To demonstrate a thorough knowledge of the intersection between the disciplines of Biology and Chemistry.
- To provide insightful knowledge on the structure and classification of carbohydrates, proteins, lipids and enzymes.
- To demonstrate an understanding of fundamental biochemical principles such as the function

of Biomolecules, metabolic pathways and the regulation of biochemical processes.

- To make students gain proficiency in laboratory techniques in biochemistry and orient them to apply the scientific method to the processes of experimentation and hypothesis testing.

Unit-I

Animal Physiology -I: Process of digestion and assimilation, Respiration - Pulmonary ventilation, transport of oxygen and CO₂, (Note: Need not study cellular respiration here), Circulation - Structure and functioning of heart, Cardiac cycle, Excretion - Structure and functions of kidney urine formation, counter current Mechanism.

Additional Inputs: Classification of animals based on Feeding habits and Excretory Products.

Unit-II

Animal Physiology -II: Nerve impulse transmission - Resting membrane potential, origin and propagation of action potentials along myelinated and non-myelinated nerve fibers. Muscle contraction - Ultra structure of muscle, molecular and chemical basis of muscle contraction. Endocrine glands - Structure, functions of hormones of pituitary, thyroid, parathyroid, adrenal glands and pancreas, Hormonal control of reproduction in a mammal.

Additional Inputs: Structure and types of Neurons, Types of muscles

Unit-III

Cellular Metabolism -I (Biomolecules) Carbohydrates - Classification of carbohydrates. Structure of glucose Proteins - Classification of proteins. General properties of amino acids Lipids - Classification of lipids. Enzymes: Classification and Mechanism of Action.

Additional Inputs: Structure of Fructose, Sucrose

Unit-IV

Cellular Metabolism -II: Carbohydrate Metabolism - Glycolysis, Krebs cycle, Electron Transport Chain, Glycogen metabolism, Gluconeogenesis, Lipid Metabolism – Synthesis of fatty acids, β -oxidation of palmitic acid Protein metabolism - Transamination, Deamination and Urea Cycle.

Unit-V

Embryology: Gametogenesis, Fertilization, Types of eggs, Types of cleavages, Development of Frog up to formation of primary germ layers

Additional Inputs : Study of Ecosystem (Wetland / Pond)

Co-curricular activities (Suggested)

- Chart on cardiac cycle, human lung, kidney/nephron structure etc.

- Working model of human / any mammalian heart.
- Chart of sarcomere/location of endocrine glands in human body
- Chart affixing of photos of people suffering from hormonal disorders
- Student study projects such as identification of incidence of hormonal disorders in the local primary health centre, studying the reasons thereof and measures to curb or any other as the lecturer feels good in nurturing health awareness among students
- Chart on structures of Biomolecules/types of amino acids (essential and non- essential)
Chart preparation by students on Glycolysis / Kerb's cycle/urea cycle etc.
- Model of electron transport chain
- Preparation of models of different types of eggs in animals
- Chart on frog embryonic development, fate map of frog blastula, cleavage etc.

REFERENCE BOOKS:

1. Eckert H. *Animal Physiology: Mechanisms and Adaptation*. W.H. Freeman & Company.
2. Floray E. *An Introduction to General and Comparative Animal Physiology*. W.B. Saunders Co., Philadelphia.
3. Goel KA and Satish KV. 1989. *A Text Book of Animal Physiology*, Rastogi Publications, Meerut, U.P.
4. Hoar WS. *General and Comparative Physiology*. Prentice Hall of India, New Delhi.
5. Lehninger AL. Nelson and Cox. *Principles of Biochemistry*. Lange Medical Publications, New Delhi.
6. Prosser CL and Brown FA. *Comparative Animal Physiology*. W.B. Saunders Company, Philadelphia.
7. *Developmental Biology* by Balinsky
8. *Developmental Biology* by Gerard Karp

9. Chordate embryology by Varma and Agarwal
10. Embryology by V. B. Rastogi
11. Austen CR and Short RV. 1980. *Reproduction in Mammals*. Cambridge University Press.
12. Gilbert SF. 2006. *Developmental Biology*, 8th Edition. Sinauer Associates Inc., Publishers, Sunderland, USA.
13. Longo FJ. 1987. *Fertilization*. Chapman & Hall, London.
14. Rastogi VB and Jaya raj MS. 1989. *Developmental Biology*. Kedar Nath Ram Nath Publishers, Meerut, Uttar Pradesh.
15. Schatten H and Schatten G. 1989. *Molecular Biology of Fertilization*. Academic Press, New York.

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited by NAAC with 'B' Grade)
Jagannaickpur, Kakinada, East Godavari, AP – 533002.

ZOOLOGY PAPER-IV, SEMESTER-IV (2023-2024)
ANIMAL PHYSIOLOGY, CELLULAR METABOLISM AND EMBRYOLOGY PRACTICALS
Credits:1 Hrs./Wk:2 Max.Marks:50

Learning Objectives:

- Identification of an organ system with histological structure.
- Deducing human health based on the information of composition of blood cells.
- Demonstration of enzyme activity *in-vitro*.
- Identification of various Biomolecules of tissues by simple colorimetric methods and also quantitative methods.
- Identification of different stages of earl embryonic development in animals.

I. Animal Physiology

1. Qualitative tests for identification of carbohydrates, proteins and fats.
2. Study of activity of salivary amylase under optimum conditions.
3. T.S. of duodenum, liver, lung, kidney, spinal cord, bone and cartilage.
4. Differential count of human blood.

II. Cellular metabolism

1. Estimation of total proteins in given solutions by Lowry's method.
2. Estimation of total carbohydrate by Anthrone method.
3. Qualitative tests for identification of ammonia, urea and uric acid
4. Protocol for Isolation of DNA in animal cells

III. Embryology

1. Study of T.S. of testis, ovary of a mammal
2. Study of different stages of cleavages (2, 4, 8 cell stages)
3. Construction of fate map of frog blastula

REFERENCE BOOKS:

- Harper's Illustrated Biochemistry
- Cell and molecular biology: Concepts & experiments. VI Ed. John Wiley & sons. Inc.
- Lab Manual on Blood Analysis and Medical Diagnostics, S. Chand and Co. Ltd.
- Laboratory techniques by Plummer.

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited by NAAC with 'B' Grade)
Jagannaickpur, Kakinada, East Godavari, AP – 533002.

ZOOLOGY- PAPER-V SEMESTER-IV (2023-2024)

IMMUNOLOGY AND ANIMAL BIOTECHNOLOGY SYLLABUS

Credits:4

Hrs/Wk:4

Course Outcomes:

This course will provide students with a deep knowledge in immunology, genetics, embryology and ecology and by the completion of the course the graduate shall be able to –

- To get knowledge of the organs of Immune system, types of immunity, cells and organs of immunity.
- To describe immunological response as to how it is triggered (antigens) and regulated (antibodies)
- Understand the applications of Biotechnology in the fields of industry and agriculture including animal cell/tissue culture, stem cell technology and genetic engineering.
- Get familiar with the tools and techniques of animal biotechnology.

Learning Objectives

- To trace the history and development of immunology
- To provide students with a foundation in immunological processes
- To be able to compare and contrast the innate versus adaptive immune systems and humoral versus cell-mediated immune responses
- Understand the significance of the Major Histocompatibility Complex in terms of immune response and transplantation
- To provide knowledge on animal cell and tissue culture and their preservation
- To empower students with latest biotechnology techniques like stem cell technology, genetic engineering, Hybridoma technology, transgenic technology and their application in medicine and industry for the benefit of living organisms
- To explain *in vitro* fertilization, embryo transfer technology and other reproduction manipulation methodologies.
- To get insight in applications of recombinant DNA technology in agriculture,

production of therapeutic proteins.

- To understand principles of animal culture, media preparation.

Unit-I

Immunology – I (Overview of Immune system): Introduction to basic concepts in Immunology, Innate and adaptive immunity, Vaccines and Immunization programme, Cells of immune system, Organs of immune system

Unit-II

Immunology – II (Antigens, Antibodies, MHC and Hypersensitivity)

Antigens: Basic properties of antigens, B and T cell epitopes, haptens and adjuvant; Factors influencing immunogenicity

Antibodies: Structure of antibody, Classes and functions of antibodies, Structure and functions of Major Histocompatibility Complexes, Exogenous and Endogenous pathways of antigen presentation and processing, Hypersensitivity – Classification and Types

Additional Input: Autoimmune disorders and Immunodeficiency disorders

Unit-III

Techniques: Animal Cell, Tissue and Organ culture media: Natural and Synthetic media, Cell cultures: Establishment of cell culture (primary culture, secondary culture, types of cell lines; Protocols for Primary Cell Culture); Established Cell lines (common examples such as MRC, HeLa, CHO, BHK, Vero); Organ culture; Cryopreservation of cultures.

Stem cells: Types of stem cells and applications, Hybridoma Technology: Production & applications of Monoclonal antibodies (MAbs).

Unit-IV

Applications of Animal Biotechnology: Genetic Engineering: Basic concept, Vectors, Restriction Endonucleases and Recombinant DNA technology.

Gene delivery: Microinjection, electroporation, biolistic method (gene gun), liposome and viral-mediated gene delivery.

Transgenic Animals: Strategies of Gene transfer; Transgenic - sheep, fish; applications Manipulation of reproduction in animals: Artificial Insemination, *In-vitro* fertilization, super ovulation, Embryo transfer, Embryo cloning.

Unit-V

PCR: Basics of PCR.

DNA Sequencing: Sanger's method of DNA sequencing- traditional and automated sequencing (2hrs)

Hybridization techniques: Southern, Northern and Western blotting DNA fingerprinting: Procedure and applications.

Applications in Industry and Agriculture: Fermentation: Different types of Fermentation and Downstream processing.

Agriculture: Monoculture in fishes, polyploidy in fishes.

Co-curricular activities (suggested)

- Organizing awareness on immunization importance in local village in association with NCC and NSS teams.
- Charts on types of cells and organs of immune system
- Student study projects on aspects such as – identification of allergies among students (hypersensitivity), blood groups in the class (antigens and antibodies duly reported) etc., as per the creativity and vision of the lecturer and students
- Visit to research laboratory in any University as part of Zoological tour and exposure and/ or hands- on training on animal cell culture.
- Visit to biotechnological laboratory in university or any central/state institutes and create awareness on PCR, DNA finger printing and blot techniques or Visit to a fermentation industry or Visit to a local culture pond and submit report on culture of fishes etc.

REFERENCE BOOKS:

1. Immunology by Ivan M. Riott
2. Immunology by Kubey
3. Sree krishna V. 2005. *Biotechnology –I*,
4. *Cell Biology and Genetics*. New Age International Publ. New Delhi, India.

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited by NAAC with 'B' Grade)

Jagannaickpur, Kakinada, East Godavari, AP – 533002.

ZOOLOGY PAPER-V SEMESTER-IV

IMMUNOLOGY AND ANIMAL BIOTECHNOLOGY PRACTICALS (2023-2024)

Credits:4

Hrs /Wk:4

Max. Marks: 50

Learning Objectives:

- a. Acquainting student with immunological techniques vis-à-vis theory taught in the classroom
- b. Interconnect the theoretical and practical knowledge of immunity with the outer world for the development of a healthier life.
- c. Demonstrate basic laboratory skills necessary for Biotechnology research
- d. Promoting application of the lab techniques for taking up research in higher studies

I. Immunology

1. Demonstration of lymphoid organs (as per UGC guidelines)
2. Histological study of spleen, thymus and lymph nodes (through prepared slides)
3. Blood group determination
4. Demonstration of
 - a. ELISA
 - b. Immune electrophoresis

II. Animal biotechnology

1. DNA quantification using DPA Method.
2. Techniques: Western Blot, Southern Hybridization, DNA Fingerprinting
3. Separation, Purification of biological compounds by paper, Thin-layer and Column chromatography
4. Cleaning and sterilization of glass and plastic wares for cell culture.
5. Preparation of culture media.

REFERENCE BOOKS:

1. Immunology Lab Biology 477 Lab Manual; Spring 2016 Dr. Julie Jameson
2. Practical Immunology A Laboratory Manual; LAP LAMBERT Academic Publishing
3. Manual of laboratory experiments in cell biology by Edward
4. Laboratory Techniques by Plummer

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re- Accredited by NAAC with B Grade)
Jagannaickpur, Kakinada, East Godavari, AP – 533002

ZOOLOGY- SEMESTER-V PAPER-6A (2023-2024)

SUSTAINABLE AQUACULTURE MANAGEMENT

Credits: 4

Hrs/Wk: 4

Learning Outcomes:

Students at the successful completion of this course will be able to

- Evaluate the present status of aquaculture at the Global level and National level
- Classify different types of ponds used in aquaculture
- Demonstrate induced breeding of carps
- Acquire critical knowledge on commercial importance of shrimps
- Identify fin and shell fish diseases

Syllabus

UNIT I:

- 1.1 Present status of Aquaculture – Global and National scenario.
- 1.2 Major cultivable species for aquaculture: freshwater, brackish water and marine.
- 1.3 Traditional, extensive, modified extensive, semi-intensive and intensive cultures of fish and shrimp.
- 1.4 Design and construction of fish and shrimp farms.

UNIT II:

- 2.1 Functional classification of ponds – head pond, hatchery, nursery ponds
- 2.2 Functional classification of ponds -rearing, production, stocking and quarantine ponds
- 2.3 Need of fertilizer and manure application in culture ponds
- 2.4 Physio-chemical conditions of soil and water optimum for culture (Temperature, depth, turbidity, light, water, PH, BOD, CO₂ and nutrients)

UNIT III:

- 3.1. Induced breeding in fishes
- 3.2. Culture of Indian major carps: Pre-stocking management (Dewatering, drying, ploughing /desilting, predators, weeds and algal blooms and their control, Liming and

fertilization)

3.3. Culture of Indian major carps - Stocking management

3.4. Culture of Indian major carps - post-stocking management

UNIT IV:

4.1 Commercial importance of shrimp & prawn.

4.2 *Macrobrachium rosenbergii*- biology, seed production.

4.3 Culture of *L. vannamei* – hatchery technology and culture practices.

4.4 Mixed culture of fish and prawns.

UNIT V:

5.1 Viral diseases of Fin Fish & shell fish.

5.2 Fungal diseases of Fin & Shell fish..

5.3 Bacterial diseases of Finfish & Shell fish

5.4 Prophylaxis in aquaculture.

REFERENCES:

1. Pillay TVR & M.A. Dill, 1979. Advances in Aquaculture. Fishing News Books Ltd., London
2. Stickney RR 1979. Principles of Warm Water Aquaculture. John Wiley & Sons Inc.1981
3. Boyd CE 1982. Water Quality Management for Pond Fish Culture. Elsevier Scientific Publishing Company.
4. Bose AN et.al. 1991. Costal Aquaculture Engineering. Oxford & IBH Publishing Company Pvt. Ltd.

Web Links:

1. http://www.fao.org/fishery/docs/CDrom/FAO_Training/FAO_Training/General/x6708e/x6708e06.htm
2. http://aquaticcommons.org/1666/1/Better-Practice3_opt.pdf
3. <https://www.notesonzooology.com/india/fishery/fish-diseases-symptoms-and-control-fishery/871>

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re- Accredited by NAAC with B Grade)
Jagannaickpur, Kakinada, East Godavari, AP – 533002

**ZOOLOGY- PAPER-6A SEMESTER-V
(2023-2024)**

SUSTAINABLE AQUACULTURE MANAGEMENT PRACTICAL SYLLABUS

Credits: 1 Hrs/Wk: 2 Max Marks: 50

Learning Outcomes:

On successful completion of this practical course, student shall be able to:

- Identify the characters of Fresh water cultivable species
- Estimate physico - chemical characteristics of water used for aquaculture
- Examine the diseases of fin and shell fish
- Suggest measures to prevent diseases in aquaculture

Syllabus:

1. Fresh water Cultivable species any (Fin & Shell Fish Specimens – Observation of morphological characters by observation and drawings)-5
2. Brackish water cultivable species (Fin & Shell fish- Specimens- Observation of Morphological Character by observing drawing) -5
3. Hands on training on the use of kits for determination of water quality in aquaculture (DO, Salinity, pH, Turbidity- Testing kits to be used for the estimation of various parameters/ Standard procedure can be demonstrated for the same)
4. Demonstration of Hypophysation (Procedure of hypophysation to be demonstrated in the practical lab with any edible fish as model)
5. Viral diseases of Fin & Shell Fish (Observation of his to pathological slides / Charts/ Models of viral pathogens in fin/ shell fish – one edible specimen can be used for observation of same in the laboratory)
6. Bacterial diseases of Fin & Shell Fish (Observation of his to pathological slides / Charts/ Models of Bacterial pathogens in fin/ shell fish – One edible specimen can be used for

observation of same in the laboratory)

7. Fungal diseases of Fin & Shell Fish (Observation of his to pathological slides / Charts/ Models of Bacterial pathogens in fin/ shell fish – One edible specimen can be used for observation of same in the laboratory)

LAB REFERENCES

1. Boyd CE 1982. Water Quality Management for Pond Fish Culture. Elsevier Scientific Publishing Company
2. http://www.fao.org/fishery/docs/CDrom/FAO_Training/FAO_Training/General/x6708e/x6708e06.htm
3. http://aquaticcommons.org/1666/1/Better-Practice3_opt.pdf
4. <https://www.notesonzoology.com/india/fishery/fish-diseases-symptoms-and-control-fishery/871>

Web resources suggested by the teacher concerned and the college librarian including reading material

Co-Curricular Activities

a) **Mandatory:**(Student training by teacher in field skills: Total 15 hrs., Lab:10 + field 05)

1. For Teacher: Training of students by the teacher in laboratory/field for not less than 15 hours on Breeding- Induced breeding in carps -hatchery technology of *L. vannamei*- Farming techniques- disease diagnostic techniques—concepts –Demonstration @ any aqua laboratory
2. For Student: Students shall (individually) visit a Hatchery/Farm/ Aqua diagnostic center and make careful observations of the process method and implements- protocols and report on the same in 10 pages hand written Fieldwork/Project work Report.
3. Max marks for Fieldwork/Project work Report: 05.
4. Suggested Format for Fieldwork/Project work: Title page, student details, index page, details of place visited, observations made, findings and acknowledgements.
5. (IE). Unit tests.

b) Suggested Co-Curricular Activities

1. Preparation of Model/Charts of Cultivable species of fin fish shell fish
2. Preparation of Model/Chart of Ideal fish Pond- with the standards prescribed.
3. Observation of aquaculture activities in their area (Observation of any activity related to aquaculture in the vicinity of the college/village).
4. Preparation of Model – charts of Fin /Shell fish Diseases with eco-friendly material.
5. Assignments, Group discussion, Seminar, Quiz, Collection of Material, Video preparation etc., Invited lecture.

ASD GOVT. DEGREE COLLEGE FOR WOMEN, (A).
(Re- Accredited by NAAC with B Grade)
Jagannaickpur, Kakinada, East Godavari, AP – 533002

Semester: V (Skill Enhancement Course - Elective), Paper-7A (2023-2024)

POSTHARVEST TECHNOLOGY OF FISH AND FISHERIES

Credits: 4

Hrs/Wk: 4

Learning Outcomes:

Students at the successful completion of this course will be able to

- Identify the types of preservation methods employed in aquaculture
- Choose the suitable Processing methods in aquaculture
- Maintain the standard quality control protocols laid down in aqua industry
- Identify the best Seafood quality assurance system

SYLLABUS:

UNIT I: Handling and Principles of fish Preservation

- 1.1 Handling of fresh fish, storage and transport of fresh fish, post mortem changes (rigor mortis and spoilage), spoilage in marine fish and freshwater fish.
- 1.2 Principles of preservation – cleaning, lowering of temperature, rising of temperature, denudation, use of salt, use of fish preservatives, exposure to low radiation of gamma rays.

UNIT II: Methods of fish Preservation

- 2.1 Traditional methods - sun drying, salt curing, pickling and smoking.
- 2.2. Advanced methods – chilling or icing, refrigerated sea water, freezing, canning, irradiation and Accelerated Freeze drying (AFD).

UNIT III: Processing and preservation of fish and fish by-products

- 3.1 Fish products – fish minced meat, fish meal, fish oil, fish liquid (ensilage), fish protein concentrate, fish chowder, fish cake, fish sauce, fish salads, fish powder, pet food from trash fish, fish manure.
- 3.2 Fish by-products – fish glue, Using glass, chitosan, pearl essence, shark fins, fish Leather and fish maws.

UNIT IV: Sanitation and Quality control

4.1 Sanitation in processing plants - Environmental hygiene and Personal hygiene in processing plants.

4.2 Quality Control of fish and fishery products – pre-processing control, control during processing and control after processing.

UNIT V: Quality Assurance, Management and Certification

5.1. Seafood Quality Assurance and Systems: Good Manufacturing Practices (GMPs); Good Laboratory Practices (GLPs); Standard Operating Procedures (SOPs); Concept of Hazard Analysis and Critical Control Points (HACCP) in seafood safety.

5.2 National and International standards – ISO 9000: 2000 Series of Quality Assurance System, Codex Alimentarius.

REFERENCES:

1. Santharam R, N Sukumaran and P Natarajan 1987. A manual of aquaculture, Oxford- IBH, NewDelhi
2. Lakshmi Prasad's, Fish Processing Technology 2012, Arjun Publishing House
3. Dr Sunitha Rai, Fish Processing Technology, 2015, Random Publications
4. Safety and Quality Issues in Fish Processing (Woodhead Publishing Series in Food Science, Technology and Nutrition) by H A Bremner
5. K.A Mahanthy, Innovations in Fishing and Fish Processing Technologies, January 2021

Web Resources:

1. <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=145743>
2. https://ecourses.icar.gov.in/e-Learningdownload3_new.aspx?Degree_Id=03

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re- Accredited by NAAC with B Grade)
Jagannaickpur, Kakinada, East Godavari, AP – 533002

Semester: V (Skill Enhancement Course - Elective), Paper-7A (2023-2024)

POSTHARVEST TECHNOLOGY OF FISH AND FISHERIES PRACTICALS

Credits: 1

Hrs/Wk: 2

Learning Outcomes: On successful completion of this practical course, student shall be able to:

- Identify the quality of aqua processed products.
- Determine the quality of fishery by products by observation
- Analyze the protocols of aqua processing methods

Practical (Laboratory) Syllabus:

1. Evaluation of fish/ fishery products for organoleptic, chemical and microbial quality.
2. Preparation of dried, cured and fermented fish products
3. Examination of salt, protein, moisture in dried / cured products
4. Examination of spoilage of dried / cured fish products, marinades, pickles, sauce.
5. Preparation of isinglass, collagen and chitosan from shrimp and crab shell.
6. Developing flow charts and exercises in identification of hazards – preparation of hazard analysis worksheet
7. Corrective action procedures in processing of fish- flow chart- work sheet preparation

(** Refer the following web sites for complete procedure method and estimations of above listed practicals)

REFERENCES:

1. Dr Sunitha Rai, Fish Processing Technology, 2015, Random Publications
2. https://ecourses.icar.gov.in/e-Learningdownload3_new.aspx?Degree_Id=03
3. <https://vikaspedia.in/agriculture/fisheries/post-harvest-and-marketing/processing-in-fisheries/fermented-products>
4. <https://krishi.icar.gov.in/jspui/bitstream/123456789/20500/1/Fermentation%20technology%20for%20fish.pdf>
5. <http://jebas.org/00200620122014/Abujam%20et%20al%20JEBAS.pdf>
6. https://krishi.icar.gov.in/jspui/bitstream/123456789/20770/1/Training%20Manual_Hygienic%20drying%20and%20packing%20of%20fish.pdf
7. https://krishi.icar.gov.in/jspui/bitstream/123456789/20770/1/Training%20Manual_Hygienic%20drying%20and%20packing%20of%20fish.pdf

8. https://krishi.icar.gov.in/jspui/bitstream/123456789/20770/1/Training%20Manual_Hygienic
9. [%20drying%20and%20packing%20of%20fish.pdf](#)
10. https://agritech.tnau.ac.in/fishery/fish_byproducts.html
11. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5352841/>
12. <http://www.fao.org/3/i1136e/i1136e.pdf>
13. <http://www.fao.org/3/x5989e/X5989e01.htm#What%20is%20sensory%20assessment>)

Web resources suggested by the teacher concerned and the college librarian including reading material.

Co-Curricular Activities

a) Mandatory: (*Lab/field training of students by teacher (lab 10 + field 05):*)

1. For Teacher: Training of students by the teacher in laboratory/field for not less than 15 hours on various steps of post-harvest techniques of fishes, on the advanced techniques in post-harvest technology – Training of students on other employability skills in the Post-harvest sector of Aquaculture Industry- like Processing, Packing, marketing of processed aqua products.
2. For Student: Students shall (individually) visit - Any fish/shrimp Processing Plant/Packing industry and make observations on post harvesting techniques and submit a brief handwritten Fieldwork/Project work Report with pictures and data /survey in 10 pages.
3. Max marks for Fieldwork/Project work Report: 05.
4. Suggested Format for Fieldwork/Project work: *Title page, student details, index page, details of place visited, observations made, findings and acknowledgements*
5. (IE): Unit tests,

b) Suggested Co-Curricular Activities

1. Observation of fish/shrimp processing plants – visit web sites of processing companies and record the details of that Unit.
2. Interaction with local fishermen to know the method of preservation and details with the available traditional technology.
3. Collection of web resources on the Quality assurance, quality control measures in Aqua Industries- cross checking the standards during the visit to any processing units.
4. Assignments, Seminar, Group discussion. Quiz, Collection of Material, invited lecture, Video preparation etc.,

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re- Accredited by NAAC with B Grade)
Jagannaickpur, Kakinada, East Godavari, AP – 533002
Zoology Semester-V Paper-6B (2023-2024)
LIVE STOCK MANAGEMENT-I (BIOLOGY OF DAIRY ANIMALS)
Credits: 4 Hrs/Wk: 4

Learning Outcomes:

Students at the successful completion of the course will be able to

- Select the suitable breeds of livestock for rearing
- Relate the anatomy of udder with letdown of milk
- Identify and manipulate the reproductive behavior of cattle
- Inspect the economics of dairy farming
- Apprise the various breeding techniques employed in live stock

Syllabus: (Total Hours: 90 including Teaching, Lab, Field Skills Training, Unit tests etc.)

UNIT I: Livestock census; Breeds of Dairy cattle, Buffaloes and Goats. Indigenous, Exotic and Crossbred Cattle breeds.

UNIT II: Anatomy of Udder; Development of udder; Lactogenesis and Galactopoises; Letdown of milk.

UNIT III: Artificial insemination; Estrous cycle; Symptoms of heat in cows and buffaloes. Conception, Pregnancy diagnosis in cattle. Multi ovulation and embryo transfer technique. Cloning.

UNIT IV: Economic traits of Dairy cattle. Methods of selection of dairy animals.

UNIT V: Systems of Dairy cattle breeding. Inbreeding, out breeding, Cross breeding, Grading up. Breeding systems (Cross breeding of cattle and grading up of buffaloes).

REFERENCES:

1. Textbook of Animal Husbandry-GC Banerjee
2. Handbook of Animal Husbandry –ICAR Edition
3. Principles and practices of Dairy Farm–Jagdish Prasad

Web resources:

1. <http://ecoursesonline.iasri.res.in/course/index.php?categoryid=42>
2. <https://vetsebooks.blogspot.com/p/e-books.html>
3. <https://www.basu.org.in/study-materials/veterinary-science/>
4. <https://vikaspedia.in/agriculture/livestock/cattle-buffalo/breeds-of-cattle-buffalo>

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re- Accredited by NAAC with B Grade)

Jagannaickpur, Kakinada, East Godavari, AP – 533002

Zoology Semester-V Paper-6B

(Course Code: ZOO205311-6BP) (2023-2024)

LIVE STOCK MANAGEMENT-I (BIOLOGY OF DAIRY ANIMALS) PRACTICAL

Credits: 1

Hrs/Wk: 2

(Max.50Marks)

Learning Outcomes:

On successful completion of this practical course, student shall be able to

1. Examine the points of dairy cow
2. Understand the behavioral changes of cow during the reproductive period
3. Differentiate the merits and demerits of cross breeds in cattle

Practical (Laboratory) Syllabus:(30hrs)

1. Points dairy cow. (Explanation with observation of charts- Model evaluation to be performed by the student in the laboratory)
2. Identification of different breeds of dairy cattle and buffaloes. (Observation of Charts of breeds in the laboratory- at least 3 breeds should be identified by the students in their locality with video, photo)
3. Male and female reproductive systems of cow – Model/ Chart (Student has to draw a labeled diagram of the male and female reproductive systems of cow – acquire skill to identify the parts).
4. Symptoms of heat in cow (Study and Understanding the physiological symptoms during heat).
5. Artificial in semi nation (Flow chart of implements – Procedure- precautions)
6. Pregnancy diagnosis in cattle.
7. Study comparative merits of cows and buffaloes; zebu and cross bred cows (Examination of merits)

Lab References:

1. Principles and practices of Dairy Farm–Jadish Prasad
2. Dairy cow points: <https://www.icar.org/Guidelines/05-Conformation-Recording.pdf>
3. Pregnancy test protocol:
<https://cgspace.cgiar.org/bitstream/handle/10568/109408/Milk%20testing%20lab%20protoco%201.pdf?sequence=1&isAllowed=y>

Co-Curricular Activities

a) **Mandatory:** *(Lab/ field training of students by teacher : (lab:10 + filed: 05):*

1. For Teacher: Training of students by the teacher in laboratory/field for not less than 15 hours on principles and practices of dairy industry- breeds –artificial insemination- reproductive behavior of cows etc. as per the syllabus above.
2. For Student: Students shall individually visit to any of the nearby cattle rearing centers/ veterinary hospital/Raithu Bharosa Kendra and make observations of the procedure and quality enhancement activities and submit a handwritten Fieldwork/Project work Report in 10 pages.
3. Max marks for Fieldwork/Project work Report: 05.
4. Suggested Format for Fieldwork/Project work Report: *Title page, student details, index page, details of place visited, observations made, findings and acknowledgements*
5. (IE) Unit tests,

b) **Suggested Co-Curricular Activities**

1. Collection of various cattle breed images from the web to prepare a album
2. Visit the sites of Veterinary colleges in India and preparation of brief report on the videos and content/ employment details
3. Sketch a model dairy farm with details
4. Invited lecture and presentation on related topics by experts
Seminar, Assignment, Group discussion. Quiz, Collection of Material, invited lecture, Video preparation etc.

ASD GOVT. DEGREE COLLEGE FOR WOMEN, (A).
(Re- Accredited by NAAC with B Grade)
Jagannaickpur, Kakinada, East Godavari, AP – 533002
Zoology Semester-V Paper-7B (2023-2024)

LIVE STOCK MANAGEMENT -II (DAIRY PRODUCTION AND MANAGEMENT)

Credits: 4

Hrs/Wk: 4

Learning Outcomes:

Students at the successful completion of the course will be able to

- Identify and suggest the suitable housing system for the dairy farming
- Understand management practices for the dairy farming
- Learn the process of milk pasteurization
- Prepare cream from milk

Syllabus: (Total Hours: 90 including Teaching, Lab, Field Skills Training, Unit tests etc.) **UNIT I**

Systems of Housing of Dairy cattle- Loose Housing and Conventional Dairy Barns. Drawing of layouts for dairy cattle dwellings; Criteria for selecting site for establishing Dairy farm buildings; Water requirement of dairy animals.

UNIT II:

Management of different classes of Dairy animals- Milk producing animals, pregnant animals dry animals, heifers and calves. Management practices for Dairy farm; Identification, Dehorning, Castration, Deworming, Vaccination, Disinfection, and Milking.

UNIT III:

- a. Pasteurization of milk: Definition, objects of pasteurization, objections to pasteurization, Principles of heat exchange. Methods of pasteurization: LTLT, HTST and Uperization.
- b) Sterilization of milk. Homogenization: Factors influencing homogenization

UNIT IV:

Market milk: Toned milk, double toned milk, Reconstituted milk, Standardized milk and full creammilk– Standards and methods of manufacture.

UNIT V:

Cream: Types of cream, composition, methods of cream separation, gravity and centrifugal methods, types of cream separators, factors affecting fat losses in skim milk and fat percentage in cream.

REFERENCES:

1. Textbook of Animal Husbandry-G C Benarjee
2. Handbook of Animal Husbandry –ICAR Edition
3. Principles and practices of Dairy Farm–Jagdish Prasad
4. <http://ecoursesonline.iasri.res.in/course/index.php?categoryid=42>
5. <https://vetsebooks.blogspot.com/p/e-books.html>
6. <https://www.basu.org.in/study-materials/veterinary-science/>
7. <https://vikaspedia.in/agriculture/livestock/cattle-buffalo/breeds-of-cattle-buffalo>

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re- Accredited by NAAC with B Grade)

Jagannaickpur, Kakinada, East Godavari, AP – 533002

Zoology Semester-V Paper-7B (2023-2024)

LIVE STOCK MANAGEMENT -II (DAIRY PRODUCTION AND MANAGEMENT) PRACTICAL

Credits: 1

Hrs/Wk: 2

Learning Outcomes:

On successful completion of this practical course, student shall be able to:

- Design a model dairy farm layout
- Understand procedure of milk pasteurization at milk processing centers
- Identify various important management practices in dairy farming

Practical (Laboratory) Syllabus :(30hrs)

(Max.50Marks)

1. Dairy Farm layout (In the laboratory student has to sketch a dairy farm with all its components)
2. Identification of cows (students have to identify the breeds of cows from the images/charts – have to identify any two breeds in the vicinity of the college/ their locality).
3. Dehorning of calves: (Method - protocol- precautions)
4. Castration of bulls (Method – Apparatus- Time-importance)
5. Deworming of dairy cattle: (Schedule – method- benefits)
6. Pasteurization of milk (Batch Method- procedure- Observation)
7. Sterilization of milk (In bottle sterilization- procedure – protocol)
8. Cream separation (By gravity method- procedure- hands on experiment)

Lab References

1. Handbook of Animal Husbandry –ICAR Edition
2. Dairy farm layout : <https://www.youtube.com/watch?v=dmukHUEUvKc>
3. Dehorning procedure : <http://www.omafra.gov.on.ca/english/livestock/dairy/facts/09-003.htm>
4. Castration of bulls: <https://vikaspedia.in/agriculture/livestock/general-management-practices-of-livestock/castration-of-ruminants>
5. Deworming: https://kvk.icar.gov.in/API/Content/PPupload/k0347_10.pdf
6. Pasteurization of milk : <http://www.jnkvv.org/PDF/08042020170652part%203.pdf>
7. <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=1690>

8. Cream separation: <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=147910>

Web resources suggested by the teacher concerned and the college librarian including reading material

Co-Curricular Activities

a) **Mandatory:** (*Lab/field training of students by teacher; lab 10+ field :05*)

1. For Teacher: Training of students by the teacher in laboratory and filed for not less than 15 hours on skills of dairy management – housing-management of dairy animals of various stages- procedure of preparation of marketable milk with procedures like sterilization, pasteurization and other techniques)
2. For Student: Student shall (individually) visit to nearby dairy farm- house hold cattle rearing – make observations on aspects like housing – management – feed- milk- revenue- breed selection- qualities of breed –etc. A handwritten Fieldwork/Project work Report to be submitted in the given format.
3. Max marks for Fieldwork/Project work Report: 05.
4. Suggested Format for Fieldwork/Project work Report: *Title page, student details, index page, details of place visited, observations made, findings and acknowledgements.*
5. (IE)Unit tests.

b) **Suggested Co-Curricular Activities**

1. Sketch model dairy house with details
2. Web resources on Protocols in the management of stages of cattle
3. Properties of varieties of milk from the market observation
4. Assignment, Seminar, invited lecture, Group discussion. Quiz, Collection of Material, Video preparation etc.

A.S.D. GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited by NAAC with 'B' Grade)
Jagannaickpur KAKINADA – 533 002, EAST GODAVARI, A.P.

DEPARTMENT OF ZOOLOGY-SKILL DEVELOPMENT COURSES

Offered in III Semester
POULTRY FARMING SYLLABUS

Total 30 hrs (02h/wk), 02 Credits & Max 50 Marks

Learning Outcomes:

By successful completion of the course, students will be able to;

1. Understand the field level structure and functioning of insurance sector and it's role in protecting the risks
2. Comprehend pertaining skills and their application for promoting insurance coverage
3. Prepare better for the Insurance Agent examination conducted by IRDA
4. Plan 'promoting insurance coverage practice' as one of the career options.

SYLLABUS:

Section I (Introduction to Poultry Farming): 10Hrs

- 1.1 General introduction to poultry farming -Definition of Poultry; Past and present scenario ofpoultry industry in India.
- 1.2 Principles of poultry housing. Poultry houses. Systems of poultry farming.
- 1.3 Management of chicks, growers and layers. Management of Broilers.
- 1.4 Preparation of project report for banking and insurance

Section II (Feed and Livestock Health Management): 10 Hrs

- 2.1 Poultry feed management – Principles of feeding, Nutrient requirements for different stagesoflayers and broilers. Feed formulation and Methods of feeding.
- 2.2 Poultry diseases – viral, bacterial, fungal and parasitic (two each); symptoms, control and management; Vaccination programme.

Section III (Harvesting of Eggs and Sanitation): 10 Hrs


- 3.1 Selection, care and handling of hatching eggs. Egg testing. Methods of hatching.

3.2 Brooding and rearing. Sexing of chicks.

3.3 Farm and Water Hygiene, Recycling of poultry waste.

Reference books:

1. Sreenivasaiah., P. V., 2015. Textbook of Poultry Science. 1st Edition. Write & PrintPublications, New Delhi
2. 2. Jull A. Morley, 2007. Successful Poultry Management. 2nd Edition. Biotech Books,New Delhi"
3. Hurd M. Louis, 2003. Modern Poultry Farming. 1st Edition. International BookDistributing Company, Lucknow."
4. Life and General Insurance Management, "
5. Financial services, Tata McGraw hill
6. <http://www.asci-india.com/BooksPDF/Small%20Poultry%20Farmer.pdf>
7. https://nsdcindia.org/sites/default/files/MC_AGR-Q4306_Small-poultry-farmer-.pdf
8. <http://ecoursesonline.iasri.res.in/course/view.php?id=335>
9. https://swayam.gov.in/nd2_nou19_ag09/preview


Signature of the Lecturer in charge
Assistant-in-Charge,
DEPARTMENT OF ZOOLOGY
A.S.D. GOVT. COLLEGE FOR WOMEN
KAKINADA-5.


Principal
PRINCIPAL
A.S.D. GOVT. DEGREE COLLEGE (W)
AUTONOMOUS
KAKINADA



A.S.D GOVT.DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited NAAC with “B” Grade)
KAKINADA, EAST GODAVARI, A.P, 533002.

DEPARTMENT OF ZOOLOGY AND AQUACULTURE TECHNOLOGY

2023-2024



Skill Development, Employability, Entrepreneurship

AQUACULTURE TECHNOLOGY

A.S.D GOVT. DEGREE COLLEGE FOR WOMEN (A)

(Re- Accredited by NAAC with B Grade)

Jagannaickpur, Kakinada, East Godavari, AP – 533002

AQUACULTURE TECHNOLOGY SEMESTER- II (2023-2024)

Course No: 3 Taxonomy and Functional Anatomy of Fin Fish and Shellfish (Minor 1)

Hrs./Week: 4

Credits :3

Syllabus:

Unit I: General characters & Classification of Cultivable fin fish and shell fish

- 1.1 General Characters of Crustacea
- 1.2 Classification of Crustacea: Major groups up to orders and their important characters.
- 1.3 General Characters of fishes
- 1.4 Classification of Fishes: Major groups up to subclass and their important characters.

Unit 2: Digestive and Respiratory systems of Fish and shell fish

- 2.1: Digestive system of fish
- 2.2 Respiratory system of fish
- 2.3 Digestive system of Prawn
- 2.4 Respiratory system of prawn

Unit 3: Circulatory systems of Fish and shell fish

- 3.1 Cardiovascular system: Structure of heart in fishes
- 3.2 Blood vascular system in prawn

Unit 4: Nervous system of Fish and shell fish

- 4.1 Nervous system in fish: Structure and functions of Brain
- 4.2 Central Nervous system in prawn.

Unit 5 Reproductive system of Fish and shell fish

- 5.1 Urino -genital system in fishes
- 5.2 Reproductive system in prawn

Additional Inputs:

1. Commercial importance of crustacea
2. Commercial importance of fishes
3. Peripheral nervous system in prawn
4. Autonomic nervous system on prawn

A.S.D GOVT. DEGREE COLLEGE FOR WOMEN (A)
(Re- Accredited by NAAC with B Grade) Jagannaickpur, Kakinada,
East Godavari, AP – 533002

AQUACULTURE TECHNOLOGY SEMESTER- II (2023-2024)

**Course No: 3 (Minor 1) Taxonomy and Functional Anatomy of Fin Fish and Shellfish
Practicals**

Hrs./Week: 2

Credits :1

1. Study of mouth parts in herbivorous and carnivorous fishes
2. Comparative study of digestive system of herbivorous and carnivorous fishes
3. Demonstration of brain of fish
4. Demonstration of cranial nerves of fish
5. Demonstration of Nervous system of prawn
6. Exposure of gills of prawn
7. Exposure of gills of fish

REFERENCE BOOKS

1. Bond E. Carl. 1979. *Biology of Fishes*, Saunders.
2. Halver JE. 1972. *Fish Nutrition*. Academic Press.
3. Hoar WS and Randall DJ. 1970. *Fish Physiology*, Vol. I-IX, Academic Press, New York.
4. Lagler KF, Bardach, JE, Miller, RR, Passino DRM. 1977. *Ichthyology*, 2nd Ed. John Wiley & Sons, New York.
5. Lovell J. 1989. *Nutrition and Feeding of Fish*. Van Nostrand Reinhold, New York.
6. Moyle PB and Joseph J. Cech Jr. 2004. *Fishes: An Introduction to Ichthyology*. 5th Ed. Prentice Hall.
7. Nikolsky GV. 1963. *Ecology of Fishes*, Academic Press.
8. Norman JR and Greenwood PH. 1975. *A History of Fishes*, Halsted Press.
9. Potts GW and Wootten RJ. 1984. *Fish Reproduction: Strategies and Tactics*, Academic Press.

A.S.D GOVT.DEGREE COLLEGE FOR WOMEN (A)
 (Re-Accredited NAAC with “B” Grade)
 KAKINADA, EAST GODAVARI, A.P - 533002.

AQUACULTURE TECHNOLOGY BOARD OF STUDIES: 2023-2024
SEMESTER III– PAPER-III (Course Code: AQ203308)
FISH NUTRITION & FEED TECHNOLOGY

Periods: 60

Max. Marks: 100

UNIT-I: NUTRITIONAL REQUIREMENTS OF CULTIVABLE FISH

- 1-1 Requirements for energy, proteins, carbohydrates, lipids, fiber, micro nutrients for different stages of cultivable fish and prawns
- 1-2 Essential amino acids and fatty acids, protein to energy ratio, nutrient interactions and protein sparing effect
- 1-3 Dietary sources of energy, effect of ration on growth, determination of feeding rate, check tray
- 1-4 Factors affecting energy partitioning and feeding

UNIT-II: FORMS OF FEEDS & FEEDING METHODS

- 2-1 Feed conversion efficiency, feed conversion ratio and protein efficiency ratio
- 2-2 Wet feeds, moist feeds, dry feeds, mashes, pelleted feeds, floating and sinking pellets, advantages of pelletization
- 2-3 Manual feeding, demand feeders, automatic feeders, surface spraying, bag feeding & tray feeding
- 2-4 Frequency of feeding

UNIT-III: FEED MANUFACTURE & STORAGE

- 3-1 Feed ingredients and their selection, nutrient composition and nutrient availability of feed ingredients
- 3-2 Feed formulation– extrusion processing and steam pelleting, grinding, mixing and drying, pelletization, and packing
- 3-3 Water stability of feeds, farm adequate feeds, micro-coated feeds, micro-encapsulated feeds and micro-bound diets
- 3-4 Microbial, insect and rodent damage of feed, chemical spoilage during storage period and proper storage methods

UNIT-IV: FEED ADDITIVES&NON-NUTRIENT INGREDIENTS

- 4.1 Binders, anti-oxidants, probiotics
- 4.2 Feed attractants and feed stimulants
- 4.3 Enzymes, hormones, growth promoters and pigments
- 4.4 Anti-metabolites, aflatoxins and fiber

UNIT-V: NUTRITIONAL DEFICIENCY INCULTIVABLEFISH

- 5-1 Protein deficiency, vitamin and mineral deficiency symptoms
- 5-2 Nutritional pathology and ant nutrients
- 5-3 Importance of natural and supplementary feeds, balanced diet

PRESCRIBEDBOOK(S):

1. HALVERJE 1989. Fish nutrition. Academic press, San diego

REFERENCES:

1. Lovellrt 1998. Nutrition andfeedingoffishes,Chapmann&Hall, NewYork
2. Sena de silva,trevoraanderson 1995.Fish nutrition in aquaculture.Chapmann &Hall,
3. Guiland J.A (ed) 1984. Penaeid shrimps- TheirBiologyand Management.
4. Jhingran VG1998.Fish and Fisheries ofIndia.Hindusthan PublishingCorporation,NewDelhi

A.S.D GOVT.DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited NAAC with “B” Grade)
KAKINADA, EAST GODAVARI, A.P - 533002.

AQUACULTURE TECHNOLOGY BOARD OF STUDIES: 2023-2024
SEMESTER III– PAPER-III (Course Code: AQ203308P)
TITLE- FISH NUTRITION & FEED TECHNOLOGY PRACTICAL SYLLABUS

Periods: 24

Max. Marks: 50

PRACTICALS: (Any 8as per the local Industry needs and Requirement)

1. Estimation of protein content in aquaculture feeds.
2. Estimation of carbohydrate content in aquaculture feeds.
3. Estimation of lipid content in aquaculture feeds.
4. Estimation of ash in aquaculture feed.
5. Study of water stability of pellet feeds.
6. Feed formulation and preparation in the lab.
7. Study of binders used in aquaculture feeds.
8. Study of feed packing materials.
9. Study of physical and chemical change during storage.
10. Study on physical characteristics of floating and sinking feeds.
11. Visit to a aqua-feed production unit.
12. Visit to a farm for studying feeding practices.

A.S.D GOVT.DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited NAAC with “B” Grade)
KAKINADA, EAST GODAVARI, A.P - 533002.

AQUACULTURE TECHNOLOGY BOARD OF STUDIES: 2023-2024
SEMESTER IV– PAPER-IV (Course Code: AQ204315)
TITLE- FRESH WATER & BRACKISH WATER AQUACULTURE

Periods: 60

Max. Marks: 100

UNIT-1: INTRODUCTION TO FRESHWATER AQUACULTURE

1-1.1 Status, scope and prospects of fresh water aquaculture in the world, India and AP

1-1.2 Different freshwater aquaculture systems

UNIT-II: CARPCULTURE

2-1 Major cultivable Indian carps– Labeo, Catla and Cirrhinus & Minor carps

2-2 Exotic fish species introduced to India– Tilapia, Pangassius and Clarius sp.

2-3 Composite fish culture system of Indian and exotic carps

2-4 Impact of exotic fish, Compatibility of Indian and exotic carps and competition among them.

UNIT-III: CULTURE OF AIR-BREATHING AND COLDWATER FISH

3-1 Recent developments in the culture of clarius, anabas, murrels,

3-2 Advantages and constraints in the culture of air-breathing and coldwater fishes- seed resources, feeding, management and production

3-3 Special systems of Aquaculture- brief study of culture in running water, re-circulatory systems, cages and pens, sewage-fed fish culture

UNIT-IV: CULTURE OF PRAWN

4-1 Fresh water prawns of India- commercial value

4-2 Macrobrachium rosenbergii and M. Malcomsonii– biology, seed production,

4-3 pond preparation, stocking, management of nursery and grow-out ponds, feeding, morphotypes and harvesting

UNIT-V: CULTURE OF BRACKISH WATER SPECIES

5-1 1 Culture of *P. mondon*– Hatchery technology and Culture practices including feed and disease management

5-2 2 Culture of *L. vannamei*– hatchery technology and culture practices including feed and disease management.

5-3 3 Mixed culture of fish and prawns

PRESCRIBEDBOOK(S):

1. Jhingran VG 1998. Fish and Fisheries of India .Hindusthan Publishing Corporation, New Delhi
2. Sena de silva, trevora anderson 1995. Fish nutrition in aquaculture. Chapman & Hall,
3. Guil and J.A (ed) 1984. Penaeid shrimps- Their Biology and Management.
4. Barrington FJW 1971. Invertebrates: Structure and Function. ELBS
5. Parker F & Haswell 1992. The text book of Zoology, Vol I. Invertebrates

A.S.D GOVT.DEGREE COLLEGE FOR WOMEN (A)
 (Re-Accredited NAAC with “B” Grade)
 KAKINADA, EAST GODAVARI, A.P - 533002.

AQUACULTURE TECHNOLOGY BOARD OF STUDIES: 2023-2024
SEMESTER IV– PAPER-IV (Course Code: AQ204315P)

FRESH WATER & BRACKISH WATER AQUACULTURE PRACTICALS SYLLABUS

Periods: 24

Max. Marks: 50

PRACTICALS :(Any 8as per the local Industry needs)

1. Identification of important cultivable carps
2. Identification of important cultivable air-breathing fishes
3. Identification of important cultivable fresh water prawns
4. Identification of different life history stages of fish
5. Identification of different life history stages of fresh water prawn
6. Collection and study of weed fish
7. Identification of commercially viable crabs– Scyllacerrata, Portunuspelagicus,
 a. P.sanguinolentus, Neptunuspelagicus, N.Sanguinolentus
8. Identification of lobsters– Panuliruspolyphagus,P.ornatus,P.homarus,P.sewelli,*P.penicillatus*
9. Identification of oysters of nutritional significance– Crossostrea madrasensis, C.gryphoides,
 C.cucullata,C.rivularis , Picnodanta
10. Identification of mussels and clams
11. Identification of developmental stages of oysters
12. Field visit to aqua farm and study of different components like dykes etc.

A.S.D GOVT.DEGREE COLLEGE FOR WOMEN (A)
(Re-Accredited NAAC with “B” Grade)
KAKINADA, EAST GODAVARI, A.P - 533002.

AQUACULTURE TECHNOLOGY BOARD OF STUDIES: 2023-2024
SEMESTER IV– PAPER-V (Course Code: AQ204315)
TITLE- FISH HEALTH MANAGEMENT & FISHERIES ECONOMICS

Periods: 60

Max. Marks: 100

UNIT I: Diseases of Fin Fish

- 1.1 Fungal diseases– Saprolegniosis, brachiomycosis, ichthyophorus diseases – Lagenidium diseases – Fusarium disease, prevention and therapy
- 1.2 Viral diseases – Emerging viral diseases in fish, haemorrhagic septicemia, spring viremia of carps, infectious hematopoietic necrosis in trout, infectious pancreatic necrosis in salmonids, swim-bladder inflammation in cyprinids, channel cat fish viral disease, prevention and therapy
- 1.3 Bacterial diseases – Emerging bacterial diseases, Aeromonas, Pseudomonas and vibrio infections, columnaris, furunculosis, epizootic ulcerative syndrome, infectious abdominal dropsy, bacterial gill disease, enteric red mouth, bacterial kidney disease, proliferative kidney disease, prevention and therapy

UNIT II: Diseases of Shell Fish

- 2.1 Major shrimp viral diseases – Baculovirus penaei, Monodon Baculovirus, Baculoviral midgut necrosis, Infectious hypodermal and hematopoietic necrosis virus, Hepatopancreatic parvo like virus, Yellow head baculovirus, white spot baculovirus.
- 2.2 Bacterial diseases of shell fish – aeromonas, pseudomonas and vibrio infections, luminous bacterial disease, and filamentous bacterial disease. Prevention and therapy
- 2.3 Protozoan diseases- Ichthyophthiriasis, Costiasis, whirling diseases, trypanosomiasis. Prevention and therapy

UNIT III: Fish Health Management

- 3.1 **Diagnostic tools – immune detection- DNA/RNA techniques,** General preventive methods and prophylaxis. Application and development of vaccines.
- 3.2 Quarantine – Significance, methods and regulations for transplants.
- 3.3 Good Feed management for healthy organisms, Zero water exchange, Probiotics in health management, Issues of biosecurity.

UNIT IV: Fisheries Economics- I

- 4.1 Methods of economic analysis of business organizations
- 4.2 Aquaculture economics- application of economics principles to aquaculture operations Various inputs and production function laws of variable proportions
- 4.3 **Cost and earnings of aquaculture systems** – carp culture, shrimp farming systems,

UNIT V: Fisheries Economics- II

- 1.1 Socio-economic conditions of fishermen in Andhra Pradesh
- 1.2 Role of Matsya fed and NABARD in uplifting fishermen’s conditions, fishermen cooperatives.

Contribution of fisheries to the national economy

1.3 Economic analysis preparation of project and project appraisal

PRESCRIBED BOOKS:

1. Shaperclaus W. 1991 Fish Diseases- Vol.I & II. Oxonian Press Pvt.ltd
2. Roberts RJ 1989. Fish pathology. Bailliere Tindall, New York
3. Lydia Brown 1993. Aquaculture for veterinarians- fish husbandry and medicine. Pergamon Press. Oxford
4. Jayaraman R 1996. Fisheries Economics. Tamilnadu Veterinary and Animal Science University. Tuticorn
5. Subba Rao N 1986. Economics of Fisheries. Daya publishing house, Delhi

REFERENCES BOOKS:.

1. Shankar KM & Mohan CV. 2002. Fish and Shellfish Health Management. UNESCO Publ. Sindermann CJ. 1990
2. Walker P & Subasinghe RP. (Eds.). 2005 Principal Diseases of Marine Fish and Shellfish. Vols. I, II. 2nd Ed. Academic Press
3. DNA Based Molecular Diagnostic Techniques: Research Needs for Standardization and Validation of the Detection of Aquatic Animal Pathogens and Diseases. FAO Publ. Wedmeyer G, Meyer FP & Smith L. 1999.
4. Bullock G et.al., 1972 Bacterial diseases of fishes. TFH publications, New Jersey
5. Post G 1987. Text book of Fish Health. TFH publications, New Jersey
6. Johnson SK 1995. Handbook of shrimp diseases. Texas A & M University, Texas
7. Dewwett KK and Varma JD 1993. Elementary economic theory. S.chand, New Delhi
8. Korakandy R 1996. Economics of Fisheries Mangement. Daya Publishing House,Delhi
9. Tripathi SD 1992. Aquaculture Economics. Asian Fisheries Society, Mangalore

A.S.D GOVT.DEGREE COLLEGE FOR WOMEN (A)
 (Re-Accredited NAAC with “B” Grade)
 KAKINADA, EAST GODAVARI, A.P - 533002.

AQUACULTURE TECHNOLOGY BOARD OF STUDIES: 2023-2024
SEMESTER IV– PAPER-V (Course Code: AQ204315)
TITLE- FISH HEALTH MANAGEMENT & FISHERIES ECONOMICS

Periods: 24

Max. Marks: 50

1. Enumeration of Bacteria by TPC Method
2. Enumeration of total Coliforms
3. Observation of gross pathology and external lesions of fish and prawn with reference to the common diseases in aquaculture
4. Examination of pathological changes in gills and gut lumen, lymphoid organ, muscles and nerves of fish
5. Examination of pathological changes in gut lumen, hepatopancreas, lymphoid organ, muscles and nerves of prawn and shrimp
6. Collection, processing and analysis of data for epidemiological investigations of viral diseases
7. Bacterial pathogens– isolation, culture and characterization
8. Identification of parasites in fishes: Protozoan, Helminths, Crustaceans
9. Antibioassays– preparation and evaluation
10. Molecular and immunological techniques; Biochemical tests; PCR; ELISA; Agglutination test; Challenge tests; Purification of virus for development of vaccines (Demonstration at institutes /labs)
11. Estimation of dose, calculation of concentration, methods of administration of various chemotherapeutics to fish and shellfish
12. Estimation of antibiotics used in aquaculture practices
13. Estimation of probiotics used in aquaculture
14. Field visit to farm for health monitoring and disease diagnosis

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)

(Re- Accredited by NAAC with 'B' Grade)

Jagannaickpur, Kakinada, East Godavari, AP – 533002

AQUACULTURE TECHNOLOGY SEMESTER: V PAPER-6A (2023-2024)

SOIL AND WATER QUALITY MANAGEMENT (Course Code: AQ205315-6A)

Credits: 4

Hrs. /Wk.: 4

UNIT I: Soil quality

(10h)

1. Soil types and their distribution. Physical and chemical properties of soil: Soil colour, texture, structure, pore space, bulk density, and water holding capacity; Conductivity, pH, redox potential, soil salinity, calcium carbonate, organic carbon, available nitrogen, available phosphorus, Carbon-Nitrogen ratio, organic matter and soil fertility.
2. Properties of water logged soils, methane and hydrogen sulphide formation. Problem soils: Saline soils, Alkali soils, Acid sulphate soils (ASS), and their reclamation.
3. Pond Seepage and its control. Soil quality criteria/requirements for aquaculture.

UNIT II: Water quality

(10h)

1. Water quality parameters: Temperature, transparency, salinity, dissolved oxygen, carbon dioxide, pH, alkalinity, hardness, conductivity, ammonia, nitrites, nitrates, orthophosphates and hydrogen sulphide; phytoplankton, zooplankton and benthos.
2. Role of aquatic microorganisms in carbon, nitrogen, phosphorus and sulphur cycles.
3. Water quality criteria for freshwater and brackish water aquaculture.

UNIT III: Soil and Water amendments

(10h)

1. Liming: Liming materials, effects of liming on pond ecosystem, liming rates for ponds, calculation of lime requirements and application of liming materials to ponds.
2. Manures and Fertilizers: Types of manures and fertilizers, primary nutrients, micronutrients, fertilizer grades, quantity and method of application; Bio fertilizers.
3. Pond fertilization: Role of organic and inorganic fertilizers in aquaculture; Problems in ponds with indiscriminate fertilization.

UNIT IV: Pond water management

(10h)

1. Daily changes in dissolved oxygen concentration, oxygen depletion in ponds, Aeration, Water exchange, and **Bio-floc technology**.
2. **Water treatment, Water filtration devices, Waste water treatment practices, Waste discharge standards, Recirculatory aquaculture system (RAS).**

3. Water quality management in freshwater carp culture; brackish water shrimp culture; and hatcheries.

UNIT V: Pond treatments

(10h)

1. Pond conditioners and Chemical treatments: Potassium permanganate, Hydrogen peroxide, Calcium hydroxide, Rotenone, Formalin and Malachite green. Methods of applying chemicals.
2. Reduction of pH; Control of turbidity, salinity, hardness and chlorides; Chlorine removal; Removal of toxic gases.
3. Control of algal blooms and aquatic weeds. Bioremediation: Soil and water probiotics for aquaculture ponds.

ADDITIONAL INPUTS: Classification of Aquatic weed plants

REFERENCES:

1. Boyd, C.E. (1982). Water Quality Management for Pond Fish Culture. Elsevier Sci. Publishing Co.
2. Boyd, C.E. and Tucker, C.S. (1992). Water Quality and Pond Soil Analyses for Aquaculture. Alabama Agricultural Experimental Station, Auburn University, USA.
3. Boyd, C.E. and Tucker, C.S. (2012). Pond aquaculture water quality management. Springer Science & Business Media. ICAR. (2006). Hand Book of Fisheries and Aquaculture. ICAR.
4. MPEDA: Handbooks on culture of carp, shrimp, etc.
5. Training Manual on Recent advances in soil and water management in brackishwater aquaculture (2018). Saraswathy, R., Kumararaja, P., Lalitha, N., Suvana, S., SatheeshaAvunje, Muralidhar, M. (Eds.), CIBA-TM Series –No.8 (2nd Ed), ICAR–Central Institute of Brackishwater Aquaculture, Chennai, India pp.137.
6. Boyd, C.E. (1995). Soil and water quality management in aquaculture ponds. INFOFISH international, 5(95), 29-36.
7. Boyd, C.E. (1995). Bottom soils, sediment, and pond aquaculture. Springer Science & Business Media.
8. Pillay, T.V.R. and Kutty, M.N. (2005). Aquaculture- Principles and Practices. 2nd Ed. Blackwell
9. Dhevendaran, K. (2008). *Aquatic Microbiology*, Daya Publ. House.
10. APHA, AWWA, WPCF. (1998). Standard Methods for the Examination of Water and Wastewater, 20th Ed. American Public Health Association, American Water Works Association and Water Pollution Control Federation, Washington, D.C.

11. Chattopadhyay, G.N. (1998). Chemical analysis of Fish Pond Soil and Water. Daya Publishing House, Delhi.
12. Ramadhas, V. and R. Santhanam (1996). A Manual of Methods of Seawater and Sediment analysis. Fisheries College & Research Institute, Tuticorin.
13. Adhikari, S and Chatterjee, D.K. (2008). Management of Tropical Freshwater Ponds. Daya Publication.
14. Boyd, C.E. (2003). Guidelines for aquaculture effluent management at the farm-level. Aquaculture, 226(1-4), 101-112.
15. Harry, O. Buckman and Nyle, C. Brady. (1963). The Nature and Properties of Soils. The Macmillan Company, New York.
16. Rajagopalsamy, C.B.T. and Ramadhas, V. 2002. Nutrient Dynamics in Freshwater Fish Culture System. Daya Publication.
17. Stickney, R.R. (1979). Principles of Warm water Aquaculture. John-Willey & sons Inc.
18. Sverdrup, H.V., Johnson, M.W. and Fleming, R.H. (1942). The Oceans: their physics, chemistry and general biology. Prentice Hall, Inc. New York.
19. *Web resources suggested by the teacher concerned and the college librarian including reading material.*

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)

(Re- Accredited by NAAC with B Grade)

Jagannaickpur, Kakinada, East Godavari, AP – 533002

AQUACULTURE TECHNOLOGY SEMESTER: V PAPER-6A (2023-2024)

(Course Code: AQ205315-6AP)

Course 6A: SOIL AND WATER QUALITY MANAGEMENT LAB

Credits: 1

Hrs. /Wk.: 2

Practical Syllabus:

1. Demonstration of laboratory glassware and equipment used in water and soil analysis.
2. Principles of Titrimetry, Gravimetry, Potentiometry, Conductometry, Refractometry, Colorimetry, Turbidimetry, Spectrophotometry (Vis, UV-Vis, Flame, Atomic Absorption Spectrophotometer (AAS)).
3. Solutions: Standard, and dilute solutions; units of concentration; standard curve.

Soil Analysis:

4. Collection and Processing of soil samples
5. Determination of Soil texture, pH, Redox potential and Conductivity.
6. Determination of Organic carbon, available nitrogen and available phosphorus.

Water Analysis:

7. Measurement of Temperature, Transparency, Turbidity, and Salinity of water.
8. Estimation of Dissolved oxygen, Free carbon dioxide, Total alkalinity and Total hardness in water.
9. Estimation of ammonia, nitrites, nitrates, and orthophosphates.
10. Collection and identification of phytoplankton, zooplankton and benthos
11. Calculation of doses of lime and fertilizers for ponds
12. Design and fabrication of different filters.

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)

(Re- Accredited by NAAC with B Grade)

Jagannaickpur, Kakinada, East Godavari, AP – 533002

AQUACULTURE TECHNOLOGY SEMESTER: V PAPER-7A (2023-2024)

(Course Code: AQ205316-7A)

ORNAMENTAL FISH CULTURE

Credits: 4

Hrs. /Wk.: 4

UNIT I: Status of Ornamental fish farming and trade

(10h)

1. Global status of ornamental fish trade and export potential.
2. Present status and prospects of ornamental fish farming and trade in India. Indian ornamental fish diversity and its status. Major marine ornamental fish resources of India. Method of collection of live fish.
3. Types of aquaria – Home and Public aquaria (freshwater and marine), Oceanarium.

UNIT II: Ornamental fishes

(10h)

1. Origin and Benefits of ornamental fish keeping as a hobby.
2. Freshwater ornamental fishes – their taxonomy and biology - varieties of Gold fish Koi, Barbs, Danios (cyprinids); Gourami, Betta (anabantids); Tetras (characins), Live bearers (Guppy, molly, sword tail, platy); Angel fish and other Cichlids, Catfishes, Loaches.
3. Marine ornamental fishes– varieties and their habitats. Other ornamental organisms– anemones, worms, lobsters, shrimps, octopus, starfish.

UNIT III: Aquarium Management

(10h)

1. Fabrication, setting up and maintenance of freshwater and marine aquarium - Lighting and aeration - Aquarium plants and their propagation methods - Aquarium accessories and decoratives. Selection of fishes and Species compatibility for aquarium keeping.
2. Water quality management for freshwater and marine aquariums. Water filtration systems – biological, mechanical and chemical. Types of filters.
3. Aquarium fish feeds – Live feeds, Dry and wet feeds. Pigmented feeds for color enhancement, larval feeds and feeding.
4. Common diseases of aquarium fish - diagnosis and treatment. Control of snail and algal growth. Medicines and chemicals used in aquaria.

UNIT IV: Breeding and Rearing of ornamental fishes

(10h)

1. Breeding of Live bearers and Egg layers – sex identification, conditioning of parent fish, stimulating spawning, parental care, hatching, and fry rearing.
2. Breeding of marine ornamental fishes (clown and damsel fishes) and larval rearing.
3. Application of genetics and biotechnology for quality strain production.

UNIT V: Commercial Production of Aquarium fish and Plants

(10h)

1. Commercial production units of ornamental fish - requirements and design
2. Commercial production of live bearers, goldfishes, gouramies, barbs, angels and tetras.
3. Mass production of aquarium plants
4. Fish conditioning, packing, transport and quarantine methods. Retail marketing and export of ornamental fish.

ADDITIONAL INPUTS**Aquatic weeds, Marine Plankton, Sea weed products.****REFERENCES:**

1. Ramachandran, A. (2002). Manual on breeding, farming and management of ornamental fishes. School of Industrial Fisheries, Cochin, India.
2. Biswas, SP., Das, JN., Sarkar, UK and Lakra, WS (2007). Ornamental Fishes of North East India: An Atlas. ICAR, National Bureau of Fish Genetic Resources, Lucknow, India.
3. Dick Mills (1998). Aquarium Fishes, Dorling Kindersly Ltd., London.
4. Spotte, S. (1993). Marine Aquarium Keeping. John Wiley and Sons, USA. Kurup, BM., Harikrishnan, M. and Renjithkumar, CR (2012). Breeding, farming and trade of ornamental fishes in India-Prospects and challenges. Souvenir- Ornamentals Kerala 2012.
5. Jameson, JD. and Santhanam, R. (1996). Manual of Ornamental Fishes and Farming Technologies, Fisheries College and Research Institute, Tuticorin.
6. Murthy, VS. (2002). Marine ornamental fish resources of Lakshadweep. CMFRI special publication, 72, 1-134.
7. Olivier, K. (2003). World trade in ornamental species (pp.49-63). Iowa State Press.
8. Van Ramshorrt, JD. (1978). The complete aquarium encyclopedia, Elsevier publishers.
9. Zaidi, S.G.S. Training manual on Ornamental fish culture. CIFE-ICAR, Mumbai.
10. Cato, JC. And Brown, CL. (Eds.) (2008). Marine ornamental species: collection, culture and conservation. John Wiley & Sons.
11. Bunting, BW., Holthus, P. and Spalding, S. (2003). The marine aquarium industry and reef conservation. Marine Ornamental Species: Collection, Culture and Conservation, 109-

12. Santhanam, R., Sukumaran, N. and Natarajan, P. (1987). Manual of Freshwater Aquaculture. Oxford & IBH Publishing.
13. Sirajudheen, TK., Salim, SS., Bijukumar, A. and Antony, B. (2014). Problems and prospects of marine ornamental fish trade in Kerala, India. J. Fish. Eco. Dev., 1151:14-30.
14. *Web resources suggested by the teacher concerned and the college librarian including reading material.*

ASD GOVT. DEGREE COLLEGE FOR WOMEN (A)

(Re- Accredited by NAAC with B Grade)

Jagannaickpur, Kakinada, East Godavari, AP – 533002

AQUACULTURE TECHNOLOGY SEMESTER: V PAPER-VIIA (2023-2024)

(Course Code: AQ205316-7AP)

ORNAMENTAL FISH CULTURE PRACTICAL

Credits: 1

Hrs. /Wk.: 2

Practical Syllabus:

1. Identification of common freshwater and marine aquarium fishes
2. Construction of a glass aquarium
3. Setting up and maintenance of aquarium (maintained by students can be evaluated after one month)
4. Water quality management in freshwater and marine aquariums
5. Identification of Aquarium plants and live food organisms, and decoratives
6. Aerators and Types of Filters
7. Breeding of egg layers (Gold fish), live bearers (Guppy) and bubble nest builder (Gourami)
8. Ornamental fish diseases and their diagnosis and treatment. Calculation of medicine/ chemical treatment dosages.
9. Conditioning and packing of ornamental fishes.

M. S. S. S.

Signature of the Lecturer in charge

LECTURER-IN-CHARGE,

DEPARTMENT OF ZOOLOGY

A.S.D. GOVT. COLLEGE FOR WOMEN

KAKINADA-2

V. S. S.

Principal

PRINCIPAL
A.S.D. GOVT. DEGREE COLLEGE (W)
AUTONOMOUS
KAKINADA



A.S.D.GOV'T. DEGREE COLLEGE FOR WOMEN (A)
JAGANNAICKPUR, KAKINADA.

DEPARTMENT OF HOME SCIENCE



స్త్రీ విద్యా ప్రవర్ధతాం

FOCUS ON

EMPLOYABILITY/ENTREPRENEURSHIP/SKILL DEVELOPMENT

2023-2024

SEMESTER-I

COURSE 1: INTRODUCTION TO HOME SCIENCE

Theory

Credits:4 5 hrs/week

Unit: 1 Basics of Home Science

- Meaning, Definition and Branches of Home Science
- Scope of Home Science
- Development of Home Science as a discipline in India, Home Science Association of India-Role and activities in promoting Home Science
- Linkages of Home Science with other related subjects

UNIT 2: Branches of Home Science

- **Human Development:** Meaning, Definition and Scope of Human Development. • Stages of Human Development, Developmental tasks/milestones.
- **Food and Nutrition:** Definition, Importance and Functions of Food. Concept of Nutrition, Basic terms used in the study of Nutrition: Nutrients, Food Groups, Balanced Diet and Food Guide Pyramid.

UNIT 3: Branches of Home Science contd.

- **Textiles and Clothing:** Origin, Importance and Functions of Clothing. • Introduction to textile terms- fiber, yarn, textile, weaving, knitting, Classification of textile fibers.
- **Extension Education and Communication:** Concept, Nature, Scope and principles of Extension and communication.
- Methods and media of community outreach.
- **Resource management & Interior Design:** Concept and scope, Need for management, Classification of resources, Factors affecting use of resources, Importance of housing and functions of housing and interior design.

Unit: 4 Research in Home Science: **Research in Home Science-** Recent developments in Foods & Nutrition, Human Development & Family Studies, Textiles & Clothing, Resource Management & Interior Design and Extension Education & Community Development.

Unit: 5 Careers & Entrepreneurship in Home Science: Scope of careers and entrepreneurship in i. Foods & Nutrition – In hospitals, health centres, food industry ii. Human Development- welfare programs of Government/NGOs, preschools iii. Textiles & Clothing- in textile industry, boutiques, research labs iv. Resource Management- construction sector (CAD assistants, interior designer), creative crafts entrepreneur v. Extension education- extension projects of Government/ NGOs, entrepreneur making teaching aids.

SEMESTER-I

COURSE 2: HEALTH, HYGIENE & WELLNESS

Theory

Credits: 3

5 hrs/week

Theory

Unit I Health & wellness – Definition & meaning

- Dimension/ Elements of health and wellness – Physical, Social, Emotional, Intellectual, and Spiritual.
- Factors affecting Health and Wellness
- Indicators of health- concept of Mortality, Morbidity, Disability

Unit II Classification & Study of Microorganisms- in terms of morphology, growth, Nutrition and Reproduction

- Bacteria, Virus, Yeasts, Algae and Mould
- Beneficial Applications of Microorganisms in Food Industry, Agriculture and other areas.

Unit III Mode of infection

- Infection- sources, mode of transmission.
- Diseases caused by microorganisms-Symptoms, etiology, mode of transmission of
 - a. Bacterial diseases- Typhoid, Tuberculosis,
 - b. Viral Diseases: Influenza, AIDS
 - c. Parasite transmitted diseases- Malaria, Dengue,

Unit-IV Prevention & Control

- Control of Micro-organisms – Sanitation, Sterilization & Disinfection- Physical and chemical method.
- Immunity- definition & types, Immunization schedule
- Hygiene - Meaning and importance of personal hygiene
- Standard precautions to prevent infections

Unit V Management of Health & Wellness

- Modern lifestyle and hypo-kinetic diseases; prevention and management through Physical exercise
- Stress, anxiety, and depression- Definition and concept
- Role of Yoga, asanas and meditation in maintaining health and wellness.
- Role of sleep-in maintenance of physical and mental health.

PRINCIPLES OF PSYCHOLOGY
Multidisciplinary Course w.e.f. AY 2023-24

Credits: 2

2 hrs/week

Unit I

Introduction: Definition, Origin of psychology, Psychology as a scientific study of behavior-Branches of Psychology-Pure and Applied

Attention: Definition, Types-Voluntary, Involuntary; Determinants of attention-Extrinsic, Intrinsic selective, sustained and divided attention.

Perception: Definition and Principles of perception.

Unit II: Emotion and Motivation

Emotion: Definition, nature and components of emotions. Theories of emotion: James-Lange, Cannon-Bard and Schachter-Singer. Emotional Quotient

Motivation: Nature and types-Intrinsic and extrinsic; Needs-Meaning, types-Maslow's hierarchy model

Unit III: Learning and memory

Learning – Definition, Characteristics and types of learning. Classical and operant conditioning: principles of classical conditioning, schedules of reinforcement,

Memory – Definition, Process of memorization, Types of Memory-Sensory (Immediate), short-term and long-term memory-Techniques of memorization, forgetting and its causes

Personality – Trait approach theories-Hippocrates, Kretschmer, Sheldon's, Jung's, Friedman and Roseman classification and type approaches theories-Allport's, Cattell's theories; assessment of personality.

Intelligence: Definition and types of Intelligence. Concept and classification of IQ

Course 03: ESSENTIALS OF HOME SCIENCE EXTENSION

Credits -3

UNIT I Extension Education -

- Meaning, Concept, Scope and objectives
- Formal and Non formal Education
- Philosophy and principles of Extension Education
- Role and Qualities of an Extension worker

Unit-II Teaching and Learning Process

- Teaching – Meaning, definition, steps in Teaching.
- Learning – Meaning, definition, Elements of Learning.
- Learning Situation – Definition, Elements of Learning Situation Principles of learning and their Implications for Teaching
- Motivation – Principles of Motivation in Extension
- Classification of motives

Unit-III Teaching Methods/Techniques

- Extension Teaching methods – Definition, Functions and Classification of Teaching methods – According to use and form
- Individual methods – Farm and home visits, Telephone calls, Personal letter, Result demonstrations.
- Group methods – Method demonstration, Group meetings/Discussions, Conferences, Field trips etc.
- Mass Methods – Print and electronic media, Internet, social media and Exhibitions
- Factors to be considered in selection and combination of teaching methods

Unit-IV Audio - Visual Aids:

- Audio Visual Aids – Meaning and Classification
- Factors Influencing selection of Audio-Visual Aids
- Principles of Preparing in Planning, Presentation and evaluating in Audio-Visual Aids
- The cone of Experience

Unit-V Communication

- Communication – Meaning, Definition and scope of Communication
- Key Elements in the process of Communication – 1. Communicator 2. Messages, 3. Channel 4. Treatment of Messages 5. Audience 6. Audience Response.
- Types of Communication – Verbal, Non Verbal, Small group and Mass Communication.
- Barriers to communication.

PRACTICAL

Credits -1

1. Visit to a community/ village to find out the socio- economic needs of the people
2. Preparation of Survey Schedule
3. Preparation and display of teaching aids – Posters, charts, flash cards etc.
4. Display of bulletin board

5. Illustrated Lecture and Method Demonstration to any community on Home Science related
II SEMESTER

Course 04: HUMAN DEVELOPMENT

Credits -3

Unit I: Introduction to Growth and Development

- Understanding the terms Child, Growth, Development, Child Development, Human Development, and Developmental tasks.
- Principles of Child Development and Factors influencing growth and Development of Children.
- Determinants of Development - Heredity vs. Environment - Maturation Vs. Learning
- Stages of Development across life span

Unit II: Pre-natal and Early Years of Development

- Stages of Pre-natal development –Factors affecting prenatal development- Physical and Psychological care during pregnancy- Complications during pregnancy.
 - Stages of birth and Types of Birth
 - Infancy – Characteristics -Physical proportions, Physiological functions, Motor activities.
 - Babyhood – Developmental Tasks and Characteristics, Physical-motor development, Cognitive development - Piaget’s Sensory motor stage, Language, Socio-emotional development.

Unit III Development during Early and Late Childhood

- Early Childhood Period –Characteristics -Physical, Emotional, Social and Cognitive development- Piaget’s Pre-operational stage -Social stages in play.
- Late Childhood Period – Characteristics, Physical, Emotional, Social and Cognitive development- Piaget’s Concrete-operational stage.

Unit IV: Development during Adolescence

- Adolescence – Definitions by WHO, UNICEF, NCERT- Characteristics of Adolescence
- Physical and physiological Changes during puberty for Boys and girls
- Developments during adolescence – Cognitive-Piaget’s Formal-operational stage, Emotional and Social development

Unit V: Development during Adult Hood

- Young Adulthood - Definition, Development tasks, significance of the period, Adjustments during young adulthood period
- Middle adulthood – Definition, physical, physiological and Psychological changes during middle age, preparation for retirement.

- Late adulthood –Sub groups and definitions, Characteristics of old age – Physical and physiological changes during old age, cognitive and memory changes. Problems of old age and coping up strategies.

PRACTICALS:

1. Observation of characteristics of an infant
2. Observation of different Developments of pre-school children —Physical development , -Language development , -Concept development.
3. Assessment of social Development among elementary school children
4. Study of adolescent adjustment problems
5. Study on awareness of cyber bullying among adolescents
6. Case study of man and woman during Middle adulthood
7. Case study of elderly man and woman

**Minor-II Semester
FOOD SCIENCE (THEORY)**

Theory: 4 Hours/week
Practicals: 2 Hours/week

UNIT –I

15 hours

1. Functions of Food, Classification of Food – Basic 5 food groups, Functional classification, objectives of foods, concept of My Plate for the day.
2. Study of various cooking methods – (Wet, dry and combination methods)- Definition, advantages and disadvantages
3. Solar cooking and Microwave Methods - Definition, Advantages and disadvantages.
4. Cereals - Structure, composition and nutritive value of cereal grain, Parboiling, gelatinization.
5. Millets – importance of millets in daily diet.

UNIT –II

10 hours

1. Pulses and grams –composition, nutritive value, germination, Toxic constituents present in pulses.
2. Vegetables - Classification, composition, nutritive value, pigments.
3. Fruits - Composition, nutritive value, changes during ripening, browning reactions.

UNIT –III

13 hours

1. Beverages – Definition, Classification
2. Spices and Condiments – Definition, Medicinal value, role of spices in cookery
3. Fats and Oils – Refined oils, Rancidity, smoking point of oil, factors affecting smoking temperature of Fats and oils.
4. Sugar cookery- Stages of sugar cookery

UNIT –IV

12 hours

1. Milk – Composition & nutritive value, Types of processed milk available in the market,

pasteurization of milk, Uses of milk in cookery

2. Egg - Structure, composition and nutritive value, uses of egg in cookery, methods to assess quality of eggs, changes during storage

UNIT –V

10 hours

1. Meat – Composition & nutritive value, post mortem changes in meat.
2. Poultry – Classification, composition & nutritive value.
3. Fish – Selection of fish, Classification, composition & nutritive value.

Practicals

1. Measuring ingredients Methods of measuring different types of foods – grains, flours & liquids
2. Cooking methods Moist heat methods – (i) boiling, simmering, steaming, & Pressure cooking, (ii). Dry heat methods – baking. (iii), Fat as a medium, Cooking-shallow and deep fat frying.
3. Methods of cooking fine and coarse cereals. Examination of starch
4. Cooking of soaked and unsoaked pulses, Common preparations with pulses.
5. Experimental cookery using vegetables of different colours & textures. Common Preparations with vegetables. Preparation of soups and salads. Prevention of darkening in fruits & vegetables.
6. Milk & milk products: Common preparation with milk, cheese & curd-cheese curry & cooking vegetables in milk.
7. Flesh foods: Fish, meat & poultry- preparations.
8. Egg Experimental cookery- boiled egg, poached egg. Common preparations with egg.
9. Beverages Preparation of hot beverages- coffee, tea. Preparation of cold Beverages-fruit drinks & milk shake.
10. Sensory Evaluation and preparation of score card.

SEMESTER III

HSC-301 – FAMILY & COMMUNITY NUTRITION

Theory: 4Hours/Week
Practicals: 2Hours/Week

THEORY

Unit-I Meal Planning – Nutrition during Adulthood, Pregnancy and Lactation(Skill)

- Dietary guidelines for Indians, Principles of meal Planning, Balanced Diet.
- Nutrition for Adults – Food and Nutritional requirements for adult man and woman of different physical activities (Sedentary, Moderate and Heavy work).
- Pregnancy – Nutritional and Food requirements, Physiological changes and complications.
- Lactation – Food and Nutritional requirements

Unit-II Nutrition during Childhood(Employability)

- Infancy – Nutritional requirements – Breast feeding and its advantages; Artificial/bottle feeding; Supplementary foods (definition and types).
- Early childhood – Food and Nutritional requirements – healthy eating habits among pre-schoolers

- School going children – Food and Nutritional requirements, packed lunch.

Unit-III Nutrition during Adolescence and Old age(Skill)

- **Adolescence-** Food and Nutritional requirements, Nutritional problems and Eating Disorders- Anorexia and Bulimia.
- **Geriatric Nutrition-** Physiological changes in elderly, Food and Nutrient Requirements, Nutrition related problems

Unit-IV Nutritional Status Assessment(Employability)

- Importance of Nutritional Status Assessment of the Community
- Direct methods – Nutritional Anthropometry, Clinical and Biochemical Assessment
- Indirect methods – Diet Surveys, Vital Health Statistics (Infant mortality rate, Measurement of morbidity)

Unit –V Nutritional Programs

- Supplementary Feeding Programmes – ICDS, Mid Day Meal Programme (MDMP).
- Prophylactic Programmes to prevent Vitamin A, Iron, Iodine deficiencies
- Role of National and International Organizations in combating malnutrition –
 - (a)International Organizations - WHO, FAO and UNICEF
 - (b) National Organizations - NIN, CFTRI, NNMB.

PRACTICALS(Employability)

1. Planning and preparation of a balanced diet for Adult man and women.
2. Planning and preparation of a balanced diet for Pregnant and Nursing mother.
3. Planning and preparation of a balanced diet for a Pre School Child.
4. Planning and preparation of a balanced diet for School child and an Adolescent
5. Planning and preparation of low cost Nutritious recipes
6. Planning and preparation of diets for PEM and Anaemia
7. Use of Anthropometric measurements in assessing the Nutritional Status.
8. Visit to Anganwadi Center – Observation of feeding programme at Anganwadi Center.
9. Visit to government school – Observation of School Lunch Programme

SEMESTER - III

HSC – 302 - PRINCIPLES OF GARMENT CONSTRUCTION

Theory: 4 Hours/week
Practicals: 2Hours/week

THEORY

Unit-I Equipment in Garment Construction

- Equipment- Measuring, Drafting, marking, sewing and finishing equipment.
- Types of sewing machine- Mechanical , Electronic , Computerized or Automated , Embroidery Machine , Over lock Sewing Machine

Unit – II Body Measurements and Pattern Making (Entrepreneurship)

- Recording of body measurements- Importance- Types of measurements – vertical, Horizontal and Girth measurements. Care to be taken in body measurements.
- Pattern making- Methods of pattern making -Drafting, draping and flat pattern making,
- Drafting – Tools for drafting- Information to be recorded on the draft – Points to be kept in mind while drafting and advantage of drafting

- Paper Patterns – Advantages, and content of paper patterns

Unit – III Estimation and Preparation of the Fabric and Pattern Layout

- Estimation of fabric for different garments.
- Importance of grain in fabric for cutting and garment construction.
- Steps in Preparation of fabric for cutting
- Pattern Layout – Importance, precautions, guidelines and care to be taken in pattern lay out for asymmetric, bold, striped checked designs etc.,
- Fabric Cutting – Guidelines to cut out pattern pieces.

UNIT –IV Garment Components

- Necklines – Types of necklines.
- Collars-Factors in designing collar styles, shapes and kinds of collars.
- Sleeves – Categories and styles of sleeves.
- Yokes – Factors for selection of yokes design and types of yokes.

Unit-V Garment Fitting(Skill)

- Elements of fit – grain, set, line, balance and ease
- Characteristics of well finished garment
- Readymade garments – Selection and examination for quality, fitting and shape
- Tailor made and Homemade garments – examination for fitting and shape
- Comparison of readymade, tailor and homemade garments
- Common fitting problems and remedies for garments

PRACTICALS(Employability)

1. Basic Stitches – Temporary, permanent and neat ending finishes.
2. Seam and seam finishes.
3. Neckline finishes – Bias, Binding and shaped finishing.
4. Plackets – Continuous bound and two piece plackets.
5. Sleeves – Plain, Puff and bell sleeve.
6. Introducing fullness - Darts, tucks, gathers and pleats.
7. Fasteners – Hook and Eye, press buttons, button and button hole.
8. Drafting and construction of saree petti coat
9. Drafting and construction of frock

SEMESTER - III HSC-303 CHILD DEVELOPMENT

Theory: 4Hours/week
Practicals: 2Hours/week

THEORY

Unit I Introduction to Growth and Development

- Understanding the terms Child, Growth, Development, Child Development, Human Development, and Developmental tasks
- Principles of Growth and Development and Factors influencing growth and Development of Children.
- Determinants of Development - Heredity Vs Environment - Maturation Vs Learning
- Stages of Development across life span

Unit II Pre-natal and Early Years of Development

- Stages of Pre-natal development - care during pregnancy-Discomforts and Complications during pregnancy.

- Stages of birth and Types of Birth
- Infancy and Babyhood: Developmental Tasks and Characteristics, Physical-motor development, Cognitive development – Piaget’s Sensory motor stage, Language, Socio-emotional development.

Unit III Development during Early and Late Childhood (Skill and Employability)

- Early Childhood Period –Characteristics -Physical, Emotional, Social and Cognitive development - Piaget’s Pre-operational stage - Social stages in play.
- Late Childhood Period – Characteristics, Physical, Emotional, Social and Cognitive development- Piaget’s Concrete-operational stage.

Unit IV Children with Special Needs(Skill and Employability)

- Childhood disabilities – General Causative factors
- Classification of childhood disabilities – Definition and characteristics of Auditory Challenged, Intellectual Challenged, Developmental Challenged and Learning Disability among children
- Gifted Children –Definition and characteristics
- Importance of Early Identification and special education

Unit V Child Rearing Practices and Behaviour Problems among Children

- Parenting Styles – Authoritarian, Authoritative and Permissive styles, Influence of child rearing practices on child’s personality.
- Behavioral Problems – Definition, Common Behaviour problems - Thumb sucking, enuresis, temper tantrums, destructiveness - Early identification.
- Juvenile delinquency – Definition and Causative factors

PRACTICALS

1. Observation of characteristics of an infant
2. Observation of different Developments of pre-school children – Physical, language, Concept development
3. Assessment of social Development among elementary school children (Skill)
4. Visit to local Special schools for children with disabilities - Taking Case studies
5. Identification of Children with Behaviour problems using a Check List

SEMESTER - IV HSC-401 - THERAPEUTIC NUTRITION

Theory: 4Hours/week
Practicals: 2Hours/week

THEORY

Unit -I Introduction to Therapeutic Nutrition(Skill)

- Therapeutic Nutrition – Purpose of Diet Therapy, Therapeutic adaptation of normal diets – liquid, soft and special feeding methods
- Dietitian – Roles and responsibilities,
- Diet counselling,
- IDA – Indian Dietetic Association

Unit -II Malnutrition and Fevers(Employability and Entrepreneurship)

- Fevers – Acute and Chronic fevers – Typhoid, T.B. – Causes, symptoms and dietary management
- Under weight – Causes, assessment and dietary management

- Overweight and Obesity – Causes, assessment and dietary management and complications

Unit -III Gastrointestinal and Liver Diseases

- Gastrointestinal Diseases – Peptic ulcer, Diarrhoea, Constipation- causes, symptoms and dietary management
- Liver diseases – Hepatitis, Cirrhosis of liver - Causes, symptoms and dietary management

Unit -IV Cardio-vascular and Renal Diseases

- Cardio-Vascular Diseases – Dietary modifications, Role of fat in the development of Atherosclerosis,
- Hypertension - Causes, symptoms and dietary management
- Kidney disease – Glomerulonephritis, Nephrosis, Chronic Renal Failure - Causes, symptoms and dietary management

Unit -V Diabetes and Cancer

- a. Diabetes Mellitus – Classification, causes, symptoms, Diagnosis, Dietary management and complications
- b. Cancer – Classification, dietary modifications

PRACTICALS

Planning and preparation of the following diets(Employability)

1. Preparation of modified diets-Liquid and Soft diets.
2. Planning and preparation of diet in fevers – Typhoid and T.B.
3. Planning and preparation of diets for Underweight and Obesity.
2. Planning and preparation of diet in diseases of Gastrointestinal System – Peptic Ulcer, Viral Hepatitis
3. Planning and preparation of diet in Cardio-Vascular diseases – Atherosclerosis and Hypertension
4. Planning and preparation of diet in Kidney diseases – Nephritis
5. Planning and preparation of diet in Diabetes Mellitus

SEMESTER - IV

HSC - 402 FABRIC CONSTRUCTION AND APPAREL CARE

Theory: 4 Hours/week
Practicals: 2Hours/week

THEORY

Unit I Fabric Construction

- Weaving – Introduction, parts of the loom, Steps in weaving.
- Types of weaves – Basic and Decorative weaves.
- Concept of Grain, fabric count / Thread count, balance, selvedge.

Unit II Knitting and Non-woven fabrics(Skill)

- Knitting – Definition, classification (weft and warp) - Types of knitting,
- Comparison of Knitting with Weaving – Properties of Knits – Use and Care of Knits
- Non – woven Fabrics – Felting, Bonding, Braiding, Knotting and bonding. Properties of Non-woven fabrics. Applications of non woven fabrics.

Unit III Finishes - Chemical, Mechanical and functional finishes(Skill)

- Introduction to finishes – Importance, Kinds of finishing processes, Classification
- Chemical finishes. – Bleaching, mercerizing, shrinking, degumming, weighting.
- Mechanical finishes – Tentering, Decating, Calendering, Schreinerizing, Moireing, napping, flocking, Crepe and wrinkled effect, beetling and embossing
- Functional finishes – water repellence, flame proofing, mildew proofing, moth proofing, antiseptic and antistatic finishes

Unit IV Clothing Selection and Wardrobe Planning

- Factors affecting selection of clothing.
- Clothing selection – Clothing for specific groups – Infants, children and teenagers.
- Selection of common household linen – Towel, table linen and bed sheets.
- Wardrobe planning – Definition, Importance, Factors and Steps for planning wardrobe

Unit V Laundering(Entrepreneurship)

- Manual Laundry Equipment – Washing, Drying and Ironing.
- Machine Laundry – Procedure in use of washing machines – Precautions. Reagents/ supplies used in Laundry – Soap, detergent, bleaching agents etc.
- Laundering procedure for cotton and linen, woollens, silk and synthetics,
- Process of Dry cleaning
- Stain removal – Classification of stains and ways of stain removal

PRACTICALS(E)

1. Identification and preparation of different weaves
2. Identification of thread count of a fabrics
3. Samples of different knits
4. Classify stains and identify the methods of removing stains.
5. Drafting and stitching of salwar.
6. Drafting and stitching of Kameez.

SEMESTER IV

HSC- 403 - HUMAN DEVELOPMENT AND FAMILY DYNAMICS

Theory: 4Hours/week

Practicals: 2Hours./week

THEORY

Unit I Human Development - Adolescence

- Adolescence – Definitions by WHO, UNICEF, NCERT, Characteristics.
- Physical and physiological Changes during puberty for Boys and girls
- Developments during adolescence – Cognitive- Piaget's Formal-operational stage, Emotional and Social development(Skill)
- Major concerns during adolescence – Substance abuse, Delinquency , Suicidal Ideation, Teen age pregnancy etc. Symptoms and warning signs - Use of Counselling.

Unit II Human Development -Young Adult Hood

- Definition, Development tasks, significance of the period, Changing responsibilities

- Adjustments during young adulthood period
- Preparation for Marriage – Factors to be considered in the choice of marriage partner. Modes of mate selection, Self-choice marriage and arranged marriage – Advantages and disadvantages.
- Pre-marital counselling – Meaning and Need for Pre-marital Counselling.(Employment)

Unit III Marriage and Adjustments

- Marriage –Definition and Functions, needs and goals. Criteria for successful marriage.
- Values and goals of marriage – Indian context. Different Marriage practices(Hindu, Muslim & Christian)
- Adjustments in marriage – In laws, sex adjustment to mate, adjustment to parenthood, and financial adjustments.
- Transition to Parenthood – Factors that influence Planned Parenthood.
- Factors responsible for an increase in the rate of legal marital dissolution – Post- marital counselling.

Unit IV Indian Family and Changing Trends

- Family – Meaning, Definition, functions of family, sociological significance of family.
- Types of Family – Definitions of Joint, Extended, Nuclear Families, Alternate family styles - Modern trends in family – Advantages and disadvantages.
- Changing Indian family structure – Factors responsible
- Problems faced by the modern family – Impact of modern family on children, Need for family counselling.

Unit V Human Development - Middle and Late Adulthood

- Middle adulthood – Definition, physical and physiological changes - health issues, Psychological changes during middle age, coping up strategies, preparation for retirement.
- Late adulthood – Sub groups and definitions, Late adulthood and Ageing (beyond 60 years) - Definitions, Characteristics of old age – Physical and physiological changes during old age, cognitive and memory changes.
- Problems of old age and coping up strategies
- Institutionalization of aged in Indian context

PRACTICALS(Employment)

1. Study of adolescent adjustment problems
2. Case study of adolescent boy and Girl
3. Identification of Mate selection criteria depicted in Mass media
4. Case study of Married couple-Marital adjustment
5. Case study of elderly man and woman.
6. Visit to counselling centre –Finding common problems of adolescents and married Couples

SEMESTER - IV

HSC -404- NUTRITIONAL BIOCHEMISTRY

Theory: 4Hours/week
Practicals: 2Hours/week

THEORY

UNIT I Introduction to Biochemistry and Carbohydrates

- Introduction to Biochemistry - Acids, Bases, PH, Buffers definitions
- Acid-base balance
- Chemistry of carbohydrates(Skill)
 - Structural classification, (Monosaccharides , Disaccharides and Polysaccharides)
 - Properties, Reactions of carbohydrates
 - Role of Fibre in human nutrition

UNIT II Lipids and Proteins

- Chemistry of Lipids
 - Classification of Fatty Acids
 - Properties of Lipids,
 - Structural Lipids – Phospholipids, Glycolipids, Lipoproteins and Cholesterol.
- Chemistry of Proteins
 - Nutritional classification of Amino Acids
 - Classification of protein
 - Properties of protein
 - Reactions of amino acids

UNIT III Enzymes and Co-Enzymes

- Enzymes – Definition, Properties, Classification, Enzyme Specificity, Enzyme Action, Inhibition and Factors effecting Enzyme Activity.
- Co enzymes – Vitamins as co enzymes

UNIT IV Metabolism of Carbohydrates

- Digestion and absorption of carbohydrates
- Homeostasis of blood glucose or Regulation of blood glucose
- Glucose Tolerance Test.
- Glycolysis
- Kreb's cycle.

UNIT V Metabolism of Lipids and Proteins

- Synthesis of triglycerides
- Beta oxidation and bio synthesis of fatty acids.
- Metabolism of Amino acids – Deamination, Transamination, Decarboxylation of amino acids.
- Integration of Carbohydrate, protein and Lipid metabolism

PRACTICALS

1. Preparation of acids, bases, buffers, measuring pH.
2. Qualitative analysis – Identification of carbohydrates
3. Qualitative analysis – Identification of proteins and amino acids
4. Qualitative analysis of Lipids.
5. Qualitative analysis of food enzymes – plant and animal.

HSC - 405 - RESOURCE MANAGEMENT & FAMILY ECONOMICS

Theory: 4Hours/week
Practicals: 2Hours/week

THEORY

UNIT I Management Process

- a. Management Process – Steps – Planning, Organizing, Controlling & Evaluating;
- b. Types of managerial situations in family- Elementary, Growth & Developmental and Preventive;
- c. Roles played by Home Maker, Role Overload, Role Conflict;
- d. Systems Approach to Management- Elements and Importance

UNIT II

- a. Factors motivating Management: Values, Goals & Standards – Types, Factors influencing, Inter-relationship
- b. Resources – classification, factors influencing
- c. Decision Making – Steps in Decision making, Types of Decisions, Factors influencing Decision making.(Skill)
- d. Conflict Resolution – Methods, Importance.

UNIT III

- a. Time Management – Importance, Tools of time management – Time Norm, Time Cost, Work Norm, Work Curve, Peak Load; Management Process applied to Time – Planning – Controlling & Evaluating.
- b. Energy Management – Importance, Management process applied to Energy; Fatigue – Types- Physiological & Psychological, Methods of Coping.
- c. Work Simplification – Techniques to study work simplification -Process Chart, Pathway Chart, Operation Chart; Mundell's Classes of Change – Three classes of Change

UNIT IV

- a. Family as an Economic Unit – Functions, Economic Goals of Families, Factors influencing Economic Goals
- b. Family Income – Definition, Classification, Methods of handling Family Income, Methods of Supplementing Family Income.

UNIT V

- a. Family Expenditure – Heads of expenditure;
- b. Budget – Steps in Budgeting, Budgets for Different Income Levels, Factors influencing Family Budget
- c. Savings – Importance, Benefits of Savings, Modes of saving in India – Advantages & Risks

PRACTICAL:

1. Decision making – technique of decision tree
2. Time norm – for any two activities
3. Work norm – for any two activities
4. Study of peak load of selected career women/full time home makers through personal interview
5. Study of work simplification by using a) process chart b) pathway chart
6. Study of fatigue experienced by women through personal interview
7. Study of economic goals of selected home makers from beginning, expanding and contracting stages of family life cycle.
8. Planning of budget for different income levels.
9. Study of different modes of savings – visit to post office/banks to know

SEMESTER IV

THEORY

Unit 1 Program Planning

- Definition, Objectives and Principles of Program Planning in Extension
- Steps in Program Planning
- Evaluation – Principles, methods of evaluating individual and group performances.
- Methods to find out felt and unfelt needs of the community.

Unit-II Lesson Planning

- Characteristics of good lesson plan – Pre-requisites and components of lesson planning.
- Planning lessons for a specific groups – Women and Children
- Different topics for lesson plans – Swatcha Bharath, Nutrition and health education.

Unit-III Community Types and Their Characteristics

- Features of Rural community
- Features of Urban community
- Features of Tribal community

Unit-IV Community Development

- Community Development – Definition , Scope objectives – Role of Functionaries
 - Panchayat Raj Systems in India (brief) – Meaning, Definition, Democratic Decentralization
 - Five tier system of Panchayat Raj – Village Panchayath –Functions
- Mandal Parishath – Seven Committees (Planning, Production etc.,) Functions
- ZillaParishath – Commitees, Functions- District, State and central level
- Extension organization in Panchayath raj set-up
- Concept of Welfare State, Directive Principles

Unit- V Government and Non-Governmental Organizations

- Government and Non- Governmental Organizations-Meaning and definition
- Role of organizations (Government and Voluntary) for the development of people
- International Agencies – WHO, CARE, UNICEF,
- National and Voluntary Agencies – ICDS, RASS, KVK, DWCRA, MEPMA
- Local Level Voluntary Agencies, people's organizations at grass roots – PASS

PRACTICALS

1. Plan an activity to create awareness among women and children of community surveyed according to their needs and interests - Lecture cum group discussion
2. Field Visits – Mandal Office, ICDS, Mahila Pranganam, PASS organization
3. Community development – Need based group project work.

SEMESTER -V

Course 16 C: FOOD QUALITY CONTROL AND ASSURANCE

Unit –I Food Quality – Definition- Food Quality and its need in food industry - Food Quality control objectives- Importance – Functions of quality control – Stages of quality control in Food industry- Methods of quality control – Quality attributes- Classification of quality attributes.

Unit – II Food quality assurance: Theoretical and practical considerations, description of

different systems: GAP, GMP, TQM, ISO, Indian Food Standards – Voluntary and Obligatory Standards (PFA, FPO, MMPO, BIS, AGMARK etc) Codex Alimentarius, WHO, Worldwide Food Safety issues. Fair Average Quality (FAQ) specification for food grains, ISO 9000 series.

Unit – III Sensory evaluation: Requirements and methods –Sensory parameters: Colour, flavour, texture, Taste, aroma, general and overall acceptability –Subjective and objective test of sensory parameters (Differential test, Rating test, Sensory threshold test)(Employability)

Unit – IV Quality assessment of Food materials i.e. Cereals, Pulses, Fruits, Vegetables products – selection method, Food Standards- Food packaging and labelling methods

Unit – V Quality assessment of Food materials i.e. Meat, Poultry, Egg, Processed food products- selection method, Food Standards- Food packaging and labelling methods

Practical Syllabus

1. Sensory and instrumental methods for measuring food sensory attributes.
2. Selection and training of sensory panel
3. Assessment of sensory evaluation of foods by Hedonic scale
4. Quality assessment of cereals
5. Quality assessment of fruits and vegetables
6. Quality assessment of meat, poultry and other processed products.
7. Quality assessment of dairy products.
8. Quality assessment of Processed food products
9. Visit to food testing lab and writing report on quality assessment of different foods
10. Visit to food processing industry to study the quality measures undertaken by them.

SEMESTER - V

Course 17 C: FOOD SAFETY, SANITATION AND HYGIENE

Theory Syllabus

Unit – I Food safety- Definition, Meaning - factors affecting food safety - importance of food safety - Risks and hazards - Food related hazards - microbial consideration in food safety- Food safety and standards bill 2005

Unit – II Basic principles of Food hygiene and Sanitation - Personal and environmental Hygiene – Hygiene aspects of Food handlers- Hygiene aspects in preparation and storage of food - dish washing and garbage disposal- Safety of leftover foods Methods of sanitation and hygiene

Unit – III Food Adulteration and Adulterants: Meaning, Methods to identify the

presence of adulterants-Types of adulteration in various foods-
Intentional, incidental and metallic contaminants - Consequences of
adulteration

Unit – IV Safety in Food processing –Regulatory compliance requirement for
establishment of food outlets - Frame work for enabling environment for
serving safe and nutritious food at food establishment or outlets.
Sterilization and disinfection using heat and chemicals – Solid and liquid
waste management and disposal.

Unit –V Objectives of developing Food Safety and Standards- Enforcement of
structure and procedure - Role of food analyst- good practices- statutory
and regulatory

requirements - Certification - HACCP, ISO-22000, FSSC-22000

Practical Syllabus

1. Detection of common adulterants in foods
2. Bacteriological analysis of water
3. Microbiological examination of different food samples.
4. Assessment of personal hygiene
5. Assessment of surface sanitation by swab/ rinse method
6. Scheme for detection of food borne pathogens
7. Market survey of preserved fruits and vegetable products.
8. Demonstration of safe food handling procedure
9. Visit to Food Service Centre-Hotel/Fast food centre to study the food safety measures and report writing
10. Visit to Food service Institution- Hostel /Hospital to study the food safety, hygiene & sanitation measures and report writing. and report writing

SEMESTER-V

Course – 18 C: Guidance and Counselling

I. Syllabus -Theory

Unit 1- Guidance and Counselling

- Meaning and scope
- Need and Importance of Guidance and Counselling
- Principles of Guidance and counselling.
- Types of Guidance- Educational, Vocational, and Personal Guidance

Unit 2-Counselling Types and Techniques

- Goals of counselling
- Types of Counselling— Education, Vocation, Social, Health, Personal, Marital, Family.
- Different types of counselling Techniques - Directive, Non-directive, Eclectic
- Stages of Counselling- Beginning, Middle and Ending phase

Unit 3- Counselling Process and Skills(Employment & Entrepreneurship)

- Process of Counselling- physical setting – Establishing the relationship – conducting counselling interview – Problems involved – Termination of counselling.
- Skills in Counselling- (listening, questioning, responding)- Diagnostic, Exploration, Relationship, Understanding, Action, Attending/ Listening Skills, Group process and Evaluation skills

Unit 4- Counselor Role, characteristics and ethics

- Role of a Counsellor - As a communication expert, inhibitor, trainer, facilitator, an idol, a teacher, and a supporter.
- Characteristics of an effective counsellor
- Confidentiality and ethics in counselling

Unit V- Counselling children and adolescents(Employment & Entrepreneurship)

- Counselling children with behavioural and emotional problems
- Counselling Parent of children with special needs
- Counselling Adolescents with problems- delinquents and addicts

II. Practical Syllabus

1. Explore and lists out various interest inventory and aptitude tests used for personal, educational and vocational guidance.
2. Group discussion and listing of problems faced by them and categories the problems in following categories - Personal/ Social/ Academic, Health etc.
3. Collection of case study of children with special need and prepare a report.
4. Collection of case study of children with problem from electronic and print media.
5. Collection of case study of adolescents with problem from electronic and print media.
6. Simulation exercises/Mock session/ Role play as counsellor and counsellee by taking above case studies– children/adolescents

7. Simulation exercises/Mock session/ Role play as counsellor and counsellee by taking above case studies– Adult/ Parent

8. Visit to a guidance and counselling center

SEMESTER-V

Course- 19 C: Education and Counselling For Parents and Community

I. Syllabus -Theory

Unit-I Parent education –Need, aspects, Types of parent education. Parents as - stake holders, planners, advisers, volunteers, and resource persons.

Unit-II Community education – Fundamental principles of community. Community education with reference to education Health, rights of children, child rearing socialization in various socio-cultural settings.(Skill & Employment)

Unit-III Techniques of Parent and community Education- Informal meeting, group and individual meetings Use of audio visual aids. Organizing parent and community programmes –school, community centers, Recreation centers, Youth clubs and other NGO's.

Unit-IV Role of professional, Contribution of professionals in parent and community education, Training programmes for young parents. Evaluation of parent and community education programmes

Unit-V Methods of Parent Education and Counseling- Strategies and Management skills for parents to deal with normal children. Children of developmental delays and disabilities. Counselling parents of Children with Special Needs.

II. Practical Syllabus

1. Study various methods of parent and community education.
2. Visit to local community for identifying parents of normal and exceptional children,

3. Conducting case studies on parents of normal children.(Skill)
4. Conducting case studies on parents of exceptional children.
5. Identification of areas and issues for parent education.
6. Developing parent education programmes.
7. Planning, conducting and evaluating parent education programmes.
8. Conducting awareness among the community regarding counselling centres.

SEMESTER-V
Course 20 A: INTERIOR DESIGN AND DECORATION

I. Syllabus –Theory

- Unit - 1** Introduction to interior design -goals, Design – definition, classification, requirements, elements of design – line, form, texture, value, size, direction, color
- Unit - 2** Principles of Art – Harmony, Balance, Proportion, Rhythm, Emphasis – methods of obtaining in interiors, importance.
- Unit - 3** **Color in interiors – Importance, Classification, Prang’s color system – hue, value and intensity, color harmonies – classification and application(Skill)**
- Unit 4** Furniture and Furnishings
- A. Furniture – styles, selection and arrangements of furniture for interiors.
- B. **Furnishings – classification, selection of furnishings, window treatment – types of curtains/draperies.**
- Unit 5** A. **Accessories – Importance, classification**
- B. Flower Arrangement – Importance, styles, classification, care of cut flowers.**
- C. Plants as accessories – Bonsai, Indoor plants – selection and care.**

II. Practical Syllabus

1. Elements of Design and types of design – naturalistic, stylized, geometric and abstract
2. Structural and decorative design – requirements and critical evaluation of art objects
3. Art principles – harmony, balance, proportion, rhythm and emphasis – sketching to illustrate application in interiors.
4. Color and color harmonies – application in interior
5. Introduction to AutoCAD
6. Setting up a drawing – tools, commands
7. Isometric drawings
8. Designing using AutoCAD – Furniture, Interiors, Floor plans/layouts/elevations
9. 3D drawing in AutoCAD.

Course 21 A : TEXTILE DESIGN

I. Syllabus- Theory

Unit- 1 Introduction to textile design
Elements of design, principles of design, classification of methods by which design is obtained in fabric – structural and surface designs

Unit - 2 Structural designs in fabrics

- A. Basic weaves – plain weave and variations, twill weave and variations, satin weave and sateen weave – features, identification
- B. Decorative weaves – jacquard weave, dobby weave, swivel weave, lappet weave, pile weave, leno weave – features, identification

Unit - 3 Surface design on fabrics(Entrepreneurship)

- A. Dyeing – preparation of fabric, classification of dyes, mode of action and application for various fibres and fabrics
- B. Printing – preparation of fabric, printing paste, printing on fabric, painting methods

– block printing, screen printing, roller, stencil, spray, digital, tie & dye and batik printing

Unit- 4 Traditional textiles of India

Importance, traditional textiles and embroideries of India – origin, fabrics of different states of India – motifs used, typical colors and fabrics used for – Dacca Muslins, Benaras Brocades, Chanderi, Kanthas of Bengal, Kasuti of Karnataka, Chikankari of Lucknow, Kashida of Kashmir, Phulkari of Punjab, Pipli of Orissa.

Unit- 5 Traditional Textiles of India

Dyed, Printed and Painted Textiles – History, Significance, Typical designs & fabrics used for

- a. Bandini/Bandhej of Gujarat & Rajasthan, Patolas, Ikkats, Telia Rumal, Pochampalli
- b. Kalamkari of Andhra Pradesh
- c. Block Printing, Stencil printing, Batik.

Course 21 A: TEXTILE DESIGN Practical Syllabus

II. Practical Syllabus:

1. Design Modification to suit different surfaces/ uses
2. Preparation of Dye Paste/Dye Solution for Dyeing & Printing
a. Tie & Dye b. Block Printing c. Batik (Demonstration/Field Visit)
3. Preparation of Samples of Traditional Embroidery -Kanthas, Pipli, Chikankari
4. Study and practice of Typical Designs used in Traditional Embroidery and printing in India
5. Market Survey to know availability of Traditional Textiles in local market
6. Survey to know the Awareness about Traditional Textiles and Embroidery among youth and adults.



V. N. O.
PRINCIPAL
A.S.D. GOVT. DEGREE COLLEGE (W)
AUTONOMOUS
KAKINADA

ASD GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), KAKINADA

(Under the jurisdiction of Adikavi Nannaya University)

Reaccredited by NAAC with B Grade (3rd Cycle)

**1.1.3 Details of courses offered by the institution that focus on employability/
entrepreneurship/ skill development during the year.**



DEPARTMENT OF PHYSICS
(2023-24)

ASD Government Degree College for Women (A), Kakinada

Course-Wise Syllabus

B.SC	PHYSICS (Semester: 1)	Credits: 4
PHYT: 1	ESSENTIALS AND APPLICATIONS OF MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES	Hrs/Wk: 5

Work load: 60hrs per semester

5 hrs/week

Aim and objectives of Course

The objective of this course is to provide students with a comprehensive understanding of the essential concepts and applications of mathematical, physical, and chemical sciences. The course aims to develop students critical thinking, problem-solving, and analytical skills in these areas, enabling them to apply scientific principles to real-world situations.

Learning outcomes of Course

1. Apply critical thinking skills to solve complex problems involving complex numbers, trigonometric ratios, vectors, and statistical measures
2. To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations
3. To Explain the basic principles and concepts underlying a broad range of fundamental areas of chemistry and to Connect their knowledge of chemistry to daily life.
4. Understand the interplay and connections between mathematics, physics, and chemistry in various applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts
- 5 To explore the history and evolution of the Internet and to gain an understanding of network security concepts, including threats, vulnerabilities, and counter measures

UNIT I: ESSENTIALS OF MATHEMATICS

Complex Numbers: Introduction of the new symbol i – General form of a complex number – Modulus-Amplitude form and conversions Trigonometric Ratios: Trigonometric Ratios and their relations – Problems on calculation of angles

Vectors: Definition of vector addition – Cartesian form – Scalar and vector product and problems, Statistical Measures: Mean, Median, Mode of a data and problems

UNIT II: ESSENTIALS OF PHYSICS: Skill & Employability

Definition and Scope of Physics- Measurements and Units - Motion of objects: Newtonian Mechanics and relativistic mechanics perspective - Laws of Thermodynamics and Significance- Acoustic waves and electromagnetic waves- Electric and Magnetic fields and their interactions- Behaviour of atomic and nuclear particles- Wave-particle duality, the uncertainty principle- Theories and understanding of universe

UNIT-III: ESSENTIALS OF CHEMISTRY

Definition and Scope of Chemistry- Importance of Chemistry in daily life -Branches of chemistry and significance- Periodic Table- Electronic Configuration, chemical changes, classification of matter, Biomolecules- carbohydrates, proteins, fats and vitamins.

UNIT-IV: APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY

Employability & Entrepreneurship

Applications of Mathematics in Physics & Chemistry: Calculus, Differential Equations & Complex Analysis Application of Physics in Industry and Technology: **Electronics and Semiconductor Industry, Robotics and Automation, Automotive and Aerospace Industries, Quality Control and Instrumentation, Environmental Monitoring and Sustainable Technologies.** Application of Chemistry in Industry and Technology: Chemical Manufacturing, Pharmaceuticals and Drug Discovery, Materials Science, Food and Beverage Industry.

UNIT-V: ESSENTIALS OF COMPUTER SCIENCE

Milestones of computer evolution - Internet, history, Internet Service Providers, Types of Networks, IP, Domain Name Services, applications. Ethical and social implications: Network and security concepts- Information Assurance Fundamentals, Cryptography-Symmetric and Asymmetric, Malware, Firewalls, Fraud Techniques- Privacy and Data Protection

REFERENCE BOOKS:

1. Functions of one complex variable by John.B.Conway, Springer- Verlag.
2. Elementary Trigonometry by H.S.Hall and S.R.Knight
- 3.Vector Algebra by A.R.Vasishtha, Krishna Prakashan Media(P)Ltd.
- 4.Basic Statistics by B.L.Agarwal, New age international Publishers
5. University Physics with Modern Physics by Hugh D. Young and Roger A. Freedman
6. Fundamentals of Physics by David Halliday, Robert Resnick, and Jearl Walker
7. Physics for Scientists and Engineers with Modern Physics" by Raymond A. Serway and John W. Jewett Jr.
8. Physics for Technology and Engineering" by John Bird
9. Chemistry in daily life by Kirpal Singh
10. Chemistry of bio molecules by S. P. Bhutan
11. Fundamentals of Computers by V. Raja Raman
12. Cyber Security Essentials by James Graham, Richard Howard, Ryan Olson

Course-Wise Syllabus

B.SC	PHYSICS (Semester: 1)	Credits: 4
PHYT: 1	ADVANCES IN MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES	Hrs/Wk: 5

Work load:60hrs per semester

5 hrs/week

Aim and objectives of Course

The objective of this course is to provide students with an in-depth understanding of the recent advances and cutting-edge research in mathematical, physical, and chemical sciences. The course aims to broaden students' knowledge beyond the foundational concepts and expose them to the latest developments in these disciplines, fostering critical thinking, research skills, and the ability to contribute to scientific advancements.

Learning outcomes of Course

1. Explore the applications of mathematics in various fields of physics and chemistry, to understand how mathematical concepts are used to model and solve real-world problems
2. To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations and understand the different sources of renewable energy and their generation processes and advances in nanomaterials and their properties, with a focus on quantum dots. To study the emerging field of quantum communication and its potential applications. To gain an understanding of the principles of biophysics in studying biological systems. Explore the properties and applications of shape memory materials.
3. Understand the principles and techniques used in computer-aided drug design and drug delivery systems, to understand the fabrication techniques and working principles of nano sensors. Explore the effects of chemical pollutants on ecosystems and human health
4. Understand the interplay and connections between mathematics, physics, and chemistry in various advanced applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts
- 5 Understand and convert between different number systems, such as binary, octal, decimal, and hexadecimal. Differentiate between analog and digital signals and understand their characteristics. Gain knowledge of different types of transmission media, such as wired (e.g., copper cables, fibre optics) and wireless (e.g., radio waves, microwave, satellite)..

UNIT-I: ADVANCES IN BASICS MATHEMATICS

Straight Lines: Different forms – Reduction of general equation into various forms – Point of intersection of two straight lines Limits and Differentiation: Standard limits – Derivative of a function –Problems on product rule and quotient rule Integration: Integration as a reverse process of differentiation – Basic methods of integration Matrices: Types of matrices – Scalar multiple of a matrix – Multiplication of matrices – Transpose of a matrix and determinants

UNIT-II: ADVANCES IN PHYSICS Skill, Employability & Entrepreneurship

Renewable energy: Generation, energy storage, and energy-efficient materials and devices. Recent advances in the field of nanotechnology: Quantum dots, Quantum Communication, recent advances in biophysics- recent advances in medical physics- Shape Memory Materials.

UNIT-III: ADVANCES IN CHEMISTRY

Computer aided drug design and delivery, nano sensors, Chemical Biology, impact of chemical pollutants on ecosystems and human health, Dye removal - Catalysis method UNIT IV: ADVANCED APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY Mathematical Modelling applications in physics and chemistry Application of Renewable energy: Grid Integration and Smart Grids, Application of nanotechnology: Nanomedicine, Application of biophysics: Biophysical Imaging, Biomechanics, Neuro physics, Application of medical physics: Radiation Therapy, Nuclear medicine Solid waste management, Environmental remediation- Green Technology, Water treatment

UNIT-IV: ADVANCED APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY

Skill Employability & Entrepreneurship

Mathematical Modelling applications in physics and chemistry Application of Renewable energy: Grid Integration and Smart Grids, Application of nanotechnology: Nanomedicine, Application of biophysics: Biophysical Imaging, Biomechanics, Neuro physics, Application of medical physics: Radiation Therapy, Nuclear medicine Solid waste management, Environmental remediation- Green Technology, Water treatment

UNIT-V: ADVANCED APPLICATIONS OF COMPUTER SCIENCE Skill & Employability

Number System-Binary, Octal, decimal, and Hexadecimal, Signals-Analog, Digital, Modem, Codec, Multiplexing, Transmission media, error detection and correction- Parity check and CRC, Networking devices- Repeater, hub, bridge, switch, router, gateway

REFERENCE BOOKS:

1. Coordinate Geometry by S.L.Lony, Arihant Publications
2. Calculus by Thomas and Finny, Pearson Publications
3. Matrices by A.R.Vasishtha and A.K.Vasishtha, Krishna Prakashan Media(P)Ltd.
4. "Renewable Energy: Power for a Sustainable Future" by Godfrey Boyle
5. "Energy Storage: A Nontechnical Guide" by Richard Baxter
6. "Nanotechnology: Principles and Applications" by Sulabha K. Kulkarni and Raghvendra A. Bohara
7. "Biophysics: An Introduction" by Rodney Cotterill
8. "Medical Physics: Imaging" by James G. Webster
9. "Shape Memory Alloys: Properties and Applications" by Dimitris C. Lagoudas
10. Nano materials and applications by M.N.Borah
11. Environmental Chemistry by Anil.K.D.E.
12. Digital Logic Design by Morris Mano
13. Data Communication & Networking by Bahrouz Forouzan

ASD Government Degree College for Women (A), Kakinada

Course-Wise Syllabus

B.SC	PHYSICS (Semester: 2)	Credits: 3
PHYT: 2	MECHANICS AND PROPERTIES OF MATTER	Hrs/Wk: 3

Work load:60hrs per semester

4 hrs/week

Aim and objectives of Course

The course on Mechanics and Properties of Matter aims to provide students with a fundamental understanding of the behaviour of physical systems, both in terms of mechanical motion and in terms of the properties of matter

Learning outcomes of Course

1. Students will be able to understand and apply the concepts of scalar and vector fields, calculate the gradient of a scalar field, determine the divergence and curl of a vector field
2. Students will be able to apply the laws of motion, solve equations of motion for variable mass systems
3. Students will be able to define a rigid body and comprehend rotational kinematic relations, derive equations of motion for rotating bodies, analyse the precession of a top and gyroscope, understand the precession of the equinoxes
4. Students will be able to define central forces and provide examples, understand the characteristics and conservative nature of central forces, derive equations of motion under central forces
5. Students will be able to differentiate between Galilean relativity and the concept of absolute frames, comprehend the postulates of the special theory of relativity, apply Lorentz transformations, understand and solve problems

UNIT-I: VECTOR ANALYSIS **Skill & Employability**

Scalar and vector fields, gradient of a scalar field and its physical significance. Divergence and curl of a vector field with derivations and physical interpretation. Vector integration (line, surface and volume), Statement and proof of Gauss and Stokes theorems

UNIT-II: MECHANICS OF PARTICLES **Skill oriented**

Laws of motion, motion of variable mass system, Equation of motion of a rocket. Conservation of energy and momentum, Collisions in two and three dimensions, Concept of impact parameter, scattering cross-section, Rutherford scattering-derivation

UNIT-III: MECHANICS OF RIGID BODIES AND CONTINUOUS MEDIA **Skill oriented**

Definition of rigid body, rotational kinematic relations, equation of motion for a rotating body, Precession of a top, Gyroscope, Precession of the equinoxes. Elastic constants of isotropic solids and their relations, Poisson's ratio and expression for Poisson's ratio. Classification of beams, types of bending, point load, distributed load.

UNIT-IV: CENTRAL FORCES Employability & Skill

Central forces, definition and examples, characteristics of central forces, conservative nature of central forces, conservative force as a negative gradient of potential energy, equations of motion under a . Derivation of Kepler's laws. Motion of satellites

UNIT-V: SPECIAL THEORY OF RELATIVITY Skill & Employability

Galilean relativity, Absolute frames. Michelson-Morley experiment, The negative result. Postulates of special theory of relativity. Lorentz transformation, time dilation, length contraction, addition of velocities, mass-energy relation.

PHYP- 3: MECHANICS AND PROPERTIES OF MATTER Skill oriented

Credits:1

2Hrs/week

Minimum of 6 experiments to be done and recorded

1. Viscosity of liquid by the flow method (Poiseuille's method)
2. Young's modulus of the material of a bar (scale) by uniform bending
3. Young's modulus of the material a bar (scale) by non- uniform bending
4. Surface tension of a liquid by capillary rise method
5. Determination of radius of capillary tube by Hg thread method
6. Viscosity of liquid by Searle's viscometer method
7. Bifilar suspension –moment of inertia of a regular rectangular body.
8. Determination of moment of inertia using Fly-wheel
9. Determination of the height of a building using a sextant.
10. Rigidity modulus of material of a wire–dynamic method (torsional pendulum)

REFERENCE BOOKS:

1. BSc Physics -Telugu Akademy, Hyderabad
2. Mechanics - D.S. Mathur, Sulthan Chand & Co, New Delhi
3. Mechanics - J.C. Upadhyaya, Ramprasad & Co., Agra
4. Properties of Matter - D.S. Mathur, S.Chand & Co, New Delhi ,11th Edn., 2000
5. Physics Vol. I - Resnick-Halliday-Krane ,Wiley, 2001
6. Properties of Matter – Brijlal & Subrmanyam, S. Chand &Co. 1982

7. Dynamics of Particles and Rigid bodies– Anil Rao, Cambridge Univ Press, 2006
8. Mechanics-EM Purcell, Mc Graw Hill
9. University Physics-FW Sears, MW Zemansky & HD Young, Narosa Publications, Delhi
10. College Physics-I. T. Bhima sankaram and G. Prasad. Himalaya Publishing House.
11. Mechanics, S. G. Venkata chalapathy, Margham Publication, 2003

ASD Government Degree College for Women (A), Kakinada

Course-Wise Syllabus

B.SC	PHYSICS (Semester: 2)	Credits: 3
PHYT: 4	WAVES AND OSCILLATIONS	Hrs/Wk: 3

Work load:60hrs per semester

4 hrs/week

Aim and objectives of Course

This course provides students with a broad understanding of the physical principles of the oscillations, to help them develop critical thinking and quantitative reasoning skills, to empower them to think creatively and critically about scientific problems and experiments

Learning outcomes of Course

1. To describe the basic characteristics of waves such as frequency, wavelength, amplitude, period, and speed.
2. To utilize mathematical relationships related to wave characteristics.
3. To compare particle motion and wave motion in different types of waves.
4. To distinguish between Longitudinal and Transverse waves.
5. To get the knowledge about how to construct and analysis the square waves, saw tooth waves, etc. from Fourier analysis

UNIT-I: Simple Harmonic oscillations **Skill**

Simple harmonic oscillator and solution of the differential equation-Physical characteristics of SHM, torsion pendulum-measurements of rigidity modulus, compound pendulum- measurement of 'g', Principle of superposition, beats, combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies. Lissajous figures

UNIT-II: Damped and forced oscillations **Skill oriented**

Damped harmonic oscillator, solution of the differential equation of damped oscillator. Energy considerations, comparison with un-damped harmonic oscillator, logarithmic decrement, relaxation time, quality factor, differential equation of forced oscillator and its solution, amplitude resonance and velocity resonance

UNIT-III: Complex vibrations **Skill oriented**

Fourier theorem and evaluation of the Fourier coefficients, analysis of periodic wave functions- square wave, triangular wave, saw tooth wave, simple problems on evolution of Fourier coefficients

UNIT-IV: Vibrating Strings and Bars Skill & Employability

Transverse wave propagation along a stretched string, general solution of wave equation and its significance, modes of vibration of stretched string clamped at ends, overtones and harmonics. Energy transport and transverse impedance. Longitudinal vibrations in bars-wave equation and its general solution. Special cases (i) bar fixed at both ends (ii) bar fixed at the midpoint (iii) bar fixed at one end. Tuning fork

UNIT-V: Ultrasonics Skill & Employability

Ultrasonics, properties of ultrasonic waves, production of ultrasonics by piezoelectric and magnetostrictive methods, detection of ultrasonics, determination of wavelength of ultrasonic waves. Applications and uses of ultrasonic waves.

PHYP- 4: WAVES AND OSCILLATIONS Skill oriented

Practical Credits: 1

2hrs/week

1. Volume resonator experiment
2. Determination of 'g' by compound/bar pendulum
3. Simple pendulum normal distribution of errors-estimation of time period and the error of the mean by statistical analysis
4. Determination of the force constant of a spring by static and dynamic method.
5. Determination of the elastic constants of the material of a flat spiral spring.
6. Coupled oscillators
7. Verification of laws of vibrations of stretched string –sonometer
8. Determination of frequency of a bar –Melde's experiment.
9. Study of a damped oscillation using the torsional pendulum immersed in liquid-decay constant and damping correction of the amplitude.
10. Formation of Lissajous figures using CRO.

REFERENCE BOOKS:

1. BSc Physics Vol.1, Telugu Academy, Hyderabad.
2. Fundamentals of Physics. Halliday/Resnick/Walker ,Wiley India Edition 2007.
3. Waves & Oscillations. S.Badami, V. Balasubramanian and K.R. Reddy, Orient Longman.
4. College Physics-I. T. Bhimasankaram and G. Prasad. Himalaya Publishing House.
5. Science and Technology of Ultrasonics- Baldevraj, Narosa, New Delhi,2004
6. Introduction to Physics for Scientists and Engineers. F.J. Buche. McGraw Hill.

ASD Government Degree College for Women (A), Kakinada

Course-Wise Syllabus

B.SC	PHYSICS (Semester: 3)	Credits: 4
PHYT: 3	HEAT AND THERMODYNAMICS	Hrs/Wk: 4

Work load:60hrs per semester

4 hrs/week

Aim and objectives of Course

Understand the basic aspects of kinetic theory of gases, Maxwell-Boltzman distribution law, equipartition of energies, mean free path of molecular collisions and the transport phenomenon in ideal gases

Gain knowledge on the basic concepts of thermodynamics, the first and the second law of thermodynamics, the basic principles of refrigeration, the concept of entropy, the thermodynamic potentials and their physical interpretations.

Learning outcomes of Course

Develop critical understanding of concept of Thermodynamic Potentials, The formulation of Maxwell's equations and its applications.

Differentiate between principles and methods to produce low temperature and liquefy air and also understand the practical applications of substances at low temperatures.

Examine the nature of black body radiations and the basic theories.

UNIT-I: Kinetic Theory of gases:(12 hrs) Skill & Employability

Kinetic Theory of gases-Introduction, Maxwell's law of distribution of molecular velocities (qualitative treatment only) and its experimental verification, Mean free path, Degrees of freedom, Principle of equipartition of energy (Qualitative ideas only), Transport phenomenon in ideal gases: viscosity, Thermal conductivity and diffusion of gases.

UNIT-II: Thermodynamics: (12hrs) Skill oriented & Employability

Introduction- Isothermal and Adiabatic processes, Reversible and irreversible processes, Carnot's engine and its efficiency, Carnot's theorem, Thermodynamic scale of temperature

and its identity with perfect gas scale, Second law of thermodynamics: Kelvin's and Clausius statements, Principle of refrigeration, Entropy, Physical significance, Change in entropy in reversible and irreversible processes; Entropy and disorder-Entropy of Universe; Temperature-Entropy (T-S) diagram and its uses ; change of entropy when ice changes into steam.

UNIT-III: Thermodynamic Potentials and Maxwell's equations:(12hrs) Skill oriented

Thermodynamic potentials-Internal Energy, Enthalpy, Helmholtz Free Energy, Gibb's Free Energy and their significance, Derivation of Maxwell's thermodynamic relations from thermodynamic potentials, Applications to (i) Clausius-Clayperon's equation (ii) Value of C_p-C_v (iii) Value of C_p/C_v (iv) Joule-Kelvin coefficient for ideal gases.

UNIT-IV: Low temperature Physics:(12hrs) **Employability & Entrepreneurship**

Methods for producing very low temperatures, Joule Kelvin effect, Porous plug experiment, Joule expansion, Distinction between adiabatic and Joule Thomson expansion, Expression for Joule Thomson cooling, Liquefaction of air by Linde's method, Production of low temperatures by adiabatic demagnetization (qualitative), Practical applications of substances at low temperatures.

UNIT-V: Quantum theory of radiation:(12 hrs) **Skill & Employability**

Black body and its spectral energy distribution of black body radiation, Kirchoff's law, Wein's displacement law, Stefan-Boltzmann's law and Rayleigh-Jean's law (Noderivations), Planck's law of black body radiation-Derivation, Deduction of Wein's law and Rayleigh- Jean's law from Planck's law, Solar constant and its determination using Angstrom Pyroheliometer, Estimation of surface temperature of Sun.

PHYP- 3: HEAT & THERMODYNAMICS **Skill oriented**

1. Specific heat of a liquid –Joule's calorimeter –Barton's radiation correction
2. Thermal conductivity of bad conductor-Lee's method
3. Thermal conductivity of rubber.
4. Measurement of Stefan's constant.
5. Specific heat of a liquid by applying Newton's law of cooling correction.
6. Heating efficiency of electrical kettle with varying voltages.
7. Thermo emf- thermo couple - Potentiometer
8. Thermal behaviour of an electric bulb (filament/torch light bulb)
9. Measurement of Stefan's constant- emissive method
10. Study of variation of resistance with temperature - Thermistor.

REFERENCE BOOKS:

- ❖ BSc Physics, Vol.2, Telugu Akademy, Hyderabad
- ❖ Thermodynamics, R.C.Srivastava, S.K.Saha& AbhayK.Jain, Eastern Economy Edition.
- ❖ Unified Physics Vol.2, Optics & Thermodynamics, Jai PrakashNath &Co.Ltd., Meerut
- ❖ Fundamentals of Physics. Halliday/Resnick/Walker.C. Wiley India Edition 2007
- ❖ Heat and Thermodynamics -N BrijLal, P Subrahmanyam, S.Chand & Co.,2012
- ❖ Heat and Thermodynamics- MS Yadav, Anmol Publications Pvt. Ltd, 2000
- ❖ University Physics, HD Young, MW Zemansky, FW Sears, Narosa Publishers, New Delhi

ASD Government Degree College for Women (A), Kakinada

B.SC PHYSICS Syllabus

BSc	PHYSICS (Semester: IV)	Credits: 4
PHYT: IV	ELECTRICITY, MAGNETISM AND ELECTRONICS	Hrs/Wk: 4

Aim and objectives of Course

Develop an understanding on the unification of electric and magnetic fields and Maxwell's equations governing electromagnetic waves.

Phenomenon of resonance in LCR AC-circuits, sharpness of resonance, Q-factor, Power factor and the comparative study of series and parallel resonant circuits.

Understand the operation of basic logic gates and universal gates and their truth tables

Learning outcomes of Course

Understand the Gauss law and its application to obtain electric field in different cases and formulate the relationship between electric displacement vector, electric Polarization, Susceptibility, Permittivity and Dielectric constant.

Under standing the operation of p-n junction diodes, zener diodes, light emitting diodes and transistors

UNIT-I

1. Electrostatics: (6hrs) skill oriented

Gauss's law-Statement and its proof, Electric field intensity due to (i) uniformly charged solid sphere and (ii) an infinite conducting sheet of charge, Deduction of Coulomb's law from Gauss law, Electrical potential-Equipotential surfaces, Potential due to a (i)uniformly charged sphere

2.Dielectrics:(6 hrs) skill oriented & Employability

Dielectrics-Polar and Non-polar dielectrics- Effect of electric field on dielectrics, Dielectric strength, Capacitance of a parallel plate condenser with dielectric slab between the plates, Electric displacement D, electric polarization P, Relation between D, E and P, Dielectric constant and electric susceptibility.

2.UNIT-II (6 hrs) skill oriented & Employability

3.Magnetostatics:

Biot Savart's -law and its applications: (i) circular loop and (ii) solenoid, Ampere's Circuital Law and its application to Solenoid, Hall effect, determination of Hall coefficient and applications.

4.Electromagnetic Induction: (6 hrs) skill oriented

Faraday's laws of electromagnetic induction, Lenz's law, Self induction and Mutual induction, Self inductance of a long solenoid, Mutual inductance of two coils, Energy stored in magnetic field, Eddy currents.

UNIT-III

3. Alternating currents: (6 hrs) skill oriented & Entrepreneurship

Alternating current - Relation between current and voltage in LR and CR circuits, Phasor and Vector diagrams, LCR series and parallel resonant circuit, Q –factor, Power in ac circuits, Power factor.

4. Electromagnetic waves-Maxwell's equations: (6 hrs) skill oriented

Idea of displacement current, Maxwell's equations-Derivation, Maxwell's wave equation (with derivation), Transverse nature of electromagnetic waves, Poynting theorem (Statement and proof), velocity wave equation using Maxwells relations in vacuum.

UNIT-IV

5. Basic Electronic devices: (12 hrs) Skill & Employability

PN junction diode, Zener diode and Light Emitting Diode (LED) and their I-V characteristics, Zener diode as a regulator- Transistors and its operation, CB, CE and CC configurations, Input and output characteristics, transistor in CE mode, Relation between alpha β γ Transistor as an amplifier.

UNIT-V:

6. Digital Electronics: (12 hrs) Skill & Employability

Number systems, Conversion of binary to decimal system and vice versa, Binary addition & Binary subtraction (1's and 2's complement methods), Laws of Boolean algebra, DeMorgan's laws-Statements and Proofs, Basic logic gates, NAND and NOR as universal gates, Exclusive-OR gate, Half adder and Full adder circuits.

PHYP – IV: ELECTRICITY, MAGNETISM AND ELECTRONICS Skill & Employability

1. Figure of merit of a moving coil galvanometer.
2. LCR circuit series/parallel resonance, Q factor.
3. Determination of ac-frequency -Sonometer.
4. Verification of Kirchoff's laws and Maximum Power Transfer theorem.
5. Field along the axis of a circular coil carrying current-Stewart & Gee's apparatus.
6. PN Junction Diode Characteristics
7. Zener Diode -V-I Characteristics
8. Zener Diode as a voltage regulator
9. Transistor CE Characteristics- Determination of hybrid parameters
10. Logic Gates- OR,AND,NOT and NAND gates. Verification of Truth Tables.
11. Verification of De Morgan's Theorems.
12. Construction of Half adder and Full adders-Verification of truth tables

RECOMMENDED TEXT BOOKS &REFERENCE BOOKS

BSc Physics, Vol.3, Telugu Akademy, Hyderabad.

- ❖ Electricity and Magnetism, D.N. Vasudeva. S. Chand & Co.
- ❖ Electricity and Magnetism, B.D.Duggal and C.L.Chhabra. Shobanlal& Co.
- ❖ Electricity, Magnetism with Electronics, K.K.Tewari, R.Chand& Co.,
- ❖ Electricity and Magnetism, R.Murugesan, S. Chand & Co.
- ❖ Principles of Electronics, V.K. Mehta, S.Chand& Co.,
- ❖ Digital Principles and Applications, A.P. Malvino and D.P.Leach, Mc GrawHill Edition.

:

B.SC	PHYSICS (Semester: IV)	Credits: 4
PHYT: V	MODERN PHYSICS	Hrs/Wk: 4

Aim and objectives of Course

Develop an understanding on the concepts of Atomic and Modern Physics, basic elementary quantum mechanics and nuclear physics.

Develop critical understanding of concept of Matter waves and Uncertainty principle.

Get familiarized with the principles of quantum mechanics and the formulation of Schrodinger wave equation and its applications.

Learning outcomes of Course

Examine the basic properties of nuclei, characteristics of Nuclear forces, salient features of Nuclear models and different nuclear radiation detectors.

Classify Elementary particles based on their mass, charge, spin, half life and interaction.

Get familiarized with the nano materials, their unique properties and applications.

Increase the awareness and appreciation of superconductors and their practical applications

UNIT-I :

1. Atomic and Molecular Physics:(12 hrs) Employability & Skill

Vector atom model and Stern-Gerlach experiment, Quantum numbers associated with it, Angular momentum of the atom, Coupling schemes, Spectral terms and spectral notations, Selection rules, Intensity rules, Fine structure of Sodium D-lines, Zeeman effect, Experimental arrangement to study Zeeman effect; Raman effect, Characteristics of Raman effect, Experimental arrangement to study Raman effect, Quantum theory of Raman effect, Applications of Raman effect.

UNIT-II:

1. Matter waves & Uncertainty Principle:(12 hrs) skill oriented

Matter waves, de Broglie's hypothesis, Wave length of matter waves, Properties of matter waves, Davisson and Germer's experiment, Phase and group velocities, Heisenberg's uncertainty principle for position and momentum & energy and time, Illustration of uncertainty principle using diffraction of beam of electrons (Diffraction by a single slit) and photons (Gamma ray microscope), Bohr's principle of complementarity.

UNIT-III:

2. Quantum (Wave) Mechanics:(12 hrs) skill oriented

Basic postulates of quantum mechanics, Schrodinger time independent and time dependent wave equations-Derivations, Physical interpretation of wave function, Eigen functions, Eigen values, Application of Schrodinger wave equation to (i) one dimensional potential box of infinite height (Infinite Potential Well).

UNIT-IV:

4. Nuclear Physics: (12 hrs) Skill oriented, Entrepreneurship & Employability

Nuclear Structure: General Properties of Nuclei, Mass defect, Binding energy; *Nuclear forces*: Characteristics of nuclear forces- Yukawa's meson theory; *Nuclear Models*: Liquid drop model, The Shell model, Magic numbers; *Nuclear Radiation detectors*: G.M. Counter, Cloud chamber, Solid State detector; *Elementary Particles*: Elementary Particles and their classification.

UNIT-V:

3. Nano materials:(7hrs) Skill oriented & Employability, Entrepreneurship

Nanomaterials – Introduction, Electron confinement, Size effect, Surface to volume ratio, Classification of nano materials– (0D, 1D, 2D); Quantum dots, Nano wires, Fullerene, CNT, Graphene(Mention of structures and properties), Distinct properties of nano materials (Mention-mechanical, optical, electrical, and magnetic properties); Mention of applications of nano materials: (*Fuel cells, Phosphors for HD TV*),

UNIT-5

Superconductivity: (5 hrs) Entrepreneurship & Employability

Introduction to Superconductivity, Experimental results-critical temperature, critical magnetic field, Meissner effect, Isotope effect, Type I and Type II superconductors, BCS theory (elementary ideas only), Applications of superconductors

PHYP:V MODERN PHYSICS Skill oriented, & Employability

1. e/m of an electron by Thomson method.
2. Determination of Planck's Constant (photocell).
3. Verification of inverse square law of light using photovoltaic cell.
4. Determination of the Planck's constant using LEDs of at least 4 different colours.
5. Determination of work function of material of filament of directly heated vacuum diode.
6. Study of absorption of α -rays.
7. Study of absorption of β -rays.
8. Determination of Range of β -particles.
9. Determination of M & H.
10. Analysis of powder X-ray diffraction pattern to determine properties of crystals.
11. Energy gap of a semiconductor using junction diode.
Energy gap of a semiconductor using thermistor
12. GM counter characteristics

REFERENCE BOOKS

- ❖ BSc Physics, Vol.4, Telugu Academy, Hyderabad
- ❖ Atomic Physics by J.B. Rajam; S.Chand& Co.,
- ❖ Modern Physics by R. Murugesan and Kiruthiga Siva Prasath. S. Chand & Co.
- ❖ Concepts of Modern Physics by Arthur Beiser. Tata McGraw-Hill Edition.
- ❖ Nuclear Physics, D.C.Tayal, Himalaya Publishing House.
- ❖ S.K. Kulkarni, Nanotechnology: Principles & Practices (Capital Publ.Co.)
- ❖ K.K.Chattopadhyay&A.N.Banerjee, Introd.to Nanoscience and Technology(PHI LearningPriv.Limited).
- ❖ Nano materials, A K Bandopadhyay. New Age International Pvt Ltd (2007)
- ❖ Textbook of Nanoscience and Nanotechnology, BS Murthy, P Shankar, BaldevRaj, BB Rath and J Murday-Universities Press-IIM

III BSc PHYSICS Syllabus (w.e.f:2020-2021A.B)

BSc	Semester: V (Skill Enhancement Course- Elective)	Credits: 2
PHYT A1PAIR COURSE-6A	Optical Instruments and Optometry	Total hours 40

Aim and objectives of Course

Understand the construction and working principles of various optical instruments used in daily life.

Acquire a critical knowledge on the various defects of eye and their correcting methods with suitable lenses

Learning outcomes of Course

Up on completion of the course students able to

Demonstrate skills of using biological microscope through hands on experience.

Understand the various techniques used in optometry and computer based eye testing.

Comprehend the various applications of microscopes and telescopes

Perform some techniques related to testing the blood and other biological samples.

Understand the technique of operation of Computer eye testing and evaluation

UNIT-I OPTICAL MICROSCOPES (10hrs)

Skill oriented

Introduction to Microscopes, Need of a Microscope, Different types of microscopes and their uses, Simple microscope-Construction, Magnifying power, normal adjustment; Compound microscope-Construction, Magnifying power, normal adjustment, Phase contrast microscope-Operating principle, Travelling microscope-Construction, working and uses

UNIT-II TELESCOPES (10hrs)

Skill oriented & Employability

Introduction to Telescopes, Different types of Telescopes and their uses, Refracting Telescopes and Reflecting telescopes, Construction, working and magnifying power of Astronomical Telescope and Terrestrial Telescopes, Binoculars – working principle and applications.

UNIT-III APPLICATIONS OF OPTICAL INSTRUMENTS (10hrs)

Skill oriented, Entrepreneurship & Employability

Introductory ideas and applications of various microscopes viz., (i) Optical microscopes (Compound microscope, Stereo microscope, Confocal microscope) (ii) Electron microscopes (TEM, SEM), (iii) Scanning Probe microscope (iv) Scanning Acoustic microscope and (v) X-ray microscope.

Introductory ideas and applications of various telescopes viz., (i) Optical telescopes (ii) Radio telescopes (iii) Solar telescopes (iv) Infrared telescope (v) Ultraviolet telescope (vi) X-ray telescope and (vii) Gamma ray telescope

UNIT-IV OPTICAL VISION (10hrs) Skill oriented, Entrepreneurship & Employability

Introduction to optical Vision, Eye as an optical instrument, Formation of image in the eye and the camera, Ophthalmic lenses, Power of the lenses, Far point and near points, Myopia and Hypermetropia defects, Removal of defects in vision using ophthalmic lenses, Contact lenses-Working principle, Different types of Contact lenses.

UNIT-V OPHTHALMIC TECHNIQUES AND OPTOMETRY (10hrs)

Skill oriented, Entrepreneurship & Employability

Ophthalmoscope and keratometry and their working principles, Evaluation of eye disorders, Guidelines for standardized eye chart preparation, Simple phoropter and its working principle and its uses, Checking the power of lenses, Principles of Computer based eye testing

PHY A1 PAIR-COURSE -6A Optical Instruments and Optometry

Skill oriented, Entrepreneurship & Employability

1. Evaluation of magnifying power of simple microscope.
2. Measurement of reflection and transmission coefficient of certain materials using a microscope.
3. Resolving power of telescope
4. Determination of radii of different capillary tubes using travelling microscope.
5. Refractive index of a liquid (water) using (i) concave mirror and (ii) convex lens and a plane mirror.
6. Removal of refractive errors of eye using combination of lenses.
7. Determination of power of a convex lens by finding its focal length.

RECOMMENDED REFERENCES TEXT BOOKS:

1. Optics and Optical Instruments: An Introduction by B. K. Johnson, Dover Publications.
2. Modern Optical Instruments and their construction by or ford Henry-Publisher: BibliLife, LLC.
3. A Text Book of Optics by Brj Lal and N.Subramanyam, S.Chand & Co.
4. Practical Optics by Menn Naftly, Elsevier Science Publishing.
5. Applications of Optics in daily life | CK-12 Foundation. <https://flexbooks.ck12.org> ›
Web sources suggested by the teacher concerned and the college librarian including Reading material

ASD Government Degree College for Women (A), Kakinada

III BSc PHYSICS Syllabus (w.e.f:2020-2021A.B)

BSc	Semester: V (Skill Enhancement Course- Elective)	Credits: 2
PHYT A1 PAIR COURSE-7A	OPTICAL IMAGING AND PHOTOGRAPHY	Total hours 40

Aim and objectives of Course

Identify the different types of cameras and camera lenses according to different purposes.

Identify and understand the focal length of the different types of lenses

Acquire a critical knowledge on natural and artificial sources of light and their application in photography

List out, identify and understand various image formation techniques including Eye.

Learn the procedures of using Analog and Digital cameras.

Learning outcomes of Course

Up on completion of the course students able to

Demonstrate skills of camera usage especially Digital Cameras.

Understand the various Image development and editing techniques.

Comprehend the concept of different types of common shooting techniques.

Demonstrate the focusing techniques of Analog and Digital cameras.

Acquire skills in the editing and development of photos and videos.

Perform some experimental skills related to images, videos using the equipment available in the lab or in a local studio

Unit-I: INTRODUCTION TO PHOTOGRAPHY:(10 hrs)

Skill oriented, Entrepreneurship & Employability

Photography-Introduction, Working principle of a camera, Image formation in simple camera and human eye, Types of cameras , Pin-hole camera , Single Lens Reflex (SLR) camera, Twin Lens Reflex (TLR) camera , Digital Single-lens reflex camera (DSLR), Digital camera, Drone flying cameras, Care and maintenance of camera, Factors influencing choice of camera

Unit-II: DIGITAL PHOTOGRAPHY:(10 hrs)

Skill oriented, Entrepreneurship & Employability

Different types of Digital cameras and their parts, Working of DSLR camera, Types of lenses- Normal, Wide angle, telephoto, Zoom lenses, Digital Image formation, Digital camera image sensors, Size of the image, Depth of focus, Depth of field, Exposure time, Aperture, Shutter speed, ISO, filters, knowledge on pixels and their uses , resolution, Camera accessories

Unit-III: PHOTOGRAPHIC LIGHT SOURCES:(10 hrs)

Skill oriented, Entrepreneurship & Employability

Need for the light in photography, Light sources- Natural light, Sun light, Moon light, Ambient light, Artificial light sources-Flood light, Spot light, Halogen light, Halogen flash light, Digital lights, Exposure, Studio photography

Unit-IV: PHOTOGRAPHIC SHOOTING TECHNIQUES:(10 hrs)

Skill oriented, Entrepreneurship & Employability

Significance and role of Camera lens in photo shooting, Arrangement of lenses in a Camera-Positioning, Techniques involved in the use of DSLR cameras, Usage of Filters, Techniques of Photomicrography, High speed Photography with motor driven camera, Basic ideas on Underwater Photography, Medical Photography, Astronomical Photography, Infra-Red (IR) Photography, Ultra Violet (UV) Photography and Forensic Photography.

Unit-V : PHOTO MANIPULATION :(10 hrs)

Skill oriented, Entrepreneurship & Employability

Developing and printing the photographs, equipment and materials used in developing and printing, image mixing and printing, Image editing through image editing software's like Adobe Photoshop – Adjustment of Brightness, Contrast, Tonal and Colour Values, Factors influencing quality of digital image, Methods of storing and processing, Image transportation through Pendrive, CD, HDD and CLOUD [Internet]

PHYT A1 PAIR COURSE-7A Skill oriented

1. Construction of a simple pin hole Camera and study it's working.
2. Capture an image using a Digital Camera and apply editing techniques.
3. Understanding various image formats and convert one image format into other(For ex: JPEG to BMP)
4. Convert a video stream into image stream by using a suitable editing software.
5. Evaluate the number of pixels and size of digital Image.
6. Comparison of the quality of a 8-bit, 16-bit and 32 bit images.
7. Perform the reduction and enlargement of a given Digital Image.
8. Change the appearance of an image by applying the filters (For ex: from the IR image of the given digital Image by suitable IR filter)

RECOMMENED REFERENCE BOOKS:

1. Object and image; An introduction to photography by George M Craven, PHI
2. An Introduction to Digital Photo Imaging Agfa, 1994
3. Advance Photography by M. Langford.
4. Digital Photography-A hands on Introduction by Phillip Krejcarek, Delmer Publishers
5. Multimedia – An Introduction by John Villamil, PHI
6. <https://www.adobe.com/in/creativecloud/photography/discover/dslr-camera.html>

Web sources suggested by the teacher concerned and the college librarian including reading material

ASD Government Degree College for Women (A), Kakinada

III BSc PHYSICS Syllabus (w.e.f:2020-2021A.B)

BSc	Semester: V (Skill Enhancement Course- Elective)	Credits: 2
PHY T A2 PAIR COURSE-6B	LOW TEMPERATURE PHYSICS & REFRIGERATION	Total hours 40

Aim and objectives of Course

Identify various methods and techniques used to produce low temperatures in the Laboratory.

Acquire a critical knowledge on refrigeration and air conditioning.

Learning outcomes of Course

Up on completion of the course students able to

Demonstrate skills of Refrigerators through hands on experience and learns about refrigeration components and their accessories.

Understand the classification, properties of refrigerants and their effects on environment.

Comprehend the applications of Low Temperature Physics and refrigeration

UNIT-I PRODUCTION OF LOW TEMPERATURE (10 hrs)

Skill oriented, Entrepreneurship & Employability

Production of low temperatures-Introduction, Freezing mixtures, Joule-Thomson effect, Regenerative cooling, Different methods of liquefaction of gases, liquefaction of air, Production of liquid hydrogen and nitrogen, Adiabatic demagnetization, Properties of materials at low temperatures, Superconductivity

UNIT-II MEASUREMENT OF LOW TEMPERATURE (10 hrs)

Skill oriented, Entrepreneurship & Employability

Gas thermometer and its correction and calibration, Secondary thermometers, resistance thermometers, thermocouples, Vapour pressure thermometers, Magnetic thermometers, Advantages and drawbacks of each type of thermometer.

UNIT-III PRINCIPLES OF REFRIGERATION (10 hrs)

Skill oriented, Entrepreneurship & Employability

Introduction to Refrigeration- Natural and artificial refrigeration , Stages of refrigeration, Types of refrigeration - Vapor compression and vapor absorption refrigeration systems, Refrigeration cycle and explanation with a block diagram, Introductory ideas on air- conditioning, Refrigerants-Introduction, Ideal refrigerant, Properties of refrigerant, Classification of refrigerants, commonly used refrigerants, Eco-friendly refrigerants

UNIT-IV COMPONENTS OF REFRIGERATOR (10 hrs)

Skill oriented, Entrepreneurship & Employability

Refrigerator and its working, Block diagram, Coefficient of Performance (COP), Tons of refrigeration (TR) and Energy Efficiency Ratio (EER), Refrigerator components: Types of compressors, evaporators and condensers and their functional aspects, defrosting in a refrigerator, Refrigerant leakage and detection.

UNIT-V APPLICATIONS OF LOW TEMPERATURE & REFRIGERATION

(10 hrs.) Skill oriented, Entrepreneurship & Employability

Applications of Low temperatures: Preservation of biological material, Food freezing, liquid nitrogen and liquid hydrogen in medical field, Superconducting magnets in MRI- Tissue ablation (cryosurgery) - Cryogenic rocket propulsion system.

Applications of refrigeration: Domestic refrigerators, Water coolers, Cold storages, Ice plants, Food preservation methods, Chemical and Process industries, Cold treatment of metals, Construction field, Desalination of water, Data centers

COURSE-6B LOW TEMPERATURE PHYSICS & REFRIGERATION

Skill, Employability & Entrepreneurship

1. Record the Principles and applications of Refrigerators and Freezers.
2. Measure the temperatures below Melting point of Ice using a thermometer available in the Lab.
3. Make a freezing mixture by adding different salts viz., Sodium chloride, Potassium Hydrate (KOH), Calcium chloride to ice in different proportions and observe the temperature changes.
4. Study the operation of a refrigerator and understand the working of different parts.
5. Study the properties of refrigerants like chlorofluorocarbons-hydro chlorofluoro- carbons and record the lowest temperatures obtained.
6. Consider a simple faulty refrigerator and try to troubleshoot the simple problems by understanding its working.
7. Understand the practical problem of filling the Freon Gas into the Refrigerator.
8. Get the Liquid Nitrogen or Liquid Helium from nearby Veterinary Hospital and measure their temperatures using chromel-alumel thermocouple or mercury thermometer and observe their physical properties like colour, smell etc and precautions to be taken for their safe handling.
9. Preparation of freeze drying food with Dry ice and liquid nitrogen
10. Preparation of freeze drying food with liquid nitrogen

RECOMMENDED REFERENCES:

1. Heat and Thermodynamics by Brij Lal & N. Subramanyam, S. Chand Publishers.
2. Thermal Physics by S C Garg, R M Bansal & C K Ghosh, McGrawHill Education, India
3. Heat and Thermodynamics by M Zemansky, McGrawHill Education (India).
4. Low-Temperature Physics by Christian E. & Siegfried H., Springer.
5. Thermal Engineering by S. Singh, S. Pati, Ch:18 Introduction to Refrigeration.
6. The Physics Hyper Text Book. Refrigerators. <https://physics.info/refrigerators/>
7. Refrigeration and Air Conditioning by Manohar Prasad, New age international (P) limited, New Delhi
8. A course in Refrigeration and Air Conditioning by S.C. Arora and S. Domkundwar, Dhanpatrai and sons, Delhi
9. [https://trc.nist.gov/cryogenics/Papers/Review/2017-Low Temperature Applications and Challenges.pdf](https://trc.nist.gov/cryogenics/Papers/Review/2017-Low%20Temperature%20Applications%20and%20Challenges.pdf)
10. <https://nptel.ac.in/content/storage2/courses/112105129/pdf/RAC%20Lecture%203.pdf>
11. Other Web sources suggested by the teacher concerned and the reading material. <https://nptel.ac.in>

ASD Government Degree College for Women (A), Kakinada

III B.SC PHYSICS Syllabus

BSc	Semester: V (Skill Enhancement Course- Elective)	Credits: 4
PHY T A2PAIR COURSE-7B	Solar Energy and Applications	Total hours 36

Aim and objectives of Course

Understand Sun structure, forms of energy coming from the Sun and its measurement.
Acquire a critical knowledge on the working of thermal and photovoltaic collectors

Learning outcomes of Course

Up on completion of the course students able to

- Demonstrate skills related to **callus culture** through hands on experience
- Understand testing procedures and fault analysis of thermal collectors and PV modules.
- Comprehend applications of thermal collectors and PV modules.
- Demonstrate skills acquired in evaluating the performance of solar cell / module in connecting them appropriately to get required power output.
- Acquire skills in identification and elimination of the damaged panels without affecting the output power in a module / array.
- Perform procedures and techniques related to general maintenance of solar thermal and photovoltaic modules.

Unit - I: BASIC CONCEPTS OF SOLAR ENERGY

(10hrs) **Skill & Employability**

Spectral distribution of solar radiation, Solar constant , zenith angle and Air-Mass, standard time, local apparent time, equation of time, direct, diffuse and total radiations, Pyrheliometer - working principle, direct radiation measurement, Pyrometer-working Principle, diffuse radiation measurement, Distinction between the two meters.

Unit - II: SOLAR THERMAL COLLECTORS

(10hrs) **Skill, Employability & Entrepreneurship**

Solar Thermal Collectors-Introduction, Types of Thermal collectors, Flat plate collector – liquid heating type, Energy balance equation and efficiency, Evacuated tube collector, collector overall heat loss coefficient, Definitions of collector efficiency factor, collector heat-removal factor and collector flow factor, Testing of flat-plate collector, solar water heating system, natural and forced circulation types, Concentrating collectors, Solar cookers, Solar dryers, Solar desalinators.

Unit - III: FUNDAMENTALS OF SOLAR CELLS (10hrs)

Skill & Employability

Semiconductor interface, Types, homo junction, hetero junction and Schottky barrier, advantages and drawbacks, Photovoltaic cell, equivalent circuit, output parameters, conversion efficiency, quantum efficiency, Measurement of I-V characteristics, series and shunt resistance, their effect on efficiency, Effect of light intensity, inclination and temperature on efficiency

Unit -IV: TYPES OF SOLAR CELLS AND MODULES (10 hrs)

Skill & Employability

Types of solar cells, Crystalline silicon solar cells, I-V characteristics, poly-Si cells, Amorphous silicon cells, Thin film solar cells-CdTe/CdS and CuInGaSe₂/CdS cell configurations, structures, advantages and limitations, Multi junction cells – Double and triple junction cells. Module fabrication steps, Modules in series and parallel, Bypass and blocking diodes

Unit – V: SOLAR PHOTOVOLTAIC SYSTEMS (10hrs)

Skill, Employability & Entrepreneurship

Energy storage in PV systems, Energy storage modes, electrochemical storage, Batteries, Primary and secondary, Solid-state battery, Molten solvent battery, lead acid battery and dry batteries, Mechanical storage – Flywheel, Electrical storage – Super capacitor

COURSE -7B Solar Energy and Applications

Skill oriented

Measurement of direct radiation using pyr heliometer.

1. Measurement of global and diffuse radiation using pyranometer.
2. Evaluation of performance of a flat plate collector
3. Evaluation of solar cell / module efficiency by studying the I – V measurements.
4. Determination of series and shunt resistance of a solar cell / module.
5. Determination of efficiency of two solar cells / modules connected in series.
6. Determination of efficiency of two solar cells / modules connected in parallel.
7. Study the effect of input intensity on the performance of solar cell / module.
8. Study the influence of cell / module temperature on the efficiency.
9. Study the effect of cell / module inclination on the efficiency.

Recommended References:

1. Solar Energy Utilization by G. D. Rai, Khanna Publishers
2. Solar Energy- Fundamentals, design, modelling and applications by G.N. Tiwari, Narosa Publications, 2005.
3. Solar Energy-Principles of thermal energy collection & storage by S.P. Sukhatme, TataMc-Graw Hill Publishers, 1999.
4. Science and Technology of Photovoltaics, P. Jayarama Reddy, CRC Press(Taylor & Francis Group), Leiden & BS Publications, Hyderabad, 2009.
5. Solar Photovoltaics- Fundamentals, technologies and applications, Chetan Singh Solanki, PHI Learning Pvt. Ltd.,
6. Web sources suggested by the teacher concerned and the college librarian including reading material.
 - (a) https://courses.edx.org/c4x/DelftX/ET.3034TU/asset/solar_energy_v1.1.pdf
 - (b) [https://www.sku.ac.ir/Datafiles/BookLibrary/45/John%20A.%20Duffie,%20William%20A.%20Beckman\(auth.\)-Solar%20Engineering%20of%20Thermal%20Processes,%20Fourth%20Edition%20\(2013\).pdf](https://www.sku.ac.ir/Datafiles/BookLibrary/45/John%20A.%20Duffie,%20William%20A.%20Beckman(auth.)-Solar%20Engineering%20of%20Thermal%20Processes,%20Fourth%20Edition%20(2013).pdf)

ASD Government Degree College for Women (A), Kakinada

B.SC PHYSICS Syllabus

BSc	Semester: V (Skill Enhancement Course- Elective)	Credits: 3
PHY C1PAIR: COURSE-6C	APPLICATIONS OF ELECTRICITY &ELECTRONICS	Total hours 36

Aim and objectives of Course

Identify various components present in Electricity & Electronics Laboratory.

Acquire a critical knowledge of each component and its utility (like resistors, capacitors, inductors, power sources etc.).

Demonstrate skills of constructing simple electronic circuits consisting of basic circuit elements.

Learning outcomes of Course

Up on completion of the course students able to

CO1: Understand the need & Functionality of various DC & AC Power sources

CO2: Comprehend the design, applications and practices of various electrical & Electronic devices and also their trouble shooting.

CO3: List out, identify and handle various equipment in Electrical & Electronics laboratory

CO4: Demonstrate skills on the utility of different electrical components and devices.

CO5: Acquire the skills regarding the operation, maintenance and troubleshooting of various Devices in the lab.

Unit-I INTRODUCTION TO PASSIVE ELEMENTS (10 hrs.)

Skill oriented

Passive and Active elements-Examples, **Resistor**-Types of Resistors, Color coding - Applications of a Resistor as a heating element in heaters and as a fuse element.

Capacitor-Types of Capacitors, Color coding, Energy stored in a capacitor, Applications of Capacitor in power supplies, motors (Fans) etc., **Inductor**-Types of Inductors, EMF induced in an Inductor, Applications of Inductor, Application of choke in a fan and in a radio tuning circuit, Series resonance circuit as a Radio tuning circuit.

II Power Sources (Batteries) (10 hrs.) Employability & Entrepreneurship

Types of power sources-DC & AC sources, Different types of batteries, Rechargeable batteries –Lead acid batteries, Ni-MH batteries, Li-ion batteries- Li-PO batteries, Series, Parallel & Series-Parallel configuration of batteries, Constant Voltage source-Constant Current Source-Applications of Current sources & Voltage sources, SMPS used in computers.

Unit-III Alternating Currents (10 hrs)

Skill & Entrepreneurship

A.C Power source-Generator, Construction and its working principle, Transformers-Construction and its working principle, Types of Transformers-Step-down and Step-up Transformers, Relation between primary turns and secondary turns of the transformer with emf., Use of a Transformer in a regulated Power supplies, Single phase motor – working principle, Applications of motors (like water pump, fan etc.).

Unit-IV Power Supplies (Skill Based) (10 hrs.)

Skill oriented

Working of a DC regulated power supply, Construction of a 5 volts regulated power supply, Design of a step-down (ex: 220-12V) and step-up (ex: 120-240V) transformers- Simple Design of FM Radio circuit using LCR series resonance (tuning) circuit, Checking the output voltage of a battery eliminator using a MultiMate.(Trouble shooting), Design of a simple 5 volts DC charger, Power supply for computers(SMPS)

Unit-V Applications of Electromagnetic Induction (10 hrs.)

Skill & Entrepreneurship

DC motor –Construction and operating principle, Calculation of power, voltage and current in a DC motor, Design of a simple Motor (for example Fan) with suitable turns of coil-DC generator-Construction, operating principle and EMF equation, Construction of a simple DC generator, Difference between DC and AC generators

RECOMMENDED REFERENCES:

1. Grob's Basic Electronics by [Mitchel Schultz](#) , TMH or McGraw Hill
2. Electronic and Electrical Servicing by Ian Robertson Sinclair, John Dunton, Elsevier Publications
3. Troubleshooting Electronic Equipment by R.S.Khandapur , TMH
4. Web sources suggested by the teacher concerned and the college librarian including reading material.

PHYT C1 PAIR-COURSE-6C

Skill oriented

1. Acquainting with the soldering techniques
2. Design and Construction of a 5 Volts DC unregulated power supply
3. Construction of a Stepdown Transformer and measurement of its output voltage. And to compare it with the calculated value.
4. Connect two or three resistors or capacitors or inductors and measure the Series, Parallel Combination values using a Multi meter and compare the values with the Calculated values.
5. Use the Digital Multi meter and Analog Multi meter to measure the output voltage of an AC & DC power supply and also the voltage and frequency of a AC signal using CRO.
6. Use the Multi meter to check the functionality of a Diode and Transistor. Also test whether the given transistor is PNP or NPN.
7. Construct a series electric circuit with R, L and C having an AC source and study the frequency response of this circuit. Find the Resonance Frequency.
8. Construct a Parallel electric circuit with R, L & C having an AC source and study the frequency response of this circuit. Find the resonant frequency.
9. Test whether a circuit is a Open circuit or Short Circuit by measuring continuity with a Multi meter and record your readings.

ASD Government Degree College for Women (A), Kakinada

B.SC PHYSICS Syllabus

BSc	Semester: V (Skill Enhancement Course- Elective)	Credits: 3
PHYT C2 PAIR: COURSE-7C	ELECTRONIC INSTRUMENTATION	Total hours 36

Aim and objectives of Course

Identify various facilities required to set up a basic Instrumentation Laboratory.
Acquire a critical knowledge of various Electrical Instruments used in the Laboratory.
Demonstrate skills of using instruments like CRO, Function Generator, Multimeter etc. through hands on experience.

Learning outcomes of Course

Up on completion of the course students able to

CO1: Understand the Principle and operation of different display devices used in the display systems and different transducers

CO2: Comprehend the applications of various biomedical instruments in daily life like B.P. meter, ECG, Pulse oxymeter etc. and know the handling procedures with safety and security.

CO3: Perform some techniques related to Biomedical Instrumentation and measurement of Certain physiological parameters like body temperature, B.P. and sugar levels etc.

UNIT-I INTRODUCTION TO INSTRUMENTS (10 hrs)

Skill oriented

Types of electronic Instruments- Analog instruments & Digital Instruments, DC Voltmeter and AC Voltmeter, Construction and working of an Analog Multimeter and Digital Multimeter (Block diagram approach), Sensitivity, 3½ display and 4½ display Digital multimeters, Basic ideas on Function generator

UNIT-II OSCILLOSCOPE (10 hrs) Skill oriented

Cathode Ray Oscilloscope-Introduction, Block diagram of basic CRO, Cathode ray tube, Electron gun assembly, Screen for CRT, Time base operation, Vertical deflection system, Horizontal deflection system, Use of CRO for the measurement of voltage (DC and DC), frequency, phase difference, Different types of oscilloscopes and their uses, Digital storage Oscilloscope

UNIT-III TRANSDUCERS (10 hrs) Skill, Employability & Entrepreneurship

Classification of transducers, Selection of transducers, Resistive, capacitive & inductive transducers, Resistive and capacitive touch screen transducer used in mobiles, Displacement transducer-LVDT, Piezoelectric transducer, Photo transducer, Digital transducer, Fibre optic sensors

UNIT-IV DISPLAY INSTRUMENTS (10 hrs) Skill, Employability & Entrepreneurship

Introduction to Display devices, LED Displays, Seven Segment Displays, Construction and operation (Display of numbers), Types of SSDs (Common Anode & Common Cathode type), Limitations of SSDs, Liquid Crystal Displays, Principle and working of 2x16 display and 4x16 LCD modules, Applications of LCD modules.

UNIT-V BIOMEDICAL INSTRUMENTS (10 hrs) Skill, Employability & Entrepreneurship

Basic operating principles and uses of (i) Clinical thermometer (ii) Stethoscope (iii) Sphygmomanometer (iv) ECG machine (v) Radiography (vi) Ophthalmoscope (vii) Ultrasound scanning (viii) Ventilator (ix) Pulse oxymeter (x) Glucometer, Basic ideas of CT scan and MRI scan

PHY A3 PAIR- COURSE -7C ELECTRONIC INSTRUMENTATION

Skill & Employability

Familiarisation of digital multi meter and its usage in the measurements of (i) resistance (ii) current, (iii) AC & DC voltages and for (i) continuity test (ii) diode test and (iii) transistor test

1. Measure the AC and DC voltages, frequency using a CRO and compare the values Measured with other instruments like Digital multi meter.
2. Formation of Sine, Square wave signals on the CRO using Function Generator and measure their frequencies. Compare the measured values with actual values.
3. Display the numbers from 0 to 9 on a single Seven Segment Display module by Applying voltages.
4. Display the letters a to h on a single Seven Segment Display module by applying voltages.
5. Measurement of body temperature using a digital thermometer and list out the error and corrections.
6. Measurement of Blood Pressure of a person using a B.P. meter and record your values and analyze them.
7. Get acquainted with an available ECG machine and study the ECG pattern to understand the meaning of various peaks
8. Observe and understand the operation of a Digital Pulse oxymeter and measure the pulse rate of different people and understand the working of the meter.

RECOMMENDED REFERENCE BOOKS:

1. Electronic Instrumentation by H.S.Kalsi , TMH Publishers
2. Electronic Instrument Hand Book by Clyde F. Coombs , McGraw Hill
3. Introduction to Biomedical Instrumentation by Mandeep Singh, PHI Learning. Biomedical Instrumentation and Measurements by Leslie Cromwell , Prentice Hall India.
4. Electronic Measurements and Instrumentation by Kishor, K Lal, Pearson, New Delhi
5. Electrical and Electronic Measurements by Sahan, A.K., Dhanpat Rai, New Delhi
6. Electronic Instruments and Measurement Techniques by Cooper, W.D. Halfrick, A.B., PHI Learning, New Delhi
7. Web sources suggested by the teacher concerned and the college librarian including reading material.



V. N. D.
PRINCIPAL
A.S.D. GOVT. DEGREE COLLEGE (W)
AUTONOMOUS
KAKINADA

DEPARTMENT OF MATHEMATICS

Employability	Skill	Entrepreneurship
----------------------	--------------	-------------------------

2023-24

IBSC I SEM MATHS (H)

1. ESSENTIALS AND APPLICATIONS OF MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

Course Objective:

The objective of this course is to provide students with a comprehensive understanding of the essential concepts and applications of mathematical, physical, and chemical sciences. The course aims to develop students' critical thinking, problem-solving, and analytical skills in these areas, enabling them to apply scientific principles to real-world situations.

Learning outcomes:

UNIT I: ESSENTIALS OF MATHEMATICS: 9hrs

Complex Numbers: Introduction of the new symbol i – General form of a complex number – Modulus-Amplitude form and conversions

Trigonometric Ratios: Trigonometric Ratios and their relations – Problems on calculation of angles

Vectors: Definition of vector addition – Cartesian form – Scalar and vector product and problems

Statistical Measures: Mean, Median, Mode of data and problems.

UNIT II: ESSENTIALS OF PHYSICS: 9hrs

Definition and Scope of Physics- Measurements and Units - Motion of objects: Newtonian Mechanics and relativistic mechanics perspective - Laws of Thermodynamics and Significance- Acoustic waves and electromagnetic waves- Electric and Magnetic fields and their interactions- Behaviour of atomic and nuclear particles- Wave-particle duality, the uncertainty principle- Theories and understanding of universe

UNIT III: ESSENTIALS OF CHEMISTRY: 9hrs

Definition and Scope of Chemistry- Importance of Chemistry in daily life - Branches of chemistry and significance- Periodic Table- Electronic Configuration, chemical changes, classification of matter, Biomolecules- carbohydrates, proteins, fats and vitamins.

UNIT IV: APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY: 9hrs

Applications of Mathematics in Physics & Chemistry: Calculus, Differential Equations & Complex Analysis

Application of Physics in Industry and Technology: Electronics and Semiconductor Industry, Robotics and Automation, Automotive and Aerospace Industries, Quality Control and Instrumentation, Environmental Monitoring and Sustainable Technologies.

Application of Chemistry in Industry and Technology: Chemical Manufacturing, Pharmaceuticals and Drug Discovery, Materials Science, Food and Beverage Industry.

UNIT V: ESSENTIALS OF COMPUTER SCIENCE:

Milestones of computer revolution- Internet, history, Internet Service Providers, Types of Networks, IP, Domain Name Services, applications.

Ethical and social implications: Network and security concepts- Information

Assurance Fundamentals, Cryptography- Symmetric and Asymmetric, Malware, Firewalls,

Fraud Techniques- Privacy and Data Protection

IBSC I SEM CORE -2

ADVANCES IN MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

Course Objective:

The objective of this course is to provide students with an in-depth understanding of the recent advances and cutting-edge research in mathematical, physical, and chemical sciences. The course aims to broaden students' knowledge beyond the foundational concepts and expose them to the latest developments in these disciplines, fostering critical thinking, research skills, and the ability to contribute to scientific advancements.

UNIT I: ADVANCES IN BASIC MATHEMATICS 9hrs

Straight Lines: Different forms – Reduction of general equation into various forms – Point of intersection of two straight lines
Limits and Differentiation: Standard limits – Derivative of a function – Problems on product rule and quotient rule
Integration: Integration as a reverse process of differentiation – Basic methods of integration
Matrices: Types of matrices – Scalar multiple of a matrix – Multiplication of matrices – Transpose of a matrix and determinants

UNIT II: ADVANCES IN PHYSICS 9hrs

Renewable energy: Generation, energy storage, and energy-efficient materials and devices.
Recent advances in the field of nanotechnology: Quantum dots, Quantum Communication- recent advances in biophysics- recent advances in medical physics- Shape Memory Materials.

UNIT III: ADVANCES IN CHEMISTRY 9hrs

Computer-aided drug design and delivery, Nano-sensors, Chemical Biology, impact of chemical pollutants on ecosystems and human health, Dye removal-Catalysis method

UNIT IV: ADVANCED APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY

9hrs

Mathematical Modeling applications in physics and chemistry
Application of Renewable energy: Grid Integration and Smart Grids, Application of nanotechnology: Nanomedicine,
Application of biophysics: Biophysical Imaging, Biomechanics, Neuro-physics, Application of medical physics: Radiation Therapy, Nuclear medicine
Solid waste management, Environmental remediation-Green Technology, Water treatment.

UNIT V: Advanced Applications of Computer Science 9hrs

Number System-Binary, Octal, decimal, and Hexadecimal, Signals-Analog, Digital, Modem, Codec, Multiplexing, Transmission media, error detection and correction- Parity check and CRC, Networking devices- Repeater, hub, bridge, switch, router, gateway.

IBSC II SEM PAPER -1

Differential Equations (Common to Major and Minor):

Course outcomes:

After successful completion of this course, the student will be able to;

1. Demonstrate the types of differential equations.
2. Solve first order ordinary differential equations.
3. Apply the concept of first order differential equations to find the orthogonal trajectories.
4. Solve exact differential equations.
5. Solve the first order linear differential equations and Bernoulli's differential equations.
6. Solve homogeneous and non-homogeneous linear differential equations with constant and variable coefficients.

UNIT-I-Differential Equations of first order and first degree:

Linear Differential Equations; Differential Equations Reducible to Linear Form; Exact Differential Equations; Integrating Factors, Equations Reducible To Exact Equations by Integrating Factors:

UNIT- II- Orthogonal Trajectories.

Cartesian co-ordinates, self-orthogonal Family of curves. Orthogonal trajectories : polar co-ordinates.

Differential Equations of first order but not of the first degree:

Equations solvable for p ; Clairaut's Equation.

UNIT- III-, Higher order linear differential equations-I:

Solution of homogeneous linear differential equations of order n with constant coefficients; Solution of the non-homogeneous linear differential equations with constant coefficients by means of polynomial operators.

General Solution of $(D)y=0$

General Solution of $(D)y=Q$ when Q is a function of x .

P.I. of $(D)y=Q$ when $Q=be^{ax}$

P.I. of $(D)y=Q$ when Q is $b\sin ax$ or $b\cos ax$.

UNIT-IV-Higher order linear differential equations-II:

Solution of the non-homogeneous linear differential equations with constant coefficients. P.I. of $(D)y=Q$ when $Q=bx^k$

P.I. of $(D)y=Q$ when $Q=e^{ax}v(x)$ P.I. of $(D)y=Q$ when $Q=x^m v(x)$

P.I. of $(D)y=Q$ when $Q=x^m v(x)$

UNIT-V-Higher order linear differential equations-III:

Method of variation of parameters (without non constant coefficient equations) ; The Cauchy-Euler Equation; Legendre's Equations.

IBSC II SEM PAPER -2

ANALYTICAL SOLID GEOMETRY:

Course outcomes:

After successful completion of this course, the student will be able to

1. Describe the planes and their properties
2. Solve the shortest distance between the lines
3. Use the concepts of spheres in applications.
4. Solve the limiting points of a sphere
5. Define cone, enveloping cone, reciprocal cone and their properties.

Unit-I: The Plane

Equation of plane in terms of its intercepts on the axis - Equations of the plane through the given points - Length of the perpendicular from a given point to a given plane - Bisectors of angles between two planes - Combined equation of two planes - Orthogonal projection on a plane.

Unit-II: The Line

Equation of a line - Angle between a line and a plane - The condition that a given line may lie in a given plane - The condition that two given lines are coplanar - Number of arbitrary constants in the equations of a straight line - Sets of conditions which determine a line - The shortest distance between two lines - The length and equations of the line of shortest distance between two straight lines - Length of the perpendicular from a given point to a given line.

Unit-III: The Sphere

Definition and equation of the sphere - Equation of the sphere through four given points - Plane sections of a sphere - Intersection of two spheres - Equation of a circle - Sphere through a given circle - Intersection of a sphere and a line - Power of a point - Tangent plane - Plane of contact; Polar plane - Pole of a Plane - Conjugate points - Conjugate planes.

Unit-IV: Spheres (continued)

Angle of intersection of two spheres - Conditions for two spheres to be orthogonal - Radical plane; Coaxial system of spheres Limiting Points - Simplified form of the equation of two spheres.

Unit-V: Cones

Definitions of a cone – vertex, guiding curve and generators - Equation of the cone with a given vertex and guiding curve - Equations of cones with vertex at origin are homogeneous - Condition that the general equation of the second degree should represent a cone - Enveloping cone of a sphere - Right circular cone - Equation of the right circular cone with a given vertex, axis and semi-vertical angle.

II BSC III SEM

ABSTRACT ALGEBRA

Course Outcomes:

After successful completion of this course, the student will be able to;

1. Define the group with important example and the elementary properties of groups, finite groups, composition table and the order of a group.
2. Understand the conditions for a subgroup of a group and examples of subgroups.

3. Identify the applications of Lagrange's theorem.
4. Understand the definition of Normal subgroups with examples and quotient group.
5. Define the homomorphisms and its elementary properties and the proof of first homomorphism theorem.
6. Understand the definition of permutation and product of permutations, even and odd permutations and the proof of Cayley's theorem.

UNIT – I GROUPS : Binary Operation; Algebraic structure; semi group; monoid; Group definition and elementary properties; Finite and Infinite groups with examples ; order of a group; Composition tables with examples.

UNIT – II (12 Hours) SUBGROUPS

Complex Definition; Multiplication of two complexes, Inverse of a complex;
Subgroup Definition and examples; criterion for a complex to be a subgroup; criterion for the product of two subgroups to be a subgroup; union and intersection of subgroups.

Co-sets and Lagrange's Theorem:

Cosets definition; properties of Cosets; Index of a subgroups of a finite groups;
Lagrange's Theorem.

UNIT-III (12 Hours) NORMAL SUBGROUPS:

Definition of normal subgroup; proper and improper normal subgroups; Hamilton group ; criterion for a subgroup to be a normal subgroup ; intersection of two normal subgroups ; Sub group of index 2 is a normal subgroup ; quotient group; criterion for an existence of a quotient group

UNIT-IV (12 Hours)

HOMOMORPHISM : Definition of homomorphism; Image of homomorphism; elementary properties of homomorphism; Isomorphism, automorphism definitions and elementary properties; kernel of a homomorphism; fundamental theorem on Homomorphism and applications.

PERMUTATIONS: Definition of permutation ; permutation multiplication ; Inverse of a permutation ; cyclic permutations; transposition; even and odd permutations; Cayley's theorem.

UNIT – V (12 Hours) RINGS:

Definition of Ring and basic properties; Boolean Ring; divisors of zero and cancellation Laws in Integral Domain; Division Ring and Field; The characteristic of a ring, The characteristic of an Integral Domain, The characteristic of a Field; Sub Rings.

II BSC III SEM
ANALYTICALSKILLS

Course Objective: Intended to inculcate quantitative analytical skills and reasoning as an inherent ability in students.

Course Outcomes: After successful completion of this course, the student will be able to;

1. Understand the basic concepts of arithmetic ability, quantitative ability, logical reasoning, business computations and data interpretation and obtain the associated skills.
2. Acquire competency in the use of verbal reasoning.
3. Apply the skills and competencies acquired in the related areas

Solve problems pertaining to quantitative ability, logical reasoning and verbal ability inside and outside the campus

UNIT –1: (10Hrs)

Arithmetic ability: Algebraic operations BODMAS, Fractions, Divisibility rules, LCM & GCD (HCF).

Verbal Reasoning: Number Series, Coding & Decoding, Blood relationship, Clocks, Calendars.

UNIT –2: (10Hrs)

Quantitative aptitude: Averages, Ratio and proportion, Problems on ages, Time-distance-speed.

Business computations: Percentages, Profit & loss, Partnership, simple compound interest.

UNIT –3: (07Hrs)

Data Interpretation: Tabulation, Bar Graphs, Pie Charts, line Graphs. Venn diagrams.

II BSC IV SEM

REAL ANALYSIS

Course Outcomes:

After successful completion of this course, the student will be able to

1. Understand the concept of real numbers and the properties of real numbers and the definitions of supremum and infimum.
2. Solve the problems in sequences, limit of a sequence.
3. Solve the problems on infinite series by using the tests like ratio test, n^{th} root test etc.,
4. Solve the problems on the basic concepts of continuity, its elementary properties and uniform continuity.
5. Understand the concepts of differentiation and the three mean value theorems can solve the problems.
6. Define the Riemann integration and solve the problems

REAL ANALYSIS

UNIT –I (12 Hours)

Real Sequences:

Introduction of Real Numbers, Sequences and their limits, Range and Boundedness of Sequences, Limit of a sequence and

Convergent sequence. The Cauchy's criterion, properly divergent sequences, Monotone sequences, Necessary and Sufficient condition for Convergence of Monotone Sequence, Sandwich

theorem, Cauchy's theorem on limits, Limit Point of Sequence, Subsequences, Cauchy Sequences, Cauchy's general principle of convergence theorem.

UNIT –II (12 Hours)

INFINITE SERIES:

Series: Introduction to series, convergence of series. Cauchy's general principle of convergence for series, tests for convergence of Series of Non-Negative Terms:

1. P-test (proof)
2. Limit comparison test
3. Cauchy's n^{th} root test or Root Test (proof) and problems.

4. D'Alembert's Test or Ratio Test proof and problems. Alternating Series: Leibnitz Test proof and problems.

UNIT –III (12 Hours)

Real Functions, Boundedness of a function, Limits of functions. Some extensions of the limit concept: Infinite Limits, Limits at infinity.

CONTINUITY:

Continuous functions: Continuity of a function, Continuous Functions on interval, algebra of continuous functions, discontinuity of a function, properties of continuous functions: Bolzano's theorem, Intermediate value theorem.

UNIT –IV(12 Hours)

DIFFERENTIATION AND MEAN VALUE THEOREMS:

The derivability of a function at a point, on an interval, relation between derivability and continuity of a function, Graphical meaning of the Derivative, Mean value Theorems: Rolle's Theorem, Lagrange's Mean value Theorem, Cauchy's Mean value Theorem and related

problems. Additional Input: Taylor's theorem, Maclaurin's theorem, Taylor's series and Maclaurin's series

UNIT – V (12 Hours)

RIEMANN INTEGRATION:

Riemann Integral, Riemann integral functions, Darboux theorem, Necessary and

sufficient condition for R-

integrability, Properties of integrable functions, Fundamental theorem of integral calculus, First mean value Theorem.

II BSC IV SEM

LINEAR ALGEBRA

Course Outcomes:

After successful completion of this course, the student will be able to;

1. Understand the concepts of vector spaces, subspaces, bases,

dimension and their

properties

2. Understand the concepts of linear transformations and their properties

3. Apply Cayley-Hamilton theorem to problems for finding the inverse of a

matrix and higher powers of matrices without using routine methods

4. Learn the properties of inner product spaces and

determine orthogonality in inner product spaces.

LINEAR ALGEBRA

UNIT-I (12 Hours)

Vector Spaces-I:

Vector Spaces, General properties of vector spaces, n-dimensional Vectors, addition and scalar multiplication of Vectors, internal and external composition, Nullspace, Vector subspaces, Algebraic subspaces, Linear Sum of two subspaces, linear combination of Vectors, Linear span, Linear independence and Linear dependence of Vectors.

UNIT -II (12 Hours)

Basis and dimension:

Basis of Vector space, Finite dimensional Vector spaces, basis extension, co-ordinates, Dimension of a Vector space, Dimension of a subspace, Quotient space and Dimension of Quotient space.

UNIT -III (12 Hours)

Linear Transformations:

Linear transformations, linear operators, Properties of L.T, sum and product of LTs, Range and nullspace of linear transformation, Rank and Nullity of linear transformations – Rank – Nullity Theorem.

UNIT-IV (12 Hours)

Eigen Values, Eigenvectors and Cay-Hamilton theorem:

Linear Equations, Characteristic equations, Characteristic Values & Vectors of square matrix, Cayley-Hamilton Theorem.

UNIT –V(12Hours)

Inner product space:

Inner product spaces, Euclidean and unitary spaces, Norm or length of a Vector, Schwartz inequality, Triangle Inequality, Parallelogram law, Orthogonality, Orthonormal set, Gram–Schmidt orthogonalisation process. Bessel's inequality and Parseval's Identity

Numerical Methods

Learning Outcomes:

Students after successful completion of the course will be able to

1. Understand various numerical methods that are used to obtain approximate solutions
2. Understand various finite difference operators and interpolation methods.
3. Work out numerical differentiation and integration whenever and wherever analytical methods are not applicable.
4. Find numerical solutions of ordinary differential equations by using various numerical methods.
5. Analyze and evaluate the accuracy of numerical methods.

Syllabus : (Hours: Teaching: 75 (incl. unit tests etc. 05), Training: 15)

Unit- 1: Finite Differences and Interpolation with Equal intervals (15h)

Introduction, Forward differences, Backward differences, Central Differences, Symbolic relations, n^{th} Differences of Some functions, 2. Advancing Difference formula, Differences of Factorial Polynomial, Summation of Series. 3. Newton's formulae for interpolation. Central Difference Interpolation Formulae.

Unit-2: Interpolation with Equal and Unequal intervals (15h)

1. Gauss's Forward interpolation formulae, Gauss's backward interpolation formulae, Stirling's formula, Bessel's formula. 2. Interpolation with unevenly spaced points, divided differences and properties, Newton's divided differences formula. 3. Lagrange's interpolation formula, Lagrange's Inverse interpolation formula.

Unit-3: Numerical Differentiation (15h)

1. Derivatives using Newton's forward difference formula, Newton's backward difference formula, 2. Derivatives using central difference formula, Stirling's interpolation formula, 3. Newton's divided difference formula, Maximum and minimum values of a tabulated function.

Unit-4: Numerical Integration (15h)

General quadrature formula on errors, Trapezoidal rule, 2. Simpson's 1/3-rule, Simpson's 3/8-rule, and Weddle's rules, 3. Euler-McLaurin Formula of summation and quadrature, The Euler transformation.

Unit-5: Numerical solution of ordinary differential equations (15h)

Introduction, Solution by Taylor's Series, 2. Picard's method of successive approximations, 3. Euler's method, Modified Euler's method, Runge - Kutta methods.

II BSC V SEM

Mathematical Special Functions

Learning Outcomes:

Students after successful completion of the course will be able to:

1. Understand the Beta and Gamma functions, their properties and relation between these two functions, understand the orthogonal properties of Chebyshev polynomials and recurrence relations.
2. Find power series solutions of ordinary differential equations.
3. solve Hermite equation and write the Hermite Polynomial of order (degree) n , also find the generating function for Hermite Polynomials, study the orthogonal properties of Hermite Polynomials and recurrence relations.
4. Solve Legendre equation and write the Legendre equation of first kind, also find the generating function for Legendre Polynomials, understand the orthogonal properties of Legendre Polynomials.
5. Solve Bessel equation and write the Bessel equation of first kind of order n , also find the generating function for Bessel function, understand the orthogonal properties of Bessel function.

Syllabus: (Hours: Teaching: 75 (incl. unit tests etc. 05), Training:

15) Unit-1: Beta and Gamma functions, Chebyshev polynomials (15h)

1. Euler's Integrals-Beta and Gamma Functions, Elementary properties of Gamma Functions, Transformation of Gamma Functions. 2. Another form of Beta Function, Relation between Beta and Gamma Functions. 3. Chebyshev polynomials, orthogonal properties of Chebyshev polynomials of first kind, recurrence relations, generating functions for Chebyshev polynomials.

Unit – 2: Power series and Power series solutions of ordinary differential equations (15h)

Introduction, summary of useful results, power series, radius of convergence, theorem on Power series. 2. Introduction of power series solutions of ordinary differential equation. 3. Ordinary and singular points, regular and irregular singular points, power series solution.

Unit-3: Hermite polynomials (15h)

Hermite Differential Equations, Solution of Hermite Equation, Hermite polynomials, generating function for Hermite polynomials. 2. Other forms for Hermite Polynomials, Rodrigue's formula for Hermite Polynomials, to find first few Hermite Polynomials. 3. Orthogonal properties of Hermite Polynomials, Recurrence formulae for Hermite Polynomials.

Unit-4: Legendre polynomials (15h)

1. Definition, Solution of Legendre's equation, Legendre polynomial of degree n , generating function of Legendre polynomials. 2. Definition of $P_n(x)$ and $Q_n(x)$ General solution of Legendre's Equation (derivations not required) to show that $P_n(x)$ is the coefficient of h^n in the expansion of $(1-2xh-h^2)^{-1/2}$. 3. Orthogonal properties of Legendre's polynomials, Recurrence formulas for Legendre's Polynomials.

Unit-5: Bessel's equation (15h)

1. Definition, Solution of Bessel's equation, Bessel's function of the first kind of order n , Bessel's function of the

second kind of order n . 2. Integration of Bessel's equation in

series form, Definition of $J_n(x)$, recurrence formulae for $J_n(x)$. 3. Generating function for $J(x)$, orthogonality of Bessel functions.



V. N. D.
PRINCIPAL
A.S.D. GOVT. DEGREE COLLEGE (W)
AUTONOMOUS
KAKINADA

**A.S.D.GOVERNMENT DEGREE COLLEGE (Women),(Autonomous),
KAKINADA**

Department of HIATORY

Multidisciplinary Course w.e.f. AY 2023-24

SEMESTER-I INDIAN HISTORY

Credits: 2 2 hrs/week

Skill

Employability

Entrepreneurship

Unit-I

Ancient Indian History and Culture: What is History-Evolution of Man-Science and Technology in Harappan Civilisation-Vedic Literature- Difference between Jainism and Buddhism Philosophy-Ashoka Dhamma Policy-**Science and Technology in Guptha Period- Chronology of Various Dynasties that ruled India (6th Century BC to 1206 CE)**

Unit-II

History and Culture of Medieval India: Delhi Sultanate: Rulers (Brief), Alla-Ud-Din-Khilji and Muhammad-Bin-Tuglaq Reforms-Greater Mughals (Brief)-**Mughal Administration-Akbar Religious Policy-Mughal Art and Architecture-Bhakti Saints**

Unit-III

History of Modern India: European Settlements-British **Revenue Policies**-Economic Impact of British Rule-**Socio-Religious Reform Movements**-**Causes for 1857 Revolt-Indian Freedom Struggle:** Vandemataram, Home Rule Movement-Gandhi's Role: Non-Cooperation Movements, Salt Satya Graha and Quit India Movement-Subash Chandra Bose-Partition of India.

**A.S.D.GOVERNMENT DEGREE COLLEGE (Women),(Autonomous),
KAKINADA**

Department of HIATORY

B.A Semester – III Semester-wise Syllabus under CBCS

Course 3: MODERN INDIAN HISTORY & CULTURE (1764-1947 A. D)

Skill

Employability

Entrepreneurship

Unit – 1

Policies of Expansion – Cornwallis - Subsidiary Alliance & Doctrine of Lapse --
William Bentick - Causes & Results of 1857 Revolt – **Lytton, Rippon, Curzon**

Unit - II

Social, Religious & Self-Respect Movements – Raja Rammohan Roy, Dayananda
Saraswathi, Swami Vivekananda, smt. Anniebesent – Jyotiba Phule, Narayana Guru,
Periyar, Dr. B. R. Ambedkar

Unit - III

Causes for the growth of Nationalism -Birth of Indian National Congress- A.O. Hume-
Freedom Struggle from 1885 to 1920: Moderate Phase — Militant Phase: Vandemataram
Movement - Home Rule Movement

Unit – IV

Freedom Struggle from 1920 to 1947: Gandhiji’s Role in the National Movement -
Revolutionary Movement – Subhas Chandra Bose – Indian National Army

Unit – V

Muslim League– Partition of India – Advent of Freedom – **Integration of Princely States into
Indian Union** – SardarVallabhai Patel

**A.S.D.GOVERNMENT DEGREE COLLEGE (Women),(Autonomous),
KAKINADA**

Department of HIATORY

SEMESTER - II

Minor History 1. Science and Human Past

Skill

Employability

Entrepreneurship

Unit-I

What is History-Is History a science?-Facts, Interpretations-Relation with other Social Sciences-**Sources of Indian History**: Archaeological and Literary Sources?

Unit-II

Hunting Gathering to the Food Production Society: Palaeolithic, Mesolithic, Neolithic and Chalcolithic Phases in India- Evolution of tools, belief systems and art forms.

Unit-III

First Urbanization in India: The Indus Valley Civilization-Definition of Civilization and Urbanization-Origin, Extent-Sites-Features of IVC-Trade and Commerce- Social and Cultural Life-Divide of the Civilization.

Unit-IV

The Vedic Corpus: Vedic Literature- Indo-Aryans Theories-**Society, Economy, Culture, religion and Polity during the Early Vedic Period**-**Society, Economy, Culture, religion and Polity during the Later Vedic Period**-Origin of Varna System.

Unit-V

Second Urbanization in India: Iron Age Cultures in the subcontinent-**Impact of Iron technology**-The emergence of City life- Urban Occupations, Crafts, Guilds-Trade and Commerce.

**A.S.D.GOVERNMENT DEGREE COLLEGE (Women),(Autonomous),
KAKINADA
Department of HIATORY**

B.A	Semester – V (Skill Enhancement Course- Elective)	Credits:4
Course:6B	Tourism and Hospitality Services	Hrs/Wk:5

Skill

Employability

Entrepreneurship

Unit:1

Tourism–Definition–Nature and Scope–History of Tourism–Types of Tourism– Domestic and International Tourism– Causes of rapid growth of tourism– National Institute of Tourism and Hospitality Management

Unit:2

Relationship between history and tourism-**Major tourist spots in AP**– Gandikota, Nagarjuna Konda, Salihundam, Kona Seema and Rayala Seema

Unit:3

Characteristics of Hospitality Industry-Inflexibility, Intangibility, Perishability-**Types of Hospitality jobs** - Hotel Manager, Hotel Receptionist, Restaurant Manager, Catering Assistant, Executive Chef etc -Concepts of Atithi Devo Bhavah-Types of hotels in India

Unit: 4

Duties, responsibilities &skills of front office staff– duties, responsibilities and skills of Housekeeping- staff- guest stay process in a hotel-major processes and stages associated with it

Unit: 5

Different types of services offered in selected Hotels/Motels/Restaurants- Room Service, **Catering Services**- **Different types of managerial issues** -**Service etiquettes**

KAKINADA

Department of HIATORY

B.A	Semester – V (Skill Enhancement Course- Elective)	Credits:4
Course:7B	Tourism Guidance and Operating Skills	Hrs/Wk:5

Skill

Employability

Entrepreneurship

Unit:1

Meaning of tour guide - **types of tour guide**: heritage guide, nature guide, adventure guide, business guide, special interest guide etc – **duties and responsibilities of guides -various roles of tour guide.**

Unit:2

Guiding techniques: leadership skills, social skills, presentation skills, communication skills – Guide's personality skills: passion, empathy, enthusiasm, punctuality, humour etc Personal Hygiene and grooming– **code of conduct**

Unit:3

Guest Relationship Management- Handling emergency situations- Medical, Personal, Official, VISA/Passport, Death, Handling Guest with special needs/Different Abilities/Different age groups.

Unit:4

Conducting Tours: Pre-Tour Planning, Route Chart, Modes of Transportation, Security Measures, and Check list etc.-**Conducting various types of tours**- Relationship with Fellow Guides Coordination with hospitality institutions.

Unit:5

Travel Agency and Tour operations – Difference between Travel Agent and Tour operator – Functions of Tour Operator – **Types of Tour Operations and of Tour Operators** - A brief study of tour operating agencies like APTDC, Southern Travels etc.

V. Ananta Lakshmi

Signature of the Principal
PRINCIPAL
A.S.D.GOV.T.DEGREE COLLEGE (W)
AUTONOMOUS
KAKINADA



A.S.D Government Degree College for Women (Autonomous): Kakinada

Department of Political Science 2022 - 2023

Single Major System 2023-24 Paper – 1 Fundamentals of Social Sciences

 Skill

 Employability

 Entrepreneurship

Unit – I - What is Social Science?

1. Definition and Scope of Social Science – Different Social Sciences
2. Distinction between Natural Science and Social Sciences
3. Interdisciplinary Nature of Social Sciences
4. Methods and Approaches of Social Sciences

Unit –II - Understanding History and Society

1. Defining History, Its Nature and Scope
2. History- A Science or an Art
3. Importance of History in the Present Society
4. Types of History and Chronology of Indian History

Unit – III -Society and Social Behaviour

1. Definition, Nature and Scope of Psychology
2. Importance of Social Interaction 3. Need of Psychology for present Society
4. Thought process and Social Behaviour

Unit – IV - Political Economy

1. Understanding Political Systems
2. Political Systems – Organs of State
3. Understanding over Economics - Micro and Macro concepts
4. Economic Growth and Development - Various aspects of development

Unit – V Essentials of Computer

1. Milestones of Computer Evolution - Computer – Block Diagram, Generations of Computers
2. Internet Basics – Internet History, Internet Service Providers – Types of Networks – IP – Domain Name Services – Applications
3. Ethical and Social Implications – Network and Security concepts – Information assurance fundamentals

Single Major System 2023-24 Paper – II Perspectives on Indian Society

Unit – 1- Man in Society

1. Human Nature and Real-Life Engagement
2. Social Groups and Social Dynamics
3. Individualism and Collectivism – Ethical Concerns
4. Human Life – Social Influence and Social Impact

Unit-II: Indian Heritage and Freedom Struggle in India

1. Cultural & Heritage sites of Tourism in India
2. Indian Dance, Music and Yoga
3. Rise of Nationalism under British Rule in brief (1857-1947)
4. Contemporary history of India-integration of Princely States, abolition of Zamindari, Formation of linguistic states

Unit – 3 - Indian Constitution 1. Philosophical Foundations of Indian Constitution

2. Elements of Indian Constitution
3. Study of Rights in Indian Constitution
4. Directive principles to State

Unit – 4. Indian Economy

1. Indian Economy - Features – Sectorial contribution in income
2. Role of Financial Institutions - RBI - Commercial Banks
3. Monetary and Fiscal Policies for Economic Development
4. Economic Reforms - Liberalization - Privatization- Globalization

Unit – 5 Impact on Society & Analytics

1. Role of Computer, impact of Computers on human behaviour, e-mail,
2. Social Networking- What's App, Twitter, Facebook, impact of Social Networks on human Behaviour.
3. Simulating, Modelling, and Planning, Managing Data, Graphing, Analysing Quantitative Data,
4. Expert Systems and Artificial Intelligence Applications in the Social Sciences

Single Major System 2023-24 Semester II

3. Fundamentals of Political Science

Unit – I: Introduction:

1. Definition Nature of Political Science
2. Scope and Importance of Political Science
3. Relations with allied disciplines: History and Economics
4. Relations with allied disciplines: Philosophy and Sociology

Unit – II: Approaches:

1. Approaches to the study of Political Science:
2. Traditional Approaches: Philosophical, Historical.
3. Modern Approaches: Behavioural and Post-Behaviourism
4. Modern Approaches: System Approach and Structural - Functional

Unit – III: State

1. Definition of the State, Nature
2. Elements of the State
3. Theories of Origin of the State: Divine Origin
4. Theories of Origin of the State: Force and Evolutionary

Unit – IV: Theory of Social Contract

1. Social Contract Theory: Origin of the theory
2. Social Contract Theory: Thomas Hobbes
3. Social Contract Theory: John Locke
4. Social Contract Theory: Jean Jacques Rousseau

Unit – V: Modern State

1. Concepts of Modern State: Meaning, Origin
2. Nature of Modern State
3. Welfare State: Origin
4. Nature of Welfare State

Semester II – Paper - 4. Concepts & Ideologies of Political Science

Unit – I: Law & Liberty:

1. Law: Meaning, Definition, Nature
2. Law: Types of Law - Sources of Law
3. Liberty: Meaning, Definition, Nature
4. Liberty: Types of Liberty

Unit – II: Equality & Power:

1. Equality: Meaning, Definition, Nature
2. Equality: Types of Equality
3. Power: Meaning, Definition, Nature
4. Authority and Legitimacy: Meaning, Definition, Nature

Unit – III: Rights:

1. Rights: Meaning, Nature
2. Rights: Classification of Rights
3. Theories of Rights: Natural, Legal, Historical
4. Theories of Rights: Idealistic, Social & Welfare

Unit – IV: Ideologies:

1. Liberalism 2. Individualism
3. Anarchism 4. Fascism

Unit – V: Isms

1. Socialism 2. Marxism
3. Multiculturalism 4. Nationalism

SEMESTER - III

Course-3: INDIAN GOVERNMENT AND POLITICS

UNIT-I: SOCIAL AND IDEOLOGICAL BASE OF THE INDIAN CONSTITUTION

1. Constitutional Development in India during British Rule-A Historical Perspective with reference to Government of India Acts, 1909,1919 and 1935.
2. Constituent Assembly-Nature, Composition, Socio-Economic, Philosophical Dimensions and Salient Features of the Indian Constitution.

UNIT-II: INDIVIDUAL AND STATE

1. Fundamental Rights, Directive Principles of State Policy and Fundamental Duties-Differences between Fundamental Rights and 11 Directive Principles of State Policy.
2. The 'Doctrine of Basic Structure of the Constitution' with reference to Judicial Interpretations and Socio-Political Realities.

UNIT-III: UNION EXECUTIVE

1. President of India-Mode of Election, Powers and Functions.
2. Parliament-Composition, Powers and Functions, Legislative Committees, Prime Minister and Council of Ministers-Powers and Functions, Role in Coalition Politics

UNIT-IV: STATE EXECUTIVE

1. Governor-Mode of Appointment, Powers and Functions.
2. Legislature-Composition, Powers and Functions, Chief Minister and Council of Ministers-Powers and Functions

UNIT-V: THE INDIAN JUDICIARY

1. Supreme Court-Composition and Appointments, Powers and Functions or Jurisdiction of the Supreme Court, Judicial Review, Judicial Activism.
2. High Court-Composition, Powers and Functions, Debates on the mode of appointment of Judges-National Judicial Appointments Commission and Judicial Reforms.

SECOND YEAR SEMESTER - IV (Under CBCS w.e.f 2020-21)

Paper - IV: INDIAN POLITICAL PROCESS

UNIT-I: FEDERAL PROCESSES

1. Features of Indian Federal System- Centre-State Relations Legislative, Administrative and Financial
2. Emerging Trends in Centre-State Relations-Restructuring Centre State Relations- Recommendations of Sarkaria Commission, M.M.Punchi Commission

UNIT-II: ELECTORAL PROCESSES

1. The Election Commission of India, Powers and Functions.
2. Issues of Electoral Reforms, Voting Behaviour-Determinants and 15 Problems of Defections.

UNIT-III: GROSSROOT DEMOCRACY-DECENTRALISATION

1. Panchayat Raj system-Local and Urban Governments-Structure, Powers and Functions.
2. Democratic Decentralization-Rural Development and Poverty alleviation with reference to 73rd and 74th Constitutional Amendment Acts, Challenges and Prospects.

UNIT-IV: SOCIAL DYNAMICS AND EMERGING CHALLENGES TO INDIAN POLITICAL SYSTEM

Role of Caste, Religion, Language and Regionalism in India. 2. Politics of Reservation, Criminalization of Politics and Internal threats to Security.

UNIT-V: REGULATORY AND GOVERNANCE INSTITUTIONS

1. NITI Ayog, Finance Commission, Comptroller and Auditor General of India.
2. Central Vigilance Commission, Central Information Commission, Lokpal and Lokayukta

SECOND YEAR SEMESTER – IV (Under CBCS w.e.f 2020-21)

Paper - V WESTERN POLITICAL THOUGHT

UNIT-I: ANCIENT GREEK POLITICAL THOUGHT

1. Plato-Rule of Philosopher Kings-Theory of Justice-Ideal State and Education
2. Aristotle-Theory of State-Classification of Governments-Citizenship, Slavery and Theory of Revolutions.

UNIT-II: MEDIEVAL AND MODERN POLITICAL THOUGHT

1. St. Augustine-Theory of Two Cities.
2. NiccoloMachiavelli-State and Statecraft.

UNIT-III: CONTRACTUAL POLITICAL THOUGHT

1. Thomas Hobbes- Social Contract and Absolute Sovereignty.
2. John Locke- Human Nature, State of Nature, Social Contract, Natural Rights and Limited Government 19
3. Jean Jacques Rousseau- Human Nature, State of Nature, Social Contract, General Will and Popular Sovereignty

UNIT-IV: UTILITARIAN POLITICAL THOUGHT

1. Jermy Bentham-Theory of Utility, Law and Reforms
2. J.S.Mill-Theory of Liberty and Representative Government.

UNIT-V: MARXIST POLITICAL THOUGHT

1. Karl Marx-Dialectical Materialism, Theory of Surplus Value and Class Struggle.
2. Antonio Gramsci-Hegemony and Civil Society.

SEMESTER – V

Course 6 B: E GOVERNANCE

(Skill Enhancement Course (Elective), 4 credits)

Unit: 1

Brief Introduction to Governance-E-Governance –Meaning, Definition, Nature, Scope, Objectives and Significance-Domains of E-Governance- E-Governance and Good Governance-Global trends in the growth of E-Governance.

Unit: 2

E-Governance in India- - National E-Governance Plan (NeGP)-National Informatics Centre- Strategies for E-Governance-E-Governance Implementations: Required infrastructure of Network, Computing, Cloud Governance, Data system, Human resources, Legal and Technological infrastructure- Major E-Governance Projects and Initiatives: Gyandoot, E-choupal, E-Bhoomi, E-Seva, CARD, E-Panchayat, and Real Time Governance (RTG) etc.

Unit: 3

Role of Information and Communication Technology in Administration, Effective delivery of Services for public utilities through E-Governance-Online filing of complaints, application Registration, issuance of certificates, issuance of land records, online payments of fees, dues etc., e-tendering, easy access to information and E-Governance in Social security and welfare schemes: Direct transfer of benefits, Biometric authentication through Aadhar, etc.

Unit: 4

E-Governance under Information Technology Act-Legal status for digital transactions-Public Private Partnership and expansion of E-Governance.

Unit: 5

E-Governance under Information Technology Act-Legal status for digital transactions-Public Private Partnership and expansion of E-Governance

THIRD YEAR SEMESTER – V

Course 7B: LOCAL ADMINISTRATION

(Skill Enhancement Course (Elective), 4 credits)

Unit: 1

Local Government: Meaning, Nature and Importance, Thoughts on Local Governments by M.K.Gandhi, Jawaharlal Nehru and Dr.B.R.Ambedkar, Important Committees: Balwant Rai Mehta (1957), Ashok Mehta (1978), L.M.Singhvi (1986).

Unit: 2

Decentralization of powers (Political, Administrative and Economic) from the States to Local Institutions- 73rd and 74th Constitutional Amendment Acts-Empowering Local Governments- Decision making powers during crisis and disasters-Relationship between local governments Authorities and Central and State Government service providers-Role of District Collector in Strengthening LGIs.

Unit: 3

Revenue raising avenues for Local Governments-Grants, Aid and support from Centre and State Governments-Public Private Partnerships-Concept of Local Development-Village as a unit,SWOC analysis of a village, existing conditions, expected developmental opportunities, the gap, natural, government and private resources, year-wise planning, finances required - Role of Local Governments in implementation of welfare and developmental programmes i.e., (MGNREGS),(SGSY), (IAY) and (PURA).

Unit: 4

Challenges for Local Administration, Financial, administrative and Political Constraints-Public relations in Local Administration-Need for training for elected representatives and other stakeholders-Audit training and Participatory training.

Unit: 5

Preparation of Reports-Minutes and Documentation-Types of Reports, Content of Minutes-
Methods of Documentation-Best practices of Reporting on functioning of Local
Administration-Use of ICT in documentation.

V. Ananta Lakshmi

Signature of the Principal
PRINCIPAL
A. S. D. GOVT. DEGREE COLLEGE (W)
AUTONOMOUS
KAKINADA



**A.S.D. GOVERNMENT DEGREE COLLEGE FOR
WOMEN (AUTONOMOUS) KAKINADA**

(Under the jurisdiction of Adikavi Nannaya University)

Reaccredited by NAAC with B Grade (3rd Cycle)

1.1.3 Details of courses offered by the institution that focus on employability/ entrepreneurship/ skill development during the year.



DEPARTMENT OF ECONOMICS

Academic Year 2023-2024

**ASD GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS),
KAKINADA**

(Accredited by NAAC with “B” in Cycle 3)

(Affiliated to Adikavi Nannayya University)

I B.A. Honours in Economics– Under CBCS, Syllabus 2023-24

For 2023 -24 Admitted Batches (I Year)

B.Sc/B.A.	Semester – I	Credits: 4
Course:1	Fundamentals of Social Sciences	Hrs/Wk: 4



Skill



Employability



Entrepreneurship

Unit	Syllabus
Unit-I	<p>What is Social Science?</p> <ul style="list-style-type: none"> • Definition and Scope of Social Science – Different Social Sciences • Distinction between Natural Science and Social Sciences • Interdisciplinary Nature of Social Sciences • Methods and Approaches of Social Sciences
Unit-II	<p>. : Understanding History and Society</p> <ul style="list-style-type: none"> • Defining History, Its Nature and Scope • History- A Science or an Art • Importance of History in the Present Society • Types of History and Chronology of Indian History
Unit-III	<ul style="list-style-type: none"> • Society and Social Behaviour • Definition , Nature and Scope of Psychology • Importance of Social Interaction • Need of Psychology for present Society • Thought process and Social Behavior
Unit-IV	<p>: Political Economy</p> <ul style="list-style-type: none"> • Understanding Political Systems • Political Systems – Organs of State • Understanding over Economics - Micro and Macro concepts • Economic Growth and Development - Various aspects of development
Unit- V	<p>: Essentials of Computer</p> <ul style="list-style-type: none"> • Milestones of Computer Evolution - Computer – Block Diagram, Generations of Computers • Internet Basics – Internet History, Internet Service Providers – Types of Networks – IP – Domain Name Services – Applications

**ASD GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS),
KAKINADA**

(Accredited by NAAC with “B” in Cycle 3)

(Affiliated to Adikavi Nannayya University)

I B.A. Honours in Economics – Under CBCS, Syllabus 2023-24

For 2023 -24 Admitted Batches (I Year)

B.Sc/B.A.	Semester – I	Credits: 4
Course:2	Perspectives on Indian Society	Hrs/Wk: 4

Unit	Syllabus
Unit-I	<p>Unit -1: Man in Society</p> <ul style="list-style-type: none"> • Human Nature and Real-Life Engagement • Social Groups and Social Dynamics • Individualism and Collectivism – Ethical Concerns • Human Life – Social Influence and Social Impact
Unit-II	<p>Unit-2: Indian Heritage and Freedom Struggle in India</p> <ul style="list-style-type: none"> • Cultural & Heritage sites of Tourism in India • Indian Dance, Music and Yoga • Rise of Nationalism Under British Rule in brief (1857-1947) • Contemporary history of India-integration of Princely States, abolition of Zamindari, formation of linguistic states
Unit-III	<p>Unit-3: Indian Constitution</p> <ul style="list-style-type: none"> • Philosophical Foundations of Indian Constitution • Elements of Indian Constitution • Study of Rights in Indian Constitution • Directive principles to State
Unit-IV	<p>Unit -4: Indian Economy</p> <ul style="list-style-type: none"> • Indian Economy - Features – Sectoral contribution in income • Role of Financial Institutions - RBI - Commercial Banks • Monetary and Fiscal Policies for Economic Development. • Economic Reforms - Liberalization - Privatization- Globalization
Unit- V	<p>Unit-5: Impact on Society & Analytics</p> <ul style="list-style-type: none"> • Role of Computer, impact of Computers on human behavior, e-mail, • Social Networking- WhatsApp, Twitter, facebook, impact of Social Networks on human behavior. • Simulating, Modeling, and Planning, Managing Data, Graphing, Analyzing Quantitative Data. • Expert Systems and Artificial Intelligence Applications in the Social Sciences

**ASD GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS),
KAKINADA**
(Accredited by NAAC with “B” in Cycle 3)
(Affiliated to Adikavi Nannayya University)
I B.A. Honours in Economics – Under CBCS, Syllabus 2023-24
2023 -24 Admitted Batches (I Year)
(Major/Minor)

B.Sc/B.A.	Semester – II	Credits: 4
Course:3	MICROECONOMICS	Hrs/Wk: 4

Unit	Syllabus
Unit-I	<p>Unit–1: Introduction to Economics</p> <ul style="list-style-type: none"> • Economic Activities and Economic System; Definition, Scope and Importance of Economics • Fundamental problems of economics: Scarcity and Choice, Production Possibilities Curve • Meaning and Scope of Microeconomics; Differences between Micro and Macro Economics • Principles of Microeconomics: Equilibrium, Optimization, Welfare; Methodology in Economics : Positive and Normative
Unit-II	<p>Unit -2: Demand and Consumption</p> <ul style="list-style-type: none"> • Demand: Meaning, Types and Factors; Law of Demand • Elasticity of Demand: Meaning, Price, Income and Cross Elasticities • Utility: Meaning, Types, Importance; Marginal Rate of Substitution (MRS), DMRS • Indifference Curves (IC): Concept, Properties; Budget Line; Consumer Equilibrium under IC
Unit-III	<p>3: Production and Supply</p> <ul style="list-style-type: none"> • Firm: Concept and Objectives; Production and Factors of Production; Concepts of Production, Cost and Revenue: Total, Average, Marginal • Production Function: Meaning and Types; Cobb- Douglas Production Function • Law of Variable Proportions; Laws of Returns to Scale • Supply: Meaning, Factors, Law of Supply, Elasticity of Supply
Unit-IV	<p>Unit-4: Markets</p> <ul style="list-style-type: none"> • Market: Concept and Classification; Perfect Competition: Characteristics, Equilibrium of Firm and Industry • Monopoly: Characteristics, Equilibrium, Price Discrimination • Monopolistic Competition: Characteristics, Equilibrium, Selling Costs • Oligopoly: Characteristics, Types, Kinked Demand Curve Model
Unit- V	<p>Unit - 5: Distribution</p> <ul style="list-style-type: none"> • Distribution: Meaning and importance: • Rent: Ricardian Theory of Rent, Marshallian Quasi Rent • Theories of Wage: Subsistence Theory, Modern Theory • Theories of Interest: Classical Theory, Loanable Funds Theory • Theories of Profit: Risk and Uncertainty Theory, Innovations Theory

ASD Government Degree College for Women (Autonomous) KAKINADA

(Accredited by NAAC with “B” in Cycle 3)

(Affiliated to Adikavi Nannayya University)

I B.A. Honours in Economics – Under CBCS, Syllabus 2023-24

For 2023 -24 Admitted Batches (I Year)

B.A.	Semester – II	Credits: 4
Course:4	Mathematical Methods For Economics	Hrs/Wk: 4



Skill



Employability



Entrepreneurship

Unit	Syllabus
Unit-I	Unit-I: Sets and Functions <ul style="list-style-type: none"> • Role of Mathematical Methods in Economics • Concept of Set theory: Types and operations in Set Theory • Concept of Function: Types of Function Polynomial Function, Homogenous Function, Logarithmic and Exponential Functions • Venn Diagrams
Unit-II	Unit- 2: Differential Calculus <ul style="list-style-type: none"> • Limit and Continuity of Function • Standard Limits-Evaluation of Limits in Simple Cases • Concept of Derivative–Rules of Differentiation, Power Rule, Product Sum, Difference-simple Economic Problems
Unit-III	Unit-3: Optimization and Its Application <ul style="list-style-type: none"> • Concept of Optimization: Conditions for Maxima and Minima of Functions of One or Two Variables • Simple examples from Economics: Maximization of Output • Revenue and Profit-Minimization of Cost under Perfect Competition and Monopoly
Unit-IV	Unit-4: Integration and Linear Programming <ul style="list-style-type: none"> • Concepts of Integration: Simple Rules of Integration • Application of Integration to Consumer’s Surplus and Producer’s Surplus • Linear Programming: Formulation of a Linear Programming Problems • Solution of Linear Programming problems through Graphical Method
Unit- V	Unit-5: Matrices and Determinant <ul style="list-style-type: none"> • Concept of Matrix–Types of Matrices • Addition and Multiplication of Matrices • Determinants and Their Properties • Inverse and Rank of a Matrix Solution of Two and Three Simultaneous Equations through Cramer’s Rule.

ASD Government Degree College for Women (AUTONOMOUS)
(Accredited by NAAC with “B” in Cycle 3)
(Affiliated to AdikaviNannayya University)

KAKINADA

BA PROGRAMME – Under CBCS, Syllabus 2023-24

II YEAR, SEMESTER-III, COURSE-III

	Skill	Employability	Entrepreneurship
II BA	Semester-III		Credits: 5
Paper III	DEVELOPMENT ECONOMICS		Hrs/Wk: 4

Unit	Syllabus
Unit-I	Economic Development as a Branch of Study of Economics – Scope and Importance - Distinction between Economic Growth and Economic Development -Measures of Economic Development and their limitations - Relevance of Herd (Group) Immunity in the context of COVID 19 - three core values of economic development : Sustainability, Self-esteem and Freedom – Economy and Environment : Concepts of sustainable development and inclusive growth.
Unit-II	Characteristics of Underdeveloped Countries - World Bank and IMF Classification of countries - Modern economic growth – Kuznets’ Six Characteristics - Obstacles to economic development - Vicious Circle of Poverty and cumulative causation - Factors of economic growth: Economic and Non-economic - Capital Formation – Foreign and Domestic capital, Debt and Disinvestment.
Unit-III	Classical Theory: Adam Smith, Ricardo and Malthus -Marxian Theory - Schumpeter Theory - Rostow’s Stages of Economic Growth - Harrod- Domar two sector model -Solow’s Model and Robinson’s Golden Age
Unit-IV	Strategies of Economic Development – Big Push - Balanced Growth -Unbalanced Growth - Mahalanobis Model - Agriculture vs Industry -Capital Intensive Technology vs Labour Intensive Technology -Role of Infrastructure in Economic Development.
Unit- V	Role of State in Economic Development -Role of Markets - Market Failure and Regulation by State -Public sector vs Private sector -Economic Planning – concept, objectives and types -NITI Ayog - Economic Federalism -Financial Institutions and Economic Development -Role of International Institutions-IDBI, ADB, IMF - Foreign Trade - FIIs and FDIs.

ASD Government Degree College for Women (AUTONOMOUS)
(Accredited by NAAC with “B” in Cycle 3)
(Affiliated to AdikaviNannayya University)
KAKINADA
BA PROGRAMME – Under CBCS, Syllabus 2023-24



Skill



Employability



Entrepreneurship

II YEAR, SEMESTER-III, COURSE-IV

II BA	Semester-IV	Credits: 5
Paper IV	ECONOMIC DEVELOPMENT-INDIA AND ANDHRA PRADESH	Hrs/Wk: 4

Unit-I	Basic characteristics of Indian Economy as a developing economy – Economic development since independence - Objectives and achievements of planning – Planning Commission/NITI Ayog and their approaches to economic development - India’s Rank in Global Human Development Index
Unit-II	Development –Intra-state and Inter- state Labour Migration and unorganized sector Problems Trends in National income - Demographic trends - Poverty and Inequalities – Occupational Structure and Unemployment - Various Schemes of employment generation and eradication of poverty – Issues in Rural Development and Urban of Migrant Labour
Unit-III	Indian Agriculture – Agricultural Strategy and Agricultural Policy – Agrarian Crisis and land reforms – Agricultural credit – Minimum Support Prices -Malnutrition and Food Security - Indian Industry - Recent Industrial Policy – Make-in India – Start-up and Stand-up programmes – SEZs and Industrial Corridors - Economic Reforms and their impact - Economic initiatives by government of India during COVID - Atmanirbhar Bharat package.
Unit-IV	Fiscal policy- Indian Tax System and Recent changes – GST and its impact on Commerce and Industry – Centre, States financial relations- Recommendations of Recent Finance Commission – Public Expenditure and Public Debt –Concepts of Budget.
Unit- V	The basic characteristics of Andhra Pradesh economy after bifurcation in 2014 – Impact of bifurcation on the endowment of natural resources and state revenue – new challenges to industry and commerce - the new initiatives to develop infrastructure – Power and Transport – Health and Education- Information Technology and e-governance – Urbanization and smart cities – Skill development and employment –Recent Social welfare programmes

ASD Government Degree College for Women (AUTONOMOUS)
(Accredited by NAAC with “B” in Cycle 3)
(Affiliated to Adikavi Nannayya University)

KAKINADA

BA PROGRAMME – Under CBCS, Syllabus 2023-24

II YEAR, SEMESTER-III, COURSE-V



Skill



Employability



Entrepreneurship

II BA	Semester-IV	Credits: 5
Paper V	VSTATISTICALMETHODSFORECONOMICS	Hrs/Wk: 4

Unit	Syllabus
Unit-I	Introduction to Statistics – Definition, scope, importance and limitations of Statistics – Primary and Secondary data- Census and Sampling techniques and their merit sand demerits.
Unit-II	Collection of data - Schedule and questionnaire – Frequency distribution –Tabulation – diagram and graphic presentation of data – Histogram, Frequency Polygon, Cumulative Frequency Curves-Bar Diagrams and Pie Diagram.
Unit-III	Measures of Central Tendency and Dispersion –Types of averages -Arithmetic Mean, Geometric Mean, Harmonic Mean–Median–Mode–Dispersion - Range, Quartile Deviation, Mean Deviation, Standard Deviation- Coefficient of Variation.
Unit-IV	Correlation and Regression Meaning, Definition and uses of Correlation-Types of Correlation- KarlPearson’sCorrelationcoefficient-Spearman’sRankCorrelation –Regression Equations-utility of regression analysis–Demand forecasting.
Unit- V	Time Series and Index Numbers: Definition and components of Time Series – Measurement of Time Series – Moving Average and the Least Squares Method – Index Numbers - Concepts of Price and Quantity Relatives – Laspeyer’s, Paasche’s and Fisher’s Ideal Index Numbers– Uses and Limitations of Index Numbers.

ASD Government Degree College for Women (AUTONOMOUS)
(Accredited by NAAC with “B” in Cycle 3)
(Affiliated to AdikaviNannayya University)
KAKINADA

BA PROGRAMME – Under CBCS, Syllabus 2023-24

III YEAR, SEMESTER-V, COURSE- VI



Skill



Employability



Entrepreneurship

III BA	Semester-V	Credits: 5
Paper VI-C	Insurance Services	Hrs/Wk: 4

Unit	Syllabus
Unit-I	Risk Management: Risk and Uncertainty, Risk Classification – Concept, Importance and Types of Insurance – Principles of Insurance – Insurance Regulations in India - Role of IRDA and Insurance Ombudsman – Scope for Insurance Business in India.
Unit-II	Life Insurance: Nature and Features - Major Life Insurance Companies in India – Important Life Insurance Products/policies and their Features: Conventional, Unit Linked, Annuities, Group Policies – Medical Examiner.
Unit-III	General Insurance: Nature, Features and Types - Major General Insurance Companies in India – Important General Insurance Products/Policies and their Features - Surveyor – Health Insurance: Nature and Features - Health Insurance Companies in India - Major Health Insurance Products/policies and their Features: Individual, Family, Group.
Unit-IV	Insurance Contract and Terms of Insurance Policy - Registration of Insurance Agency with the Company — Procedure to issue a Policy: Application and Acceptance – Policy Lapse and Revival – Premium Payment, Assignment, Nomination and Surrender of Policy – Policy Claim - Important Websites and Apps of Insurance in India
Unit- V	Insurance Customer and Categories – Understanding Customer Mindset and Satisfaction - Addressing the Grievances of the Customer – Ethical Behavior in Insurance – Moral Hazard– Discussion of two different Case Studies related to Life or General or Health Insurance Services.

ASD Government Degree College for Women (AUTONOMOUS)
 (Accredited by NAAC with “B” in Cycle 3)
 (Affiliated to AdikaviNannayya University)
KAKINADA

BA PROGRAMME – Under CBCS, Syllabus 2022-23

III YEAR, SEMESTER-V, COURSE- VII

	Skill	Employability	Entrepreneurship
III BA	Semester-V		Credits: 5
Paper VII-C	Banking and Financial Services		Hrs/Wk: 4

Unit	Syllabus
Unit-I	Meaning of Banking – Principles of Banking – Functions of Banking – Structure of Indian Banking System – Regulations of Banking in India – Role of RBI in Banking – Anti-money Laundering - Basics of Financial literacy - Problems and Challenges of Banking in India.
Unit-II	Bank Deposit Account Types – Account Opening and Closing – Banking Customer types –KYC Norms – Negotiable Instruments: Cheque, Bill of Exchange, Promissory Note, Endorsement - Principles of Lending – Different categories of Loans – Mortgaging –Priority Sector Lending – E-Banking facilities: Debit Card, Credit Card, Net Banking, Mobile Banking, Tele-banking, Micro ATMs, Digital Currency – Core Banking Solutions.
Unit-III	Banking Correspondent Model - Activities of Banking Correspondent: Deposit Mobilization. Identification of Borrowers, Collection and Recovery Loan, Other Banking Services – Common Services Centre (CSC) - Provision of Services by CSC – Requirement for Registering CSC and Telecentre - Case Study of Banking Correspondents with any Bank or CSC in Local Area.
Unit-IV	Non-Banking Financial Institutions (NBFIs): Types and Major Players of NBFIs in India – Important Financial Services offered by NBFIs and their Features – Concept of EMI – Micro Finance: Concept and Operation - Chit Funds: Concept and Operations– Payment Banks - Regulations of NBFIs in India – Problems and Challenges of NBFIs in India.
Unit- V	Types of loans by Finance Service Company (FSC) – Customer of FSC: Types and Needs - Marketing of FSC’s Loans – Procedures and Requirements in FSC’s Loan Sanction - Collection and Recovery of FSC Loans - Case Study of a FSC’s services in Local Area.




V. N. D.
 PRINCIPAL
 A.S.D. GOVT. DEGREE COLLEGE (W)
 AUTONOMOUS
 KAKINADA

Signature of Head of the Department.

Signature of the Principal

**A.S.D. GOVERNMENT DEGREE COLLEGE FOR
WOMEN (AUTONOMOUS) KAKINADA**

(Under the jurisdiction of Adikavi Nannaya University)

Reaccredited by NAAC with B Grade (3rd Cycle)

**1.1.2 Details of courses offered by the institution that focus on
Employability/ Entrepreneurship/ Skill development during the year.**



DEPARTMENT OF ENGLISH

Colour	Focuses on
Yellow	Skill
Green	Employability
Pink	Entrepreneurship

A.S.D. GOVERNMENT COLLEGE FOR WOMEN (AUTONOMOUS)

KAKINADA

DEPARTMENT OF ENGLISH

General English for B.A., B.Com & B.Sc SEMESTER - I (With effect from 2023-2024)

A COURSE IN COMMUNICATION AND SOFT SKILLS

Syllabus Paper code: 23101

I. UNIT: Listening Skills

- a. Importance of Listening
- b. Types of Listening
- c. Barriers to Listening
- d. Effective Listening

II. UNIT: Phonetics

- a. Sounds of English: Vowels and Consonants
- b. Syllable
- c. Word Stress
- d. Intonation

III. UNIT: Grammar

- a. Words Often confused
- b. Articles
- c. Prepositions
- d. Tenses
- e. Question tags

IV. UNIT: Speaking Skills

- a. Greetings & Introduction
- b. Asking and Giving Information
- c. Yes, We Can Barack Obama
- d. Agreeing/ Disagreeing
- e. A Leader Should Know How to Manage Failure Dr. A.P.J. Abdul Kalam

V. UNIT: Soft Skills

- a. SWOC
- b. Attitude
- c. Emotional Intelligence
- d. Netiquette
- e. Interpersonal Skills

Paper Code: ENG23301
A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), KAKINADA
DEPARTMENT OF ENGLISH
General English for
B.A., B.Com and B.Sc,
SEMESTER - III (With effect from 2022-2023)
A COURSE IN CONVERSATIONAL SKILLS

I.UNIT

Speech: 1. Tryst with Destiny Jawaharlal Nehru

Skills: 2. Greetings

3. Introductions

II. UNIT

Speech: 1. I Have a dream

Interview: 2. A Leader Should Know How to Manage Failure Dr.A.P.J.Abdul Kalam/ India Knowledge at Wharton

Skills: 3. Requests

III. UNIT

Interview: 1. Nelson Mandela's Interview With Larry King

Skills: 2. Asking and Giving

Information: 3. Agreeing and Disagreeing

IV. UNIT

Interview: 1. JRD Tata's Interview With T.N.Ninan

Skills :

2. Dialogue Building:

3. Giving Instructions/Directions

V. UNIT

1. Speech: 1. You've Got to Find What You Love Steve Jobs

Skills: 2. Debates

3. Descriptions

4. Role Play

PAPER CODE LSC23101
A.S.D. GOVT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS) KAKINADA
Department of English
REVISED UG SYLLABUS UNDER CBCS
(Implemented from the Academic Year - 2023-24)
SYLLABUS: 2023-2024
LIFE SKILLS COURSES COMMUNICATION SKILLS
SEMESTER-I

Theory

Credits: 2

2 hrs/week

Course Content:

UNIT-I BASICS OF COMMUNICATION

1. Nature and importance of communication
2. Process of Communication
3. Principles of communication
4. Barriers to effective communication
5. Strategies for effective communication

UNIT-II PRESENTATION SKILLS

1. Preparation of a good presentation
2. Verbal communication in presentation
3. Non-verbal communication in presentation
4. Visual aids/Materials in presentation
5. Analyzing audience and managing questions

UNIT-III INTERVIEWS AND GROUP DISCUSSIONS

1. Interview and its types
2. Before, during and after an interview
3. Do's and Don'ts in an interview
4. Basic Interview questions
5. Structure and process of Group Discussions
6. Role functions, Do's and Don'ts



V. N. D.
PRINCIPAL
A.S.D. GOVT. DEGREE COLLEGE (W)
AUTONOMOUS
KAKINADA

PAPER CODE LSC23201
A.S.D. GOVT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)KAKINADA
Department of English
SKILL COURSE w.e.f. AY 2023-24
CBCS I YEAR UG HONOURS DEGREE PROGRAM - 2023-2024
SEMESTER-II BUSINESS WRITING

Time:2 hours

Max. marks: 40

Unit 1. Introduction to Business Writing: Importance and purpose of effective business writing; Characteristics of good business writing; Common challenges and misconceptions. Writing Clear and Concise Emails: Appropriate email etiquette in the professional environment, organizing email content and using effective subject lines, Understanding tone and formality in email communication.

Unit 2. Memos and Interoffice Communication: Formatting and structure of memos, Writing memos for various purposes like updates, announcements, requests. Ensuring clarity and coherence in interoffice communication. Business Letters and Formal Correspondence: Structure and components of a business letter, writing persuasive and professional business letters, Responding to inquiries and complaints effectively.

Unit 3: Business Proposals and Reports: Crafting business proposals for projects and initiatives, Formal report writing - format, sections, and organization, Analyzing data and presenting findings in reports. Writing for Digital Platforms: Business writing for websites, social media, and online communication, Leveraging technology for efficient and impactful **business writing Activities:**

1. Writing Assignments: Regular business writing tasks covering different document types.
2. Business Proposal Project: Crafting a comprehensive business proposal for a hypothetical scenario.
3. Reports and Presentations: Preparing formal reports and presenting findings to the class.
4. Quizzes and Tests: Assessing understanding of business writing principles and grammar.
5. Class Participation: Active engagement in discussions, peer reviews, and activities.

A.S.D.GOVERNMENT DEGREE COLLEGE (Women),(Autonomous),

KAKINADA

DEPARTMENT OF SANSKRIT

I B.A., B. Com., B.sc.

Part-1 (ii) Second Language

I SEMESTER SYLLABUS

PAPER – I: POETRY, PROSE & GRAMMAR.2023-24

Skill

Employability

Entrepreneurship

SAN 23102

Unit 1: प्राचीनपद्यसाहित्यम् (Ancient Poetry)

१. धनुर्भङ्गः श्रीमद्रामायणे बालकाण्डे, सप्तषष्टितमः सर्गः।
२. शरणागत रक्षणम् श्रीमहाभारते अनुशासनपर्वणि, द्वात्रिंशत्तमोऽध्यायः।

Unit II: आधुनिकपद्यसाहित्यः।

१. पुत्रसंजीवनम् महोदय मुल्लपूडि नारायणशाखिणः पुत्रसंजीवनकाव्ये द्वितीयः सर्गः।
२. रामकीर्तिः सत्यवतशासिनः श्रीरामकीर्ति महाकाव्ये एकः सर्गः।

Unit 3: गद्यसाहित्यम् (Prose Literature)

१. खलोकित्तः हितोपदेशे सन्धिपरिच्छेदात्।
२. लोकमान्यः श्रीरामनाथशासिकृतः निवन्धः।

Unit 4: व्याकरणम् (Grammar - Ajantha Shabdās and Dhatus).

१. अजन्तशब्दाः देव, कवि, भानु, धातु, पितृ, गो, रमा, मति।
२. धातवः भू, गम्, स्था, हस, लभ, मुद्, अस्, भा।
३. सन्धयः समासाः (द्वन्द्वः, तत्पुरुषः, कर्मधारयः, द्विगुः)।

A.S.D.GOVERNMENT DEGREE COLLEGE (Women),(Autonomous),

KAKINADA

DEPARTMENT OF SANSKRIT

I B.A., B. Com., B.sc.

Part-1 (ii) Second Language

II SEMESTER SYLLABUS

PAPER – I: POETRY, PROSE & GRAMMAR.2023-24

SAN 23202

UnitI:

1. पाणिग्रहणम् रघुवंशमहाकाव्ये सप्तमः सर्गः।

२. पत्रार्चनम् नानायन्येभ्यः।

Unit II: आधुनिकपद्यसाहित्यः।

१. पत्राधारी श्रीमत्प्रतापरणायने मेवाडकाण्डे त्रयोदशः सर्गः।

२. सुखवर्गः धम्मपदम् (प्रो. पी. श्रीरामचन्द्रदुः अनूदित संस्कृतसंस्करणम्)।

Unit:III गद्यसाहित्यः।

१. अमोघदर्शनम् बाणस्य कादम्बरीतः।

२. धारुचेष्टितम्कविकोपकलापतः।

Unit:iv: व्याकरणम्।

१. अजन्तशब्दाः नदी, तनु, वधू, मातृ, वन, फल, यति, मधु।

२. धातवः लिप्, पू, की, पुर, रच्, वन्द, युध्।

Unit V :व्याकरणम्।

१. सन्धयः हल्सन्धिः, विसर्गसन्धिः।

२. समासाः अव्ययीभावः, बहुव्रीहिः।



V. N. O.
PRINCIPAL
A.S.D. GOVT. DEGREE COLLEGE (W)
AUTONOMOUS
KAKINADA

A.S.D.GOVERNMENT DEGREE COLLEGE (Women),(Autonomous),

KAKINADA

DEPARTMENT OF SANSKRIT

II B.A., B. Com., B.sc.

Part-1 (ii) Second Language

III SEMESTER SYLLABUS 2023-24

Drama, Upanishad, Alamkara and History of Literature.

SAN20302

(W.e.f.2020-2021)

UNIT – I : OLD DRAMA

1. "Madhyamavyayogaha". Bhasa Natakachakram. krishadas academy, Varanasi 1998.

UNIT – II :MODERN DRAMA

"Sankalpabalam" by Prof.G.S.R.Krishna Murthy, Published by Semushi, R.S.Vidyapeetam, Tirupati-2019.

UNIT – III :UPANISHAD

1. "Sishyanusasanam" – Sikshavalli of Taittireeyopanishad.

2. "Sraddatrayavibhagayoga", 17th Chapter, Bhagavadgita, Geetapress, Gorakhpoor.

UNIT - IV : 1. ALANKARAS:

1. Upama 2. Ananvaya 3. Utpreksha 4. Deepakam

5. Aprastutaprasamsa 6.Drushtanta 7. Prateepa.

2. HISTORY OF SANSKRIT LITERATURE

1. Panini 2.Kautilya 3.Bharatamuni 4. Bharavi 5.Magha

6.Bhavabhuti 7. Sankaracharya, 8.Jagannatha. 9. Dandi.

UNIT – V : HALANT SABDAS

1. Jalamuch 2.Vaach 3.Marut 4.Bhagavat 5.Bhavat

6.Pachats 7. Naman 8.Rajan 9.Gunin 10.Vidwas 11. Manas

V. Ananta Lakshmi



Signature of the Principal
PRINCIPAL
A.S.D. GOVT. DEGREE COLLEGE (W)
AUTONOMOUS
KAKINADA

A.S.D Government Degree College for Women (Autonomous): Kakinada
Department of Telugu -2023-2024

Single Major System-Semester-I-General Telugu- 2023-24-Paper– 1-Sahiti Sourabham

 Skill

 Employability

 Entrepreneurship

Unit-I (Pracheena Kavitwam)

Unit-I (Pracheena Kavitwam)

Rajaneethi – Nannayya – Andhramahabharatam-Sabha Parvam – Prathamaswasam

Unit-II (Aadhunika Kavitwam)

Gabbilam- Jashuva – Prathama Bhagam

Unit-III-(Kathanika)

Alarasa Puttillu – Kalyana Sundari Jagannath

Diddubatu – Gurajada Apparao

Unit-IV – (Navala)

Asamarthuni Jeevayatri – Thripuranenu Gopichand

Unit-V (Jeevitha Charitra)

Moodu Vangmaya Sikharaalu- Thirumala Ramachandra

Vyakaram

Sandhulu, Samasalu, Arthalangaralu

A.S.D Government Degree College for Women (Autonomous): Kakinada
Department of Telugu -2023-2024

Single Major System-Semester-II-General Telugu- 2023-24-Paper– II-Srujanatmaka Rachana

 Skill

 Employability

 Entrepreneurship

Unit-I-Vyakthikarana Naipunyaalu – Bhasha

Unit-II- Anuvada Rachana –

Unit-II- Anuvada Rachana -

Unit-III-Maadhyamaalaku Rachana-TV, Radio, Magazines, News writing

Unit-IV- Telugu Vyasa Rachana Sakshi Vyasam, Upadhyaya Uvacha


Unit-V-Telugu Sanketikata-Telugu Lipi-Unicode-Wikipedia

Unit-V-Telugu Sanketikata-Telugu Lipi-Unicode-Wikipedia

**A.S.D Government Degree College for Women (Autonomous): Kakinada
Department of Telugu -2023-2024**

Single Major System-Semester-II-General Telugu- 2023-24-Paper– II-Srujana Bharati

 Skill

 Employability

 Entrepreneurship

Unit-I- Vyaktheekarana Naypunyalu

Unit-II-Srujanatmaka Rachana

Unit-III-Anuvada Rachana

Unit-III-Anuvada Rachana

Unit-IV-Maadhyamalaku Rachana(1)




Print Media

Unit-V-Maadhyamaalaku Rachana(2)

Electronic Media

Unit-V-Maadhyamaalaku Rachana(2)

A.S.D Government Degree College for Women (Autonomous): Kakinada
Department of Telugu -2023-2024
Single Major System-Semester-II-Minor Telugu- 2023-24
Paper– I-Aadhunika Kavita Parichayam

 Skill  Employability  Entrepreneurship

Unit-I-I- Aadhunika Kavitha Lakshanaalu-Aavirbhava Vikaasalu

Janmabhoomi Geyam-Rayaprolu, Makoddi Thelladorathanam- Garimella

Unit-II-Bhava Kavitwam-Swechha Geetham-Devulapalli Krishnasastri

Amrutham Kurisina Rathri- Devarakonda Balagangadhara Tilak

Unit-III- Abhyudaya Kavitwam-Aadhunika Mahabharatam-Guntur Seshendra sarma

Narudo Bhaskarudo-Siva Sagar

Unit-IV-Dalitha Kavitwam-Deergha Kavyam-Gosangi-Endluri Sudhakar

Unit-V-Sthreevada Kavitwam-Bandipotu Kavitha Khandika-Savitri

Soundaryatmaka Himsa-Kavitha Khandika-Vimala

A.S.D Government Degree College for Women (Autonomous): Kakinada
Department of Telugu -2023-2024
Single Major System-Semester-V-Special Telugu- 2023-24
Paper– VIIA-Rachana Reethulu



Skill



Employability



Entrepreneurship

Unit-I-Telugu Rachana Reethulu-Anuvada Rachana

Anuvada Rachana

Unit-II-Mudrana-Prasarana-Samajika Maadhyamaa Rangaalu

Unit-III-Artha Parinamamu-Dhwani Parinamamu

Unit-IV-Mandalika Vijnanam-Shishta Bhasha-Pramanika Bhasha

Unit-V-Srujana Rangam lo Telugu-Kavitha-Katha-Vyasam-Natika-Ekankika-Prakatana-Paata

Unit-V-Srujana Rangam lo Telugu-Kavitha-Katha-Vyasam-Natika-Ekankika-Prakatana-Paata

A.S.D Government Degree College for Women (Autonomous): Kakinada
Department of Telugu -2023-2024
Single Major System-Semester-V-Special Telugu- 2023-24
Paper– VIA-Telugu Bhasha Swaroopam

Unit-I-Telugu Vyakaranam

Unit-II-Sandhi Samasamu

Unit-III-Kriya Vijnanam

Unit-IV-Vaakya Vijnanam-Prouddah Vyakaranam

Unit-V-Vaakya Prayoga Reethulu



V. N. O.
PRINCIPAL
A.S.D. GOVT. DEGREE COLLEGE (W)
AUTONOMOUS
KAKINADA

ASD Government College for Women (Autonomous), Kakinada

DEPARTMENT OF HINDI

I B.A/B.Com/B.Sc/B.Voc, SEMESTER- I, GENERAL HINDI PAPER- HIN24101

Gadya Saahity - Skill Employability-

Unit-I

1. मित्रता- आचार्य रामचंद्र शुक्ल
2. साहित्य की महता - महावीर प्रसाद दविवेदी
3. बिंदा- महादेवी वर्मा

Unit- II

1. मुक्तिधन- प्रेमचन्द
2. पुरस्कार-जयशंकर प्रसाद
3. और वह पढ़ गई डॉ कुसुम वियोगी

Unit- III

1. हिन्दी साहित्य का इतिहास-
2. सामान्य परिचय
3. काल विभाजन

Unit- IV

1. कार्यालयीन शब्दावली (अंग्रेजी से हिन्दी, हिन्दी से अंग्रेजी)
2. लिंग
3. वचन
4. काल
5. कारक

Unit-V

पत्र लेखन

1. व्यक्तिगत पत्र
2. आवेदन पत्र

(छुट्टी पत्र, पिता जी के नाम पर पत्र, मित्र के नाम पर पत्र, प्राध्यापक पद के लिए आवेदन पत्र, अनुवादक पद के लिए आवेदन पत्र)

ASD Government College for Women (Autonomous), Kakinada

DEPARTMENT OF HINDI

I B.A /B.Com/B.Sc/ SEMESTER- II, GENERAL HINDI PAPER- II- HIN24201

(Hindi Padya Sahitya) Skill- Employability-

Unit-1-प्राचीन कविता

१. कबीर दास ५ दोहे
२. सूरदास - बाल वर्णन
३. तुलसीदास - ५ दोहे

Unit - II-आधुनिक कविता

१. मातृभाषा - भारतेन्दु हरिश्चंद्र - ५ दोहे
२. भिक्षुक - सूर्यकांत त्रिपाठी निराला
३. मादा भ्रूण- रजनी तिलक

Unit - III-सामान्य निबन्ध

१. विद्यार्थी और अनुशासन
२. विश्व भाषा के रूप में हिंदी
३. पर्यावरण प्रदूषण

Unit-IV-प्रयोजन मूलक हिन्दी - परिचय
सरकारी पत्र- परिभाषा एवं पत्र का नमूना

१. परिपत्र
२. ज्ञापन
३. अधिसूचना

Unit - V

१. अनुवाद - अंग्रेजी से हिन्दी (४-५ पंक्तियों) तेलुगू से हिन्दी (४-५ पंक्तियाँ)
२. संक्षेपण

2. Stability of metal complexes:

Thermodynamic stability and kinetic stability, factors affecting the stability of metal complexes, chelate effect, determination of composition of complex by Job's method and mole ratio method.

Bioinorganic Chemistry:

Metal ions present in biological systems, classification of elements according to their action in biological system. Geochemical effect on the distribution of metals, Sodium / K - pump, carbonic anhydrase and carboxypeptidase. Excess and deficiency of some trace metals. Toxicity of metal ions (Hg, Pb, Cd and As), reasons for toxicity, Use of chelating agents in medicine, Cis-platin as an anti-cancer drug. Iron and its application in bio-systems, Haemoglobin, Myoglobin. Storage and transfer of iron.

PHYSICAL CHEMISTRY

UNIT-III:

Phase rule: Concept of phase, components, degrees of freedom. Thermodynamic derivation of Gibbs phase rule. Phase diagram of one component system - water system, Study of Phase diagrams of Simple eutectic systems i) Pb-Ag system, desilverisation of lead ii) NaCl-Water system, Congruent and incongruent melting point- Definition and examples for systems having congruent and incongruent melting point , freezing mixtures.

UNIT IV:

Electrochemistry: Specific conductance, equivalent conductance and molar conductance- Definition and effect of dilution. Cell constant. Strong and weak electrolytes, Kohlrausch's law and its applications, Definition of transport number, determination of transport number by Hittorf's method. Debye-Huckel-Onsager's equation for strong electrolytes (elementary treatment only), Application of conductivity measurements- conductometric titrations. Electrochemical Cells- Single electrode potential, Types of electrodes with examples: Metal-metal ion, Gas electrode, Inert electrode, Redox electrode, Metal-metal insoluble salt- salt anion. Determination of EMF of a cell, Nernst equation, Applications of EMF measurements - Potentiometric titrations. Fuel cells- Basic concepts, examples and applications

UNIT V: Chemical Kinetics:

The concept of reaction rates. Effect of temperature, pressure, catalyst and other factors on reaction rates. Order and molecularity of a reaction, Derivation of integrated rate equations for zero, first and second order reactions (both for equal and unequal concentrations of reactants). Half-life of a reaction. General methods for determination of order of a reaction. Concept of activation energy and its calculation from Arrhenius equation. Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions. Comparison of the two theories (qualitative treatment only). Enzyme catalysis- Specificity, factors affecting enzyme catalysis, Inhibitors and Lock & key model. Michaels- Menten equation- derivation, significance of Michaelis-Menten constant.

Additional inputs: Sidgwick's electronic theory, Werner theory, Calculation of CFSE for weak and strong field ligands, Chlorophyll and its functions, Structures of Haemoglobin and Chlorophyll, Clarius-Clayperon equation, Phase Diagram of Mg-Zn System, Reduced phase rule and Condensed Systems, Arrhenius theory of weak electrolytes, Ostwald's dilution law of weak electrolytes, Graphical representations of Integrated rate equations of Zero and First Order Reactions, Derivation of integrated rate equations for third order reactions.

REFERENCE BOOKS:

1. Text book of physical chemistry by S Glasstone
2. Concise Inorganic Chemistry by J.D.Lee
3. Advanced Inorganic Chemistry Vol-I by Satyaprakash, Tuli, Basu and Madan
4. Advanced physical chemistry by Gurudeep Raj
5. Principles of physical chemistry by Prutton and Marron
6. Advanced physical chemistry by Bahl and Tuli
7. Inorganic Chemistry by J.E.Huheey
8. Basic Inorganic Chemistry by Cotton and Wilkinson
9. A textbook of qualitative inorganic analysis by A.I. Vogel
10. Atkins, P.W. & Paula, J.de Atkin's Physical Chemistry Ed., Oxford University Press 10thEd(2014)
11. Castellan, G.W.PhysicalChemistry, 4thEd.Narosa(2004)
12. Mortimer,R. G.PhysicalChemistry3rdEd. Elsevier:NOIDA,UP(2009).

**A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), KAKINADA
LABORATORY COURSE -IV 30hrs (2 h / w)**

Practical Paper-IV (At the end of Semester-IV)

(Course-5L) Conductometric and Potentiometric Titrimetry Lab :40 Marks

Course Outcomes:

1. Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
2. Apply concepts of electrochemistry in experiments
3. Be familiar with electroanalytical methods and techniques in analytical chemistry which study an analyte by measuring the potential (volts) and/or current (amperes) in an electrochemical cell containing the analyte

Conductometric and Potentiometric Titrimetry 50 M

1. **Conductometric titration-** Determination of concentration of HCl solution using standard NaOH solution.
2. **Conductometric titration-** Determination of concentration of CH₃COOH Solution using standard NaOH solution.
3. **Conductometric titration-** Determination of concentration of CH₃COOH and HCl in a mixture using standard NaOH solution.
4. **Potentiometric titration-** Determination of Fe (II) using standard K₂Cr₂O₇ solution.
5. Determination of rate constant for acid catalyzed ester hydrolysis.
6. Adsorption of Acetic Acid on Charcoal.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), KAKINADA
DEPARTMENT OF CHEMISTRY
BOARD OF STUDIES: 2023-24
THIRD YEAR, SEMESTER- V

Paper 6 - D (ENVIRONMENTAL CHEMISTRY) 60 h (4 h / w)

Course6-D: Environmental Chemistry

(Skill Enhancement Course (Elective), Credits -05

Max Marks: 100

I. Learning Outcomes:

Students after successful completion of the course will be able to:

1. Understand the environment functions and how it is affected by human activities.
2. Acquire chemical knowledge to ensure sustainable use of the world's resources and ecosystems services.
3. Engage in simple and advanced analytical tools used to measure the different types of pollution.
4. Explain the energy crisis and different aspects of sustainability.
5. Analyze key ethical challenges concerning biodiversity and understand the moral principles, goals and virtues important for guiding decisions that affect Earth's plant and animal life.

II Syllabus : *(Total Hours: 90, including Teaching, Lab, Field Skills Training, Unit tests etc.)*

UNIT-I: Introduction

10 h

Environment Definition – Concept of Environmental chemistry- Scope and importance of environment in nowadays – Nomenclature of environmental chemistry – Segments of environment– Effects of human activities on environment – Natural resources–Renewable Resources–Solar and biomass energy and Nonrenewable resources – Thermal power and atomic energy – Reactions of atmospheric oxygen and Hydro logical cycle.

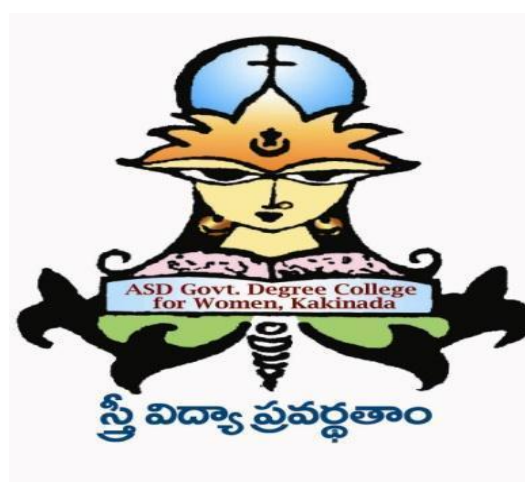
UNIT-II: Air Pollution

10 h

Definition – Sources of air pollution – Classification of air pollution – Ambient air quality standards- Climate change – Global warming – Pollution from combustion systems- Acid rain – Photochemical smog – Greenhouse effect – Formation and depletion of ozone – Bhopal gas disaster–Instrumental techniques to monitor pollution – Controlling methods of air pollution.

**A.S.D GOVERNMENT DEGREE COLLEGE FOR WOMEN (A),
KAKINADA**

DEPARTMENT OF CHEMISTRY



**1.1.3 Details of courses offered by the institution that focus on
employability/ entrepreneurship/ skill development during the
year.**

2023-24

Skill	Employability	Entrepreneurship
--------------	----------------------	-------------------------

SEMESTER – II

I B.Sc. CHEMISTRY (HONOURS)

(Course –III & IV)

	A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS) KAKINADA	Program & Semester I B.Sc. CHEMISTRY (H) SEMESTER - II			
Course Code CHE24201	TITLE OF THE COURSE Course -III: GENERAL & INORGANIC CHEMISTRY				
Teaching	Hours Allocated: 45 (Theory) (3 hrs. / Wk.)	L	T	P	C
Pre-requisites:	Basic knowledge about inorganic chemistry and elements	3	-	-	3

Course Objectives:

1. Gain knowledge about on atomic structure and Periodic table
2. Gain knowledge about different types of chemical bonds and their applications
3. Get knowledge on different theories of acids and bases and their applications

Course Outcomes:

On Completion of the course, the students will be able to-		Cognitive Domain
CO1	1. Understand the structure of atom and the arrangement of elements in the periodic table.	Understanding
CO2	2. Understand the nature and properties of ionic compounds.	Understanding
CO3	3. Explain the existence of special types of compounds through weak chemical forces.	Application
CO4	4. Define acids and bases and predict the nature of salts.	Application

Syllabus:

Unit - I: Atomic Structure and Periodic table

9 h

Electronic configuration: Bohr theory, dual nature of electrons, Heisenberg uncertainty principle, the Schrodinger time independent equation, significance of wave functions, Pauli's exclusion principle, Hund's rule, sequence of energy levels (Aufbau principle).

Periodicity: Periodic law and arrangement of elements in the periodic table (Groups and Periods)

General properties of atoms: size of atoms and ions-atomic radii, ionic radii, covalent radii; trend in ionic radii, ionization potential, electron affinity; electro negativity - Pauling, Mulliken-Jaffe, Allred-Rochow definitions; oxidation states and variable valency; isoelectronic relationship;

inert-pair effect;

UNIT - II: Ionic bond

9 h

Properties of ionic compounds, factors favoring the formation of ionic compounds, ionization potential, electron affinity, and electronegativity. Lattice energy: definition, factors affecting lattice energy, Born-Haber cycle-enthalpy of formation of ionic compound and stability. Stability of ionic compounds in terms of ΔH_f and U_o . Solubility and thermal stability of ionic compounds. Covalent character in ionic compounds-polarization and Fajan's rules and its applications.

UNIT - III: The Covalent Bond

9 h

Valence Bond theory- hybridization of atomic orbitals and geometry of molecules- BeCl_2 , BF_3 , CH_4 , PCl_5 , SF_6 , effect of bonding and nonbonding electrons on the structure of molecules, effect of electronegativity, Isoelectronic principle, illustration of structures by VESPR model: NH_3 , H_2O , SF_4 , ICl_4^- , ICl_2^- , XeF_4 , XeF_6 .

Molecular orbital theory-LCAO method, construction of M.O. diagrams for homonuclear and hetero-nuclear diatomic molecules (N_2 , O_2 , CO and NO).

UNIT - IV: Metallic and Weak Bonds

9 h

The Metallic bond: metallic properties, free electron theory, Valence Bond Theory, Band theory of metals. Explanation of conductors, semiconductors and insulators.

Weak bonds: hydrogen bonding-intra- and intermolecular hydrogen bonding, influence on the physical properties of molecules, comparison of hydrogen bond strength and properties of hydrogen bonded N, O and F compounds; associated molecules-ethanol and acetic acid; Vander Waals forces, ion dipole-dipole interactions.

UNIT - V: Acids and Bases

9 h

Theories of acids and bases: Arrhenius theory, Bronsted-Lowry theory, Lewis theory, the solvent system,

Non aqueous solvents: classification-protonic and aprotic solvents, liquid ammonia as solvent-solutions of alkali and alkaline earth metals in ammonia.

Types of chemical reactions: acid-base, oxidation-reduction, calculation of oxidation number. Definition of pH, pKa, pKb. Types of salts, Salt hydrolysis. Pearson's concept, HSAB principle & its importance, bonding in Hard-Hard and Soft-Soft combinations.

Additional inputs:

Metals, Non-Metals, Metalloids, Coloumbs Law and Bornlande Equation, Applications of Semi Conductors, Similarities and differences between Ionic and Metallic Bonds, Characteristics of Covalent Bond, Theories of Acid Base indicators : Ostawalds Theory and Benzenoid Quininoid Theory.

	A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS) KAKINADA	Program & Semester			
Course Code CHE24201P	TITLE OF THE COURSE Course -III: ANALYSIS OF SIMPLE SALT	I B.Sc. CHEMISTRY(H) (II Semester)			
Teaching	Hours Allocated: 30 (Practical)	L	T	P	C
Pre- requisites	Qualitative analysis of inorganic simple anions and cations	-	-	2	1

Course Objectives:

1. Identification of inorganic simple anions
2. Identification of inorganic simple cations
3. Usage of different lab equipment and reagents for simple salt analysis.
4. Chemical reactions involving in the identification of acidic and basic radicals.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Understand the basic concepts of qualitative analysis of inorganic salts
CO2	Usage of glassware, equipment and chemicals involved in salt analysis
CO3	Apply the concepts of common ion effect, solubility product and concepts related to qualitative analysis
CO4	Acquire knowledge of micro scale salt analysis procedure.

Syllabus:

Analysis of Inorganic SIMPLE SALT

50 M

Analysis of simple salt containing ONE anion and ONE cation from the following:

Anions: Carbonate, Sulphate, Chloride, Bromide, Acetate, Nitrate, Borate and Phosphate

Cations: Lead, Copper, Iron, Aluminium, Zinc, Nickel, Manganese, Calcium, Strontium, Barium, Magnesium and Ammonium

	A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS) KAKINADA	Program & Semester			
Course Code CHE24202	TITLE OF THE COURSE Course -IV: INORGANIC CHEMISTRY (3hr/week)	I B.Sc. Chemistry (H) (I Semester)			
Teaching	Hours Allocated: 45 (Theory)	L	T	P	C
Pre-requisites	Basics in inorganic chemistry and elements	3		-	3

Course Objectives:

1. To learn the preparation and structure and Diborane and Borazole.
2. To provide knowledge about different types of Interhalogen compounds.
3. To provide basic knowledge on d-block elements and f-block elements.
4. To learn the synthetic applications of Grignard reagents.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Acquire knowledge on preparation and structure and Diborane and Borazole.
CO2	Identify the importance of Interhalogen compounds and pseudo halogens.
CO3	Apply properties of d-block and f-block elements in developing new materials
CO4	Identify the importance of Organo metallic compounds in Organic synthesis.

Syllabus:

UNIT –I Chemistry of p-block elements – I (9 h) Skill oriented

Group 13: Preparation & structure of Diborane, Borazine and $(BN)_x$

Group 14: Preparation, classification and uses of silicones and Silanes.

Group 15: Preparation & structure of Phosphonitrilic Chloride $P_3N_3Cl_6$

Unit II Chemistry of p-block elements – II (9 h) Skill oriented

Group 16: Classification of Oxides, structures of oxides and Oxoacids of Sulphur

Group 17: Preparation and Structures of Interhalogen compounds. Pseudo halogens.

UNIT-III Chemistry of d-block elements (9h) Skill & Employability oriented

Characteristics of d-block elements with special reference to electronic configuration, variable valence, color, magnetic properties, catalytic properties and ability to form complexes. Stability of various oxidation states of 3d series-Latimer diagrams.

UNIT-IV Chemistry of f-block elements (9h) Skill oriented

Chemistry of lanthanides - electronic configuration, oxidation states, lanthanide contraction, consequences of lanthanide contraction, color, magnetic properties. Separation of lanthanides by ion exchange method. Chemistry of actinides - electronic configuration, oxidation states, actinide contraction, comparison of lanthanides and actinides.

Unit – V Radioactivity (9h) Skill oriented

Definition, Isotopes, n/p ratio, binding energy, types of radioactivity, Soddy-Fajan's displacement law, Law of Radioactivity, Radioactive decay series, Nuclear Reactions fission and fusion, Applications of radioactivity .

	A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS) KAKINADA	Program & Semester			
Course Code	TITLE OF THE COURSE Course -IV: Preparation of Inorganic compounds	I B.Sc. CHEMISTRY(H) (II Semester)			
Teaching	Hours Allocated: 30 (Practical)	L	T	P	C
Pre-requisites	Properties of various inorganic elements	-	-	2	1

Course Objectives:

1. To get knowledge on properties of inorganic elements
2. Understand the structures of inorganic compounds
3. Usage of different lab equipment and reagents for preparation of inorganic compounds
4. Chemical reactions involving in the preparation of inorganic compounds

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Understand the basic concepts of inorganic preparations
CO2	Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
CO3	Apply the properties of various elements for the preparation of inorganic compounds.
CO4	Acquire knowledge on the structures of inorganic compounds

Syllabus:

Preparation of Inorganic compounds **Skill oriented**

50 M

Preparation of following Inorganic compounds:

1. Crystallization of compounds and determination of melting point.
2. Preparation of Cuprous chloride.
3. Preparation of Potash Alum.
4. Preparation of Chrome Alum.
5. Preparation of Ferrous oxalate
6. Preparation of Ferrous ammonium sulphate.

Reference books:

1. Vogel's Quantitative Inorganic Analysis, Seventh edition, Pearson.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), KAKINADA
DEPARTMENT OF CHEMISTRY
BOARD OF STUDIES: 2023-24
SECOND YEAR, SEMESTER– III
Paper III (ORGANIC CHEMISTRY & SPECTROSCOPY) 60 h (4 h / w)

ORGANIC CHEMISTRY 30 h (2h / w)

UNIT –I

Chemistry of Halogenated Hydrocarbons: Alkyl Halides: Methods of preparation and properties, nucleophilic substitution reactions– SN1, SN2 and SNi mechanisms with stereochemical aspects and effect of solvent etc.; nucleophilic substitution vs. elimination, Williamson's synthesis. Aryl Halides: Preparation (including preparation from diazonium salts) and properties, nucleophilic aromatic substitution; **SN Ar, Benzyne mechanism.** Relative reactivity of alkyl, allyl, benzyl, vinyl and aryl halides towards nucleophilic substitution reactions.

1. Alcohols & Phenols

Alcohols: preparation, properties and relative reactivity of 1°, 2°, 3° alcohols, Bouvet Blanc Reduction; Oxidation Of Diols By Periodic Acid and lead Tetraacetate, Pinacol- Pinacolone Rearrangement;

Phenols: Preparation and Properties; Acidity and Factors Affecting It, Ring substitution reactions, Reimer–Tieman and Kolbe's–Schmidt Reactions, Fries and Claisen Rearrangement with mechanism.

UNIT II:

Carbonyl Compounds: Structure, reactivity, preparation and properties; Nucleophilic Addition, Nucleophilic Addition-elimination reactions with ammonia derivatives Mechanisms of **Aldol and Benzoin Condensation, Claisen-Schmidt, Perkin, Cannizzaro and Wittig reaction, Beckmann Haloform Reaction And Baeyer Villiger oxidation**, α - substitution reactions, oxidations and reductions (Clemmensen, Wolf–Kishner, with LiAlH₄ & NaBH₄). Addition Reactions Of α , β -unsaturated carbonyl compounds: Michael Addition. Active Methylene Compounds: Keto-enol tautomerism. Preparation and Synthetic Applications Diethyl malonate and ethyl acetoacetate.

UNIT III:

Carboxylic Acids and their Derivatives: General methods of preparation, physical properties and reactions of monocarboxylic acids, effect of substituent acidic strength. Typical reactions of carboxylic acids, hydroxy acids and unsaturated acids. Preparation And Reactions Of Acid Chlorides, anhydrides, esters and amides; Comparative study of nucleophilic substitution at acyl group-**Mechanism of acidic and alkaline hydrolysis of esters, Claisen Condensation, Reformatsky reactions and Curtius Rearrangement Reactions** involving H, OH and COOH groups- salt formation, anhydride formation, acid chloride formation, amide formation and esterification (mechanism). Degradation of carboxylic acids by Huns-Diecker reaction, decarboxylation by Schmidt reaction, Arndt- Eistert synthesis, halogenation by Hell- Volhard- Zelensky reaction.

SPECTROSCOPY

30 h (2h / w)

UNIT -IV

Molecular Spectroscopy: Interaction of electromagnetic radiation with molecules and various types of spectra;

Rotation spectroscopy: Selection rules, intensities of spectral lines, determination of bond lengths of diatomic and linear triatomic molecules, isotopic substitution.

Vibrational Spectroscopy: Classical Equation of Vibration, computation of force constant, Harmonic and anharmonic oscillator, Morse Potential curve, vibrational degrees of freedom for polyatomic molecules, modes of vibration. Selection rules for vibrational transitions, Fundamental Frequencies, overtones and hot bands.

Electronic spectroscopy: Energy levels of molecular orbitals (σ , π , n). Selection rules for electronic spectra. Types of electronic transitions in molecules, effect of conjugation. Concept of chromophore. bathochromic and hypsochromic shifts. Beer-Lambert's law and its limitations.

Nuclear Magnetic Resonance (NMR) spectroscopy: Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of signals. Chemical shift, NMR splitting of signals - spin-spin coupling, coupling constants. Applications of NMR with suitable examples - ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromo ethane, ethyl acetate, toluene and acetophenone.

UNIT-V

Application of Spectroscopy to Simple Organic Molecules

Application of visible, ultraviolet and Infrared spectroscopy in organic molecules. Application of electronic spectroscopy and Woodward rules for calculating λ_{max} of conjugated dienes and α , β – unsaturated compounds.

Infrared radiation and types of molecular vibrations, functional group and fingerprint region. IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on $>\text{C}=\text{O}$ stretching absorptions).

LABORATORY COURSE -III 30hrs (2 h / w)

Practical Paper-III (At the end of Semester-III)

Organic Preparations and IR Spectral Analysis Lab : 50 Marks

Organic preparations: 40M

i. Acetylation of one of the following compounds:

amines (aniline, o-, m-, p- toluidine and o-, m-, p-anisidine) and phenols (β -naphthol, vanillin, salicylic acid) by any one method:

a. Using conventional method.

b. Using green approach

ii. Benzoylation of one of the following amines

(aniline, o-, m-, p- toluidine and o-, m-, p-anisidine)

a. Nitration of any one of the following: Acetanilide/nitrobenzene by conventional method

b. Salicylic acid by green approach (using ceric ammonium nitrate).

IR Spectral Analysis: 10M

IR Spectral Analysis of the following functional groups with examples

a) Hydroxyl groups

b) Carbonyl groups

c) Amino groups

d) Aromatic groups

DEPARTMENT OF CHEMISTRY
BOARD OF STUDIES: 2023-24
SECOND YEAR, SEMESTER- IV

Paper IV (Course 4) INORGANIC, ORGANIC & PHYSICAL CHEMISTRY

UNIT I:

Organometallic Compounds: Definition and classification of organometallic compounds on the basis of bond type, Concept of hapticity of organic ligands. Metal Carbonyls: 18electronrule, electron count of mononuclear, polynuclear and substituted metal carbonyls of 3d series. General methods of preparation of mono and binuclear carbonyls of 3d series. **P-acceptor behaviour of carbon monoxide. Synergic effects (VB approach)** - (MO diagram of CO can be referred to for synergic effect to IR frequencies).

UNIT II:

Carbohydrates: Occurrence, classification and their biological importance, Monosaccharides: Constitution and absolute configuration glucose and fructose, epimers and anomers, mutarotation, determination of ring size of glucose and fructose, Haworth Projection And Conformational Structures; **Interconversions of aldoses and ketoses; Killiani-Fischer synthesis and Ruff degradation;** Disaccharides– Elementary Treatment Of Maltose, lactose and sucrose. Polysaccharides–Elementary Treatment Of starch.

UNIT III:

Amino acids and proteins: Introduction: Definition of Amino acids, classification of Amino acids into alpha, beta, and gamma amino acids. Natural and essential amino acids - definition and examples, classification of alpha amino acids into acidic, basic and neutral amino acids with examples. **Methods of synthesis: General methods of synthesis of alpha amino acids (specific examples - Glycine, Alanine, valine and leucine)** by following methods: a) from halogenated carboxylic acid b) Gabriel Phthalimide synthesis c) strecker's synthesis.

Physical properties: Zwitter ion structure - salt like character - solubility, melting points, amphoteric character, definition of isoelectric point.

Chemical properties: General reactions due to amino and carboxyl groups - lactams from gamma and delta amino acids by heating- peptide bond (amide linkage). Structure and nomenclature of peptides and proteins.

Heterocyclic Compounds: Introduction and definition: Simple five membered ring compounds with one hetero atom Ex. Furan. Thiophene and pyrrole - Aromatic character – Preparation from 1, 4, -dicarbonyl compounds, Paul-Knorr synthesis. Properties: Acidic character of pyrrole -

electrophilic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions - Diels Alder reaction in furan. Pyridine – Structure - Basicity - Aromaticity- Comparison with pyrrole- one method of preparation and properties - Reactivity towards Nucleophilic substitution reaction.

UNIT IV:

Nitrogen Containing Functional Groups: Preparation, properties and important reactions of nitro compounds, amines and diazonium salts.

1. Nitro hydrocarbons

Nomenclature and classification-nitro hydrocarbons, structure -Tautomerism of nitroalkanes leading to aci and keto form, Preparation of Nitroalkanes, reactivity -halogenation, reaction with HONO (Nitrous acid), Nef reaction and Mannich reaction leading to Micheal addition and reduction.

2.Amines:

Introduction, classification, chirality in amines (pyramidal inversion), importance and general methods of preparation.

Properties: Physical properties, Basicity of amines: Effect of substituent, solvent and steric effects. Distinction between Primary, secondary and tertiary amines using Heinsberg's Method and Nitrous Acid. Discussion of the following reactions with emphasis on the mechanistic pathway: Gabriel Phthalimide synthesis, Hoffmann- Bromamide Reaction, Carbylamine Reaction, Mannich reaction, Hoffmann's exhaustive methylation, Hofmann-elimination reaction and Cope elimination.

Diazonium Salts: Preparation and synthetic applications of diazonium salts including preparation of arenes, haloarenes, phenols, amino and nitro compounds. Coupling Reactions of Diazonium Salts (preparation of azo dyes).

UNIT V:

Photochemistry: Difference between thermal and photochemical processes, Laws of photochemistry- Grothus- Draper's law and Stark-Einstein's law of photochemical equivalence, Quantum yield- Photochemical reaction mechanism- hydrogen- chlorine and hydrogen- bromine reaction. Qualitative description of fluorescence, phosphorescence, Jablonski diagram, Photosensitized reactions- energy transfer processes (simple example).

Thermodynamics: The first law of thermodynamics-statement, definition of internal energy and enthalpy, Heat capacities and their relationship, Joule-Thomson effect- coefficient, Calculation of work for the expansion of perfect gas under isothermal and adiabatic conditions for reversible processes, State function. Temperature dependence of enthalpy of formation- Kirchoff's equation,

Second law of thermodynamics Different Statements of the law, Carnot cycle and its efficiency, Carnot theorem, **Concept of entropy**, entropy as a state function, entropy changes in reversible and irreversible processes. Entropy changes in spontaneous and equilibrium processes. Third law of thermodynamics, Nernst heat theorem, Spontaneous and non- spontaneous processes, Helmholtz and Gibbs Energies-Criteria for spontaneity.

LABORATORY COURSE -IV 30hrs (2 h / w)

Practical Paper-IV (At the end of Semester-IV)

(Course-4L) Organic Qualitative analysis Lab: 50 Marks

Organic Qualitative analysis 50 M

Analysis of an organic compound through systematic qualitative procedure for functional group identification including the determination of melting point and boiling point with suitable derivatives.

Alcohols, Phenols, Aldehydes, Ketones, Carboxylic acids, Aromatic primary amines, amides and simple sugars

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), KAKINADA
DEPARTMENT OF CHEMISTRY
BOARD OF STUDIES: 2023-24
SECOND YEAR, SEMESTER– IV
Paper IV (Course 5) (INORGANIC&PHYSICAL CHEMISTRY)

INORGANIC CHEMISTRY

UNIT I:

Coordinator Chemistry: IUPAC nomenclature of coordination compounds, Structural and stereoisomerism in complexes with coordination numbers 4 and 6. Valence Bond Theory (VBT): Inner and outer orbital complexes. Limitations of VBT, Crystal field effect, octahedral symmetry. Crystal field stabilization energy (CFSE), Crystal field effects for weak and strong fields. Tetrahedral symmetry, **Factors affecting the magnitude of crystal field splitting energy, Spectrochemical series,** Comparison of CFSE for Octahedral and Tetrahedral complexes, Tetragonal distortion of octahedral geometry, Jahn-Teller distortion, square planar coordination.

UNIT II:

1. Inorganic Reaction Mechanism:

Introduction to inorganic reaction mechanisms. Concept of reaction pathways, transition state, intermediate and activated complex. Labile and inert complexes, ligand substitution reactions -SN1 and SN2, Substitution reactions in square planar complexes, Trans-effect, theories of trans effect and its applications

2. Stability of metal complexes:

Thermodynamic stability and kinetic stability, factors affecting the **stability of metal complexes,** chelate effect, determination of composition of complex by Job's method and mole ratio method.

Bioinorganic Chemistry:

Metal ions present in biological systems, classification of elements according to their action in biological system. **Geochemical effect on the distribution of metals,** Sodium / K - pump, carbonic anhydrase and carboxypeptidase. Excess and deficiency of some trace metals. Toxicity of metal ions (Hg, Pb, Cd and As), reasons for toxicity, Use of chelating agents in medicine, Cis-platin as an anti-cancer drug. Iron and its application in bio-systems, Haemoglobin, Myoglobin. Storage and transfer of iron.

PHYSICAL CHEMISTRY

UNIT-III:

1.Phase rule: Concept of phase, components, degrees of freedom. Thermodynamic derivation of Gibbs phase rule. Phase diagram of one component system - water system, Study of Phase diagrams of Simple eutectic systems i) Pb-Ag system, desilverisation of lead ii) NaCl-Water system, Congruent and incongruent melting point- Definition and examples for systems having congruent and incongruent melting point , **freezing mixtures.**

UNIT IV:

Electrochemistry: Specific conductance, equivalent conductance and molar conductance- Definition and effect of dilution. Cell constant. Strong and weak electrolytes, Kohlrausch's law and its applications, Definition of transport number, determination of transport number by Hittorf's method. Debye-Huckel-Onsager's equation for strong electrolytes (elementary treatment only), Application of conductivity measurements- **conductometric titrations.** Electrochemical Cells- Single electrode potential, Types of electrodes with examples: Metal- metal ion, Gas electrode, Inert electrode, Redox electrode, Metal-metal insoluble salt- salt anion. Determination of EMF of a cell, Nernst equation, Applications of EMF measurements - **Potentiometric titrations** Fuel cells- Basic concepts, examples and applications

UNIT V:

Chemical Kinetics:

The concept of reaction rates. Effect of temperature, pressure, catalyst and other factors on reaction rates. Order and molecularity of a reaction, Derivation of integrated rate equations for zero, first and second order reactions (both for equal and unequal concentrations of reactants). Half-life of a reaction. General methods for determination of order of a reaction. Concept of activation energy and its calculation from Arrhenius equation. Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions. Comparison of the two theories (qualitative treatment only). Enzyme catalysis- Specificity, factors affecting enzyme catalysis, Inhibitors and Lock & key model. **Michaels- Menten equation**- derivation, significance of Michaelis-Menten constant.

LABORATORY COURSE -IV

Practical Paper-IV (At the end of Semester-IV)

(Course-5L) Conductometric and Potentiometric Titrimetry Lab : 50 Marks

Conductometric and Potentiometric Titrimetry 50 M

1. **Conductometric titration**- Determination of concentration of HCl solution using standard NaOH solution.
2. **Conductometric titration**- Determination of concentration of CH₃COOH Solution using standard NaOH solution.
3. **Conductometric titration**- Determination of concentration of CH₃COOH and HCl in a mixture using standard NaOH solution.
4. **Potentiometric titration**- Determination of Fe (II) using standard K₂Cr₂O₇ solution.
5. Determination of rate constant for acid catalyzed ester hydrolysis.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), KAKINADA

DEPARTMENT OF CHEMISTRY

BOARD OF STUDIES: 2023-24

THIRD YEAR, SEMESTER- V

Paper 6 - D (ENVIRONMENTAL CHEMISTRY)

Course6-D: Environmental Chemistry

UNIT-I: Introduction

10 h

Environment Definition – Concept of Environmental chemistry- Scope and importance of environment in nowadays – Nomenclature of environmental chemistry – Segments of environment– Effects of human activities on environment – Natural resources–Renewable Resources–Solar and biomass energy and Nonrenewable resources – Thermal power and atomic energy – Reactions of atmospheric oxygen and Hydro logical cycle.

UNIT-II : Air Pollution

Definition – Sources of air pollution – Classification of air pollution – Ambient air quality standards- Climate change – Global warming – Pollution from combustion systems- Acid rain – Photochemical smog – Greenhouse effect – Formation and depletion of ozone – Bhopal gas disaster–Instrumental techniques to monitor pollution – Controlling methods of air pollution.

UNIT-III: Water Pollution

Unique physical and chemical properties of water – Water quality standards and parameters – Turbidity- pH Dissolved oxygen – BOD, COD, Suspended solids, total dissolved solids, alkalinity– Hardness of water–Methods to convert temporary hard water in to soft water – Methods to convert permanent hard water into soft water – eutrophication and its effects – Industrial waste water treatment.

UNIT-IV : Chemical Toxicology

Toxic chemicals in the environment – effects of toxic chemicals – cyanide and its toxic effects – pesticides and its biochemical effects – toxicity of lead, mercury, arsenic and cadmium- Solid waste management.

UNIT-V: Ecosystem and biodiversity

Ecosystem

Concepts–structure–Functions and types of ecosystem–Abiotic and biotic components – Energy flow and Energy dynamics of ecosystem– Food chains – Food web– Tropic levels–Biogeochemical cycles (carbon, nitrogen and phosphorus)

Biodiversity

Definition – level and types of biodiversity – concept- significance – magnitude and distribution of biodiversity–trends-bio geographical classification of India–biodiversity at national, global and regional level.

Course 6-D: Environmental Chemistry – Practical syllabus

III. Practical (Laboratory) Syllabus: (30 h) (Max.50 M).

1. Identification of various equipment in the laboratory.
2. Determination of carbonate and bicarbonate in water samples by double titration method.
3. Determination of hardness of water using EDTA
 - a) Permanent hardness
 - b) Temporary hardness
4. Determination of Chlorides in water samples by Mohr's method.
5. Determination of pH, turbidity and total solids in water sample.
6. Determination of Ca^{+2} and Mg^{+2} in soil sample by flame photometry.
7. Determination of PH in soil samples using pH metry.

A.S.D. GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), KAKINADA
DEPARTMENT OF CHEMISTRY
BOARD OF STUDIES: 2023-24
THIRD YEAR, SEMESTER– V
Paper 7 - D (GREEN CHEMISTRY AND NANOTECHNOLOGY) 60 h (4 h / w)

Course7- D: Green Chemistry and Nanotechnology

UNIT-I : Green Chemistry – Part I

10h

Introduction-Definition of green Chemistry, Need for green chemistry, Goals of Green chemistry Basic principles of green chemistry. **Green synthesis- Evaluation of the type of the reaction**

i) Rearrangements (100% atom economic), ii) Addition reaction (100% atom economic). Organic reactions by Sonication method: apparatus required and examples of sonochemical reactions (Heck, Hunsdiecker and Wittig reactions).

UNIT- II Green Chemistry: Part- II

10 h

A) Selection of solvent:

i) Aqueous phase reactions

ii) Reactions in ionic liquids, Heck reaction, Suzuki reactions, epoxidation. Iii) Solid supported synthesis

B) Supercritical CO₂: Preparation, properties and applications

(decaffeination, drycleaning)

C) Green energy and sustainability.

UNIT-III Microwave and Ultrasound assisted green synthesis: 10 h

Apparatus required, examples of MAOS (synthesis of fused anthraquinones, Leuckart reductive amination of ketones) - Advantages and disadvantages of MAOS. **Aldol condensation –Cannizzaro reaction- Diels-Alder reactions-Strecker's synthesis**

UNIT-IV Green catalysis and Green synthesis

10 h

Heterogeneous catalysis, use of zeolites, silica, alumina, supported catalysis - biocatalysis: Enzymes, microbes Phase transfer catalysis (micellar /surfactant)

1. Green synthesis of the following compounds: adipic acid, catechol, disodium menudo acetate(alternative Strecker's synthesis)

2. Microwave assisted reaction in water –Hoffmann elimination – methyl benzoate to benzoic acid – oxidation of toluene and alcohols–microwave assisted reactions in organic solvents. Diels-Alder reactions and decarboxylation reaction.
3. Ultrasound assisted reactions–sonochemical Simmons–Smith reaction (ultrasonic alternative to iodine)

UNIT – V Nanotechnology in Green chemistry

10 h

Basic concepts of Nano science and Nanotechnology – Bottom-up approach and Top down approaches with examples – Synthesis of Nano materials – Classification of Nanomaterial – Properties and Application of Nanomaterial. Chemical and Physical properties of Nanoparticles – Physical synthesis of nanoparticles – Inert gas condensation - aerosol method - Chemical Synthesis of nanoparticles – precipitation and co-precipitation method, sol-gel method.

Practical (Laboratory) Syllabus: (30 hrs.) (Max.50 Marks).

1. Identification of various equipment in the laboratory.
2. Acetylation of 1^o amine by green method: Preparation of acetanilide
3. Rearrangement reaction in green conditions: Benzil - Benzilic acid rearrangement
4. Radical coupling reaction: Preparation of 1,1-bis -2-naphthol
5. Green oxidation reaction: Synthesis of adipic acid
6. Preparation and characterization of biodiesel from vegetable oil/ waste cooking oil
7. Preparation and characterization of Nanoparticles of gold using tea leaves.
8. Benzoin condensation using Thiamine Hydrochloride as a catalyst instead of cyanide.
9. Photo reduction of Benzophenone to Benzopinacol in the presence of sunlight.

**A.S.D. GOVERNMENT DEGREE COLLEGE FOR
WOMEN (AUTONOMOUS) KAKINADA**

(Under the jurisdiction of Adikavi Nannaya University)

Reaccredited by NAAC with B Grade (3rd Cycle)

**1.1.3 Details of courses offered by the institution that focus on
employability/ entrepreneurship/ skill development during the year.**

2023-24



DEPARTMENT OF COMMERCE



Indicates skill development based topics in syllabus



Indicates Employability development based topics in syllabus



Indicates Entrepreneurship development based topics in syllabus

COURSE 1: FUNDAMENTALS OF COMMERCE

COURSE CODE:BCOM23101

Unit 1: Introduction: Definition of Commerce – Role of Commerce in Economic Development-- Role Commerce in Societal Development. Imports and Exports, Balance of Payments. World Trade Organization.

Unit 2: Economic Theory: Macroeconomics – Meaning, Definition, Measurements of National Income, Concepts of National Income. Micro Economics – Demand and Supply. Elasticity of Demand and Supply. Classification of Markets -Perfect Competition – Characteristics – Equilibrium Price, Marginal Utility.

Unit 3: Accounting Principles: Meaning and Objectives Accounting, Accounting Cycle - Branches of Accounting - Financial Accounting, Cost Accounting, Management Accounting. Concepts and Conventions of Accounting – GAAP.

Unit 4: Taxation: Meaning of Tax, Taxation - Types of Tax- Income Tax, Corporate Taxation, GST, Customs & Exercise. Differences between Direct and Indirect Tax – Objectives of Tax- Concerned authorities – Central Board of Direct Taxes (CBDT) and Central Board of Excise and Customs (CBIC).

Unit 5: Computer Essentials: Web Design - WordPress Basics, Developing a Simple Website. Digital Marketing - Social Media Marketing, Content Marketing, Search Engine Optimization (SEO), E-mail Marketing. Data Analytics- Prediction of customer behavior, customized suggestions.

COURSE 2: BUSINESS ORGANIZATION

Unit 1: Business: Concept, Meaning, Features, Stages of development of business and importance of business. Classification of Business Activities. Meaning, Characteristics, Importance and Objectives of Business Organization.. Difference between Industry & Commerce and Business & Profession, Modern Business and their Characteristics.

Unit 2: Promotion of Business: Considerations in Establishing New Business. Qualities of a Successful Businessman. Forms of Business Organization - Sole Proprietorship, Partnership, Joint

Stock Companies & Co-operatives and their Characteristics, relative merits and demerits, Difference \\

Unit 3: Plant Location and Layout: Meaning, Importance, Factors affecting Plant Location. Plant Layout - Meaning, Objectives, Importance, Types of Layout. Factors affecting Layout. Size of Business Unit - Criteria for Measuring the Size and Factors affecting the Size. Optimum Size and factors determining the Optimum Size.

Unit 4: Business Combination: Meaning, Characteristics, Objectives, Causes, Forms and Kinds of Business Combination. Rationalization: Meaning, Characteristics, Objectives, Principles, Merits and demerits, Difference between Rationalization and Nationalization.

Unit 5: Computer Essentials: Milestones of Computer Evolution – Computer, Block diagram, generations of computer. Internet Basics - Internet, history, Internet Service Providers, Types of Networks, IP, Domain Name Services, applications, Ethical and Social Implications - Network and security concepts- Information Assurance Fundamentals, Cryptography - Symmetric and Asymmetric, Malware, Firewalls, Fraud Techniques, privacy and data protection

SKILL COURSE
ENTREPRENEURSHIP DEVELOPMENT
COURSE CODE:ED23102SC

Unit-I: Entrepreneurship: Definition and Concept of entrepreneurship - Entrepreneur Characteristics - Classification of Entrepreneurs –Role of Entrepreneurship in Economic Development –Start- ups.

Unit-II: Idea Generation and Project Formulation: Ideas in Entrepreneurships – Sources of New Ideas – Techniques for Generating Ideas – Preparation of Project Report-Contents; Guidelines for Report preparation – Project Appraisal Techniques –Economic Analysis-Financial Analysis-Market Analysis.

Unit-III: Institutions Supporting and Taxation Benefits: Central level Institutions: NABARD; SIDBI,– State Level Institutions –DICs – SFC - Government Policy for MSMEs - Tax Incentives and Concessions.

SEMESTER-II
COURSE 3: FINANCIAL ACCOUNTING
COURSE CODE: CFA23201

Unit-I: Introduction:- Need for Accounting - Definitions, objectives, functions, - Book keeping and accounting - Advantages and limitations - Accounting concepts and conventions - double entry book keeping - Journal - Posting to Ledger - Preparation of Subsidiary books including Cash book.

Unit-II: Final Accounts: - Final accounts - Preparation of Trading account, Profit & loss account and Balance Sheet using computers.

Unit-III: Depreciation: Meaning and Causes of Depreciation - Methods of Depreciation: Straight Line – Written down Value – Annuity and Depletion Method (including Problems).

Unit-IV: Consignment Accounts: Consignment - Features - Proforma Invoice - Account Sales- Del-credere Commission - Accounting Treatment in the Books of Consigner and Consignee - Valuation of Closing Stock - Normal and Abnormal Losses (including Problems).

Unit-V: Joint Venture Accounts: Joint Venture - Features - Difference between Joint-Venture and Consignment – Accounting Procedure – Methods of Keeping Records–One Vendor Keeps the Accounts and Separate Set off Books Methods (including Problems).

SEMESTER-II

COURSE 4: BUSINESS MANAGEMENT

COURSE CODE: CBM23202

Unit 1: Management: Definition & Meaning of Management - Henry Fayol Principals of Management and F.W.Taylor's Scientific Management - Functions of Management - Levels of Management..

Unit 2: Planning: Planning – Nature, importance, Process of Planning and Types of Planning. Decision making – Process and Types

Unit 3: Organizing: Organizing - Nature & Importance, Principles of Organizing. Delegation & Decentralization – Departmentation – Span of Management. Organizational structure – line, line & staff and functional.

Unit 4: Directing: Functions of Directing - Motivation – Theories of motivation (Maslow Need and Hierarchy theory) and Motivation techniques. Leadership – Styles of Leadership and Types.

Unit 5: Controlling; Nature, importance and Problems – effective coordination. Basic Control Process and Control techniques.

MARKETING SKILLS

COURSE CODE: MRK203203

Unit I: Introduction to Marketing: Core Marketing Concepts – Company Orientation towards the Marketplace – The Holistic Marketing Concept - Marketing Management Tasks; Marketing Environment: Macro and Micro Components and their Impact on Marketing Decisions – Marketing Research and Information; Market Segmentation, Targeting and Positioning Strategies - Determinants of Consumer Behaviour;

Unit II: Marketing Mix: Elements of Marketing Mix - Product, Price, Promotion and Place, 7P's of Service Marketing Mix; Product: Classification of Products - Product Life Cycle - New Product

Development – Branding Decisions; Price: Pricing Strategies: Understanding Pricing – Steps in setting the Price - Price Adapting Policies, and Initiating and Responding to Price Changes: Promotion: Marketing Communications, Promotion Mix Elements: Advertising, Sales Promotion, Personal Selling, Events and Experiences, Public Relations and Publicity, Online and Social Media Marketing; Place: Marketing Channels: Channel Functions and Flows, Channel Management Decisions..

Unit III:\Nature and Role of Selling:Importance of Selling, Nature and Role of Selling: Importance of Selling – Role in the Context of Organization; Attributes of a Good Salesperson: Personality and Physical Characteristics, Enthusiasm, Confidence, Intelligence, Self-Worth, Knowledge-product, Competition, Organization, Market, Customer, Territory; **Communication Skills, Persuasive Skills. Personal Selling Skills: The opening – Need and problem identification–the Presentation and Demonstration – Dealing with Objections – Negotiations – Closing the Sale -follow up.**

STOCK MARKET OPERATIONS COURSE CODE:

UNIT – I **Markets – Introduction- Types of Markets; Primary Market: Meaning, Functions, Intermediaries - Role of Primary Market –New Issues Market –IPO’s –Recent trends in Primary Market – Secondary Market: Functions, Various Stock Exchanges in India (BSE, NSE) and Regulatory framework– SEBI– Listing conditions–Secondary Market Intermediaries.**

UNIT – II **Stock Exchanges BSE, NSE & MCX –Different Trading Systems – DEMAT- Different types of Settlements –De-mat Settlement –Physical settlement - Pay-in and Pay-out –Bad Delivery– Short delivery –Auction –Market types, Order types and Books.**

UNIT – III **Stock Market Indices: Meaning, Purpose, and Construction in developing Index – Methods– Stock Market Indices in India – Scrip selection criteria for BSE Sensex and NSE S&P CNX Nifty. Overview: Derivatives, Commodity and Currency market.**

Course 3A Advanced Accounting (Gen & CA)
COURSE CODE: AA203201

UNIT I:

Accounting for Non Profit Organizations: Non Profit Entities-Meaning -Features of Non-Profit Entities–Provisions as per Sec8- Accounting Process- Preparation of Accounting Records- Receipts and Payments Account- Income and Expenditure Account - Preparation of Balance Sheet (including simple problems).

UNIT II:

Single Entry System: Features – Differences between Single Entry and Double Entry – Disadvantage of Single Entry .**Ascertainment of profit and preparation of statement of Affairs**(including Problems).

UNIT III:

Hire Purchase System: Features –Difference between Hire Purchase and Instalment

Purchase Systems -Accounting Treatment in the Books of Hire Purchaser and Hire Vendor
- Default and Repossession (including Problems).

UNIT IV:

Partnership Accounts-I: Meaning – Partnership Deed - Fixed and Fluctuating Capitals-
Accounting Treatment of Goodwill-Admission and Retirement of partner (including problems)

UNITV:

Partnership Accounts-II: Dissolution of a Partnership Firm – Application of Garner v/s
Murray Rule in India – Insolvency of one or more Partners(including).

Course 3B BUSINESS STATISTICS (General & Vocational)

COURSE CODE:

Unit 1: Introduction to Statistics:

Definition, importance and limitations of statistics - Collection of data - Schedule and questionnaire –
Frequency distribution – Tabulation -Diagrammatic and graphic presentation of data using
Computers (Excel).

Unit 2: Measures of Central Tendency:

Characteristics of measures of Central Tendency-Types of Averages – Arithmetic Mean, Geometric
Mean, Harmonic Mean, Median, Mode, Deciles, Percentiles, Properties of averages and their
applications.

Unit 3: Measures of dispersion and Skewness:

Properties of dispersion – Range - Quartile Deviation –Mean Deviation-Standard Deviation-
Coefficient of Variation-Skewness definition-Karl Pearson's and Bowley's Measures of skewness-
Normal Distribution.

Unit 4: Measures of Relation:

Meaning and use of correlation – Types of correlation-Karlpearson's correlation coefficient –
Spearman's Rank correlation-probable error-Calculation of Correlation by Using Computers.
Regression analysis comparison between correlation and Regression – Regression Equations-
Interpretation of Regression Co-efficient. (Theory only)

Unit 5: Analysis of Time Series & Index Numbers:

Time Series: Components of Time series- Measurement of trend and Seasonal Variations (Time
Index Numbers: Methods of Construction of Index Numbers – Price Index Numbers – Quantity
Index Numbers –Tests of Adequacy of Index Numbers – Cost of Index Numbers-Limitations of
Index Numbers – Use of Computer Software.

4A Corporate Accounting

COURSE CODE: CA23401

Accounting for Share Capital – division of share capital – equity share vs preferenceshares -Issue and forfeiture of shares (preparation of journals)- concept & process of book building - Issue of rights and bonus shares - Buyback of shares (only theory).

Unit-II:

Issue of Debentures – difference between share and debenture – types of debentures - Employee Stock Options – Accounting Treatment for Convertible and Non-Convertible debentures (preparation of Journal).

Unit –III:

Valuation of Goodwill and Shares: Need and methods - Normal Profit Method, Super Profits Method – Capitalization Method - Valuation of shares - Need for Valuation - Methods of Valuation - Net assets method, Yield basis method, Fair value method (including problems).

UNIT – IV:

Company Final Accounts: Preparation of Final Accounts – Adjustments relating to preparation of final accounts – Profit and loss account and balance sheet – (including problems).

Unit –V

Provisions of the Companies Act, 2013 relating to issues of shares and debentures - Book Building- Preparation of Balance Sheet and Profit and Loss Account – Schedule-III.

Course 4C: Income Tax (Gen & CA)
COURSE CODE: IT23404

Unit-I: Introduction to Income Tax Law - Basic concepts: Income, Person, Assesse, Assessment year, Agricultural Income, Capital and revenue, Residential status, Income exempt from tax (theory only).

Unit-II: Income from salary: Allowances, perquisites, profits in lieu of salary, deductions from salary income, computation of salary income and qualified savings eligible for deduction u/s 80C (including problems).

Unit-III: Income from House Property: Annual value, let-out/self occupied/ deemed to be let-out house, deductions from annual value - computation of income from house property (including simple problems). - **Profits and Gains from Business or Profession** (theory only)

Unit-IV: Income from Capital Gains(including problems on long term capital gains)- Income from other sources - (from Individual point of view) - chargeability - and assessment (including simple problems).

Unit-V:Computation of total income of an individual - Deductions under section - 80 (including simple problems).

Course 4D Business Law (Gen & CA)

COURSE CODE: BL23403

Meaning and Definition of Contract-Essential elements of valid Contract -Valid, Void and Voidable Contracts - Indian Contract Act, 1872.

Unit-II: Offer and Acceptance

Definition of Valid Offer, Acceptance and Consideration -Essential elements of a Valid Offer, Acceptance and Consideration.

Unit-III: Capacity of the Parties and Contingent Contract

Rules regarding to Minors contracts - Rules relating to contingent contracts - Different modes of discharge of contracts-Rules relating to remedies to breach of contract.

Unit-IV: Sale of Goods Act 1930

Contract of sale - Sale and agreement to sell - Implied conditions and warranties - Rights of unpaid vendor.

Unit-V: Cyber Law and Contract Procedures - Digital Signature - Safety Mechanisms.

Course 4E Auditing

COURSE CODE: AUD23405

UNITI:

Introduction: Meaning – Objectives – Importance of Auditing – Characteristics - Book Keeping vs Auditing- Accounting vs Auditing –Role of Auditor in Checking Corporate Frauds.

UNITII:

Types of Audit: Based on Ownership, Time and Objective - Independent, Financial, Internal, Cost,Tax,Government,SecretarialAudits

UNITIII:

Planning of Audit: Steps to be taken at the Commencement of a New Audit – Audit Programme – Audit Note Book– Audit Working Courses - Audit Evidence - Internal Check, Internal Audit and Internal Control.

UNITIV:

Vouching and Investigation: Definition and Importance of Vouching–Objectives of Vouching-Vouching of Cash and Trading Transactions–Investigation-Auditingvs. Investigation

UNITV:

Company Audit and Auditors Report: Auditor's Qualifications – Appointment and Reappointment–Rights,Duties, Liabilities and Disqualifications-Audit Report: Contents– Preparation-Relevant Provisions of Companies Act, 2013.

Course 16-C: DIGITAL MARKETING

Unit 1: Introduction

Digital marketing: Meaning – importance – traditional online marketing vs digital marketing –online market place analysis Micro Environment – Online Macro Environment - trends in

digitalmarketing – competitive analysis.

Unit – II: Web site planning and creation

Web Site: meaning – objectives – components of website - website creation – incorporation of design and – adding content, installing and activating plugging.

Unit 3: Search Engine Optimization (SEO)

SEO: Meaning – History and growth of SEO –Importance of Search Engine - On page Optimization – off page optimization – Role of Search Engine Operation- google Ad words–Search Engine Marketing: Campaign Creation – Ad Creation, Approval and Extensions.

Unit 4: Social Media Marketing:

Meaning of social media and Social Media Marketing – social Management tools-strategy and planning – social media network – Social Networking – video creation and sharing – use of different social media platforms - Content creation - Blogging – Guest Blogging.

Unit 5: Email marketing:

Meaning – Evolution of email – importance of email marketing – Development and Advancements in e mail marketing - email marketing platforms – creating and Tracking emailers –create forms – create opt-in lists – mapping industry trends

Course 17 C -Service Marketing

COURSE CODE: SM235206-17C

Unit 1: Introduction: Nature and Scope of services

Introduction: Nature and Scope of services characteristics of services, classification of services – need for service marketing - reasons for the growth of services sector, Overview of marketing Different Service Sectors -Marketing of Banking Services - Marketing in Insurance Sector -Marketing of Education Services.

Unit-2: Consumer Behavior in Services Marketing

Customer Expectations on Services- Factors influencing customer expectation of services. - Service Costs experienced by Consumer, the Role of customer in Service Delivery, Conflict Handling in Services, Customer Responses in Services, Concept of Customer Delight

Unit-3: Customer Relationship marketing and Services Market Segmentation.

Customer Relationship marketing: Meaning -Importance of customer & customer's role in Service delivery, Benefits of customer relationship, retention strategies. Services Market Segmentation: - Market segmentation -Basis & Need for segmentation of services, bases of Segmentation services, segmentation strategies in service marketing.

UNIT 4: Customer Defined Service Standards.

Customer Defined Service Standards - Hard and Soft, Concept of Service Leadership and Service Vision -Meeting Customer Defined Service Standards -Service Flexibility Versus Standards - Strategies to Match Capacity and Demand - managing Demand and Supply of Service –applications of Waiting Line and Queuing Theories to Understand Pattern.

Unit 5: Service Development and Quality Improvement.

Service Development – need, importance and Types of New Services - stages in development of new services, service Quality Dimensions - Service Quality Measurement and Service Mapping, Improving Service Quality and Service Delivery, Service Failure and Recovery.

Course 18 A: MANAGEMENT ACCOUNTING AND PRACTICE
COURSE CODE: MAP205201-18A

UNIT I: Introduction

Nature & Scope of Management Accounting – Management Accounting Principles – Significance of Management Accounting - Difference between management accounting, financial accounting and Cost accounting – Limitations of Management Accounting – Installation of Management Accounting – Tools of Management Accounting

UNIT 2: Ratio Analysis Meaning - Advantages and Limitation of Ratio Analysis – Types of Ratios –Profitability UNIT Ratios Gross Profit Ratio (GPR) – Net Profit Ratio (NPR) – Operating Ratio –Solvency Ratios- Current Ratio – Liquidity Ratio – Debt-Equity Ratio- Turnover Ratios-Fixed Assets Turnover Ratio –Working Capital Turnover Ratio – Debtors Turnover Ratio – Creditors Turnover Ratio – Stock Turn Over Ratio - Return on Investment (ROI)-Calculation and interpretation.

UNIT 3: Fund Flow and Cash Flow Analysis as per AS3

Meaning and Concept of Working Capital (Fund) – Fund Flow Statement –Meaning and Uses of Funds Flow Statement – Preparation of Funds Flow Statement. Cash Flow Statement – Meaning and Uses of Cash Flow Statement – Preparation of Cash Flow Statement – Difference between Cash Flow Statement and Funds flow Statement.

UNIT 4: Budgeting and Budgetary Control

Meaning of Budget – Forecast and Budget - Elements of Budget – Features – objectives and budget procedure -- Classification of Budgets - Meaning of Control – Meaning of Budgetary control – objectives of Budgetary control system – Advantages and Limitations of Budgetary control system. Prepare cash budget, fixed budget and flexible budget.

UNIT 5: Management Reporting:

Reports - Meaning -- Modes of Reporting – Requisites of a good report — Kinds of Reports– General formats of Reports - Need for Management Reporting- financial reporting Vs. Management Reporting - Strategies for Writing Effective Reporting.

Course19 A: COST CONTROL TECHNIQUES
COURSE CODE: CCT235202-19A

Unit 1: Introduction: Meaning of Cost Control – Cost Control Techniques – Requisites of effective Cost Control System – Cost Reduction – meaning – essentials for an effective cost Reduction Program– Scope of cost reduction - Difference between Cost Control and Cost Reduction –Meaning of cost audit – Types of Cost Audit – Auditing techniques.

Unit 2: ACTIVITY BASED COSTING

Concept of ABC – Characteristics of ABC – Categories of ABC – Allocation of Overheads Under ABC – Cost Reduction under ABC – advantages of implementing ABC – Application on overhead allocation on the basis of ABC

Unit 3: Cost Volume Profit Analysis (CVP Analysis)

Applications of Marginal Costing – profit planning – Evaluation of Performance-fixing selling price – Key Factor –Make or Buy decision – Accept or Reject - closing down or

suspending activities.

Unit 4: Standard Costing and Variance Analysis

Concept of Standard Cost and Standard Costing – Advantages and limitations – analysis of Variances -importance of Variance Analysis - computation and application of variances relating to material and labour.

UNIT 5: Application of Modern Techniques

Kaizen Costing – Introduction – objectives – scope –Principles – 5 S (Sort, Set in Order, Shine, Standardize, and Sustain) in Kaizen Costing– Advantages and Disadvantages of Kaizen Costing .Learning Curve Analysis-concept and Application.

Course- 20-B. LIFE INSURANCE WITH PRACTICE

COURSE CODE: LIP235204-21B

Unit-I: Features of Life insurance contract Life Insurance- Features- Advantages - Group Insurance – Group Gratuity Schemes – Group Superannuation Schemes, Social Security Schemes- Life Insurance companies in India.

Unit-II: Plans of Life Insurance

Types of Plans: Basic - Popular Plans – Term Plans-Whole Life-Endowment-Money Back-Savings-Retirement-Convertible - Joint Life Policies - Children’s Plans - Educational Annuity Plans - Variable Insurance Plans – Riders

Unit-III: Principles of Life Insurance

Utmost Good Faith- Insurable Interest- Medical Examination - Age proof, Special reports - Premium payment - Lapse and revival – Premium, Surrender Value, Non-Forfeiture Option -Assignment of Nomination- Loans – Surrenders – Foreclosure.

Unit-IV: Policy Claims

Maturity claims, Survival Benefits, Death Claims, Claim concession - Procedures Problems in claim settlement - Consumer Protection Act relating to life insurance insurance claims.

Unit-V: Regulatory Framework and Middlemen

Role of IRDAI & other Agencies - Regulatory Framework - Mediators in Life Insurance – Agency services – Development Officers and other Officials.

Course 21- B. GENERAL INSURANCE PROCEDURE AND PRACTICE

COURSE CODE: GIP205204-21B

Unit-I: Introduction

General Insurance Corporation Act - General Insurance Companies in India - Areas of General Insurance- Regulatory Framework of Insurance- IRDA - Objectives -Powers and Functions -Role of IRDA- Insurance Advisory Committee.

Unit-II: Motor Insurance:

Motor Vehicles Act 1988 - Requirements for compulsory third party insurance – Policy Documentation & Premium- Certificate of insurance – Liability without fault Compensation on structure formula basis - Hit and Run Accidents.

Unit-III: Fire & Marine Insurance

Kinds of policies – Policy conditions –Documentation- Calculation of premium- Calculation of Loss- Payment of claims.

Unit-IV: Agriculture Insurance

Types of agricultural insurances - Crop insurance - Problems of crop insurance - Crop Insurance Vs Agricultural relief - Considerations in Crop insurance - Live Stock

Insurance.

Unit-V: Health & Medical Insurance

Types of Policies-Calculation of Premium- Riders-Comprehensive Plans-Payment of Claims.