BHARATHIDASAN UNIVERSITY   **TIRUCHIRAPPALLI - 620 024.**

B.Sc. COMPUTER SCIENCE

CHOICE BASED CREDIT SYSTEM –

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(Applicable to the candidates admitted from the academic year 2022-2023 onwards)

Sem.	Part	Course	Title	Ins. Hrs	Credits	Exam Hours	Marks Int.	Marks Ext.	Total
I	I	Language Course – I Tamil $ / Other Languages + #		6	3	3	25	75	100
	II	English Course - I		6	3	3	25	75	100
	III	Core Course – I (CC)	Programming in C and Data Structures	5	5	3	25	75	100
		Core Practical – I (CP)	Programming in C Lab	4	4	3	40	60	100
		First Allied Course – I (AC)		4	4	3	25	75	100
		First Allied Course – II (AC)		3	-	-	-	-	-
	IV	Value Education		2	2	3	25	75	100
		TOTAL		**30**	**21**	**-**	**-**	**-**	**600**
II	I	Language Course - II Tamil $ / Other Languages + #		6	3	3	25	75	100
	II	English Course - II		6	3	3	25	75	100
	III	Core Course – II (CC)	Programming in Java	5	5	3	25	75	100
		Core Practical – II (CP)	Programming in Java Lab	4	4	3	40	60	100
		First Allied Course – II (AC)		3	2	3	25	75	100
		First Allied Course – III (AC)		4	4	3	25	75	100
		Add on Course – I ##	Professional English – I	6*	4	3	25	75	100
	IV	Environmental Studies		2	2	3	25	75	100
	VI	Naan Mudhalvan Scheme (NMS) @@	Language Proficiency for Employability - Effective English	-	2	3	25	75	100
		TOTAL		**30**	**29**	**-**	**-**	**-**	**900**

III	I	Language Course – III Tamil $ / Other Languages + #		6	3	3	25	75	100
	II	English Course - III		6	3	3	25	75	100
	III	Core Course – III (CC)	Programming in Python	5	5	3	25	75	100
		Core Practical - III (CP)	Programming in Python Lab	4	4	3	40	60	100
		Second Allied Course – I (AC)		4	4	3	25	75	100
		Second Allied Practical (AP)		3	-	-	-	-	-
		Add on Course – II ##	Professional English - II	6*	4	3	25	75	100
	IV	Non-Major Elective - I @ Those who choose Tamil in Part I can choose a non-major elective course offered by other departments. Those who do not choose Tamil in Part I must choose either a) Basic Tamil if Tamil language was not studied in school level or b) Special Tamil if Tamil language was studied up to 10th & 12th std.	Fundamentals of Information Technology	2	2	3	25	75	100
		TOTAL		**30**	**25**	**-**	**-**	**-**	**700**
IV	I	Language Course –IV Tamil $ / Other Languages + #		6	3	3	25	75	100
	II	English Course – IV		6	3	3	25	75	100
	III	Core Course - IV (CC)	Database Management Systems	5	5	3	25	75	100
		Core Practical - IV (CP)	Database Management Systems Lab	4	4	3	40	60	100
		Second Allied Practical (AP)		3	2	3	40	60	100
		Second Allied Course – II (AC)		4	4	3	25	75	100
	IV	Non-Major Elective II @ Those who choose Tamil in Part I can choose a non-major elective course offered by other departments. Those who do not choose Tamil in Part I must choose either a) Basic Tamil if Tamil language was not studied in school level or b) Special Tamil if Tamil language was studied up to 10th & 12th std.	Working Principles of Internet	2	2	3	25	75	100
	VI	Naan Mudhalvan Scheme (NMS) @@	Digital Skills for Employability	-	2	3	25	75	100
		TOTAL		**30**	**25**	**-**	**-**	**-**	**800**

V	III	Core Course - V (CC)	Fundamentals of Algorithms	5	5	3	25	75	100
		Core Course – VI (CC)	Computer Networks	5	5	3	25	75	100
		Core Course – VII (CC)	Digital Electronics and Microprocessor	5	5	3	25	75	100
		Core Practical -V (CP)	Digital Electronics and Microprocessor Lab	4	4	3	40	60	100
		Major Based Elective – I (Any one)	1. Artificial Intelligence and Expert Systems 2. Computer Graphics	5	4	3	25	75	100
	IV	Skill Based Elective I	Web Technology	4	2	3	25	75	100
		Soft Skills Development		2	2	3	25	75	100
		TOTAL		**30**	**27**	**-**	**-**	**-**	**700**
VI	III	Core Course - VIII (CC)	Operating Systems	6	5	3	25	75	100
		Core Course - IX (CC)	Programming in PHP	6	5	3	25	75	100
		Core Practical – VI (CP)	Programming in PHP Lab	4	4	3	40	60	100
		Major Based Elective - II (Any one)	1. Software Engineering 2. Big Data Analytics	5	4	3	25	75	100
		Project		4	3	-	40	60	100
	IV	Skill Based Elective – II	Mobile Application Development	4	2	3	25	75	100
	V	Gender Studies		1	1	3	25	75	100
		Extension Activities **		-	1	-	-	-	-
	VI	Naan Mudhalvan Scheme (NMS) @@		-	2	3	25	75	100
		TOTAL		**30**	**27**	**-**	**-**	**-**	**800**
		GRAND TOTAL		**180**	**154**	**-**	**-**	**-**	**4500**

List of Allied Courses

First Allied Course   **Second Allied Course**

Mathematics   Applied Physics

$ For those who studied Tamil upto 10th +2 (Regular Stream).

+ Syllabus for other Languages should be on par with Tamil at degree level.

Those who studied Tamil upto 10th +2 but opt for other languages in degree level under Part- I should study special Tamil in Part – IV.

The Professional English – Four Streams Course is offered in the 2nd and 3rd Semester (only for 2022-2023 Batch) in all UG Courses. It will be taught apart from the Existing hours of teaching / additional hours of teaching (1 hour /day) as a 4 credit paper as an add on course on par with Major Paper and completion of the paper is must to continue his / her studies further. (As per G.O. No. 76, Higher Education (K2) Department dated: 18.07.2020).

* The Extra 6 hrs / cycle as per the G.O. 76/2020 will be utilized for the Add on Professional English Course.

@ NCC Course is one of the Choices in Non-Major Elective Course. Only the NCC cadets are eligible to choose this course. However, NCC Course is not a Compulsory Course for the NCC Cadets.

** Extension Activities shall be outside instruction hours.

@@ Naan Mudhalvan Scheme.

SUMMARY OF CURRICULUM STRUCTURE OF UG PROGRAMMES

Sl. No.	Part	Types of the Courses	No. of Courses	No. of Credits	Marks
1.	I	Language Courses	4	12	400
2.	II	English Courses	4	12	400
3.		Core Courses	9	45	900
4.		Core Practical	6	24	600
5.		Allied Courses I & II	4	16	400
6.	III	Allied Practical	2	4	200
7.		Major Based Elective Courses	2	8	200
8.		Add –on Course (Professional English I & II)	2	8	200
9.		Project	1	3	100
10.		Non-Major Elective Courses	2	4	200
11.		Skill Based Elective Courses	2	4	200
12.	IV	Soft Skills Development	1	2	100
13.		Value Education	1	2	100
14.		Environmental Studies	1	2	100
15.		Gender Studies	1	1	100
16.	V	Extension Activities	1	1	---
17.	VI	Naan Mudhalvan Scheme	3	6	300
		Total	**46**	**154**	**4500**

PROGRAMME OUTCOMES:

- Graduates will be able to comprehend the basic concepts learnt and apply in real life situations with analytical skills.
- Graduates with acquired skills and enhanced knowledge will be employable / become entrepreneurs or will pursue higher Education.
- Graduates with acquired knowledge of modern software tools will be able to contribute effectively as software engineers.
- Graduates will be able to comprehend the related concepts to Computer Science with Allied papers
- Graduates will be imbibed with ethical values and social concerns to ensure peaceful society.

PROGRAMME SPECIFIC OUTCOMES:

- Acquired the required knowledge in the Hardware and Software aspects of Computer Science domain and the art of programming.
- Understood the development methodologies of software systems and the ability to analyze design and develop computer applications for real life problems.
- Gained knowledge and skills to collaborate and communicate with peers in IT / ITES industries
- The ability to understand, adjust and adapt with the dynamic technical environment for the growth of IT industry.
- The capacity to transfer the skills gained, to provide innovative and novel solutions by maintaining ethical norms for the betterment of humane society.

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First Year   **CORE COURSE I**   **Semester I**
                      PROGRAMMING IN C AND
                      DATA STRUCTURES
Code: **(Theory)**   **Credit: 5**

COURSE OBJECTIVES:

- To know about the basics of C Programming, Control and Looping Structures and programming with it.
- To understand Arrays, Pointers and String Processing in C language
- To know about the basic concepts in Data Structures.

UNIT - I:

Basic of C: History of C and its importance – Structure of a C program – Data Types – Constants and Variables – Operators and Expressions – Order of Precedence, Evaluating of Arithmetic Expressions – Type Conversion- Decision Statements: if, if-else, and nested if statements.

UNIT - II:

Loops Structures: For Loop, While, Do-while loop – Arrays: - One Dimensional Array, Two-dimensional Arrays, Character Arrays and Strings – Functions: Function with arrays - Function with decision and looping statements - Recursion.

UNIT - III:

Pointers: Introduction – Pointer Expressions – Chain of Pointers – Pointers and Arrays – Array of Pointers – Pointers as function arguments – Functions returning Pointers – Pointers to Functions – Function pointer – Structures - declaration, initialization, Array of Structures – Pointer to structures, Structures and functions – Typed of Enumerated data types, Unions.

UNIT - IV:

Strings Processing, Standard string library functions – Files: introduction and files functions – Writing and reading in Text mode – Simple application: Display the contents of a file. Write data to a file. Append data to an existing file – File IO– Reading and writing structures.

UNIT - V:

Stack: LIFO concept, Stack operations, Array implementation of stack – Queue: FIFO concept, Queue operations, Array implementation of queue – Singly Linked List: concepts, operations – Doubly Linked List: concepts, operations – Trees: General trees, Binary trees.

UNIT – VI   CURRENT CONTOURS (For continuous internal assessment only):

Contemporary Developments Related to the Course during the Semester Concerned.

REFERENCES:

1. E. Balagurusamy, "Programming in ANSI C", Tata McGraw Hill, New Delhi, Seventh Edition, 2016.
2. E.Horowitz, S.Sahni and Susan Anderson Freed, "Fundamental Data Structures in C", 2ed, Orient BlackSwan Publisher, 2009.
3. Byron S. Gottfried, "Programming with C", Schaum's Outline Series, Tata- McGraw Hill Edition, New Delhi, 1991.
4. E. Karthikeyan, "A Textbook on C Fundamentals, Data Structures and Problem Solving", Prentice-Hall of India Private Limited, New Delhi, 2008.
5. Yashavant Kanetkar, "Let us C", BPB Publications, Tenth Edition, New Delhi, 2010.
6. Szuhay, Jeff, and Szuhay, Jeff, "Learn C Programming: A Beginner's Guide to Learning C Programming the Easy and Disciplined Way", Packt Publishing, 2020.
7. Jena, Sisir Kumar, and Jena, Sisir Kumar, "C Programming: Learn to Code", CRC Press, 2021.
8. https://www.tutorialspoint.com/cprogramming/index.htm
9. https://www.w3schools.in/data-structures/intro

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

*   Summarize the basic knowledge to develop C programs
*   Manipulate Looping, arrays and functions
*   Apply and write programs for solving real world problems
*   Create open, read, manipulate, write and close files.
*   Understand the basic concepts in data structures.

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First Year   **CORE PRACTICAL I**   **Semester I**
PROGRAMMING IN C LAB
Code: **(Practical)**   **Credit: 4**

COURSE OBJECTIVES:

- To understand the programming fundamentals of C language.
- To impart writing skill of C programming and data structures for a list of problems.
- To impart hands-on training for writing a C program using computers.

1. Write a Program
   (i) To convert temperature from degree Centigrade to Fahrenheit,
   (ii) Find whether given number is Even or Odd,
   (iii) Find the greatest of Three numbers.
2. Write a Program to display Monday to Sunday using switch statement
3. Write a Program to display first Ten Natural Numbers and their sum.
4. Write a Program to perform Multiplication of Two Matrices.
5. Write a Program
   (i) To find the maximum number in an Array using pointer.
   (ii) To reverse a number using pointer.
   (iii) To add two numbers using pointer.
6. Write a Program to solve Quadratic Equation using functions.
7. Write a Program to find factorial of a number using Recursion.
8. Write a Program to demonstrate Call by Value and Call by Reference.
9. Write a Program to create a file containing Student Details.
10. Write a program to implement a stack using singly linked list, Implement Queue using Linked List.

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Relate the use of language constructs to solve simple programs
- Develop programs for various concepts in C language
- Understand and trace the execution of the list of programs
- Understand the usage of file handling in C programming
- Solve data problems related to data structures.

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First Year   **CORE COURSE II**   **Semester II**
                                   PROGRAMMING IN JAVA
Code: **(Theory)**   **Credit: 5**

COURSE OBJECTIVES:

- To acquire the programming skills with java.
- To implement the object-oriented concepts with java language
- To learn the art of GUI programming with Applet.

UNIT - I:

Foundation, Essentials, Control Statement and Classes & Objects, Stage of Java – origin of Java – challenges - features - Object-Oriented Programming; Java Essentials: Elements - API - variables - primitive data types – String Class - operators –combined assignment operators - conversion – scope – comments - keyboard input; Control Statements: if, if-else, nested if & if-else-if statements – logical operators – comparison – conditional operator – switch – increment and decrement – while, do-while & for loops – nested loops – break and continue; Classes and Objects: classes and objects -modifiers - passing arguments– constructors - package & import - static class members –method overloading– constructor overloading –returning objects – this variable – recursion – nested & inner classes – abstract classes & methods.

UNIT - II:

Arrays, String Handling, Inheritance, Interface and Packages, Introduction – processing array – passing arrays – returning arrays – String arrays – two Dimensional Arrays - Arrays with Three or More Dimensions; String Handling: String class – concatenation – comparison – substring – methods – other methods–String Buffer, String Builder & String Tokenizer classes; Inheritance: basics – inheriting and overriding superclass methods – calling superclass constructor – polymorphism – inherit from different classes – abstract classes – final Class; Interfaces: Basics – multiple Interfaces – multiple inheritance using interface – multilevel interface – Packages – Create and access packages in Net Beans IDE – static Import and package class – access specifiers.

UNIT - III:

Exception Handling, I/O and File Handling and Multithreading, Introduction - try and catch block - multiple catch block - nested try - finally Block – throw Statement – exception propagation – throw Clause - custom exception – built-in exception; Multithreading: Introduction – threads – thread creation – life cycle – joining a thread – scheduler &priority – synchronization – inter-thread communication – thread control – thread Pool – thread group – daemon thread; Files and I\O Streams: file Class – streams – byte streams – filtered byte streams – Random Access File class – character streams.

UNIT - IV:

Applet and GUI Part I, Fundamentals – applet class – life cycle – steps for applet program – passing values through parameters – graphics – event handling; GUI I:GUI – creating windows – dialog boxes – layout managers – AWT component classes – Swing component classes – applications of AWT controls.

UNIT - V:

GUI Part II and Java Database Connectivity, Event handling – AWT components – AWT graphics classes – Swing controls – application using Swing and AWT; Java Database Connectivity: types of drivers – JDBC architecture – JDBC classes &interfaces – steps in JDBC applications – creating a new Database and table with JDBC.

UNIT – VI   CURRENT CONTOURS (For continuous internal assessment only)

Contemporary Developments Related to the Course during the Semester Concerned.

REFERENCES:

1. S. Sagayaraj, R. Denis, P. Karthik & D. Gajalakshmi, "Constructive Java Programming", Universities Press, 2021.
2. E. Balagurusamy, "Programming with JAVA", Tata McGraw Hill, New Delhi, 2019.
3. C. Muthu, "Programming with JAVA", Vijay Nicole Imprints Private Limited, Chennai, Second Edition, 2011.
4. Bruce Eckel, Chuck Allison, "Thinking in Java", Prentice Hall Publications, 2006
5. Malina Pronto, "Java: How To Learn Java Programming: How To Improve Your Java Coding In 2020/2021: 5 Programming Languages To Learn For Beginners In Tech", Independently Published, 2020.
6. Nick Samoylov, "Learn Java 12 Programming: A Step-by-step Guide to Learning Essential Concepts in Java", Packt Publishing, 2019.
7. https://www.javatpoint.com/java-tutorial

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

*   Understand the concept of OOP as well as the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading.
*   Identify members of a class and to implement them
*   Create Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring (e.g., by using access control identifies, and create user define package for specific task,(reusability concepts) error exception handling)
*   Develop programs using the Java standard class library.
*   Develop software using Java programming language, (using applet, AWT controls, and JDBC).

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First Year   **CORE PRACTICAL II**   **Semester II**
                     PROGRAMMING IN JAVA LAB
Code: **(Practical)**   **Credit: 4**

COURSE OBJECTIVES:

- To understand the basics of JAVA programs and their execution.
- To learn concepts like inheritance, packages and interfaces.
- To understand the life cycle of the applets, database connectivity and their functionality.

1. Write a program to sort the given numbers using arrays.
2. Write a program to implement the FIND and REPLACE operations in the given text.
3. Write a program to implement a calculator to perform basic arithmetic Operations, doing with constructers
4. Write a program to find the student's percentage and grade using command line arguments.
5. Write a program to draw circle or triangle or square using polymorphism and inheritance.
6. Implement multiple inheritance concepts in java using interface, you can choose your own example of a company or education institution or a general concept which requires the use of interface to solve a particular problem.
7. Write a program to create threads and perform operations like start, stop, suspend, resume
8. Write a program to develop an applet to play multiple audio clips using multithreading.
9. Write a program to retrieve employee data from a file
10. Write a program to retrieve student data from a Database

Course Outcomes:

Upon successful completion of this course the students would be able to:

- Develop java programs to understand the OOP concepts.
- Write java programs for classes and objects.
- Develop simple programs with multiple threads.
- Write java programs using Applets.
- Develop java programs to connect databases and files.

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Second Year   **CORE COURSE III**   **Semester III**
                     PROGRAMMING IN PYTHON
Code: **(Theory)**   **Credit: 5**

COURSE OBJECTIVES:

- To develop programs using functions and pass arguments in Python.
- To write programs using loops and decision statements in Python.
- To design and program Python applications.

UNIT - I:

Introduction to Python: Features of Python - How to Run Python - Identifiers - Reserved Keywords - Variables - Comments in Python - Indentation in Python - Multi-Line Statements - Multiple Statement Group (Suite) - Quotes in Python - Input, Output and Import Functions - Operators. Data Types and Operations: Numbers – Strings – List – Tuple – Set – Dictionary – Data type conversion.

UNIT - II:

Flow Control: Decision Making – Loops – Nested Loops – Types of Loops. Functions: Function Definition – Function Calling - Function Arguments - Recursive Functions - Function with more than one return value.

Unit - III:

Modules and Packages: Built-in Modules - Creating Modules - import Statement - Locating Modules - Namespaces and Scope - The dir() function - The reload() function - Packages in Python - Date and Time Modules. File Handling- Directories in Python.

UNIT - IV:

Object-Oriented Programming: Class Definition - Creating Objects - Built-in Attribute Methods - Built-in Class Attributes- Destructors in Python – Encapsulation - Data Hiding – Inheritance - Method Overriding- Polymorphism.

UNIT - V:

Exception Handling: Built-in Exceptions-Handling Exceptions- Exception with Arguments - Raising Exception - User-defined Exception - Assertions in Python. Regular Expressions: The match() function - The search() function - Search and Replace - Regular Expression Modifiers: Option Flags-Regular Expression Patterns- Character Classes-Special Character Classes - Repetition Cases - findall() method - compile() method.

UNIT – VI   CURRENT CONTOURS (For continuous internal assessment only):

An Introduction to Interactive Programming in Python - Study on Julia – an highlevel language approach.

REFERENCES:

1. Jeeva Jose and P. Sojan Lal, "Introduction to Computing and Problem Solving with PYTHON", Khanna Book Publishing Co, 2016.
2. Mark Summerfield. ― Programming in Python 3: A Complete introduction to the Python Language, Addison-Wesley Professional, 2009.
3. Martin C. Brown, ―PYTHON: The Complete Reference‖, McGraw-Hill, 2001
4. Wesley J. Chun, "Core Python Programming", Prentice Hall Publication, 2006.
5. Timothy A Budd, "Exploring Python", Tata McGraw Hill, New Delhi, 2011
6. Jake Vander Plas, "Python Data Science Handbook: Essential Tools for Working with Data", O'Reilly Media, 2016.
7. Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist, 2nd edition, Updated for Python 3, Shroff/O Reilly Publishers, 2016
8. Guido van Rossum and Fred L. Drake Jr, ―An Introduction to Python ―Revised and updated for Python 3.2, Network Theory Ltd., 2011.

COURSE OUTCOMES:

Upon successful completion of this course the students would be able:

- To recall and understand the features of python programming language
- To illustrate various programming mechanism used in python
- To apply various language construct to write simple programs in python
- To examine the application of object oriented concept in python
- To distinguish the various constructs used in python.

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COURSE OBJECTIVES:

- To write, test, and debug simple Python programs.
- To implement Python programs with conditionals and loops.
- To represent compound data using Python lists, tuples, and dictionaries.

1. Flow controls, Functions and String Manipulation
2. Operations on Tuples and Lists
3. Operation on sets
4. Operations on Dictionary
5. Simple OOP– Constructors – create a class for representing a car
6. Method Overloading – create classes for vehicle and Bus and demonstrate method overloading
7. Files – Reading and Writing – perform the basic operation of reading and writing with student file
8. Regular Expressions
9. Modules
10. Packages
11. Exception Handling

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Write simple programs using control structures, functions and strings
- Develop programs using tuples, lists, sets and dictionary
- Write simple programs using Constructors, Method overloading and inheritance
- Develop programs using files and regular expressions
- Write simple programs using packages and exception handling

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Second Year   **NON MAJOR ELECTIVE I**   **Semester III**
                   FUNDAMENTALS OF INFORMATION
                              TECHNOLOGY
Code   **(Theory)**   **Credit: 2**

COURSE OBJECTIVES:

- To familiarize the students with the world of IT and IT-enabled services.
- To provide an in-depth knowledge about internet and internet tools.
- To enable the students to understand about Computer Security

UNIT - I:

Introduction to Computers - Generation of Computers - Classification of Digital Computer - Anatomy of Digital Computer.

UNIT-II:

CPU and Memory - Secondary Story Devices - Input Devices - Output Devices.

UNIT-III:

Introduction to Computer Software - Programming Language - Operating Systems - Introduction to Database Management System.

UNIT - IV:

Computer Networks - WWW and Internet - Email - Web Design

UNIT - V:

Computers at Home, Education, Entertainment, Science, Medicine and Engineering - Introduction to Computer Security - Computer Viruses, Bombs, Worms.

UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned

REFERENCES:

1. Alexis Leon and Mathews Leon, Fundamentals of Information Technology, Vikas Publishing House Pvt. Ltd, 2009
2. Fundamentals of Computers and Information Technology, M.N Doja,2005
3. Ramesh Bangia,"Computer Fundamentals and Information Technology", Laxmi Publications Pvt Limited, 2008.
4. Bharihoke, "Fundamentals of Information Technology", Excel Books, 2009.
5. Ralph Stair, George Reynolds, "Fundamentals of Information Systems" Cengage Learning, 2015.

6. Shun-Ping Chen, "Fundamentals of Information and Communication Technologies", Cambridge Scholars Publisher, 2020.

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Understand basic concepts and terminologies in IT and IT-enabled services.
- Understanding personal computers and their operations.
- Understand about operating systems and database management
- Comprehend about WWW, internet, email and web design concepts
- Respond to computer security issues.

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Second Year CORE COURSE IV **Semester IV**
DATABASE MANAGEMENT SYSTEMS
Code (Theory) **Credit: 5**

COURSE OBJECTIVES:

- To impart the basic database concepts, applications, data models, schemas and instances.
- To familiarize Entity Relationship model for a database.
- To Demonstrate the use of constraints and relational algebra operations.

UNIT - I:

Introduction: Database-System Applications- Purpose of Database Systems - View of Data -Database Languages - Relational Databases - Database Design -Data Storage and Querying Transaction Management -Data Mining and Analysis - Database Architecture - Database Users and Administrators - History of Database Systems.

UNIT - II:

Relational Model: Structure of Relational Databases -Database Schema - Keys – Schema Diagrams - Relational Query Languages - Relational Operations Fundamental Relational-Algebra Operations Additional Relational-Algebra Operations- Extended Relational-Algebra Operations - Null Values - Modification of the Database.

UNIT - III:

SQL Overview of the SQL Query - Language - SQL Data Definition - Basic Structure of SQL Queries - Additional Basic Operations - Set Operations - Null Values Aggregate Functions - Nested Subqueries - Modification of the Database -Join Expressions - Views - Transactions - Integrity Constraints - SQL Data Types and Schemas – Authorization.

UNIT - IV:

Relational Languages: The Tuple Relational Calculus - The Domain Relational Calculus Database Design and the E-R Model: Overview of the Design Process - The Entity-Relationship Model - Reduction to Relational Schemas - Entity-Relationship Design Issues - Extended E-R Features - Alternative Notations for Modeling Data - Other Aspects of Database Design

UNIT - V:

Relational Database Design: Features of Good Relational Designs - Atomic Domains and First Normal Form - Decomposition Using Functional Dependencies - Functional-Dependency Theory - Decomposition Using Functional Dependencies - Decomposition Using Multivalued Dependencies-More Normal Forms - Database-Design Process

UNIT - VI: CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned.

REFERENCES:

1. Database System Concepts, Sixth edition, Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill-2010.

2. Jagdish Chandra Patni, Hitesh Kumar Sharma, Ravi Tomar, Avita Katal., "Database Management System: An Evolutionary Approach", CRC Press, 2022.
3. Abraham Silberschatz, Hendry F. Korth, S Sudharshan," Database System Concepts", 6th Edition, McGraw Hill International, 2019.
4. Blokdyk, Gerardus, and Blokdyk, Gerardus, "RDBMS Relational Database Management System a Complete Guide", 2020 Edition, Emereo Pty Limited, 2019.
5. Wilfried Lemahieu, Seppevanden Broucke, Bart Baesens, "Principles of Database Management: The Practical Guide to Storing, Managing and Analyzing Big and Small Data", Cambridge University Press, 2018.
6. C.J. Date, "An Introduction to Database Systems" Addison Wesley, 2000.
7. https://tutorialspoint.dev/computer-science/dbms

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Understand the basic concepts of Database Systems
- Know about SQL queries to interact with Database
- Design a Database using ER Modelling
- Apply normalization on database design to eliminate anomalies
- Analyze database transactions and to control them by applying ACID properties.

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COURSE OBJECTIVES:

- To understand the basic concepts and the applications of database systems using MYSQL.
- To create and perform basic operation with MYSQL.
- To interact with MYSQL by using nested queries, set of aggregate operations and views.

1. Create a table and perform the following basic mysql operations
   a. Set the primary key
   b. Alter the structure of the table
   c. Insert values
   d. Delete values based on constraints
   e. Display values using various forms of select clause
   f. Drop the table

2. Develop mysql queries to implement the following set operations
   a. Union
   b. Union all
   c. Intersect
   d. Intersect all

3. Develop mysql queries to implement the following aggregate functions
   a. Sum
   b. Count
   c. Average
   d. Maximum
   e. Minimum
   f. Group by clause & having clause

4. Develop mysql queries to implement following join operations
   a. Natural join
   b. Inner join
   c. Outer join-left outer, right outer, full outer
   d. Using join conditions

5. Develop mysql queries to implement nested subqueries
   a. Set membership (int, not int)
   b. Set comparison (some, all)
   c. Empty relation (exists, not exists)
   d. Check for existence of Duplicate tuples(unique, not unique)

6. Develop mysql queries to create a views and expand it.

7. Develop mysql queries to implement
   a. String operations using %
   b. String operations using '_'

c. Sort the element using asc,desc
   [*create necessary reletions with requires attribute]

8. Consider the following database for a banking enterprise
   BRANCH(branch-name:string, branch-city:string, assets:real)
   ACCOUNT(accno:int, branch-name:string, balance:real)
   DEPOSITOR(customer-name:string, accno:int)
   CUSTOMER(customer-name:string, customer-street:string, customercity:
   string)
   LOAN(loan-number:int, branch-name:string, amount:real)
   BORROWER(customer-name:string, loan-number:int)
   i. Create the above tables by properly specifying the primary keys and the
   ii. foreign keys
   iii. Enter at least five tuples for each relation
   iv. Find all the customers who have at least two accounts at the Main
       Branch.
   v. Find all the customers who have an account at all the branches located
   vi. In a specific city.
   vii. Demonstrate how you delete all account tuples at every branch located
        in a specific city. Generate suitable reports.
   viii. Create a suitable front end for querying and displaying the results.

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Write queries to manipulate data.
- Demonstrate the aggregate functions and set operations.
- Apply the join operations.
- Know about usage of nested sub queries.
- Understand the method to create views.

*****

WORKING PRINCIPLES OF INTERNET

Code   **(Theory)**   **Credit: 2**

COURSE OBJECTIVES:

- To teach the basics of the World Wide Web
- To understand the fundamentals of the Internet and the usage
- To know the components of Multimedia on the internet

UNIT - I:

What is Internet? The Internet's underlying Architecture

UNIT - II:

Connecting to the Internet – Communicating on the Internet

UNIT - III:

How the World Wide Web works. Common Internet tools

UNIT - IV:

Multimedia on the Internet – Intranet and shopping on the Internet

UNIT - V:

Safeguarding the Internet

UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned

REFERENCES:

1. Preston Gralla, "How the Internet Works", Pearson Education, Eighth Edition, 2006.
2. C.Xavier, Fundamentals of Internet and Emerging Technologies, New Age International Private Limited; First Edition ,2021
3. Alexis Leon, Internet for Everyone, S. Chand (G/L) & Company Ltd; Second Edition 2012.
4. Andrea C. Nakaya,"Internet and Social Media Addiction", Reference Point Press,2015.
5. Richard Fox, Wei Hao,"Internet Infrastructure: Networking, Web Services, and Cloud Computing", CRC Press, 2017.
6. Douglas E. Comer,"The Internet Book: Everything You Need to Know about Computer Networking and How the Internet Works", CRC Press, 2018.

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Understand the evolution of the Internet.
- Know the basic knowledge of the web
- Comprehend the protocols and standards used throughoutthe Internet.
- Discuss a variety of Internet and WWW applications and related technologies.
- Evaluate the opportunities and threats created by interconnecting computers via the Internet.

*****

Third Year   **CORE COURSE V**   **Semester V**
                          FUNDAMENTALS OF ALGORITHMS
Code   **(Theory)**   **Credit: 5**

COURSE OBJECTIVES:

- To study the fundamentals of algorithms
- To understand trees, traversals and about shortest path.
- To know about the different algorithms related to sorting, optimality and backtracking

UNIT - I:

Introduction – Algorithm Specification, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Performance Measurement, Randomized algorithms.

UNIT - II:

Trees – Binary tree representations – Tree Traversal – Threaded Binary Trees – Binary Tree Representation of Trees – Graphs and Representations – Traversals, Connected Components and Spanning Trees – Shortest Paths and Transitive closure – Activity Networks – Topological Sort and Critical Paths.

UNIT - III:

Algorithms – Priority Queues - Heaps – Heap Sort – Merge Sort – Quick Sort – Binary Search – Finding the Maximum and Minimum.

UNIT - IV:

Greedy Method: The General Method – Optimal Storage on Tapes – Knapsack Problem – Job Sequencing with Deadlines – Optimal Merge Patterns.

UNIT - V:

Back tracking: The General Method – The 8-Queens Problem – Sum of Subsets – Graph Coloring.

UNIT VI: CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned

REFERENCES:

1. Ellis Horowiz, SartajSahni, "Fundamentals of Data Structure",Galgotia Publications, 2008.
2. Ellis Horowiz, Sartaj Sahni and Sanguthevar Rajasekaran, "Computer Algorithms", University Press, 2008.
3. Seymour Lipschutz, "Data Structures",TataMcgraw Hill, Schaum's Outline Series, 2014.
4. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Third Edition, PHI Learning Private Limited, 2012.

5. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, "Data Structures and Algorithms
6. Anany Levitin, "Introduction to the Design and Analysis of Algorithms", Third Edition, Pearson Education, 2012.
7. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, "Introduction to Algorithms",MIT Press, 2022.
8. https://www.tutorialspoint.com/data_structures_algorithms/algorithms_basics.htm
9. https://www.tutorialspoint.com/design_and_analysis_of_algorithms/index.htm

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Know the basic concepts of algorithms
- Understand trees and shortest path algorithms.
- Compare and contrast different sorting algorithms
- Comprehend greedy and optimality algorithms.
- Appreciate the backtracking concept and its different algorithms.

*****

Third Year   **CORE COURSE VI**   **Semester V**
                                  COMPUTER NETWORKS
Code   **(Theory)**   **Credit: 5**

COURSE OBJECTIVES:

- To describe the general principles of Computer Networks.
- To describe how the different layers in a computer network work
- To know about Wired LAN: IEEE Standards and Satellite networks.

UNIT - I:

Data Communication – Networks – The Internet – Protocols and Standards – OSI Model-Layers in OSI Model - TCP/IP Protocol Suite – Addressing.

UNIT - II:

Analog and Digital – Digital Signals – Transmission Impairment – Performance – Multiplexing – Guided Media – Unguided Media. Switching: Circuit Switched Networks – Datagram Networks – Virtual Circuit Networks

UNIT -III:

Data Link Layer: Error Detection and Correction -Introduction – Block Coding: Error detection, Error correction – Data Link Control: Framing – Flow and Error Control – Protocols – Noiseless Channels – Noisy channels – HDLC – Point to Point Protocol.

UNIT - IV:

Wired LAN: IEEE Standards – Standard Ethernet. Wireless LAN: IEEE 802.11 – Bluetooth. Connecting LANs: Connecting Devices – Virtual LANs. Wireless WAN: Cellular Telephony – Satellite Networks. Network Layer-Logical Addressing: IPv4 Addresses – IPv6 Addresses.

UNIT - V:

Transport Layer: Process to Process Delivery – User Datagram Protocol - TCP. Application Layer: Domain Name Space – DNS in the Internet – Electronic Mail – File Transfer. WWW: Architecture – HTTP.

UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned.

REFERENCES:

1. Behrouz A. Forouzan, "Data Communications and Networking", McGraw-Hill Companies, New York, 5th Edition, 2017.

2. William Stallings "Data and computer communications", Prentice Hall of India, 7th Edition, 2004.
3. Andrew S Tanenbaum, "Computer Networks", Prentice Hall of India, New Delhi, 2013.
4. Dr M. P. Vani, "Data Communication and Computer Network", Notion Press, 2019.

5. Hazim Gaber, "Understanding Computer Networks 2020", Independently Published, 2020.
6. Grigorios N. Beligiannis, Ram Palanisamy, S. Smys, Álvaro Rocha, "Computer Networks and Inventive Communication Technologies", Springer, 2021.
7. https://www.guru99.com/data-communication-computer-network-tutorial.html

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Recall the basic concepts of computer networks
- Summarize the technical specifications of various layers of the OSI model in a computer network
- Identify the appropriate protocols and standards for computer networks
- Classify technical factors of cellular networks and satellite communication
- Know about the different functionalities of an application layer.

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Third Year   **CORE COURSE VII**   **Semester V**
DIGITAL ELECTRONICS AND MICROPROCESSOR
Code   **(Theory)**   **Credit: 5**

COURSE OBJECTIVES:

- To impart knowledge about the basics of Digital Systems
- To focus on the study of Boolean algebra, Combinational circuits.
- To impart knowledge about basic parts and functions of microprocessor and to have an understanding of the Registers, Interrupts, Interfaces, Buses, Pins, Instructions of 8085 microprocessor

UNIT - I:

Digital Systems and Binary Numbers - Digital Systems - Binary Numbers - Number Base Conversions - Octal and Hexadecimal Numbers - Complements of Numbers. Signed Binary Numbers - Binary Codes - Binary Storage and Registers - Binary Logic

UNIT - II:

Boolean Algebra and Logic Gates - Introduction - Basic Definitions - Axiomatic Definition of Boolean Algebra - Basic Theorems and Properties of Boolean Algebra. Boolean Functions - Canonical and Standard Forms - Other Logic Operations - Digital Logic Gates - Integrated Circuits.

UNIT - III:

Combinational Logic - Introduction - Combinational Circuits - Analysis of Combinational Circuits - Design Procedure - Binary Adder - Subtractor - Decimal Adder - Binary Multiplier - Magnitude Comparator - Decoders - Encoders - Multiplexers - HDL Models of Combinational Circuits.

UNIT - IV:

Evolution of Microprocessor – Single chip Microcomputer – Microprocessor Applications –Buses- Memory Addressing capacity and CPU – Microcomputers – Processor Architecture – Intel 8085 – Instruction cycle – Timing Diagram.

UNIT - V:

Instruction Set of Intel 8085 – Instruction and Data Format – Address Modes – Status Flags – Intel 8085 instruction - Programming Microprocessor – Assembly language – Assembler.

UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned.

REFERENCES:

1. M. Morris R. Mano, Michael D. Ciletti. Digital Design: With an Introduction to the Verilog HDL, VHDL, and System Verilog, 6th Edition, 2018
2. Badri Ram, "Fundamentals of Microprocessors and Microcomputers", Dhanpat Rai Publications, 2012.
3. Dhanasekharan Natarajan, "Fundamentals of Digital Electronics", Springer International Publishing, 2020
4. Dr. S Salivahanan,"Analog and Digital Electronic", McGraw-Hill Education, 2019.
5. Soumitra Kumar Mandal, "Digital Electronics", McGraw-Hill Education, 2018.
6. A. Anand Kumar, "Fundamentals of Digital Circuits", Prentice Hall India Pvt. Limited, 2016.
7. Senthil Kumar Saravanan, Jeevananthan, "Microprocessors and Microcontrollers", Oxford University Press, 2010.

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Understand about various number systems
- Know about Boolean Algebra and Logic Gates
- Draw and explain Combinational circuits
- Explain the Evolution of Microprocessors
- Use the Instruction Set of Intel 8085 in simple programs.

*****

Third Year   **CORE PRACTICAL V**   **Semester V**
                    DIGITAL ELECTRONICS AND MICROPROCESSOR
                                            LAB
Code   **(Practical)**   **Credit: 4**

COURSE OBJECTIVES:

* To have hands-on experience with digital electronics concepts.
* To experiment the design of basic logic circuits, combinational and sequential circuits
* To write ALP and to execute them with a microprocessor kit.

A. Digital Electronics Experiments

1. Verification of Logic gates
2. Construction of half and full adder
3. K-Map
4. Shift register
5. Up Down Counters

B. Microprocessor Experiments

1. Eight Bit Addition and Subtraction
2. Sum of series
3. Data transfer
4. Maximum of N Numbers
5. Decimal to Hexadecimal

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

* Verify the logic gate and the working of Adder and subtractors
* Construct and study the function of Shift registers
* Understand the working of Up Down Counters
* To write simple ALPs and execute them
* To manipulate an array with ALP.

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Third Year **MAJOR BASED ELECTIVE I** **Semester V**
1) **ARTIFICIAL INTELLIGENCE AND EXPERT**
SYSTEMS
Code **(Theory)** **Credit: 4**

COURSE OBJECTIVES:

• To study about the basic concepts in Artificial intelligence and reasoning
• To know about knowledge representation and its subsequent inference
• To study the concept of expert systems

UNIT - I:

Problems and Search : Searching strategies- Uninformed Search- breadth first search, depth first search, uniform cost search, depth limited search, iterative deepening search, bidirectional search - Informed Search- Best first search ,Greedy Best first search , A* search – Constraint satisfaction problem , Local searching strategies.

UNIT - II:

Reasoning: Symbolic Reasoning Under Uncertainty- Statistical Reasoning - Weak Slot-And-Filler-Structure - Semantic nets – Frames- Strong Slot-And-Filler Structure-Conceptual Dependency-Scripts- CYC.

UNIT - III:

Knowledge Representation: Knowledge Representation - Knowledge representation issues - Using predicate logic - Representing Knowledge Using Rules. Syntactic-Semantic of Representation – Logic & slot and filler - Game Playing – Minimal search- Alpha beta cutoffs –Iterative deepening planning – component of planning system – Goal stack planning.

UNIT - IV:

Natural Language Processing**:** Natural Language Processing –Syntactic processing, semantic analysis-Parallel and Distributed AI-Psychological modeling-parallelism and distributed in reasoning systems – Learning Connectionist Models – Hopfield networks, neural networks.

UNIT - V:

Expert Systems: Common Sense –qualitative physics, common sense ontologies-memory organization -Expert systems –Expert system shells- explanation – Knowledge acquisition -Perception and Action – Real time search- robot architecture.

UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned

REFERENCES:

1. Elaine Rich, Kevin Knight, "Artificial Intelligence", 3/e, Tata McGraw Hill, 2017.
2. Russell , " Artificial intelligence :A modern Approach , Pearson Education ,3rd edition,2013
3. I. Gupta, G. Nagpal, "Artificial Intelligence and Expert Systems", Mercury Learning & Information, 2020.
4. C.S. Krishnamoorthy, S. Rajeev, "Artificial Intelligence and Expert Systems for Engineers", CRC Press, 2018.
5. V. Daniel Hunt, "Artificial Intelligence & Expert Systems Sourcebook, Springer US, 2012.
6. Artificial Intelligence and Expert system by V.Daniel hunt, Springer press, 2011.
7. Nilsson N.J., "Principles of Artificial Intelligence", Morgan Kaufmann.1998.

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Understand the history of artificial intelligence (AI) and its foundations.
- Describe the modern view of AI as the study of agents that receive percepts from the Environment and perform actions.
- Demonstrate awareness of informed search and exploration methods.
- Create knowledge of decision making and learning methods
- Recall the concepts of expert systems.

*****

Third Year	**MAJOR BASED ELECTIVE I**	Semester V
	2) COMPUTER GRAPHICS	
Code	**(Theory)**	Credit: 4

COURSE OBJECTIVES:

- To understand the basic objectives and scope of computer graphics.
- To identify computer graphics applications and common graphics APIs.
- To know the basic structures of 2D and 3D graphics systems.

UNIT - I:

Overview of Computer Graphics System: Video Display Devices – Raster Scan Systems – Random – Scan Systems - Graphics Monitors and Workstations – Input Devices – Hardcopy Devices – Graphics Software.

UNIT - II:

Output Primitives: Line Drawing Algorithms – Loading the Frame Buffer – Line Function – Circle – Generating Algorithms. Attributes of Output Primitives: Line Attributes – Curve Attributes – Color and Grayscale levels– Area fill Attributes – Character Attributes – Bundled Attributes – Inquiry Functions.

UNIT - III:

2D Geometric Transformations: Basic Transformation – Matrix Representations – Composite Transformations – Window to View port Co-Ordinate Transformations. Clipping: Point Clipping – Line Clipping – Cohen-Sutherland Line Clipping – Liang Barsky Line Clipping – Polygon Clipping – Sutherland – Hodgman Polygon Clipping – Curve Clipping – Text Clipping.

UNIT - IV:

Graphical User Interfaces and Interactive Input Methods: The User Dialogue – Input of Graphical Data – Input Functions – Interactive Picture Construction Techniques. Three Dimensional Concepts: 3D-Display Methods – #Three Dimensional Graphics Packages.

UNIT - V:

3D Geometric and Modelling Transformations: Translation – Scaling – Rotation – Other Transformations. Visible Surface Detection Methods: Classification of Visible Surface Detection Algorithm –Blackface Detection – Depth-Buffer Method – A-Buffer Method – Scan-Line Method –Applications of Computer Graphics.

UNIT VI CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned

REFERENCES:

1. Donald Hearn M. Pauline Baker, Computer Graphics C Version, Pearson Education, 2014.
2. Alexey Boreskov, Evgeniy Shikin, "Computer Graphics From Pixels to Programmable Graphics Hardware", CRC Press, 2013.
3. Donald Hearn M. Pauline Baker, "Computer Graphics C Version", Pearson Education, 2014.
4. Branislav Sobota, "Computer Graphics and Imaging", Intech Open Publication, 2019.
5. Dr. Deepali A. Godse, Atul P. Godse, "Computer Graphics", UNICORN Publishing Group, 2020.
6. Gabriel Gambetta, "Computer Graphics from Scratch A Programmer's Introduction to 3D Rendering", No Starch Press, 2021.

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Understand the basics of Computer Graphics, Different Graphics Systems and Applications of Computer Graphics.
- Learn Algorithms for Scan Conversion and filling of Basic Objects and their Comparative Analysis.
- Use of Geometric Transformations on Graphical Objects and their Application in Composite form.
- Apply 2D Geometric Transformations
- Use 3D Geometric and Modelling Transformations.

*****

Third Year   **SKILL BASED ELECTIVE I**   **Semester V**
WEB TECHNOLOGY
Code   **(Theory)**   **Credit: 2**

COURSE OBJECTIVES:

* To understand the basic concepts related to HTML, JavaScript and VB script.
* To familiarize various concepts associated with Dynamic webpages
* To know about data representation with XML and XSL.

UNIT - I:

HTML: Introduction – SGML – Outline of an HTML Document – Head Section – Body Section – HTML Forms.

UNIT - II:

Java Script: Introduction – Language Elements – Objects of Java Script – Other Objects – Arrays.

UNIT - III:

VB Script: Introduction – Embedding VBScript Code in an HTML Document – Comments – Variables – Operators – Procedures – Conditional Statements – Looping Constructs – Object and VB Script – Cookies.

UNIT - IV:

Dynamic HTML (DHTML): Introduction – Cascading Style Sheets (CSS) – DHTML Document Object Model and Collections – Event Handling.

UNIT - V:

Extensible Mark-Up Language (XML): Introduction – HTML vs XML – Syntax of the XML Document – XML Attributes – XML Validation – XML DTD – The Building Blocks of XML Documents – DTD Elements – DTD Attributes – DTD Entities – DTD Validation – XSL – XSL Transformation.

UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned.

REFERENCES:

1. N.P. Gopalan and J. Akilandeswari, Web Technology – A Developer's Perspective, Prentice Hall of India Private Ltd, New Delhi, Second Edition, 2016.
2. C.Xavier, Web Technology and Design, NEW AGE; First edition, 2018
3. Steven M. Schafer, "HTML, XHTML, and CSS Bible", Wiley Publication, 2011
4. Keith Grant, "CSS in Depth", Manning Publication, 2018.

5. William Alvin Newton, Steven Webber, "Computer Programming JavaScript, Python, HTML, SQL, CSS", Independently Published, 2019.
6. Hasanraza ANSARI, "Learn VBScript", Independently Published, 2021.
7. https://www.geeksforgeeks.org/web-technology/

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Understand and apply the webpage concepts.
- Develop static and dynamic web pages
- Understand the feature of JavaScript and VB Script
- Develop knowledge about XML fundamentals and usage of XML technology.
- Understand about the web design with XSL and data validation with DTD.

*****

Third Year   **CORE COURSE VIII**   **Semester VI**
                              OPERATING SYSTEMS
Code   **(Theory)**   **Credit: 5**

COURSE OBJECTIVES:

- To understand the basics of Operating systems and their working
- To Learn and understand operating system services and methods
- To understand the different types of devices connected with Operating systems.

UNIT - I:

Introduction - What Is an Operating System-Operating System Software -A Brief History of Machine Hardware -Types of Operating Systems - Brief History of Operating System Development-Object-Oriented Design

UNIT - II:

Early Systems: Single-User Contiguous Scheme -Fixed Partitions-Dynamic Partitions-Best-Fit versus First-Fit Allocation -Deallocation - Relocatable Dynamic Partitions. Virtual Memory: Paged Memory Allocation-Demand Paging-Page Replacement Policies and Concepts -Segmented Memory Allocation-Segmented/Demand Paged Memory Allocation - Virtual Memory-Cache Memory

UNIT - III:

Overview-About Multi-Core Technologies-Job Scheduling Versus Process Scheduling-Process Scheduler-Process Scheduling Policies-Process Scheduling Algorithms –A Word About Interrupts-Deadlock-Seven Cases of Deadlock -Conditions for Deadlock- Modeling Deadlock-Strategies for Handling Deadlocks –Starvation- Concurrent Processes: What Is Parallel Processing-Evolution of Multiprocessors- Introduction to Multi-Core Processors-Typical Multiprocessing Configurations--Process Synchronization Software.

UNIT - IV:

Types of Devices-Sequential Access Storage Media-Direct Access Storage Devices-Magnetic Disk Drive Access Times- Components of the I/O Subsystem- Communication among Devices-Management of I/O Requests

UNIT - V:

The File Manager -Interacting with the File Manager -File Organization – Physical Storage Allocation -Access Methods-Levels in a File Management System – Access Control Verification Module

UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned

REFERENCES:

1. Ann McIver Mc Hoes, Ida M. Flynn, "Understanding Operating Systems", Course Technology, Cengage Learning, 2011.
2. Greg Tomsho,"Guide to Operating Systems", Cengage Learning, 2020.

3. Cesar Herrera, Darrell Hajek, Flor Narciso, "Principles of Operating Systems", Amazon Digital Services LLC - KDP Print US, 2020.
4. Cesar Herrera, Darrell Hajek,"Principles of Operating Systems", Independently Published, 2019.
5. Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau,"Operating Systems: Three Easy Pieces", Create Space Independent Publishing Platform, 2018.
6. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, "Operating System Concepts", Wiley Publisher, 2018.
7. https://www.guru99.com/os-tutorial.html

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Recall the basic principles and importance of the operating system in a computer
- Illustrate the objectives and functions of the operating system components
- Identify the various operating system techniques
- Analyse the issues and challenges of the operating system and security mechanisms
- Evaluate the functions and features of file management in operating systems

*****

Third Year   **CORE COURSE IX**   **Semester VI**

PROGRAMMING IN PHP

Code   **(Theory)**   **Credit: 5**

COURSE OBJECTIVES:

- To understand the basics of PHP and Ajax
- To know about various constructs available in PHP
- To understand and implement the AJAX based dynamic client-server interaction

UNIT - I:

Essentials of PHP - Operators and Flow Control - Strings and Arrays.

UNIT - II:

Creating Functions - Reading Data in Web Pages - PHP Browser – Handling Power.

UNIT - III:

Object-Oriented Programming –Advanced Object-Oriented Programming

UNIT - IV:

File Handling –Working with Databases – Sessions, Cookies, and FTP

UNIT - V:

Ajax – Advanced Ajax – Drawing Images on the Server.

UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned

REFERENCES:

1. Steven Holzner, The PHP Complete Reference, McGraw Hill Education, 2007.
2. Vikram Vaswani, PHP: A Beginner's Guide, McGraw Hill Education, 2008.
3. Don Gosselin, Diana Kokoska, Robert Easterbrooks, "PHP Programming with MySQL", Course Technology, 2010.
4. Kevin Tatroe, Peter MacIntyre, Rasmus Lerdorf, " Programming PHP: Creating Dynamic Web Pages", O'Reilly Media, 2013.
5. Alan Forbes, "The Joy of PHP: A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL, Create Space Independent Publishing Platform, 2015.
6. Antonio Lopez, "Learning PHP 7, Packt Publishing, 2016.
7. https://www.guru99.com/php-tutorials.html

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Understand the fundamental knowledge of developing web applications with PHP.
- Illustrate the advanced concepts like strings, arrays and functions
- Design Web based applications.
- Analyze and solve various database tasks using PHP.
- Develop AJAX based applications.

*****

COURSE OBJECTIVES:

- To acquire the programming experience in PHP
- To apply variables, strings, and constants to a PHP a script and test it with a program.
- To design an authentication web page in PHP with MySQL.

1. Write a program to find the factorial of a number.
2. Write a program using Conditional Statements need a number N and check whether it is divisible by M
3. Write a program to find the maximum value in a given multi-dimensional array.
4. Write a program to find the GCD of two numbers using user-defined functions.
5. Design a simple web page to generate multiplication table for a given number.
6. Design a web page that should compute one's age on a given date.
7. Write a program to download a file from the server.
8. Write a program to store the current date and time in a COOKIE and display the 'Last Visited' date and time on the web page.
9. Write a program to store page views count in SESSION, to increment the count on each refresh and to show the count on web page.
10. Write a program to design a simple calculator.
11. Design an authentication web page in PHP with MySQL to check username and password.

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Learn PHP programming on handling strings and arrays.
- Design web pages for different applications with MYSQL
- Handle files, sessions and cookies by downloading a file from the server,
- Develop real-time applications.
- Gain experience in drawing images using Ajax.

*****

COURSE OBJECTIVES:

- To impart knowledge in the life cycle of software engineering
- To learn about Requirements Analysis Modeling, Basic Issues in Software Design and Software coding
- To acquire exposure in Web Engineering

UNIT - I:

Introduction: Introduction to Software Engineering - Software Process – Software Process Models - Software Model - Requirements Engineering Principles: Requirements Engineering - Importance of Requirements - Types of Requirements - Steps involved in Requirements Engineering.

UNIT - II:

Requirements Analysis Modeling: Analysis Modeling Approaches - Structured Analysis - Object Oriented Analysis - Design and Architectural Engineering : Design Process and Concepts - Basic Issues in Software Design - Characteristics of Good Design - Software Design and Software Engineering - Function Oriented System vs Object Oriented System - Modularity, Cohesion, Coupling, Layering - Real Time Software Design - Design Models - Design Documentation.

UNIT - III:

Object Oriented Concepts: Fundamental Parts of Object Oriented Approach – Data Hiding and Class Hierarchy Creation - Relationships - Role of UML in OO Design -Design Patterns - Frameworks - Object Oriented Analysis - Object Oriented Design - User Interface Design : Concepts of User Interface - Elements of User Interface -Designing the User Interface - User Interface Evaluation - Golden Rules of User Interface Design - User Interface Models - Usability

UNIT - IV:

Software Coding - Introduction to Software Measurement and Metrics – Software Configuration - Project Management Introduction - Introduction to Software Testing - Software Maintenance

UNIT - V:

Web Engineering : Introduction to Web - General Web Characteristics – Web Application Categories - Working of Web Application - Advantages and Drawbacks of Web Applications - Web Engineering - Emerging Trends in Software Engineering – Web 2.0 - Rapid Delivery - Open Source Software Development - Security Engineering - Service Oriented Software Engineering - Web Service - Software as a Service – Service Oriented Architecture - Cloud Computing - Aspect

Oriented Software Development - Test Driven Development - Social Computing

UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned

REFERENCES:

1. Chandramouli Subramanian, Saikat Dutt Chandramouli Seetharaman, B.G. Geetha, Software Engineering, Pearson Publications, 2015.
2. Software Engineering, Jibitesh Mishra, Pearson Education, 2011.
3. Ian Sommerville,"Software Engineering", Pearson, 2011.
4. Rod Stephens, "Beginning Software Engineering", Wiley, 2015.
5. Ashfaque Ahmed, Bhanu Prasad,"Foundations of Software Engineering", CRC Press, 2016.
6. Titus Winters, Tom Manshreck, Hyrum Wright, "Software Engineering at Google", O'Reilly Media, 2020.

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Recall the various techniques of software process models.
- Understand the requirements for a software project.
- Develop frameworks for software projects.
- Apply the knowledge, techniques, and skills in the development of a software product.
- Make use of web engineering concepts for software development.

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Third Year	**MAJOR BASED ELECTIVE II**	**Semester VI**
	2) BIG DATA ANALYTICS	
Code	**(Theory)**	**Credit: 4**

COURSE OBJECTIVES:

- To explore the fundamental concepts of big data analytics.
- To understand the concepts of Enterprise Technologies and Big Data Business Intelligence.
- To acquire knowledge about Big Data Storage.

UNIT - I:

Introduction: Concepts and Terminology – Big Data Characteristics – Different Types of Data –case study Background – Business goals and Obstacles – Business Motivations and Drivers for Big Data Adoption-Marketplace Dynamic – Business Architecture- Business Process Management.

UNIT - II:

Big data Adoption and Planning Considerations: Organization Prerequisites – Data Procurement – Privacy – Security – Provenance – Limited Real-time Support – Distinct Performance Challenges – Distinct Governance Requirements – Distinct Methodology – Big Data Analytics – Data Identification – Data Acquisition and Filtering – Data Extraction – Data validation and cleansing – Data Aggregation and Representation.

UNIT - III:

Enterprise Technologies and Big Data Business Intelligence: Online Transaction and Processing (OLTP) – Online Analytical Processing (OLAP) – Extract Transform Load (ETL) – Data Warehouses – Data Marts.

UNIT - IV:

Big Data Processing Concepts: Introduction – Parallel Data Processing – Distributed Data Processing – Hadoop – Processing Workloads – Cluster – Processing in Batch Mode – Map – Combine – Partition – Shuffle and Sort.

UNIT - V:

Big Data Storage Technology: On-Disk Storage Devices – NoSQL Database – In-Memory Storage Device – Big Data Analytics Techniques – Quantitative Analysis – Qualitative Analysis – Data Mining – Statistical Analysis – A/B Testing – Correlation-Regression – Machine Learning.

UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned.

REFERENCES:

1. Paul Buhler, Wajid Khattak and Thomas Erl, "Big Data Fundamentals: Concepts, Drivers & Techniques", Prentice Hall Publications, 1st Edition, January 2016.
2. Dr. A.V.K. Shanthi, Dr. Praveen Kumar Misra, Dr. Bramah Hazela, Dr. Saptarshi Gupta, published a book "Big Data Analytics- Discovering, Analysying, Visualizing and Presenting Data", by Scientific International Publishing House.
3. Soraya Sedkaoui,"Data Analytics and Big Data", Wiley, 2018.
4. DT Editorial Services, "Big Data (Hadoop 2, Map Reduce, Hive, YARN, Pig, R and Data Visualization) Black Book", 1st Edition, Dreamtech Press, 2016.
5. Soumendra Mohanty, Madhu Jagadeesh, and Harsha Srivatsa, "Big Data Imperatives: Enterprise Big Data Warehouse, BI Implementations and Analytics", Apress Media, 2013.
6. Tom White, "Hadoop: The Definitive Guide", Third Edition, O'Reilly Media, 2012.

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Recall the basics of Big Data and its applications
- Know about OLTP,OLAP and ETL,
- Apply the cutting-edge tools and technologies to analyze Big Data
- Analyse various big data tools and techniques
- Evaluate various storage and analytical techniques.

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Third Year   **PROJECT**   **Semester-VI**

Code: **Credit: 3**

The candidate shall be required to take up a Project Work by group or individual and submit it at the end of the final year. The Head of the Department shall assign the Guide who, in turn, will suggest the Project Work to the students in the beginning of the final year. A copy of the Project Report will be submitted to the University through the Head of the Department on or before the date fixed by the University.

The Project will be evaluated by an internal and an external examiner nominated by the University. The candidate concerned will have to defend his/her Project through a Viva-voce.

ASSESSMENT/EVALUATION/VIVA VOCE:

1. PROJECT REPORT EVALUATION (Both Internal & External)

    I. Plan of the Project   - 20 marks

    II. Execution of the Plan/collection of   - 45 marks
             Data / Organisation of Materials /
             Hypothesis, Testing etc. and
             presentation of the report.

    III. Individual initiative   - 15 marks

2. Viva-Voce / Internal & External   - 20 marks

        TOTAL   **- 100 marks**

PASSING MINIMUM:

	Vivo-Voce 20 Marks	**Dissertation 80 Marks**
Project	40% out of 20 Marks (i.e. 8 Marks)	40% out of 80 marks (i.e. 32 marks)

A candidate who gets less than 40% in the Project must resubmit the Project Report. Such candidates need to defend the resubmitted Project at the Viva-voce within a month. A maximum of 2 chances will be given to the candidate.

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Third Year   **SKILL BASED ELECTIVE II**   **Semester VI**
                    MOBILE APPLICATION DEVELOPMENT
Code   **(Theory)**   **Credit: 2**

COURSE OBJECTIVES:

- To gain a basic knowledge of Android application development
- To understand about user Interfaces for the Android platform.
- To familiarize of the Android Studio development tool.

UNIT - I:

Introduction to Android: The Android Platform, Android SDK, Eclipse Installation, Android Installation, building you First Android application, Understanding Anatomy of Android Application, Android Manifest file

UNIT - II:

Android Application Design Essentials: Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions

UNIT - III:

Android User Interface Design Essentials: User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation

UNIT - IV:
Testing Android applications, Publishing Android application, Using Android preferences, Managing Application resources in a hierarchy, working with different types of resources.

UNIT - V:

Using Common Android APIs: Using Android Data and Storage APIs, managing data using Sqlite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World.

UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned

REFERENCES:

1. Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2011.
2. Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd,2010
3. Mark L Murphy, "Beginning Android3", Apress Publications, 2011.
4. Bill Phillips, Chris Stewart, Kristin Marsicano, Brian Gardner, "Android Programming", Big Nerd Ranch, 2019.
5. Barry Burd, John Paul Mueller, "Android Application Development All in one for Dummies",Wiley Publications, 2020.

6. NamrataBandekar, Darryl Bayliss, Fuad Kamal, "Android Apprentice (Fourth Edition) Beginning Android Development with Kotlin", R R BOWKER LLC, 2021.
7. https://www.javatpoint.com/android-tutorial

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Identify various concepts of mobile application programming in Android platform
- Implement the business logic in an app with java
- Understand Android User Interface Design with XML
- Know about Common Android APIs
- Deploy applications to the Android marketplace for distribution.

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BHARATHIDASAN UNIVERSITY,   **TIRUCHIRAPPALLI - 620 024.**

ALLIED MATHEMATICS for

B.C.A., B.Sc. ARTIFICIAL INTELLIGENCE & MACHINE LEARNING,
B.Sc. COMPUTER SCIENCE, B.Sc. CYBER SECURITY,
B.Sc. INFORMATION TECHNOLOGY & B.Sc. SOFTWARE DEVELOPMENT
PROGRAMMES

(Applicable to the candidates admitted from the academic year 2022-23 onwards)

ALLIED COURSE I
ALGEBRA AND CALCULUS
Code: **(Theory)**   **Credit: 4**

COURSE OBJECTIVES:

- To train the students to solve the problems in theory of equations
- To provide knowledge about the matrix, differentiation and various methods for evaluation of integrals.

UNIT – I:

Theory of Equations: Relation between roots & coefficients – Transformations of Equations – Diminishing ,Increasing & multiplying the roots by a constant- Forming equations with the given roots –Rolle's Theorem, Descarte's rule of Signs(statement only) – simple problems.

UNIT – II:

Matrices : Singular matrices – Inverse of a non-singular matrix using adjoint method - Rank of a Matrix – Consistency - Characteristic equation, Eigen values, Eigen vectors – Cayley Hamilton's Theorem (proof not needed) –Simple applications only

UNIT – III:

Differentiation: Maxima & Minima – Concavity , Convexity – Points of inflexion - Partial differentiation – Euler's Theorem - Total differential coefficients (proof not needed) –Simple problems only.

UNIT – IV:

Integration : Evaluation of integrals of types:

$$1) \int \frac{px + q}{ax^2 + bx + c}dx \quad 2) \int \frac{px + q}{\sqrt{ax^2 + bx + c}}dx \quad 3) \int \frac{dx}{a + b\cos x} \quad 4) \int \frac{dx}{a + b\sin x}$$

Evaluation using Integration by parts – Properties of definite integrals – Fourier Series in the range $(0, 2\pi)$ – Odd & Even Functions – Fourier Half range Sine & Cosine Series

UNIT – V:

Differential Equations: Variables Separable – Linear equations – Second order of types $(aD^2 + bD + c)y = F(x)$ where a,b,c are constants and $F(x)$ is one of the following types

$(i) e^{Kx}$ $(ii) \sin(kx)$ or $\cos(kx)$ $(iii) x^n, n$ being an integer $(iv) e^{Kx} f(x)$

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Derivatives of Implicit and parametric Functions

REFERENCES:

1. T.K. Manickavasagam Pillai & others, Algebra, Volume I, S.V Publications , 1985 Revised Edition (Units I, II)
2. S. Narayanan, T.K. Manicavachagam Pillai, Calculus, Vol. II, S. Viswanathan Pvt Limited, 2003. (Units III, IV and V)
3. M.L. Khanna, Differential Calculus, Jaiprakashnath and Co., Meerut-2004.

COURSE OUTCOMES:

After completing this course, the students will be able to

- Train the students to solve the problems in theory of equations.
- Apply Cayley Hamilton theorem for finding the inverse of square matrices.
- Get exposed the basic concepts of differentiation and integration.
- Acquire the knowledge about differential equations.

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Code: (Theory) **Credit: 2**

COURSE OBJECTIVES:

- To learn knowledge about an algebraic and transcendental equations.
- To make the students gain wide knowledge in probability which plays a main role in solving real life problems.

UNIT – I:

Algebraic & Transcendental equations: Bisection Method, Newton Raphson Method, Iteration method - Finite differences – Forward, Backward differences – Newton's forward & backward difference interpolation formulae – Lagrange's interpolating polynomial.

UNIT – II:

Numerical differentiation - Numerical Integration using Trapezoidal rule and Simpson's first & second rules (proof not needed) - Solutions to Linear Systems – Gaussian Elimination Method – Jacobi & Gauss Siedal iterative methods – Theory and problems.

UNIT – III:

Numerical solution of ODE: Solution by Taylor Series Method, Euler's Method, Runge - Kutta 2nd order method- Adam's Predictor Corrector Method and Milne's Predictor Corrector Methods.

UNIT – IV:

Arithmetic Mean – Geometric Mean – Harmonic Mean - Median, Mode , Standard Deviation - Quartile Deviation – Percentiles - Expectation – Variance and covariance.

UNIT – V:

Correlation and Regression –Properties of Simple Correlation and regression coefficients – Simple Numerical Problems only.

UNIT – VI   CURRENT CONTOURS (For Continuous Internal Assessment Only):

An introduction to MATLAB

REFERENCES:

1. S.S. Sastry, Numerical Analysis (Unit 1 , 2 , 3)
2. Gupta. S.C & Kapoor, V.K, Fundamentals of Mathematical Statistics, Sultan Chand & sons, New Delhi -1994. (Units 4 & 5)

3. M.K. Jain, S.R.K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Private Limited, 1999.
4. C.E. Froberg, Introduction to Numerical Analysis, II Edn., Addison Wesley, 1979.

COURSE OUTCOMES:

After completing this course, the students will be able to

- Solve algebraic and transcendental equations.
- Appreciate the importance of probability of random variables and understand the correlation and regression coefficients.

*****

OPERATIONS RESEARCH

Code: **(Theory)**   **Credit: 4**

COURSE OBJECTIVES:

- To learn the basic concepts about Linear Programming Problem, Transportation Problem Assignment Problem, Sequencing Problem and Network.
- To make students solve real life problems in Business and Management.

UNIT – I:

Operations Research: Introduction - Basics of OR – OR & decision making – Role of Computers in OR - Linear programming formulations & graphical solution of two variables – Canonical & standard forms of LPP

UNIT – II:

Simplex Method: Simplex Method for <, =, > constraints – Charne's method of penalties– Two phase Simplex method.

UNIT – III:

Transportation problem: Transportation algorithm –Degeneracy algorithm – Degeneracy in Transportation Problem, Unbalanced transportation problem- Assignment algorithm –Unbalanced Assignment problem

UNIT – IV:

Sequencing problem: Processing of n jobs through two machines – Processing of n jobs through 3 machines – processing of two jobs through m machines.

UNIT – V:

Networks: Network – Fulkerson's rule - measure of activity – PERT computation – CPM computation - Resource scheduling.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Integer and Dynamic programming.

REFERENCES:

1. Manmohan & Gupta , Operations Research, Sultan Chand Publishers, New Delhi
2. Prem Kumar Gupta and D.S. Hira, Operations Research : An Introduction,
3. S. Chand and Co., Ltd. New Delhi,
4. Hamdy A. Taha, Operations Research (7th Edn.), McMillan Publishing Company, New Delhi, 1982.

COURSE OUTCOMES:

After completing this course, the students will be able to

- Acquire the basic concepts of LPP.
- Apply various methods for finding a solution of an LPP.
- Use the basic concepts of TP, AP and Network Problems to develop the problem solving skills.

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BHARATHIDASAN UNIVERSITY TIRUCHIRAPPALLI - 620 024.

ALLIED PHYSICS FOR B.Sc. PROGRAMMES

(For the candidates admitted from the academic year 2022-23 onwards)

ALLIED COURSE I
PHYSICS I
Code: (Theory)   Credit: 4

COURSE OBJECTIVES:

- To know the elastic nature of materials, analyze the expression for Young's modulus and comprehend about viscosity and surface tension of fluids.
- To acquire knowledge of the centre of gravity, states of equilibrium of rigid bodies and stability of floating bodies.
- To understand the laws of thermodynamics, thermal conductivity and blackbody radiation.
- To familiarize the concepts of interference and diffraction.
- To know the formation, characteristics and applications of diodes and transistors.

UNIT - I   PROPERTIES OF MATTER:

Elasticity: Stress – Strain – Hooke's law – Young's modulus - Behaviour of wire under progressive tension – Bending of beams – Expression for the bending moment – Measurement of Young's modulus by bending of beams – Non-uniform bending and Uniform bending.

Viscosity: Streamline flow and Turbulent flow – critical velocity - Poiseuille's formula – Determination of coefficient of viscosity of a liquid (Variable pressure head).

Surface Tension: Drop weight method of determining the surface tension of a Liquid – Experiment to determine the interfacial tension.

UNIT - II   MECHANICS:

Centre of Gravity – Centre of Gravity of a solid hemisphere – Hollow hemisphere – Solid cone.
States of Equilibrium: Equilibrium of a rigid body –Stable, unstable and neutral equilibrium – Example.
Stability of Floating bodies – Metacentre – Determination of Metacentric height of a ship.

UNIT - III THERMAL PHYSICS:

Thermodynamics: Laws of thermodynamics – Reversible and irreversible process – Heat engine – Carnot's theorem.

Radiation: Black body – Stefan's law – Newton's law of cooling – Newton's law of cooling from Stefan's law – Experimental determination of Stefan's constant –Wien's displacement law – Rayleigh - Jean's law – Planck's law.

Heat Conduction: Coefficient of Thermal Conductivity –Determination of Thermal Conductivity of a bad Conductor by Lee's disc method.

UNIT - IV OPTICS:

Interference: Superposition of waves –Principle of interference – Air wedge – Newton's rings.

Diffraction: Introduction –Plane diffraction Grating – Theory of plane transmission Grating.

Fiber Optic communication: Introduction – Optic Fiber – Numerical Aperture – Coherent bundle – Fiber optic communication System and its advantages.

UNIT – V ELECTRONICS:

Intrinsic and extrinsic semiconductor – PN Junction diode – Biasing of PN junction – V-I characteristics of junction diode – Rectifiers – Half wave – Full wave and Bridge rectifiers – Zener diode – Characteristics of Zener diode – Voltage regulator – Transistor – Characteristics of transistor – CB and CE mode –Transistor as an amplifier.

UNIT – VI CURRENT CONTOURS (For internal continuous assessment only):

Reinforced concrete–Advanced Nano photonics–Surface tension of thermal fluids–Nano fluids–Low Viscous silicon liquid immersed transformers – Bio diesel – fueled diesel engines –Electronic transformers.

REFERENCES:

1. R.Murugeshan, *Properties of matter,* S.Chand & Co. Pvt. Ltd., Revised Edition, 2017.
2. Narayanamoorthy and N.Nagarathinam, *Mechanics Part II,* The National Publishing Company, Chennai, 2005.
3. Dr.N.Subramaniyam, Brijlal and Dr.M.N.Avathanulu*, Optics*, S.Chand & Co. Pvt. Ltd. - 5 Edition, New Delhi, 2015.
4. BrijLal, N.Subrahmanyam, P.S.Hemne, *Heat and Thermodynamics and Statistical Physics,* S.Chand & Co. Pvt. Ltd., Revised edition, 2021.
5. V.Vijayendran, S.Viswanathan, *Digital Fundamentals,* Printers & Publishers Private Ltd, Chennai, 2004.
6. Brijlal and Subramaniyan, *Properties of Matter*, S.Chand & Co. Pvt. Ltd, 2005.

7. D S Mathur, *Mechanics*, S.Chand & Co. Reprint Edition, 2006
8. Brijlal and Subramaniyan, *Thermal Physics*, S.Chand & Co., 2001.
9. R.Murugeshan and Kiruthiga Sivaprasath, *A Text Book of Optics*, S.Chand & Co. Pvt. Ltd.- 9 threvised edition Ramnagar, New Delhi, 2014.
10. V.K.Mehta and Rohit Mehta, *Principles of Electronics*, S.Chandand company Ltd., 2015.
11. https://byjus.com
12. https://digitalcommons.unl.edu/cgi/viewcontent.
13. https://sciencing.com

COURSE OUTCOME:

Upon completion of this course, the students would be able to

- Apply the concepts of elasticity, viscosity and surface tension to solve problems encountered in everyday life.
- Understand the centre of gravity, states of equilibrium of rigid bodies and also stability of floating bodies.
- Understand the laws of thermodynamics, thermal conductivity and black body radiation.
- Understand the theories and experiments on interference and diffraction using air wedge, Newton's ring and grating.
- Know the formation, characteristics and applications of diodes and transistor.

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PHYSICS PRACTICAL I

Code: **(Practical)**   **Credit: 2**

COURSE OBJECTIVES:

- To educate and motivate the students in the field of Physics.
- To acquire the skill of handling instrument.
- To develop the observation and circuit drawing skills.
- To enhance the process-oriented performance skills.
- To inculcate the skill of experimental verification of laws in Physics.

(ANY12 EXPERIMENTS)

EXPERIMENTS:

1. Determination of Young's modulus by Non-Uniform bending using Pin and Microscope.
2. Determination of Young's modulus by Uniform bending using Scale and Telescope.
3. Surface tension and Interfacial Surface tension by Drop weight Method.
4. Coefficient of viscosity of a liquid –Variable Pressure head Method.
5. Specific heat capacity of a liquid by Newton's law of cooling Method.
6. Thermal conductivity of a bad conductor by Lee's disc Method.
7. Spectrometer–Refractive index of a solid prism.
8. Spectrometer–Finding the wavelength of spectral lines using Grating–Normal incidence method.
9. Newton's Rings–Determination of radius of curvature of a long focus lens.
10. Air wedge –Thickness of the given thin wire.
11. Meter bridge–Determination specific resistance of a coil.
12. Carry Foster's Bridge – Determination of specific resistance of a coil.
13. Potentiometer – Calibration of a Low range voltmeter.
14. Characteristics of a Junction diode–Forward resistance and knee voltage.
15. Characteristics of a Zenerdiode – Break down voltage.
16. Basic logic gates – AND, OR and NOT gates using discrete components.
17. Basic logic gates – AND, OR and NOT gates using ICs.
18. Realizing NAN Dasa Universal gate.
19. Realizing NOR as a Universal gate.
20. Verification of De-Morgan's theorem.

REFERENCES:

1. Department of Physics, *Practical Physics,* (B.Sc. Physics Main), St. Joseph's College, Tiruchirapalli - 2009.
2. Dr.S.Somasundaram, *Practical Physics,* Apsara publications, Tiruchirapalli, 2012.
3. M.N.Srinivasan, S.Balasubramanian, R.Ranganathan, *A text*

book of Practical Physics, S.Sultanch and publications, New Delhi, 2013.

4. Dr.R.K. Shukla, Dr.Anchal Srinivastava, *Practical Physics*, New Age International (P) Ltd, India, 2022.
5. P. R.Sasikumar, *Practical Physics*, PHI Learning Pvt. Ltd, New Delhi, 2011.
6. C.L.Arora, *A Text Book of Practical Physics*, S.Sultanch and publications, New Delhi, 2019.
7. InduPrakash, Ram Krishna, A.K. Jha, *A text book of Practical Physics*, Kitab Mahal Publications, Delhi, 2011.
8. N.N.Ghosh, *B.Sc Practical Physics*, Bharath Bhawan Publications, India, 2nd Edition 2017.
9. https://www.kanchiuni.ac.in/maths
10. https://nptel.ac.in/courses

Course Outcome:

Upon completion of this course, the student would be able to :

• Understand the Laboratory techniques.
• Evaluate a process based on the results obtained from the experiments quantitatively and qualitatively.
• Extend the scope of investigation as expected.
• Communicate a process with help of the outcomes of an experiment.
• Develop the skill of conducting an experiment collaboratively and ethically.

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ALLIED COURSE II
PHYSICS II

Code: **(Theory)**   **Credit: 4**

COURSE OBJECTIVES:

- To understand the Coulomb's law and Gauss theorem and to gain a brief knowledge of capacitors.
- To acquire the knowledge on properties, types of magnetic materials and hysteresis of ferromagnetic material.
- To know atom models and understand the properties, types of x-rays and Crystal structure.
- To study the basics of nucleus and their properties, nuclear reaction, nuclear models and elementary particles.
- To learn the binary number system, binary arithmetic operations, logic gates and De-Morgan's theorem.

UNIT - I   ELECTROSTATICS:

Coulomb's inverse square law – Gauss theorem and its applications - Intensity at a point due to a charged sphere and cylinder – Principle of a capacitor – Capacity of a spherical and cylindrical capacitors–Energy stored in a capacitor–Loss of energy due to sharing of charges – Capacitors in series and parallel–Types of capacitors.

UNIT – II   MAGNETISM:

Intensity of magnetization – Susceptibility – Types of magnetic materials – Properties of para, dia and ferromagnetic materials–Cycle of magnetization – Hysteresis – B-H curve –Applications of B-Hcurve–Magnetic energy per unit volume–Ferro magnets and their applications.

UNIT - III   ATOMIC PHYSICS:

Atom Models: Summerfield's and Vector atom Models – Pauli's exclusion principle –Various quantum number sand quantization of orbits.

X-rays: Continuous and Characteristic X-rays – Mosley's Law and its importance –Bragg's law – Miller indices – Determination of Crystal Structure by Laue's Powder photo graph method.

UNIT - IV   NUCLEAR PHYSICS:

Introduction–Nucleus–Classification of Nuclei – Nuclear Size – Charge – Mass and Spin – Liquid drop model –Nuclear Radiations and their properties-Particle accelerators – Betatron – Proton Synchrotron – Four types of reactions –Elementary particles and their classifications.

UNIT - V   DIGITAL ELECTRONICS:

Decimal–Binary Octal and Hexa Decimal number systems and their Mutual Conversions – 1's and 2's complement of a Binary number and Binary arithmetic (Addition, Subtraction, Multiplication and Division) – Binary Subtraction by 1's and2's complement method – Basic logic gates –AND, OR, NOT – NAND, NOR and EX-OR gates – NAND and NOR as universal gates – De-Morgan's Theorems.

UNIT – VI CURRENT CONTOURS (For internal continuous assessment only):

Magnetic and electromagnetic components- Atom interferometer- Nuclear reactor simulations – Cold fusion – Artificial intelligence – Electronic School books.

REFERENCES:

1. R.Murugeshan, Er.Kiruthiga Sivaprasath, *Modern Physics*, S.Chand & Co, New Delhi, First edition, 2004
2. R.Murugeshan, *Electricity and Magnetism*, S.Chand & Co, New Delhi,Third Revised Edition, 2008.
3. Brijlal & Subramanian, *Electricity and Magnetism,* Ratan Prakashan Mandir, 1995.
4. R.S.Sedha, *A text book of Digital Electronics*, S.Chand & Co, New Delhi, First Edition, 2008.
5. R.Murugesan, *Allied Physics Paper I and II*, S.Chand & Co, New Delhi, Revised Edition, 2010.
6. Arthur Beiser, Mahajan, Choudhury, *Concepts of Modern Physics*, Pustakkosh Pubications, India, 2015
7. GurbinderKaur, Gary R Pickrell, *Modern Physics*, Tata Mcgraw Hill Educational (P) Ltd, India, 2014.
8. Narayanamurthi, *Electricity and Magnetism*, The National Publishing Co, First Edition, 1988.
9. J.B.Rajam, *Atomic Physics*, S.Chand & Company Limited, New Delhi, First Edition, 1990.
10. B.N.Srivastava, *Basic Nuclear Physic*, Pragati Prakashan, Meerut, 005.
11. Donald P.Leach, Albert Paul Malvino, Goutam Saha, *Digital principle and Applications,* Mc Graw-Hill Publishing Company, 6th Editions, New York, 2008.
12. https://wepdf.com/al/allied-physics
13. https://archive.nptel.ac.in/courses
14. https://nptel.ac.in/courses

COURSE OUTCOME:

Upon completion of this course, the student would be able to

- Understand Coulomb's law, Gauss theorem and gain a brief knowledge of capacitors.
- Understand the properties, types of magnetic materials and hysteresis of ferromagnetic material.
- Acquire the knowledge of atom models and X rays.
- Know the basics of nucleus and their properties, nuclear reaction, nuclear models and elementary particles.
- Learn the binary number system, binary arithmetic operations, logic gates and De-Morgan's Theorem.

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BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI – 620 024

APPLIED PHYSICS FOR B.Sc. COMPUTER SCIENCE PROGRAMME ONLY

(For the candidates admitted from the academic year 2022-23 onwards)

ALLIED COURSE I
APPLIED PHYSICS I

Code: **(Theory)**   **Credit: 4**

COURSE OBJECTIVES:

- To bring out the subjects related with the computer field which help students to keep pace with these topics.
- To make the students understand the basic concepts of current electricity alternating current and the related laws.
- To enable the learners to acquire knowledge about four different number systems, conversion, Boolean algebra, Logic gates and semiconductor memories.

UNIT – I   CURRENT ELECTRICITY:

Ohm's Law- Verification of Ohm's Law-Kirchhoff's law- Applications of Kirchhoff's law Wheat stone's bridge - Metre bridge- Carey Foster's bridge- Potentiometer Measurement of Current and Resistance- Calibration of low range Voltmeter.

UNIT – II   ALTERNATING CURRENT:

AC circuits with double components – measurement of current and voltage – power in an AC Circuit-Power Factor (derivation)- Wattless current – Choke - series and parallel resonant circuits - Impedance-Q factor- Sharpness of resonance.

UNIT - III   NUMBER SYSTEMS CODES AND LOGIC GATES:

Number Systems - Conversions - Binary: Addition, Subtraction, Multiplication, Division- 8421 Code - BCD Code - Excess 3 code - Gray code - Binary to Gray and Gray to Binary Conversion - ASCII code – Basic and Derivative Gates: AND, OR, NOT, NAND, NOR, EX-OR - NAND & NOR as Universal Gates.

UNIT – IV   BOOLEAN ALGEBRA, ARITHMETIC AND COMBINATIONAL LOGIC CIRCUITS:

Basic laws of Boolean algebra - De Morgan's theorem - Verification of Boolean expression using Boolean laws - Half-adder - Full adder - Half-Sub tractor- Full sub tractor (using basic gates) – Encoder - Decimal to BCD encoder- Decoder -BCD to decimal decoder.

UNIT – V   SEMICONDUCTOR MEMORIES:

Introduction – ROM using diodes and transistors – ROM in terms of digital circuits – Building memory of larger capacity – PROM – EPROM – EEPROM – ROM as a unit in microcomputers – RAM – Static RAM – Dynamic RAM – Memory Parameters.

UNIT – VI   CURRENT CONTOURS (For continuous internal assessment only):

Solar electricity- Hydroelectricity -Digital camera-Digital television-CRO-Digital computer

REFERENCES:

1. BrijLal and N. Subrahmanyam, *A Text Book of Electricity and Magnetism*, S. Chand & Company Pvt. Ltd, New Deihi-2020.
2. Puri V.K., *Digital Electronics circuits and systems*, TATA Mcgraw hill publications, New Delhi, 2011.
3. Vijayendran. V & Subramanian. V, *Introduction to Integrated Electronics*, S. Viswanath PVT Ltd., Chennai 2012.
4. Murugeshan. R, *Electricity and Magnetism,* S. Chand & Company Ltd., Tenth edition, 2017.
5. Sundaravelusamy, A, *Applied Physics Paper-I B.Sc Computer Science,* Karur:Priya Publications, 2011.
6. Narayanamurthi and Nagarathinam, *Electricity and Magnetism,* The National Publishing Company, Madras, 1994.
7. Murugeshan. R, *Electricity and Magnetism,* S. Chand & Company Ltd., 2015.
8. Gothaman W.H., *Digital Electronics,* Prentice Hall of India PVT., New Delhi, 1996.
9. Sanjay D Jain, *Applied Physics*, Universities Press, Hyderabad, Telengana. 2013
10. Tewari K K , *Electricity and Magnetism,* S. Chand & Company Ltd.,3rdedition,2007.
11. Sathya Prakash, *Electricity and Magnetism,* Pragati prakashan, 2016.
12. ArthurBeiser, *Concepts of Modern Physics* 2009, McGraw-Hill
13. J.R. Taylor, C.D. Zafiratos, M.A. Dubson*, Modern Physics*, 2009, PHI Learning.
14. Albert Paul, Malvino, *Digital Principles and Applications*, Delhi: Tata Mcgrawhill Publishing, 2012.
15. Tewari K K , *Electricity and Magnetism,* S. Chand & Company Ltd.,3rdedition,2007.
16. 1.https://archive.nptel.ac.in/courses/115/106/115106122/
17. 2.https://pages.uoregon.edu/rayfrey/DigitalNotes.pdf
18. 3.https://nptel.ac.in/courses/117106086

COURSE OUTCOMES:

Upon completion of this course, the students would be able to

- Recall the basic concepts of current electricity and its various laws.
- Solve basic electronics problems with ac circuits that involve capacitance, inductance, impedance, reactance and power calculations.
- Differentiateall the four number systems studied.
- Review Boolean algebra and draw arithmetic circuits.
- Analyse the calibration of electrical instruments.

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APPLIED PHYSICS

Code: **(Practical)**   **Credit: 2**

COURSE OBJECTIVES:

- To familiarize students with basic laboratory equipment to study the physics concepts encountered in the lecture course.
- To give knowledge of some basic electronic components and circuits.
- To promote the exhaustive requirements and expectations of the students to acquire practical knowledge for the theory given in their syllabus.

ANY 12 EXPERIMENTS:

1. Semi-Conductor diode - Characteristics.
2. Zener diode – Characteristics.
3. FET- Characteristics.
4. Transistor Characteristics - CE configuration.
5. Transistor Characteristics-CB Configuration.
6. Field along the axis of a coil – Determination of M and H
7. Metre Bridge-Determination of Specific Resistance.
8. Potentiometer-Measurement of Current.
9. Potentiometer-Calibration of low range voltmeter.
10. Carey Foster's Bridge- Determination of Specific Resistance.
11. LCR - Series resonance circuit
12. LCR - Parallel resonance circuit
13. Mathematical Operator-Addition, Subtraction using OP-Amp.
14. Logic Gates (AND, OR, NOT, NAND, NOR) Using IC's. -Verification of truth tables.
15. NAND and NOR as Universal Gates.
16. Verification of De-Morgan's Theorems.
17. Half Adder and Half Subtractor using logic gates.
18. Full Adder and Full Subtractor using logic gates.
19. Single Stage Amplifier.
20. Logic Gates (AND, OR, NOT) Using Discrete's. Components–Verification of truth tables.

REFERENCES:

1. Srinivasan M.N. Balasubramanian S. & Renganathan R., A Text book of Practical Physics, Sulthan Chand & Sons, New Delhi, 2000.
2. Somasundram S., Practical Physics, Apsara Publications, Tiruchirappalli.2012.
3. Arora C L., B.Sc. Practical physics, Chand and company, 2010.
4. Department of Physics, Practical Physics, (B.Sc. Physics Main), St. Joseph's College, Tiruchirapalli 2009. .
5. Kushwaha P S., Applied physics practical & viva-voce, Bharat BharatiPrakashan&Co, 2015.
6. John Henderson, Practical Electricity and Magnetism, Forgotton books publisher, 2018.
7. Tooley M .,Practical Digital Electronics Hand book Bpb Publications,2008
8. https://nptel.ac.in/courses/122106025

9.   https://onlinecourses.nptel.ac.in/noc20_ph16/preview

COURSE OUTCOMES:

Upon completion of this course, the students would be able to

- Gain the practical knowledge about electricity, magnetism and measurements such as resistance, voltage, current.
- Distinguish electronic components
- Construct the learnt electronic circuits on their own
- Analyze the logic gates and their usage in digital circuits.
- Develop the skill of conducting an experiment collaboratively.

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ALLIED COURSE II
APPLIED PHYSICS II

Code: (Theory)   Credit: 4

COURSE OBJECTIVES:

- To impart knowledge of certain important fields of physics by simplifying the learning process to a greater extent
- To make the students understand how Laser and Maser is powerful than normal light, their types and its advantages.
- To inculcate the knowledge of transistor and different configurations, H parameters and applications of FET amplifier.

UNIT – I   SEMICONDUCTOR PHYSICS

Theory of energy bands in crystals- Distinction between conductors, Insulators and Semiconductors – Intrinsic and Extrinsic semiconductors – Hall effect in semiconductor– Zener diode –Tunnel diode - Backward diode - Breakdown voltage avalanche Breakdown.

UNIT – II   TRANSISTORS:

Transistors - PNP and NPN transistors - DC Characteristics of CE and CB configuration-Hybrid parameters-Functions of Transistor as an amplifier and oscillator – FET-N-channel FET - performance Characteristics - FET amplifier.

UNIT – III   LASERS:

Laser and Maser - Basic concepts of stimulated emission –Population inversion and Meta stable state-He-Ne laser-Ruby laser - Ammonia Maser - production – Advantages.

UNIT – IV   OPTO-ELECTRONIC DEVICES:

LED Radiation transition - Emission spectra –Luminescent efficiency-Method of Excitation-Visible LED-Materials for LED - LED configuration -Photo conduction – Photo diode-Photo transistor-electronic watches-seven segment display -LCD.

UNIT - V   OPERATIONAL AMPLIFIER:

The basic operational amplifier– Inverting and Non inverting operational Amplifier – Differential operational amplifier- CMRR-Basic uses of operational amplifier as sign and scale changer and phase shifter - Adder – Subtractor – comparator - Differentiator - ADC Successive approximation.

UNIT – VI   CURRENT CONTOURS (For continuous internal assessment only):

Electric car technology-IOT sensors and devices-Robot control-Laser cladding-Barcode reader- Laser surgery-Laser pointer-ADC-DAC.

REFERENCES:

1. Jacob Millman, Micorelectronics, McGraw Hill publications, New Delhi, 1985.
2. Mithal G.K. and Vanvasi, Pulse and Digital electronics, Khanna publication, New Delhi, 2006.
3. Sundaravelusamy, A, Applied Physics Paper-II B.Sc Computer Science, Karur: Priya Publications, 2011.
4. Theraja, B L, Electronics Devices & Circuits, Delhi: S. Chand & Co, 2011
5. Mehta V.K. & Mehta Rohit, Principles of Electronics (Multicolour Edition) ,10th Rev.edition,2006
6. Ramanan, Function Electronics, TMH, New Delhi, 1994.
7. Millman & Halkias, Electronics devices and Circuits, McGraw-Hill, 1967.
8. J.R. Taylor, C.D. Zafiratos, M.A. Dubson, *Modern Physics*, 2009, PHI.
9. Sanjay D Jain, Engineering Physics, Universities Press, Hyderabad, Telengana 2012.
10. Ali, S N, Basic Electronics, Delhi: Vayu Education of India,2011
11. Amar K Gangully, Opto Electronic Devices and Circuits Theory and Applications, Delhi: Narosa Publishing House, 2011.
12. Mehta V.K, Principles of Electronics, S. Chand & Co, 2005.electronics.
13. William T. Silfvast, *Laser fundamentals* Second edition ,University of Central Florid, Cambridge University Press, June 2012.
14. K. Thyagarajan Ajoy Ghatak, *Lasers- Fundamentals And Applications* ,Edition: 2,Laxmi Publications Pvt Ltd,2019
15. Thomas F. Schubert, Jr. And Ernest M. Kim. *Fundamentals Of electronics. Book 1, Electronic devices and circuit applications,* San Rafael, California (1537 Fourth Street, San Rafael, CA 94901 USA): Morgan & Claypool, 2014.
16. **https://nptel.ac.in/courses/115102025**
17. **https://www.classcentral.com/course/swayam-laser-fundamentals-and-applications-12914.**
18. **https://www.tutorialspoint.com/linear_integrated_circuits_applications/linear_integrated_circuits_applications_op_amp_applications.htm**

COURSE OUTCOME:

Upon completion of this course, the students would be able to

- Understand the rapid growth of electronic technology.
- Know the semiconductors classification and their applications in various domains.
- Analyse the characteristics of transistor, transistor biasing circuits and oscillator circuits.
- Evaluate the advantages of Opto-Electronic Devices.
- Demonstrate analog electrical devices, particularly operational amplifiers and their applications applying the learnt concepts.

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PROFESSIONAL ENGLISH FOR PHYSICAL SCIENCES-I

OBJECTIVES:

- To develop the language skills of students by offering adequate practice in professional contexts.
- To enhance the lexical, grammatical and socio-linguistic and communicative competence of first year physical sciences students
- To focus on developing students' knowledge of domain specific registers and the required language skills.
- To develop strategic competence that will help in efficient communication
- To sharpen students' critical thinking skills and make students culturally aware of the target situation.

LEARNING OUTCOMES:

- Recognise their own ability to improve their own competence in using the language
- Use language for speaking with confidence in an intelligible and acceptable manner
- Understand the importance of reading for life
- Read independently unfamiliar texts with comprehension
- Understand the importance of writing in academic life
- Write simple sentences without committing error of spelling or grammar

  (Outcomes based on guidelines in UGC LOCF – Generic Elective)

UNIT 1: COMMUNICATION

1. **Listening**: Listening to instructions

2. **Speaking**: Telephone etiquette and Official phone conversations

3. **Reading** short passages (3 passages, one from each – Physics, Chemistry, Mathematics/Computer Science)

5. **Writing:** Letters and Emails in professional context

6. **Grammar in Context:**
   - Wh and yes or no,
   - Q tags
   - Imperatives
7, **Vocabulary in Context:** Word formation - .
   - i)   Creating antonyms using Prefixes
   - ii) Intensifying prefixes (E. g inflammable)

Changing words using suffixes

A) Noun Endings
B) Adjective Endings
C) Verb Endings

UNIT 2: DESCRIPTION

Listening – Listening to process description

Speaking - Role play
Formal: With faculty and mentors in academic environment, workplace communication
Informal: With peers in academic environment, workplace communication

Reading –Reading passages on products, equipment and gadgets

Writing – Writing sentence definitions (e.g. computer) and extended definitions (e.g. artificial intelligence)
Picture Description – Description of Natural Phenomena

Grammar **in Context**: Connectives and linkers.

Vocabulary – Synonyms (register) - Compare & contrast expressions.

UNIT 3: NEGOTIATION STRATEGIES

Listening - Listening to interviews of specialists / inventors in fields (Subject specific)

Speaking – Brainstorming. (mind mapping). Small group discussions (subject-specific)

Reading – longer Reading text. (Comprehensive passages)

Writing – Essay Writing (250 word essay on topics related to subject area, like pollution, use of pesticides in cultivation, merits and demerits of devices like mobile phones, merits and demerits of technology in development)

Grammar in Context: Active voice & Passive voice – If conditional - Collocations –Phrasal verbs

UNIT 4: PRESENTATION SKILLS

Listening - Listening to presentation. Listening to lectures. Watching – documentaries (discovery / history channel)

Speaking –Short speech
- Making formal presentations (PPT)

Reading – Reading a written speech by eminent personalities in the relevant field /Short poems / Short biography.

Writing - Writing Recommendations
Interpreting visuals - charts / tables/flow diagrams/charts

Grammar in Context – Modals

Vocabulary (register) - Single word substitution

UNIT 5: CRITICAL THINKING SKILLS

Listening - Listening to advertisements/news and brief documentary films (with subtitles)

Speaking – Simple problems and suggesting solutions.

Reading: Motivational stories on Professional Competence, Professional Ethics and Life Skills (subject-specific)

Writing Studying problem and finding solutions- (Essay in 200 words)

Grammar-Make simple sentences

Vocabulary -Fixed expressions

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SUGGESTED ACTIVITIES

UNIT 1

Listening: Links for formal conversation can be given - Gap filling exercises – Multiple Choice questions – Making notes.

Speaking - Role play activity

Reading – Note making. Note-Taking.

Writing: Guided Writing (developing hints)

        Email

Grammar: Vocabulary – Worksheets – Games.

UNIT 2

Listening-
Process Descriptions (Processes of Condensation and Evaporation./Process of Measuring the thickness of a wire using a Screw -Gauge./process of Exaction of sugar from sugarcane)

Speaking – Role Play

Reading – Multiple choice questions - Evaluative answers – Classifying and labeling

Writing - Picture description – Description of natural phenomena (rainbow, earthquake, volcanic eruption, erosion, natural disasters in 150 to 200 words).

Vocabulary: Expansion of compound nouns

UNIT 3
Listening- Gap fill exercises – Listening comprehension

Speaking -Debates

Reading -Reading comprehension

Writing – Essay Writing

Grammar - Vocabulary, Activities, Worksheets & Games.

UNIT 4

Listening - Note taking (of listening & viewing items) - Filling a table based on the listening item.

Speaking – JAM, Presentations. (PPT-TECHNICAL)

Reading-Reading comprehension

Writing– Difference between recommendations and instructions

Questions/MCQs based on graphs/flow diagrams/charts

Grammar: Vocabulary – Activities, Worksheets & Games.

UNIT 5

Listening – Radio News/ TV-News telecast /

Speaking - Watch or listen to documentaries and ask questions

Reading - Reading motivational stories (success stories in subject area)

Writing - Essay writing.

Grammar -Vocabulary –Activities, Worksheets & Games

Professional English-Semester-II [part-III -add on Course]

Weightage: 4 Credits   **Duration: 90hrs**

Objectives:

The Professional Communication Skills Course is intended to help Learners in Arts and Science colleges

- Develop their competence in the use of English with particular reference to the workplace situation.

- Enhance the creativity of the students, which will enable them to think of innovative ways to solve issues in the workplace.

- Develop their competence and competitiveness and thereby improve their employability skills.

- Help students with a research bent of mind develop their skills in writing reports and research proposals.

Unit 1- Communicative Competence   **(18 hrs)**

Listening – Listening to two talks/lectures by specialists on selected subject specific topics -(TED Talks) and answering comprehension exercises (inferential questions)

Speaking: Small group discussions (the discussions could be based on the listening and reading passages- open ended questions

Reading: Two subject-based reading texts followed by comprehension activities/exercises

Writing: Summary writing based on the reading passages.

Grammar and vocabulary exercises/tasks to be designed based on the discourse patterns of the listening and reading texts in the book. This is applicable for all the units.

Unit 2 - Persuasive Communication   **(18 hrs)**

Listening: listening to a product launch- sensitizing learners to the nuances of persuasive communication

Speaking: debates – Just-A Minute Activities

Reading: reading texts on advertisements (on products relevant to the subject areas) and answering inferential questions

Writing: dialogue writing- writing an argumentative /persuasive essay.

Unit 3- Digital Competence   (18 hrs)

Listening to interviews (subject related)

Speaking: Interviews with subject specialists (usingvideo conferencing skills)

Creating Vlogs (How to become a vlogger and use vlogging tonurture interests – subject related)

Reading: Selected sample of Web Page (subject area)

Writing: Creating Web Pages

Reading Comprehension: Essay on Digital Competence for Academic and Professional Life.

The essay will address all aspects of digital competence in relation to MS Office and how they can be utilized in relation to work in the subject area

Unit 4 - Creativity and Imagination   (18 hrs)

Listening to short (2 to 5 minutes) academic videos (prepared by EMRC/ other MOOC videos on Indian academic sites – E.g. https://www.youtube.com/watch?v=tpvicScuDyo)

Speaking: Making oral presentations through short films – subject based

Reading: Essay on Creativity and Imagination (subject based)

Writing – Basic Script Writing for short films (subject based)

- Creating blogs, flyers and brochures (subject based)
- Poster making – writing slogans/captions(subject based)

Unit 5- Workplace Communication& Basics of Academic Writing (18 hrs)

Speaking: Short academic presentation using PowerPoint

Reading & Writing: Product Profiles, Circulars, Minutes of Meeting.

Writing an introduction, paraphrasing

Punctuation(period, question mark, exclamation point, comma, semicolon, colon, dash, hyphen, parentheses, brackets, braces, apostrophe, quotation marks, and ellipsis)

Capitalization (use of upper case)

Outcomes of the Course.

At the end of the course, learners will be able to,

• Attend interviews with boldness and confidence.

- Adapt easily into the workplace context, having become communicatively competent.

- Apply to the Research &Development organisations/ sections in companies and offices with winning proposals.

Instruction to Course Writers:

1. **Acquisition of subject-related vocabulary should not be overlooked**. Textboxes with relevant vocabulary may be strategically placed as a Pre Task or in Summing Up
2. Grammar may be included if the text lends itself to the teaching of a Grammatical item. However, testing and evaluation does not include Grammar.

BHARATHIDASAN UNIVERSITY   **TIRUCHIRAPPALLI - 620 024**

PART-IV VALUE EDUCATION COURSE

FOR ALL UG ARTS, SCIENCE, COMMERCE AND MANAGEMENT
CHOICE BASED CREDIT SYSTEM – LEARNING OUTCOMES BASED
CURRICULUM FRAMEWORK (CBCS - LOCF)
(Applicable to the candidates admitted from the academic year 2022-2023 onwards)

First Year   **PART-IV**   **Semester-I**
                       VALUE EDUCATION
Code: **(Theory)**   **Credit: 2**

OBJECTIVES:

* To understand the philosophy of life and values through Thirukural
* To analyse the components of values education to attain the sense of citizenship
* To understand different types of values towards National Integration and international understanding
* To learn yoga as value education to promote mental and emotional health
* To understand human rights, women rights and other rights to promote peace and harmony

UNIT I :   PHILOSOPHY OF LIFE AND SOCIAL VALUES:

Human Life on Earth (Kural 629) -Purpose of Life (Kural 46) -Meaning and Philosophy of Life (Kural 131, 226) -Family (Kural 45), Peace in Family (Kural 1025) Society (Kural 446), The Law of Life (Kural 952), Brotherhood (Kural 807) Five responsibilities / duties of Man (a) to himself (b) to his family (c) to his environment (d) to his society, (e) to the Universe in his lives (Kural 43, 981).

UNIT-II – HUMAN VALUES AND CITIZENSHIP

Aim of education and value education: Evolution of value oriented education, Concept of Human values: types of Values- Character Formation – Components of Value education- A P J Kalam's ten points for enlightened citizenship- The role of media in value building

UNIT-III VALUE EDUCATION TOWARDS NATIONAL AND GLOBAL DEVELOPMENT:

Constitutional or national values: Democracy, socialism, secularism, equality, Justice, liberty, freedom and fraternity - Social Values: Pity and probity, self-control, universal brotherhood - Professional Values - Knowledge thirst, sincerity in profession, regularity, punctuality and faith -Religious Values: Tolerance, wisdom, character - Aesthetic Values- Love and appreciation of literature and fine arts and respect for the same- National Integration and International Understanding.

UNIT IV : YOGA AND HEALTH:

Definition, Meaning, Scope of Yoga - Aims and objectives of Yoga - Yoga Education with modern context - Different traditions and schools of Yoga - Yoga practices: Asanas, Pranayama and Meditation.

UNIT V : HUMAN RIGHTS:

Concept of Human Rights: Indian and international perspectives- Evolution of Human Rights- definitions under Indian and International documents -Broad classification of Human Rights and Relevant Constitutional Provisions: Right to Life, liberty ad Dignity- Right to equality- Right against exploitation- Cultural and Educational Right- Economic Rights- Political Rights- Social Rights - Human Rights of Women and Children – Peace and harmony.

UNIT - VI: CURRENT CONTOURS: (for continuous internal assessment only):

BOOKS FOR REFERENCES:

1. Thirukkural with English Translation of Rev. Dr. G.U. Pope, Uma Publication, 156, Serfoji Nagar, Medical College Road, Thanjavur 613 004
2. திருக்குறள் - ஜி.யு.போப் - ஆங்கில மொழியாக்கத்துடன் உமா நூல், வெளியீட்டகம், தஞ்சாவூர்,
3. Leah Levin, Human Rights, NBT, 1998
4. V.R. Krishna Iyer, Dialetics and Dynamics of Human Rights in India, Tagore Law Lectures.
5. Yogic Thearpy - Swami Kuvalayananda and Dr.S.L.Vinekar, Government of India, Ministry of Health, New Delhi.
6. SOUND HEALTH THROUGH YOGA - Dr.K.Chandrasekaran, Prem Kalyan Publications, Sedaptti, 1999.
7. Grose. D. N – "A text book of Value Education' New Delhi (2005)
8. Gawande . EN – "Value Oriented Education" – Vision for better living. New Delhi (2002) Saruptsons
9. Brain Trust Aliyar- "Value Education for Health, Happiness and Harmony" Erode (2004) Vethathiri publications

COURSE OUTCOMES: After completion of the course, the student will be able to:

- Apply the values in thirukural to be peaceful, dutiful and responsible in family and society
- Develop character formation and sense of citizenship
- Be secular, self-control, sincere, respectful and moral.
- Master yoga, asana and meditation to promote mental health
- Be attitudinal to follow the constitutional rights

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BHARATHIDASAN UNIVERSITY   **TIRUCHIRAPPALLI - 620 024**

PART-IV ENVIRONMENTAL STUDIES COURSE

**FOR ALL UG ARTS, SCIENCE, COMMERCE AND MANAGEMENT
CHOICE BASED CREDIT SYSTEM – LEARNING OUTCOMES BASED
CURRICULUM FRAMEWORK (CBCS - LOCF)**
(Applicable to the candidates admitted from the academic year 2022-2023 onwards)

First Year   **PART-IV**   **Semester-II**
                      ENVIRONMENTAL STUDIES
Code: **(Theory)**   **Credit: 2**

COURSE OBJECTIVES:

- To appreciate the scope of Environmental Studies, Community ecology and the interdisciplinary nature of environmental issues
- To have a basic knowledge of Natural resources its classification, concepts, and natural resources of India.
- The course designed to gain knowledge on values of biodiversity and conservation on global, national, and local scales
- To study about sources and effects of environmental pollution like air, water, soil, thermal, marine, nuclear and noise
- To understand the concerns related to Sustainable Development on environment and health
- To introduce the students in the field of Law and Policies and Acts both at the national and international level relating to environment.

UNIT-1:   The Multidisciplinary nature of environmental studies
             Definition, scope and importance.   (2 lectures)
             Need for public awareness

UNIT-2:   Natural Resources:
             Renewable and non-renewable resources:
             Natural resources and associated problems.

   a)   Forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
   b)   Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems.

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

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

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

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

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

(8 lectures)

Unit: 3   Ecosystems

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession.
- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem:-
- a. Forest ecosystem
- b. Grassland ecosystem
- c. Desert ecosystem
- d. Aquatic ecosystems, (ponds, streams, lakes, rivers, oceans, estuaries)

(6 lectures)

Unit: 4   Biodiversity and its conservation

- Introduction – Definition : Genetic, species and ecosystem diversity
- Biogeographical classification of India
- Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values
- Biodiversity at global, National and local levels
- India as a mega-diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
- Biological Diversity Act 2002/ BD Rules, 2004

(8 lectures)

Unit: 5   Environmental Pollution

Definition

Causes, effects and control measures of :
a.   Air Pollution
b.   Water Pollution
c.   Soil Pollution
d.   Marine Pollution
e.   Noise pollution
f.   Thermal Pollution
g.   Nuclear hazards

- Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution
- Pollution case studies
- Disaster management: floods, earthquake, cyclone and landslides.
- Ill-Effects of Fireworks: Firework and Celebrations, Health Hazards,
               Types of Fire, Firework and Safety

                                                  (8 lectures)

Unit: 6   Social Issues and the Environment

- From Unsustainable to Sustainable development.
- Urban problems related to energy.
- Water conservation, rain water harvesting, watershed management.
- Resettlement and rehabilitation of people; its problems and concerns.
Case studies
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation.
- Consumerism and waste products.
- Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and Control of Pollution) Act.
- Wildlife Protection Act.
- Forest Conservation Act.
- Issues involved in enforcement of environmental legislation
- Public awareness.

                                                  (7 lectures)

Unit: 7   Human Population and the Environment

- Population growth, variation among nations.
- Population explosion – Family Welfare Programmes
- Environment and human health
- Human Rights - Value Education

- HIV/ AIDS - Women and Child Welfare
- Role of Information Technology in Environment and human health
- Case studies.

Unit: 8   **Field Work**

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

References:

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt ltd, Ahamedabad – 380013, India, E-mail: mapin@icenet.net(R)
3. Brunner R.C. 1989, Hazardous Waste Incineration, McGraw Hill Inc 480 p
4. Clark R.S. Marine Pollution, Clanderson Press Oxford (TB)
5. Cunningham, W.P.Cooper, T.H.Gorhani E & Hepworth, M.T. 2001.
6. De A.K. Environmental Chemistry, Wiley Eastern Ltd
7. Down to Earth, Centre for Science and Environment (R)
8. Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford University, Press 473p.
9. Hawkins, R.E. Encyclopedia of India Natural History, Bombay Natural History Society, Bombay (R)
10. Heywood, V.H & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge University Press 1140 p.
11. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws Himalaya Pub. House, Delhi 284 p.
12. Mckinney, M.L. & Schoch R.M. 1996. Environmental Science systems & Solutions, Web enhanced edition 639 p.
13. Mhaskar A.K. Matter Hazardous, Techno-Science Publications (TB)
14. Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
15. Odum, E.P. 1971 Fundamentals of Ecology. W.B. Saunders Co. USA. 574 p
16. Rao MN & Datta, A.K. 1987 Waste Water treatment, Oxford & IBH Publication Co. Pvt Ltd 345 p.
17. Sharma B.K. 2001 Environmental chemistry Goel Publ House, Meerut.
18. Survey of the Environment, The Hindu (M).
19. Townsend C. Harper, J and Michael Begon, Essentials of Ecology, Blackwell science (TB)
20. Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media (R).
21. Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno-Science Publications (TB).
22. Wagner K.D. 1998 Environmental Management. W.B. Saunders Co. Philadelphia USA 499 p

(M) Magazine   (R) Reference   (TB) Textbook

23. http://nbaindia.org/uploaded/Biodiversityindia/Legal/33%20Biological%20Diversity%20

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COURSE OUTCOMES:

- Understand the environmental importance including interactions across local to global scales.
- The learners to update and analyze environmental relationships and interactions of environmental components
- The student to gain knowledge on importance of natural resources in a systematic way.

- The course content is introduce the concept of renewable and non-renewable energy resources and its scenario in India and at global level
- The students will know the relationship between biodiversity and ecosystem functions, direct and indirect values of biodiversity resources and their bioprospecting opportunities.
- The learners can gain awareness related on environmental pollution, causes and pollution control with case studies.
- Student to obtain the environmental ethics and gain knowledge about the sustainable development.
- Learners should realize the environmental legislation and policies of national and international regime and know the regulations applicable to industries and other organizations with significant Environmental aspects

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Second Year   **NON MAJOR ELECTIVE COURSE- I   Semester-III**
                                              TOUR OPERATIONS
Code: **(Theory)**   **Credit: 2**

OBJECTIVES:

- To know the definition and concepts of tourism
- To understand the types of travel formalities
- To learn the Preparation of Tour Itinerary

UNIT- I   TRANSPORT INDUSTRY:

Introduction to Transport Industry – Road Transport – Rail Transport - Cruise Liners Transportation - Reading of Railway Time Table – Railway Ticket Booking Procedures.

UNIT-II   AIR TRANSPORT:

Development of Air Transport – Formation of IATA – Airline Industry (International and Domestic) - Role of Airlines in Tourism.

UNIT-III   TRAVEL FORMALITIES:

Passport – VISA – Medical Certificates – Insurance – Customs - Foreign Exchange -Baggage allowance.

UNIT-IV   TRAVEL AGENCY:

Evolution of Travel Agency – Departments and Functions of a Travel Agency - Source of income for Travel Agency.

UNIT-V   TOURS OPERATIONS:

Origin of Tour Operations – Organising a Tour Program – Package Tours – Car Rentals – Tourist Guide Service -Preparation of Tour Itinerary – Tour Costing.

UNIT - VI   CURRENT CONTOURS (For Continuous Internal Assessment Only):

Railway Ticket Booking Procedures - Baggage allowance - Organizing a Tour Program - Preparation of Tour Itinerary.

REFERENCE BOOKS:

1. Burkart and Melik, **Tourism -Past, Present and Future**, London, 1995.
2. R.M. Kaul, **Dynamics of Tourism – A Triology**, Vol.I., New Delhi, 1997.
3. Seth Pran Nath, Successful Tourism Practices, Vol.I., New Delhi, 1997.
4. Lonely Planet India, Guidebook, Travel literature

COURSE OUTCOME:

- Successful completion of this course will lead the students to appropriate knowledge in Tour operations.

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CULTURAL TOURISM

Code: **(Theory)**   **Credit: 2**

OBJECTIVES:

1. To gain the knowledge of Cultural Resources.
2. To understand the idea of Cultural Festivals
3. To get the knowledge of Cultural destinations.

UNIT- I   CULTURAL TOURISM:

Definition - Meaning and Scope - Significance – Types of CulturalTourism Attractions - Culinary Traditions: North Indian - South Indian -Continental.

UNIT-II   ARTS AND CRAFTS :

Music: Hindustani   - Carnatic -Classical   Dances: Kuchipudi, Odisi, Kathakali, Manipuri,Kadhak and Bharathanattiyam - Folk Dances.

UNIT-III   CULTURAL RESOURCES OF NORTH INDIA :

Madura- Jaipur-Vaishnavadevi Temple Deccan Region: Konark – Amaravati- Somnathpur Temple -South India : Belur, Helibidu, Gurauvayur, Thiruppati- Madurai- Case studies: Darasuram, Velankanni.

UNIT-IV   FESTIVALS:

Konark Festival in Odisha - Sarang Festival in Kolkata - Music Festival in Chennai- -Dance Festivals in Mamallapuram and Chidambaram - Music Festival in Thiruvaiyaru.

**UNIT-V   INDIAN CULTURAL DESTINATION – CULTURAL INSTITUTION IN
                  INDIA:**

Cultural Event Management – Preservation and Conservation of Monuments – Role of ASI, ICO, MOS -Mutts in India- Unique features of Tamil Culture: Chastity, Equality, Nobility, Charity , Justice.

UNIT - VI   CURRENT CONTOURS (For Continuous Internal Assessment Only):

Hindustani Music - Culinary traditions of South India - Konark Festival–Role of ASI in heritage conservation.

REFERENCES :

1. V.s. Agarwal, the Heritage of Indian Art, Publications Divisions, Govt. of India, New Delhi.
2. A.L. Basham, The Wonder That was India, 3rd edition, London.
3. L. Basham, A Cultural History of India, Oxford University Press, New Delhi.
4. பண்டையநாகரிகங்கள் - எஸ்.எல். வி . மூர்த்தி
5. Art, Culture and Spirituality - Swami Atmaramananda&Dr.M.Sivaramkrishna.
6. The Book of Hindu Festivals and Ceremonies - Om Lata Bahadur.
7. Cultural Tourism In India- Luvkushmishra

COURSE OUTCOME:

- Successful completion of this course will lead the students to appropriate knowledge in Cultural Tourism.

PART-IV SOFT SKILLS DEVELOPMENT COURSE

**FOR ALL UG ARTS, SCIENCE, COMMERCE AND MANAGEMENT
CHOICE BASED CREDIT SYSTEM – LEARNING OUTCOMES BASED
CURRICULUM FRAMEWORK (CBCS - LOCF)**
(Applicable to the candidates admitted from the academic year 2022-2023 onwards)

Third Year   **PART-IV**   **Semester-V**
     SOFT SKILLS DEVELOPMENT
Code: **(Theory)**   **Credit: 2**

OBJECTIVES :

- To Develop communicative competence among the Students.
- To enhance the learner's soft skills by giving adequate exposure in LSRW and sub skills.
- To enable learners to put the life skills into practice with confidence.

UNIT- I   KNOW THYSELF / UNDERSTANDING SELF:

Introduction to Soft skills-Self discovery-Developing positive attitude-Improving perceptions- Forming values.

UNIT -II   INTERPERSONAL SKILLS/ UNDERSTANDING OTHERS:

Developing interpersonal relationship-Team building-group dynamics-Net working- Improved work relationship

UNIT -III   COMMUNICATION SKILLS / COMMUNICATION WITH OTHERS:

Art of listening –Art of reading –Art of speaking –Art of writing-Art of writing e-mails e mail etiquette.

UNIT- IV   CORPORATE SKILLS / WORKING WITH OTHERS

Oral Presentation – Memos- Note taking - Note making and preparing Minutes- Reports, Proposals, Abstracts - Technical Writing.

UNIT -V   SELLING SELF / JOB HUNTING

Writing resume/cv-interview skills-Group discussion- Mock interview-Mock GD – Goal setting - Career planning

UNIT - VI: CURRENT CONTOURS: (for continuous internal assessment only):

REFERENCES:

1. N. Krishnasamy, Manju Dhariwel and Lalitha Krishnasamy(2015). Mastering Communication Skills and Soft Skills – Bloomburg.
2. Meena.K and V.Ayothi (2013) A Book on Development of Soft Skills (Soft Skills : A Road Map to Success), P.R. Publishers & Distributors,
3. Meera Banerjee and Krishna Mohan: Developing Communication Skills, Trinity Publishers-(Lakshmi Publications.
4. Alex K. (2012) Soft Skills – Know Yourself & Know the World, S.Chand & Company LTD, Ram Nagar, New Delhi- 110 055.

COURSE OUTCOMES:

- Develop listening, speaking, reading and writing skills in English.
- Enhance soft skills and engage in a range of communicative tasks and activities
- Comprehend a text and identify specific and global information
- Promote communicative ability in both spoken and written form of the language
- Develop interpersonal skills to maintain human relationship
- Develop corporate skills to promote leadership qualities and team spirit.

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பாலின சமத்துவம்

அலகு - I

பாலினம் தொடர்பான கோட்பாடுகள் :பாலியல் - பாலினம் - உடற்கூறுரீதியாக நிர்ணயித்தல் - ஆணாதிக்கம் - பெண்ணியம் - பாலின பாகுபாடு – பாலின வேலைப்பாகுபாடு – பாலின ஒருபடித்தானவைகள் - பாலின உணர்வூட்டல் - பாலின சமவாய்ப்பு – பாலின சமத்துவம் - பாலின மையநீரோட்டமாக்கல் - அதிகாரப்படுத்துதல்

அலகு -II

மகளிரியல் Vs பாலின சமத்துவக்கல்வி – பல்கலைக்கழக மானியக்குழுவின் வழிக்காட்டுதல்கள் - ஏழாவது ஐந்தாண்டுதிட்டம் முதல் பதினோராவது ஐந்தாண்டுதிட்டம் - பாலின சமத்துவக்கல்வி : பெய்ஜிங் மாநாடு மற்றும் பெண்களுக்கு எதிரான அனைத்து வன்முறைகளையும் ஒழிப்பதற்கான சர்வதேச உடன்படிக்கை - இணைத்தல் /உட்படுத்துதல் - ஒதுக்கல் -

அலகு – III

பாலியல் பாகுபாட்டிற்கான தளங்கள் : குடும்பம் - பாலின விகிதாச்சாரம் - கல்வி – ஆரோக்கியம் - ஆளுமை –மதம் - வேலை Vs வேலை வாய்ப்பு – சந்தை – ஊடகங்கள் - அரசியல் - சட்டம் -குடும்ப வன்முறை –பாலியல் துன்புறுத்தல் - அரசு கொள்கைகள் மற்றும் திட்டங்கள் .

அலகு – IV

பெண்கள் மேம்பாடு மற்றும் பாலின சமத்துவ மேம்பாடு : முயற்சிகள் - சர்வதேச பெண்களுக்கான தசாப்தம் - சர்வதேச பெண்கள் ஆண்டு – பெண்களின் மேம்பாட்டிற்கான தேசிய கொள்கை – பெண்கள் அதிகார ஆண்டு 2001 – சர்வதேச கொள்கைகளை மைய நீரோட்டமாக்கல்

அலகு – V

பெண்கள் இயக்கங்கள் மற்றும் பாதுகாப்பு நிறுவன ஏற்பாடுகள் : தேசிய மற்றும் மாநில மகளிர் ஆணையம் - அனைத்து மகளிர் காவல் நிலையங்கள் - குடும்ப நீதி மன்றங்கள் - குடும்ப வன்முறையிலிருந்து பெண்களைப் பாதுகாக்கும் சட்டம் 2005 – பணியிடங்களில் பெண்கள் மீதான பாலியல் துன்புறுத்தல்களை தடுப்பதற்கான உச்சநீதிமன்ற வழிகாட்டுதல்கள் - தாய்சேய் சேமநலச்சட்டம் - பெண்சிசுவை கருவிலேயே கண்டறியும் தொழில் நுட்பம் (முறைப்படுத்துதல் மற்றும் தவறாக பயன்படுத்துதலை தடை செய்திடும்) சட்டம் - ஈவ்டீசிங் (பெண்களை தொல்லை செய்தல்) தடுப்புச்சட்டம் - சுய உதவிக் குழுக்கள் - பஞ்சாயத்து அமைப்புகளுக்கான 73வது மற்றும் 74வது சட்டத்திருத்தம்.

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References

1. Bhasin Kamala, Understanding Gender : Gender Basics , New Delhi : Women Unlimited , 2004

2. Bhasin Kamala, Exploring Masculinity: Gender Basics , New Delhi: Women Unlimited ,2004

3. Bhasin Kamala , What is Patriarchy? : Gender Basics, New Delhi :Women Unlimited ,1993

4. Pernau Margrit, Ahmad Imtiaz, Reifeld Hermut (ed.,)Family and Gender : Changing Values in Germany and India ,New Delhi :Sage Publications,2003

5. Agarwal Bina, Humphries Jane and Robeyns Ingrid(ed.,) Capabilities , Freedom , and Equality: Amartya Sen's Work from a Gender Perspective,New Delhi : Oxford University Press ,2006

6. Rajadurai. S.V,Geetha.V,Themes in Caste Gender and Religion, Tiruchirappalli : Bharathidasan University ,2007

7. Misra Geetanjali, Chandiramani Radhika (ed.,) Sexuality , Gender and Rights: Exploring Theory and Practice in South and Southeast Asia, New Delhi : Sage Publication ,2005

8. Rao Anupama (ed.,) Gender &Caste : Issues in Contemporary Indian Feminism, New Delhi : Kali for Women, 2003

9. Saha Chandana , Gender Equity and Gender Equality : Study of Girl Child in Rajasthan , Jaipur: Rawat Publication ,2003.

10. Krishna Sumi, (ed.,),Livelihood and Gender : Equity in Community Resource Management, New Delhi : Sage Publication ,2004

11. Pludi.A Michele(ed.,) praeger Guide to the Psychology of Gender ,London : Praeger Publisher ,2004

12. Wharton .S Amy , The Sociology of Gender : An Introduction to Theory and Research , USA : Blackwell Publishing ,2005

13. Mohanty Manoranjan(ed.,) Class ,Caste ,Gender : Readings in Indian Government and Politics – 5,New Delhi : Sage Publications ,2004.

14. Arya Sadhna Women ,Gender Equality and the State ,New Delhi :Deep &Deep Publication, 2000

15. பாலியலை புரிந்து கொள்வோம், மதுரை :ஏக்தா,………..

16. Mishra .O.P,Law Relating to Women &Child ,Allahabad :Central Law Agency ,2001

17. Chari Leelavathi ,Know Your Rights ,Madras; Tamilnadu Social Welfare Board,1987

18. Bhattacharya Malini , Sexual Violence and Law ,Kolkata; West Bengala Commission for Women ,2002

19. Sexual Harassment at the Workplace – A Guide , New Delhi ;Sakshi,1999

20. அஜிதா, குடும்ப வன்முறையிலிருந்து பெண்களை பாதுகாக்கும் சட்டம் 2005, மதுரை : ஏக்தா 2005

21. கு.சாமிதுரை& இராதாகிருட்டிணன், பெண்கள் நலன் காக்கும் சட்டங்கள், மதுரை: Account Test Center:2007

22. பொன்.கிருஷ்ணசாமி,ஜே.பால் பாஸ்கர்&ஆ.ஜான் வின்சென்ட், பெண்களும் உச்ச நீதிமன்றழும், மதுரை :சோக்கோ வாசகர் வட்டம், 2004

23. வனஜா &சியாமா சுந்தரி, பெண்களுக்கான சட்டங்கள், செகந்திராபாத் : உலகத்தோழமை மையம்

24. க.உமாசங்கர், பி.பாலசந்தர், க.சசிகலா, செ.பழனிச்சாமி, சூரியன் (பெண்கள் தொடர்பான சட்டங்கள் குறித்த தொடக்கநிலை கையேடு: செகந்திராபாத்: உலகத்தோழமை மையம்,2006

25. குடும்ப வன்முறையிலிருந்து பெண்களை பாதுகாக்கும் சட்டம் 2005- கையேடு, திருச்சி:

26. Women's Integrated National Development Trust

27. ரவீந்திரநாத். ஜி.ஆர்., 'ராகிங் ஒழிப்போம்!' 'ஈவ்டிசிங்' ஒழிப்போம், சென்னை I.D.P.D.வெளியீடு

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BHARATHIDASAN UNIVERSITY   **TIRUCHIRAPPALLI - 620 024**

PART-V GENDER STUDIES COURSE

FOR ALL UG ARTS, SCIENCE, COMMERCE AND MANAGEMENT
CHOICE BASED CREDIT SYSTEM – LEARNING OUTCOMES BASED
CURRICULUM FRAMEWORK (CBCS - LOCF)
(Applicable to the candidates admitted from the academic year 2022-2023 onwards)

Third Year   **PART-V**   **Semester-VI**
                              GENDER STUDIES

Code: **(Theory)**   **Credit: 2**

OBJECTIVES:

- To make students to aware of Gender constructions and gendering Process
- To explore existing gender biases in the society and to understand the need to work towards the inclusive society
- To inculcate sensitivity and build gender perspectives.
- To use the course to bring attitudinal cum behavioral changestowards gender neutral ambience and promote the humanistic values

UNIT- I   INTRODUCTION TO GENDER STUDIES CONCEPTS

Gender Spectrum.-Sex – Gender distinction – Biological Determinism – Patriarchy – Feminism –Gender Socialization and Stereotyping-Gender Discrimination – Gender Division of labour and roles– Gender Sensitivity and awareness – Gender Equity – Equality – Gender Main streaming and Gender Analysis.

UNIT- II   UGC INITIATIVES ON WOMEN'S STUDIES

Definition of Women's Studies –Gender Studies –UGC Initiatives and guidelines on Women's Studies - Beijing Conference, UN Initiatives – Convention on Elimination of All forms of

Discrimination Against Women (CEDAW)- Sustainable Development Goals on Gender Equality (SDG 5) and targets

UNIT- III   AREAS OF GENDER DISCRIMINATION

Gender Socialization- Sex Ratio– Health and Nutrition– – Literacy and Education - Employment- Governance – participation in decision making- politics- property rights and access to credit- gender based violence- Social institutions –Family, Caste, Class, religion, gender, State. Market – Media – Politics – Judiciary

UNIT -IV   WOMEN DEVELOPMENT AND GENDER EMPOWERMENT

Towards Equality Report of Status of Women in India 1974 – International Women's Decade – International Women's Year –National Policy for Empowerment of Women 2001

UNIT -V   WOMEN'S MOVEMENTS AND SAFEGUARDING MECHANISM :

 In India National /State Commission for Women(NCW) – All Women Police Station – Family Court Legislations safeguarding women –Transgender Policy—Constitutional amendments for women's political participation

UNIT - VI   CURRENT CONTOURS: (for continuous internal assessment only):

Tamil Nadu State Policy for Women 2021- National Policy for Women 2015 – Prevention of Sexual Harassment at Work places Act 2013-
Protection of Children from Sexual Offences Act, 2012 - Analysis of regressive and progressive High court and supreme court judgments- women proactive policies, programmes, interventions

REFERENCE :

1. Bhasin Kamala, Understanding Gender : Gender Basics , New Delhi : Women Unlimited , 2004
2. Bhasin Kamala, Exploring Masculinity: Gender Basics , New Delhi: Women Unlimited ,2004
3. Bhasin Kamala , What is Patriarchy? : Gender Basics, New Delhi :Women Unlimited ,1993
4. Arya Sadhna Women ,Gender Equality and the State ,New Delhi :Deep &Deep Publication ,2000
5. பாலியலை புரிந்து கொள்வோம், மதுரை :ஏக்தா,………..
6. Mishra .O.P,Law Relating to Women &Child ,Allahabad :Central Law Agency ,2001
7. Uma Chakravarti, Gendering Caste Through a Feminist Lens, Sage Publication 2003

8. Bhattacharya Malini , Sexual Violence and Law ,Kolkata; West Bengala Commission for Women ,2002
9. Sexual Harassment at the Workplace – A Guide , New Delhi ;Sakshi,1999
10. அஜிதா, குடும்ப வன்முறையிலிருந்து பெண்களை பாதுகாக்கும் சட்டம் 2005, மதுரை : ஏக்தா 2005
11. பொன்.கிருஷ்ணசாமி,ஜே.பால் பாஸ்கர்&ஆ.ஜான் வின்சென்ட், பெண்களும் உச்ச நீதிமன்றமும், மதுரை :சோக்கோ வாசகர் வட்டம், 2004
12. குடும்ப வன்முறையிலிருந்து பெண்களை பாதுகாக்கும் சட்டம் 2005- கையேடு, திருச்சி: Women's Integrated National Development Trust
13. https://www.schooloflegaleducation.com/women-and-law-in-india-e-book/

COURSE OUTCOMES:

• Students would have gained a perspective and understood the social reality of gender society understood the differences of gender and sex and may resort to building alternative perspectives and critical thinking.

• Gained knowledge on the various social institutions governing gender and the intersectionality.

• Exposed to the kind of initiatives of the State towards gender equality

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PART-V GENDER STUDIES COURSE

FOR ALL UG ARTS, SCIENCE, COMMERCE AND MANAGEMENT
CHOICE BASED CREDIT SYSTEM – LEARNING OUTCOMES BASED
CURRICULUM FRAMEWORK (CBCS - LOCF)
(Applicable to the candidates admitted from the academic year 2022-2023 onwards)

Third Year	**PART-V**	**Semester-VI**
	பாலின சமத்துவம்	
Code:	**(Theory)**	**Credit: 2**

நோக்கம் :

- பாலின கட்டமைப்புகள் மற்றும் பாலினச்செயல்முறைகள் குறித்து மாணவர்களுக்கு விழிப்புணர்வு ஏற்படுத்துதல்
- சமூகத்தில் உள்ளடக்கிய தேவையைப் புரிந்து கொள்வதற்காக வெளியேறும் பாலின பிரச்சனைக்ள ஆராய்தல்
- பாலின சமத்துவ சமுதாயத்தை உருவாக்குவதற்கான உணர்திறனை உருவாக்குதல்
- பாலின நடுநிலை சூழலை உருவாக்கப் பாலின முன்னோக்கு, அணுகுமுறை, நடத்தை மாற்றங்கள் மற்றும் மனிதநேய மதிப்புகளை மேம்படுத்துதல்

அலகு -I   பாலினம் தொடர்பான கோட்பாடுகள்:

பாலினப்பார்வை -பால் - பாலின வித்தியாசம்   - உடற்கூறுரீதியாக நிர்ணயித்தல் - ஆணாதிக்கம் - பெண்ணியம் - பாலின சமூகமயமாக்கல்   மற்றும் ஒருபடித்தானவைகள் - பாலின பாகுபாடு - பாலின வேலைப்பாகுபாடு மற்றும் பங்குகள் - பாலின உணர்வூட்டல் மற்றும் விழிப்புணர்வு- பாலின சமன்நிலை மற்றும் சமத்துவம் - பாலின மைய நீரோட்டமாக்கல் - பாலின பகுப்பாய்வு

அலகு -II   மகளிரியல் ஏள பாலின சமத்துவக்கல்வி:

மகளிரியல் - பாலினவியல் வரையரை- பல்கலைக்கழக மானியக்குழுவின் மகளிரியளுக்கான தலையீடுகள் மற்றும் வழிக்காட்டுதல்கள் - பெய்ஜிங் மாநாடு- ஐக்கிய நாடுகள் சபையின் தலையீடுகள் மற்றும் பெண்களுக்கு எதிரான அனைத்து பாகுபாடுகளையும் ஒழிப்பதற்கான சர்வதேச உடன்படிக்கை ___ நீடித்த நிலையான வளர்ச்சி இலக்குகளில் பாலின சமத்துவம் (SDG 5) மற்றும் இலக்குகள்

அலகு -III   பாலியல் பாகுபாட்டிற்கான தளங்கள் :

பாலின விகிதாச்சாரம் -___ ஆரோக்கியம் மற்றும் ஊட்டச்சத்து- கல்வியறிவு மற்றும் கல்வி ___ வேலைவாய்ப்பு- ஆளுகை- முடிவெடுத்தல்- அரசியல் -சொத்துரிமை - நிதியை கையாளுதலில் பங்கேற்றல்- பாலின ரீதியாக வன்முறைகள்- சமூக நிறுவனங்கள் - குடும்ப, சாதி, வர்கம், மதம், பாலினம், அரசு,சந்தை, ஊடகம்கள், மற்றும் நீதி துறை

அலகு -IV   பெண்கள் மேம்பாடு மற்றும் பாலின சமத்துவ மேம்பாடு

Towards Equality Report of Status of Women in India 1974 - சர்வதேச பெண்களுக்கான தசாப்தம் - சர்வதேச பெண்கள் ஆண்டு ___ பெண்களை அதிகாரப்படுத்துதலுக்கான தேசிய கொள்கை 2001

அலகு-V   பெண்கள் இயக்கங்கள் மற்றும் பாதுகாப்பு வழிமுறைகள்

தேசிய மற்றும் மாநில மகளிர் ஆணையம் - அனைத்து மகளிர் காவல் நிலையங்கள் - குடும்ப நீதி மன்றங்கள் - மாற்றுப்பாலினத்தவர்களுக்கான கொள்கை- பெண்களின் அரசியல் பங்கேற்பிற்கான அரசியல் சாசன சட்டதிருத்தங்கள்

அலகு- VI   தற்போதைய வரையறைகள் - அகமதிப்பீட்டிற்கு மட்டும்:
(Current Contours - For Continuous Internal Assessment Only)

தமிழக அரசின் பெண்களுக்கான கொள்ளை 2021- பெண்களுக்கான தேசிய கொள்கை 2015 - பணியிடங்களில் பெண்கள் மீதான பாலியல் துன்புறுத்தல்களை தடுப்பதற்கான சட்டம் 2013 - பாலியல் குற்றங்களிலிருந்து பெண் குழந்தைகள் பாதுகாக்கும் சட்டம் 2012 ___ உயர் நீதி மன்ற மற்றும் உச்ச நீதி மன்ற தீர்ப்புகள், கொள்கைகள் திட்டங்கள் மற்றும் தலையீடுகளை பகுப்பாய்வு செய்தல்

REFERENCE :

1. Bhasin Kamala, Understanding Gender : Gender Basics , New Delhi : Women Unlimited , 2004

2. Bhasin Kamala, Exploring Masculinity: Gender Basics , New Delhi: Women Unlimited ,2004

3. Bhasin Kamala , What is Patriarchy? : Gender Basics, New Delhi :Women Unlimited ,1993

4. Arya Sadhna Women ,Gender Equality and the State ,New Delhi :Deep &Deep Publication ,2000

5. பாலியலை புரிந்து கொள்வோம், மதுரை :ஏக்தா,……….

6. Mishra .O.P,Law Relating to Women &Child ,Allahabad :Central Law Agency ,2001

7. Uma Chakravarti, Gendering Caste Through a Feminist Lens, Sage Publication 2003

8. Bhattacharya Malini , Sexual Violence and Law ,Kolkata; West Bengala Commission for Women ,2002

9. Sexual Harassment at the Workplace – A Guide , New Delhi ;Sakshi,1999

10. அஜிதா, குடும்ப வன்முறையிலிருந்து பெண்களை பாதுகாக்கும் சட்டம் 2005, மதுரை : ஏக்தா 2005

11. பொன்.கிருஷ்ணசாமி,ஜே.பால் பாஸ்கர்&ஆ.ஜான் வின்சென்ட், பெண்களும் உச்ச நீதிமன்றமும், மதுரை :சோக்கோ வாசகர் வட்டம், 2004

12. குடும்ப வன்முறையிலிருந்து பெண்களை பாதுகாக்கும் சட்டம் 2005- கையேடு, திருச்சி: Women's Integrated National Development Trust

13. https://www.schooloflegaleducation.com/women-and-law-in-india-e-book/

பாடநெறி முடிவுகள் **மாணவர்கள் இந்த பாடத்தில் பயின்ற பிறகு:**

- மாணவர்கள் சமூகத்தில் காணப்படுகின்ற பால் மற்றும் பாலின ரீதியான வித்தியாசங்களை புரிந்து கொள்வதோடு மாற்றுச்சிந்தனைகள் மற்றும் விமர்சன கண்ணோட்டங்களை பெற இயலும்.

- பாலின மற்றும் பாலின உட்கூறுகளை ஆளுகைக்கு உட்படுத்துகின்ற பல்வேறு சமூக நிறுவனங்களை பற்றிய அறிவை பெறுவார்கள்

- பாலின சமத்துவத்தை அடைவதற்கான அரசின் பல்வேறு தலையீடுகள் பற்றி அறிந்திருப்பார்கள்

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