COURSE STRUCTURE

AND

SYLLABUS FOR

DIPLOMA IN CIVIL ENGINEERING

2nd year (Semester III)

(APPLICABLE FROM AY 2024-2025 ADMITTED BATCH ONWARDS)

CENTRAL INSTITUTE OF TECHNOLOGY KOKRAJHAR

CE Diploma 3rd Semester Course Structure & Syllabus

(In line with AICTE / NEP)

Semester – 3

Sl.	Code No.	Course Title	L	T	P	Credits
1.	DCE301	Surveying-I	3	1	0	4
2.	DCE302	Environmental Engineering	3	1	0	4
3.	DCE303	Strength of Materials	3	1	0	4
4.	DCE304	Construction Materials	3	0	0	3
5.	DCE371	Surveying-I Laboratory	0	0	2	1
6.	DCE372	Environmental Engineering Laboratory	0	0	2	1
7.	DHS302	Engineering Economics and Accountancy	3	0	0	3
8.	DHS371	Gender Sensitization	0	0	2	0
		Total Credit	15	3	6	20

Course Code:	DCE301
Course Title:	Surveying-I
Course Credit:	4 (L: 3 T: 1 P: 0)

Course objective:	1. To understand types of surveying works required 2. To know the types of method and equipment to be used for different survey 3. To know the use and operational details of various surveying equipment
Pre-requisites:	NIL
Course outcomes:	After completion of this course students will 1. Select the type of survey required for given situation 2. Compute area of open field using chain, tape, cross staff etc. 3. Conduct traversing in the field using chain and compass 4. Use of levelling instrument to determine reduced level for preparation of contour maps

Unit no.	Topic	Nos. of contact hours
1	Introduction, classification of survey, chain surveying - principle, instruments used, procedure, problems and errors in chain survey.	8
2	Compass surveying: types, description and uses, measurement of bearings in WCB and QB systems, local attraction and related problems.	8
3	Levelling: differential levelling, booking and reduction of levels, related problems and practices.	8
4	Contouring: Principles, methods and applications, contour gradient.	8
5	Introduction to advanced surveying techniques such as GPS, DGPS, Drone surveying etc.	8

Textbooks:

1. Punmia, B.C.; Jain, Ashok Kumar; Jain, Arun Kumar, Surveying I, Laxmi Publications, New Delhi.
2. Kanetkar, T.P.; Kulkarni, S.V., Surveying & Levelling Vol.-I, Pune Vidyarthi Griha Prakashan, Pune.

Reference Books:

1. Basak, N.N., Surveying and Levelling, McGraw Hill Education, New Delhi
2. Duggal, S.K., Surveying I, McGraw Hill Education, New Delhi.
3. Basak, N.N., Surveying and Levelling, Tata McGraw Hill, New Delhi.

Course Code:	DCE 302
Course Title:	Environmental Engineering
Course Credit:	4 (L: 3 T: 1 P: 0)

Course objective:	The objective of this course are: • To introduce the sources, types and impact of environmental pollution on ecosystem and human health. • To impart fundamental knowledge and practical skills related to planning, design, construction and maintenance of water supply system • To equip students with the ability to understand water sources, estimate water demand, need of water quality analysis • To develop an understanding of treatment processes and efficient distribution systems • To develop an understanding of methods wastewater treatment, pollution control and solid waste management • To equip students with basic skills to identify the environmental problems and apply appropriate engineering solutions
Pre-requisites:	None
Course outcomes:	After completion of this course students will be able to: 1. Understand the fundamentals of Environmental Engineering 2. Identify water demand and sources of water supply 3. Demonstrate understanding of water quality parameters and standards 4. Understands and explain the processes involve in the collection, treatment and distribution of water 5. Understand sewerage systems, wastewater characterizes and treatment methods 6. Describe methods for safe disposal of treated wastewater 7. Identify the types and sources of pollution and its effects and explain controlling measures and preventing strategies for different types of pollution

Module no.	Topic	Nos. of contact hours
1	Introduction, estimation of quantity of water, per capita demand, design period and factors considered for selection of design period. Population forecasting.	6
2	Sources of water and their suitability with regards to quality and quantity, storage capacity of reservoir, water quality parameters	8

3	Water treatment plant Layout plan, estimation of raw water discharge for treatment plant, treatment of water- screenings, sedimentation, coagulation and flocculation, types of coagulants, optimum dose of coagulants, mixing devices, design of flocculation unit. theory of filtration, types of filters and their comparison, design of rapid sand filter, washing of filter, disinfection, methods of removing hardness distribution system, methods of water supply and storage	20
4	Sewerage system, estimation of wastewater discharge in a sewer in sewerage system, hydraulic design of sewers, estimation of storm water discharge in urban area, characteristics of sewage, strength of sewage, population equivalent, treatment of sewage- primary and secondary treatments, oxidation ponds, sewage disposal, self-purification of streams, sludge digestion and disposal, concept of air pollution	10

Textbooks:

1. Water Supply Engineering, S.K. Garg, Khanna Publications, Delhi, 2009.
2. Sewage Disposal and Air Pollution Engineering, S.K. Garg, Khanna Publications, Delhi, 2009.
3. B.C Punmia, “Water Supply Engineering”, Laxmi Publications Pvt. Ltd., 2016
4. APHA, Standard Methods Examination of Water and Wastewater, American Public Health Association, Washington DC, 1995

Reference Books:

1. Water Supply &Sanitary Engineering, G.S. Birdi and J.S. Bindie, Dhanpat Rai Publishing Co., New Delhi,1998.
2. Water supply Water Supply Engineering (Environmental Engineering Vol. I): P.N. Modi Standard Book House, N. Delhi. 2010.
3. Environmental Engineering, Peavy, Tachobanoglous & Rowe, McGraw Hill International, N.Y.,1985.
4. Waste water Engineering: Treatment, Disposal and Reuse, Metcalf & Eddy, Tata McGraw Hill, New Delhi, 2003

Course Code:	DCE 303
Course Title:	Strength of materials
Course Credit:	4 (L: 3 T: 1 P: 0)

Course objective:	1. Introduces continuum mechanics and material modeling based on energy principles. 2. Covers key concepts: deformation, strain, momentum balance, stress, elasticity, and plasticity. 3. Emphasizes a unified approach using thermodynamics for material understanding and design. 4. Focuses on analytical methods to determine strength, stiffness, and stability of structural members. 5. Considers both equilibrium laws and material mechanical properties.
Pre-requisites:	Basic engineering mathematics; Engineering mechanics
Course outcomes:	After completion of this course students will 1. Understand elasticity theory, strain/displacement relationships, and Hooke's law; perform strength and stability calculations. 2. Analyze and calculate combined stresses in members and structures using classical and energy methods. 3. Use Mohr's circle to evaluate combined stresses; determine shear center in thin-walled beams. 4. Compute beam deflections under various loads; analyze unsymmetrical loading; apply failure criteria and solve torsion problems in solid and thin-walled members.

Unit	Topic	Nos. of contact hours
1	**Simple stresses and strains Contact hours:** Concept of Stress & Strain, normal & shearing stress, strains, stress-strain relationship, generalized Hooke's law, modulus of Elasticity, modulus of Rigidity, Bulk modulus, Hoop stress, Lateral strain, Poisson's ratio and Volumetric strain, Elastic moduli and the relationship between them, stress – strain diagram for mild steel.	9
2	**Torsion Contact hours:** Derivation of torsion equation and its assumptions. Applications of the equation of the hollow and solid circular shafts, torsional rigidity. .	7
3	**Shear forces and bending moments. Contact hours:** Relationships between load, Shearing force, Bending moment, Shear force and Bending moment diagrams.	8
4	**Stresses in beams. Contact hours:** Theory of simple bending stresses in beams, Bending and shear stress distribution over cross-sections of determinate beams.	8
5	**Principal stress and strain Contact hours:** Normal stress, tangential stress, principal stresses, principal planes, Mohr's circle of stresses and strain and related problems.	7
6	**Columns and Struts. Contact hours:** Axially loaded Compression members, crushing load, Buckling load, Columns, Euler, Rankine and Secant formulae and related problems.	7

Textbooks:

1. D.S. Bedi, "Strength of Materials", Khanna Book Publishing Co.
2. AICTE Prescribed Textbook: Physics (Introduction to Mechanics), Bhattarchaya, A.B., Khanna Book Publishing Co., 2023.
3. Timoshenko, S. and Young, D. H., "Elements of Strength of Materials", DVNC, New York, USA.

Reference Books:

1. Kazmi, S. M. A., "Solid Mechanics" TMH, Delhi, India.
2. Hibbeler, R. C. Mechanics of Materials. 6th ed. East Rutherford, NJ: Pearson Prentice Hall, 2004
3. Crandall, S. H., N. C. Dahl, and T. J. Lardner. An Introduction to the Mechanics of Solids. 2nd ed. New York, NY: McGraw Hill, 1979
4. Mechanics of Materials - Ferdinand P. Beer, E. Russel Jhonston Jr., John T. DEwolf – TMH 2002.
5. Strength of Materials by R. Subramanian, Oxford University Press, New Delhi.
6. Laboratory Manual of Testing Materials - William Kendrick Hall

Course Code:	DCE304
Course Title:	Construction Materials
Course Credit:	3 (L: 3 T: 0 P: 0)

Course objective:	• To learn about various construction materials and understand their relevant characteristics. • To be able to identify suitability of various materials for different construction purposes. • To know about natural, artificial, and processed materials available for various purposes of construction activities.
Pre-requisites:	None
Course outcomes:	After completion of this course students will • Understand the properties of various building materials, such as rocks, bricks, timber, cement, sand etc. • Learn about the uses of different materials in various building components and construction practices. • Be familiar with relevant standards and specifications for building materials.

Unit	Topic	Nos. of contact hours
1	Rock: Classification, quarrying and dressing.	8
2	Bricks: Manufacturing processes, classification and properties. Flooring and roofing tiles.	8
3	Production, properties and uses of lime; cement and sand-mortar. Concrete: Plain and reinforced.	8
4	Timber: Types, defects, methods of seasoning, methods of preservation, timber products.	8

5	Iron and structural steel: Manufacturing processes, properties, defects	8
6	Types and uses of paints; varnishes and distemper. Sound and heat insulting materials; Glasses; plastics and asphaltic materials.	8

Textbooks:

1. Ghose, D. N., Construction Materials, Tata McGraw Hill, New Delhi.
2. S.K. Sharma, Civil Engineering Construction Materials, Khanna Publishing House, Delhi
3. Varghese, P.C., Building Materials, PHI learning, New Delhi.
4. Rangwala, S.C., Engineering Materials, Charator publisher, Ahmedabad.

Reference Books:

1. Somayaji, Shan, Civil Engineering Materials, Pearson education, New Delhi.
2. Rajput, R.K, Engineering Materials, S. Chand and Co., New Delhi.
3. Sood H., Laboratory Manual on Testing of Engineering Materials, New Age Publishers, New Delhi.
4. Sharma C. P., Engineering Materials, PHI Learning, New Delhi.
5. Duggal, S. K, Building Materials, New International, New Delhi.

Course Code:	DCE371
Course Title:	Surveying-I Laboratory
Course Credit:	1 (L:0 T:0 P:2)

Course objective:	1. To understand types of surveying works required 2. To know the types of method and equipment to be used for different survey 3. To know the use and operational details of various surveying equipment
Pre-requisites:	NIL
Course outcomes:	After completion of this course students will 1. Select the type of survey required for given situation 2. Compute area of open field using chain, tape, cross staff etc. 3. Conduct traversing in the field using chain and compass 4. Use of levelling instrument to determine reduced level for preparation of contour maps

Unit	Topic	Nos. of contact hours
1	Chain Surveying	4
2	Compass: Traversing	4
3	Levelling: Observation using Auto level and levelling staff, Fly levelling	6
4	Contouring: Direct and Indirect method	6
5	Use of GPS, Remote sensing, DGPS	4

Textbooks:

3. Punmia, B.C.; Jain, Ashok Kumar; Jain, Arun Kumar, Surveying I, Laxmi Publications, New Delhi.
4. Kanetkar, T.P.; Kulkarni, S.V., Surveying & Levelling Vol.-I,Pune Vidyarthi Griha Prakashan, Pune.

Reference Books:

4. Basak, N.N., Surveying and Levelling, McGraw Hill Education, New Delhi
5. Duggal, S.K., Surveying I, McGraw Hill Education, New Delhi.
6. Basak, N.N., Surveying and Levelling, Tata McGraw Hill, New Delhi.

Course Code:	DCE372
Course Title:	Environmental Engineering Laboratory
Course Credit:	1 (L:0 T:0 P:2)

Course objective:	1. To familiarize students with water and wastewater sampling techniques 2. To determine key water and wastewater quality parameters 3. To gain hands on experience with laboratory instruments and analytical techniques 4. To understand the importance of test result in assessing environmental quality and to correlate the laboratory finds
Pre-requisites:	NIL
Course outcomes:	After completion of this course students will 1. perform sampling and testing of water and wastewater 2. determine and interpret key water quality parameters 3. demonstrate proper use and calibration of instruments 4. interpret test result as per relevant standards

Unit no.	**Experiment**	**Nos. of contact hours**
I	Introduction to standards, collection and preservation of samples, sampling techniques and laboratory equipment	2
II	Experiment on determination of total dissolved and suspended solids in water	2
III	Experiment on determination of pH	2
IV	Experiment on determination of conductivity	2
V	Experiment on determination of chlorides	2
VI	Experiment on determination of turbidity and jar test	2
VII	Experiment on determination of acidity of water	2
VIII	Experiment on determination of alkalinity of water	2
IX	Experiment on determination of total hardness	2
X	Experiment on determination of residual chlorine	2
XI	Experiment on determination of DO, BOD, COD	6

Textbooks:

1. Water Supply Engineering, S.K. Garg, Khanna Publications, Delhi, 2009.
2. Sewage Disposal and Air Pollution Engineering, S.K. Garg, Khanna Publications, Delhi, 2009.
3. APHA, Standard Methods Examination of Water and Wastewater, American Public Health Association, Washington DC, 1995

Reference Books:

1. Water Supply &Sanitary Engineering, G.S. Birdi and J.S. Bindie, Dhanpat Rai Publishing Co., New Delhi,1998.
2. Environmental Engineering, Peavy, Tachobanoglous & Rowe, McGraw Hill International, N.Y.,1985.
3. Waste water Engineering: Treatment, Disposal and Reuse, Metcalf & Eddy, Tata McGraw Hill, New Delhi, 2003

Course Code:	DHS302
Course Title:	Engineering Economics and Accountancy
Course Credit:	3 (L: 3 T: 0 P: 0)

Course objective:	1. To gain a foundational understanding of basic economic concepts and their application in engineering contexts, including supply and demand, cost structures, and economic decision-making. 2. To learn methods for accurate cost estimation and budgeting for engineering projects, including direct and indirect costs. 3. To Gain a basic understanding of fundamental accounting principles, including the accounting cycle, financial statements, and key accounting concepts. 4. To learn to perform essential accounting procedures such as recording transactions, preparing journal entries, and managing ledgers. 5. To develop skills in preparing and interpreting financial statements, including balance sheets, income statements, and cash flow statements.
Pre-requisites:	Nil
Course outcomes:	After completion of this course students will 1. Engineering students will have a clear understanding of basic accounting. 2. Students will be confident to deal with financial related matters.

Part A: Engineering Economics	
Unit: 1	**Introduction of Economics**
1.1	Definition of Economics, Nature and scope of the Study.
1.2	Definition of Engineering Economics
1.3	Meaning and concepts of Utility, Consumption, value, price, Goods and National income, Inflation.
1.4	Wants, Definition and Characteristics

1.5	Wealth and Welfare – Definition, meaning and types.
Unit:2	**Demand And Supply**
2.1	Meaning and types of Demand
2.2	The law of Demand, its limitations
2.3	Preparation of Demand Schedule
2.4	Meaning of Supply
2.5	The law of supply, its limitations
2.6	Preparation of supply schedule
Unit: 3	**Production**
3.1	Meaning and factors of Production
3.2	Factors determining efficiency of labour
3.3	Saving, investment and capital formation
3.4	Meaning of Production Function
Unit: 4	**Money**
4.1	Meaning of Money
4.2	Types of Money
4.3	Functions of Money
Unit: 5	**Banking Organisation**
5.1	Central Bank – its functions
5.2	Commercial Banks – its functions
Unit: 6	**Pricing**
6.1	Objective of Pricing Policy
6.2	Price determinants
6.3	Price discrimination
Part B: Accountancy	
Unit: 7	**Introduction to Book Keeping and Accountancy**
7.1	Definition and objectives of Book Keeping
7.2	Need and Advantages of Book Keeping
7.3	Definition of Accounting
7.4	Difference between book keeping and accounting
7.5	Double Entry Systems – main features
7.6	Advantage and disadvantages of Double Entry System
Unit: 8	**Introduction to Computerized Accounting System**
8.1	Components of Computerized Accounting Software
8.2	Need for Computerized Accounting
8.3	Difference between computerized Accounting and Manual Accounting
Unit: 9	**Transaction**
9.1	Definition
9.2	Meaning of Account
9.3	Classification of Accounts: Traditional Approach and Modern Approach
9.4	Meaning of Debit and Credit
9.5	Rules of Debit and Credit

Unit: 10	**Journal and Ledger**
10.1	Meaning of Journal
10.2	Recording of Transaction in Journal
10.3	Meaning of Ledger
10.4	Objective and Utility of Ledger
10.5	Posting and Balancing of Ledger
10.6	Distinction between Journal and Ledger
10.7	Names of Different Books of Accounts
Unit: 11	**Cash Book**
11.1	Meaning and Importance of Cash Book
11.2	Characteristics and Advantages of Cash Book
11.3	Discount – Trade Discount and Cash Discount
11.4	Different Types of Cash Book: Single column cash book, Double column Cash Book and Triple column Cash book
11.5	Bank Reconciliation Statement – Basic Idea
Unit: 12	**Unit: 12 Trial Balance and Error in Accounting**
12.1	Meaning and Objects of Trial Balance
12.2	Main features and Advantage of Trial Balance
12.3	Preparation of Trial Balance
12.4	Types of Error in Accounting
Unit: 13	**Unit: 13 Components of Final Accounts**
13.1	Meaning and objectives of Trading Account
13.2	Contents of Trading Account
13.3	Meaning and objectives of Profit and Loss Account
13.4	Contents of Profit and Loss Account
13.5	Meaning of Depreciation, revenue expenditure and capital expenditure
13.6	Contents of Balance Sheet

Reference Books:

1. Introductory Micro Economics- Sandeep Garg- Dhanpat Rai Publication Pvt. Ltd. New Delhi.
2. Introductory Macro Economics- Sandeep Garg- Dhanpat Rai Publication Pvt. Ltd. New Delhi.
3. Theory and Practice of Accountancy-B.B. Dam, R.A. Sarda, R. Barman, B. Kalita-Capital Publishing Company, Guwahati-5.
4. Book-Keeping & Accountancy- Juneja. Chawla & Saksena- Kalyani Publisher, New Delhi-110002.
5. Tally. ERP 9 for Beginners- Tally Solutions Pvt. Ltd.-Sahaj Enterprises, Bangalore.

Course Code:	DHS371
Course Title:	Gender Sensitization
Course Credit:	0 (L: 0 T: 0 P: 2)

Course objective:	1. To raise and develop social consciousness among the students. 2. To sensitize the students regarding the issues of gender and the gender inequalities prevalent in society. 3. To initiate the gender perspective in all domains of understanding with the issues of their daily life.
Pre-requisites:	
Course outcomes:	The students will be equipped and encouraged in capacity building to enable them to engage in policy decisions to remove gender biases in all fields of life in the process of gender equality for workplace and in Nation building in general.

Unit/ Module no.	Topic
Unit I	**Understanding Gender and Related Concepts** ▪ Housework ▪ Gender Based Violence ▪ Sexualities ▪ Intersectionality ▪ Gender, Caste & Class
Unit II	**Gender Sensitization** ▪ Gender Sensitization: Meaning, Nature & importance ▪ Challenges before Gender Sensitization ▪ Practices for Gender Sensitization
Unit-III	**Towards Equality: Convention & Declaration** ▪ Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW) ▪ Declaration on the Elimination of Violence Against Women (DEVAW)
Unit IV	**Towards Equality: Constitutional Provisions and Acts** ▪ Gender Equality: Constitutional Provisions ▪ Protection of Women from Domestic ViolenceAct,2005 ▪ Protection of Children from Sexual OffencesAct,2012 ▪ Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act,2013

Reference Book:

1. Jane Pilcher & Imelda Whelehan: *50 Key Concepts in Gender Studies*, SAGE Publications, New Delhi
2. Bhasin, kamla: *What is Patriarchy?* Kali for Women, New Delhi
3. V. Geetha: *Gender*, STREE-SAMYA, Kolkata
4. V. Geetha: *Patriarchy*, STREE-SAMYA, Kolkata
5. Convention on the Elimination of All Forms of Discrimination against Women Adopted and opened for signature, ratification and accession by General Assembly resolution 34/180 of 18 December 1979 entry into force 3 September 1981, in accordance with article 27(1)

6. Declaration on the Elimination of Violence against Women Proclaimed by General Assembly resolution 48/104 of 20 December 1993

COURSE STRUCTURE

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SYLLABUS FOR

DIPLOMA IN

COMPUTER SCIENCE AND ENGINEERING

2nd year (Semester III)

(APPLICABLE FROM AY 2024-2025 ADMITTED BATCH ONWARDS)

CENTRAL INSTITUTE OF TECHNOLOGY KOKRAJHAR

CSE Diploma 3rd Semester Course Structure & Syllabus

(In line with AICTE / NEP)

Semester – 3

Sl.	Code No.	Course Title	L	T	P	Credits
1.	DCS301	Computer Programming	2	0	0	2
2.	DCS302	Scripting Languages (PYTHON)	2	0	0	2
3.	DCS303	Data Structures	2	0	0	2
4.	DCS304	Computer System Organisation	3	0	0	3
5.	DCS305	Algorithms	3	0	0	3
6.	DCS371	Computer Programming Lab	0	0	4	2
7.	DCS372	Scripting Languages (PYTHON) Lab	0	0	4	2
8.	DCS373	Data Structures Lab	0	0	2	1
9.	DHS302	Engineering Economics and Accountancy	3	0	0	3
10	DHS371	Gender Sensitization	0	0	2	0
		Total Credit				20

Course Code	:	DCS301
Course Title	:	Computer Programming
Number of Credits	:	2 (L:2; T:0; P:0)

Course Learning Objectives:

To enable students, develop structured solutions to problems and implement them using comput- ers. This involves two parts: i) Formulating a solution for a given problem as a well-defined sequence of actions, and ii) Expressing solution in a machine readable form or a programming language. For the second part, we will learn the common units of programming languages. The first part can only be learned through the repeated practice of solving problems.

Course Content:

The language of choice will be C. The focus will be on problem solving and problems where these ideas can be applied. The main focus of the class will be to take examples of problems where these ideas can be employed.

UNIT 1:

Introduction to Problem Solving (computational way of thinking); Variables and Representation

UNIT 2:

Arithmetic, Relational, Logical and Bitwise Operators; Input, Output, Formatting and File I/O

UNIT 3:

Conditional Statements, Repeat Statements, Loops and Nested Loops

UNIT 4:

Arrays and Memory Organization, Strings, Multidimensional Arrays, Functions and Parameter Pass- ing

UNIT 5:

Recursion and Recursive solutions

Suggested Lab Work:

This is a skill course. Topics/concepts taught in the class should be practiced in the Lab same week and practiced regularly during the semester till the student becomes confident about it. Students should work on solved and unsolved problems listed in the text books. Teachers also should formulate prob- lems and give them as assignments. This course is all about some theory and a lot of practice.

Reference Books:

1. Let Us C, Yashavant Kanetkar
2. Problem Solving and Programming in C, R.S. Salaria, Khanna Publishing House
3. C Programming Absolute Beginner's Guide, Dean Miller and Greg Perry
4. The C Programming Language, Kernighan and Ritchie, Prentice Hall of India
5. Programming in ANSI C, E. Balagurusamy, Tata McGraw-Hill
6. C Programming & Data Structures, B. A. Fouruzan and R. F. Gilberg, CENGAGE Learning.
7. Outline of Programming with C, Byron Gottfried, Schaum, McGraw-Hill

Course outcomes:

Students should be able to computationally formulate basic problems and write code snippets to execute them. The focus of the course as mentioned above should be on example based learning. The basic nitty gritties can be skipped, however, the application part should be clear. For instance, when to use an array, when to use a loop and when to use conditional statements.

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Course Code	:	DCS302
Course Title	:	Scripting Languages (PYTHON)
Number of Credits	:	2 (L: 2, T: 0, P: 0)

Course Learning Objectives:

To learn how to work with a scripting language.

Course Content:

UNIT 1: Introduction, Variables and Data Types

History, Features, Setting up path, Installation and Working with Perl/Python, Basic Syntax

Understanding Perl/Python variables, Numeric data types, Using string data type and string opera- tions, Basic Operators, Understanding coding blocks, Defining list and list slicing, Other Data Types (Tuples, List, Dictionary -Python, Arrays, Associative Arrays/Hashes - Perl)

UNIT 2: Control Structures

Conditional blocks using if, else and elif, For loops and iterations, while loops, Loop manipulation using continue, break and else (and pass in Python), Programming using conditional and loops block

UNIT 3: Functions, Modules and Packages

Organizing Perl codes using functions, Organizing Perl projects into modules, Importing own module

as well as external modules, Understanding Packages

UNIT 4: File I/O, Text Processing, Regular Expressions

Understanding read functions, Understanding write functions, Programming using file operations, Powerful pattern matching and searching, Power of pattern searching using regex

UNIT 5: Frameworks

Frameworks - Web2Py, Django, Ruby on Rails, Struts (any one of these or any other)

Suggested Lab Work:

This is a skill course. Topics/concepts taught in the class should be practiced in the Lab same week and practiced regularly during the semester till the student becomes confident about it. Students should work on solved and unsolved problems listed in the text books. Teachers also should formulate prob- lems and give them as assignments. This course is all about some theory and a lot of practice.

Reference Books:

1. Taming Python by Programming, Jeeva Jose, Khanna Publishing House
2. Starting Out with Python, Tony Gaddis, Pearson
3. Core Python Programming, Wesley J. Chun, Prentice Hall
4. Python Programming: Using Problem Solving Approach, Reema Thareja, Oxford University
5. Introduction to Computation and Programming Using Python. John V. Guttag, MIT Press.
6. Beginning Python using Python 2.6 and Python 3, James Payne, Wrox publishing
7. Practical Programming: An Introduction to Computer Science using Python 3, Paul Gries, The Pragmatic Bookshelf

Course outcomes:

At the end of the course students will be able to build a program with a scripting language and will be able to learn any other scripting language on their own.

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Course Code	:	DCS303
Course Title	:	Data Structures
Number of Credits	:	2 (L: 2, T: 0, P: 0)

Course Learning Objectives:

To provide a strong foundation for implementing programming language to formulate, analyze and develop solutions related to various data structures problems.

Course Content:

UNIT 1:

Introduction to Data Structures: Basic Terminology, Classification of Data Structures, Operations on

Data Structures.

UNIT 2:

Linear Data Structures- Stacks: Introduction to Stacks, Array Representation of Stacks, Operations on a Stack, Applications of Stacks-Infix-to-Postfix Transformation, evaluating Postfix Expressions. Queues: Introduction to Queues, Array Representation of Queues, Operations on a Queue, Types of Queues-DeQueue, Circular Queue, Applications of Queues-Round Robin Algorithm.

UNIT 3:

Linked Lists: Singly Linked List, Representation in Memory, Operations on a Single Linked List, Circular Linked Lists, Doubly Linked Lists, Linked List Representation and Operations of Stack, Linked List Representation and Operations of Queue.

UNIT 4:

Non Linear Data Structures - Trees: Basic Terminologies, Definition and Concepts of Binary Trees, Representations of a Binary Tree using Arrays and Linked Lists, Operations on a Binary Tree-Insertion, Deletion, Traversals, Types of Binary Trees.

GRAPHS: Graph Terminologies, Representation of Graphs- Set, Linked, Matrix, Graph Traversals

Suggested Lab Work:

This is a skill course. Topics/concepts taught in the class should be practiced in the Lab same week and practiced regularly during the semester till the student becomes confident about it. Students should work on solved and unsolved problems listed in the text books. Teachers also should formulate prob- lems and give them as assignments. This course is all about some theory and a lot of practice.

This course is linked with a previous course on Computer Programming and a parallel course on

Algorithms, hence exercises should not be done in isolation.

Reference Books:

1. Data Structures, R.S. Salaria, Khanna Book Publishing, New Delhi
2. Data Structures Using C, Reema Thareja, Oxford University Press India.
3. Classic Data Structures, Samanta Debasis, Prentice Hall of India.
4. Fundamentals of Data Structure in C, Horowitz, Ellis, Sahni, Sartaj, Anderson-Freed, Susan, University Press, India.
5. Data Structures: A Pseudo code approach with C, Richard F. Gilberg, Behrouz A. Forouzan, CENGAGE Learning, India.
6. Data Structures and Algorithms: Concepts, Techniques and Applications, G. A. V. Pai, McGraw- Hill Education, India.

Course outcomes: Have a good understanding of Data Structures and its applications in algorithms.

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Course Code	:	DCS304
Course Title	:	Computer System Organisation
Number of Credits	:	3 (L: 3, T: 0, P: 0)

Course Learning Objectives:

To have a thorough understanding of the basic structure and operation of a digital computer, its architectures and computational designs.

Course Content:

UNIT 1:

Structure of Computers: Computer Functional units, Von-Neumann architecture, Bus structures, Ba-

sic Operational Concepts, Data representation (Fixed and Floating point), Error detecting codes.

Register Transfer and Micro Operations: Register transfer, Bus and memory transfers, Arithmetic micro-operations, Logic micro-operations, Shift micro-operations, and Arithmetic logic shift units.

UNIT 2:

Micro Programmed Control: Control memory, Address sequencing, and design of control unit.

Computer Arithmetic: Addition and Subtraction, Multiplication and Division algorithms, Float- ing-point arithmetic operation, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline Vector Pro- cessing, Array Processors.

UNIT 3:

Introduction to Microprocessor Architecture: Instruction Set Architecture design principles from

programmer's perspective. One example is microprocessors (Intel, ARM, etc).

UNIT 4:

Assembly Language Programming: Simple programs, Assembly language programs involving logical, branch and call instructions, sorting, evaluation of arithmetic expressions, string manipulation, as- sembler directives, procedures and macros.

UNIT 5:

Memory and Digital Interfacing: addressing and address decoding, interfacing RAM, ROM, EPROM, programmable peripheral interface, various modes of operation and interfacing to processor, inter- facing keyboard, displays, etc.

Reference Books:

1. Computer System Architecture, M. Moris Mano, Pearson/PHI, India.
2. Microprocessors Interface, Douglas V.Hall, Tata McGraw-Hill.
3. Computer Organization, Carl Hamacher, Zvonks Vranesic, SafeaZaky, McGraw-Hill
4. Advanced Microprocessors and Peripherals- Architecture, Programming and interfacing, A.K.Ray, K.M.Bhurchandi, Tata McGraw-Hill, New Delhi, India.
5. Computer Organization and Design: A Hardware/Software Interface (MIPS Edition) by Patterson and Hennessy

Course outcomes: Have a good understanding of the functioning of computer systems as such and its various subcomponents. Students will be able to understand computing requirements for a specific purpose, analyse performance bottlenecks of the computing device and choose appropriate computing device for a given use case.

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Course Code	:	DCS305
Course Title	:	Algorithms
Number of Credits	:	3 (L: 3, T: 0, P: 0)

Course Learning Objectives:

The objective of this course is to prepare the student with the algorithmic foundations of computing. A sound grasp of algorithms is essential for any computer science engineer. Almost all programming involves algorithms at some level.

Course Content:

UNIT 1: Fundamentals

Programming Models. Data Abstraction. Sets, Multisets, Asymptotic and worst-case analysis of algorithms.

UNIT 2: Sorting

The sorting problem. Bubble sort, Selection sort, Insertion sort, Mergesort, Quicksort.

UNIT 3: Searching

Symbol Tables, Binary Search Trees, Balanced Search Trees. Hash Tables.

UNIT 4: Graphs

Definition of a directed and undirected graph. Paths, Cycles, spanning trees. Directed Acyclic Graphs. Topological Sorting. Minimum Spanning Tree algorithms. Shortest Path algorithms: Dijkstra's algorithm. Flow-based algorithms.

UNIT 5: Strings

String Sort. Tries. Substring Search. Regular Expressions. Elementary Data compression.

Reference Books:

1. Algorithms, Sedgewick and Wayne, Pearson
2. Introduction to Algorithms, Cormen, Leiserson, Rivest and Stein. MIT Press
3. Introduction to Theory of Computation, Sipser Michael, Cengage Learning.
4. Design & Analysis of Algorithms, Gajendra Sharma, Khanna Publishing House

Course outcomes:

The student should be able to design basic algorithms for sorting and searching. The student should be able to understand the basic notions of time and space complexity of algorithms. The student should be able to implement sorting, searching, tree and graph algorithms in a modern computer programming language.

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Course Code	:	DCS371
Course Title	:	Computer Programming Lab
Number of Credits	:	2 (L: 0, T: 0, P: 4)

Course Learning Objectives:

This Lab course is intended to practice what is taught in theory class of 'Computer Programming' and become proficient in computer programming. Computer programming is all about regular practice. Students should work on solved and unsolved problems listed in the text books, and the problems given by the teacher. Some of the topics that should necessarily be covered in the lab are listed below.

Course Content:

S.No.	Topics for Practice
1	Familiarization with the programming environment (Editor, Compiler, etc.)
2	Programs using I/O statements and various operators
3	Programs using expression evaluation and precedence
4	Programs using decision making statements and branching statements
5	Programs using loop statements
6	Programs to demonstrate applications of n dimensional arrays
7	Programs to demonstrate use of string manipulation functions
8	Programs to demonstrate parameter passing mechanism
9	Programs to demonstrate recursion
10	Programs to demonstrate use of pointers
11	Programs to demonstrate command line arguments
12	Programs to demonstrate dynamic memory allocation
13	Programs to demonstrate file operations

The language of choice will be C. This is a skill course. The more you practice, the better it will be.

Reference Books:

1. Let Us C, Yashavant Kanetkar
2. Problem Solving and Programming in C, R.S. Salaria, Khanna Publishing House
3. C Programming Absolute Beginner's Guide, Dean Miller and Greg Perry
4. The C Programming Language, Kernighan and Ritchie, Prentice Hall of India
5. Programming in ANSI C, E. Balagurusamy, Tata McGraw-Hill
6. C Programming & Data Structures, B. A. Fouruzan and R. F. Gilberg, CENGAGE Learning.

Course outcomes:

Students should be able to write code snippets, and then compile, debug and execute them.

*****

Course Code	:	DCS372
Course Title	:	Scripting Languages Lab (PYTHON)
Number of Credits	:	2 (L: 0, T: 0, P: 4)

Course Learning Objectives:

This Lab course is intended to practice whatever is taught in theory class of 'Scripting Languages' and become proficient in scripting. Computer programming is all about regular practice. Students should work on solved and unsolved problems listed in the text books, and the problems given by the teacher. Some of the topics that should necessarily be covered in the lab are listed below.

Course Content:

S.No.	Topics for Practice
1	Practice basic coding syntax
2	Write and execute scripts based on data types
3	Write and execute Python scripts with conditionals and loops
4	Write and execute Scripts based on Functions and Modules
5	File Processing scripts
6	Write and execute Regular Expressions
7	Write and execute SQL Queries
8	Write and execute scripts using DBI
9	Develop a simple web application

Teachers may choose any one scripting language. This is a skill course. More student practice and try to find a solution on their own, better it will be.

Reference Books:

1. Taming Python by Programming, Jeeva Jose, Khanna Publishing House
2. Starting Out with Python, Tony Gaddis, Pearson
3. Core Python Programming, Wesley J. Chun, Prentice Hall
4. Python Programming: Using Problem Solving Approach, Reema Thareja, Oxford University Press
5. Introduction to Computation and Programming Using Python. John V. Guttag, MIT Press.
6. Beginning Python using Python 2.6 and Python 3, James Payne, Wrox publishing
7. Practical Programming: An Introduction to Computer Science using Python 3, Paul Gries, The Pragmatic Bookshelf

Course outcomes:

At the end of the course students will be able to build a program with a scripting language and will be able to learn any other scripting language on their own.

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Course Code	:	DCS373
Course Title	:	Data Structures Lab
Number of Credits	:	1 (L: 0, T: 0, P: 2)

Course Learning Objectives: This Lab course is intended to practice whatever is taught in theory class of 'Data Structures', Algor ithms' and is an extension of previous course on 'Computer Programming'. Students should work on problems listed in the text books, and the problems given by the teacher. Some of the topics that should necessarily be covered in the lab are listed below. This Lab course requires a good coordination between theory courses in Data Structures and Algorithms.

Course Content:

S.No.	Topics for Practice
1	Write a program using recursive and non-recursive functions to perform search operation in a given list of integers using linear search technique
2	Search operation in a given list of integers using binary search technique
3	Write a program to implement insertion sorting for a given random data
4	Write a program to implement bubble sorting for a given random data
5	Write a program to implement quick sorting for a given random data
6	Write a program to implement selection sorting for a given random data
7	Write a program to implement heap sorting for a given random data
8	Write a program to implement Hashing tables
9	Write a program to implement single linked list
10	Write a program to implement double linked list
11	Write a program to implement circular linked list
12	Write a program to Implement Stack operations using array and linked list
13	Write a program to Implement Queue operations using array and linked list.
14	Write a program to implement Breadth First Search (BFS)
15	Write a program to implement Depth First Search (DFS)
16	Write a program to implement a binary tree of integers
17	Write a program to find the minimum depth of a binary tree

Use 'C' as a programming language for the purpose. This is a skill course. The more students practice and try to find solutions on their own, the better it will be.

Reference Books:

1. Data Structures, R.S. Salaria, Khanna Book Publishing
2. Data Structures Using C, Reema Thareja, Oxford University Press India.
3. Classic Data Structures, Samanta Debasis, Prentice Hall of India.
4. Fundamentals of Data Structure in C, Horowitz, Ellis, Sahni, Sartaj, Anderson-Freed, Susan, University Press, India.
5. Data Structures: A Pseudo code approach with C, Richard F. Gilberg, Behrouz A. Forouzan, CENGAGE Learning, India.
6. Data Structures and Algorithms: Concepts, Techniques and Applications, G. A. V. Pai, McGraw-Hill Education, India.

Course outcomes: Students will be able to write programs for creating and doing different operations on various data structures. Students will be able to use/implement various algorithms learnt in the course on Algo- rithms. In summary, students will have a good command over Data Structures and its applications in Algorithms.

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Name of the Programme:	3 years Diploma in Engineering (Papers offered for the department of CE, FET, CAI & CSE)
Semester:	3rd Semester

Course Code:	DHS302
Course Title:	ENGINEERING ECONOMICS AND ACCOUNTANCY
Course Credit:	3 (L: 3 T: 0 P: 0)

Course objective:	1. To gain a foundational understanding of basic economic concepts and their application in engineering contexts, including supply and demand, cost structures, and economic decision-making. 2. To learn methods for accurate cost estimation and budgeting for engineering projects, including direct and indirect costs. 3. To Gain a basic understanding of fundamental accounting principles, including the accounting cycle, financial statements, and key accounting concepts. 4. To learn to perform essential accounting procedures such as recording transactions, preparing journal entries, and managing ledgers. 5. To develop skills in preparing and interpreting financial statements, including balance sheets, income statements, and cash flow statements.
Pre-requisites:	
Course outcomes:*	After completion of this course students will 1. Engineering students will have a clear understanding of basic accounting. 2. Students will be confident to deal with financial related matters.

Module A : Engineering Economics	
Unit : 1	**Introduction of Economics**
1.1	Definition of Economics, Nature and scope of the Study.
1.2	Definition of Engineering Economics
1.3	Meaning and concepts of Utility, Consumption, value, price, Goods and National income, Inflation.
1.4	Wants , Definition and Characteristics

1.5	Wealth and Welfare – Definition, meaning and types.
Unit :2	**Demand And Supply**
2.1	Meaning and types of Demand
2.2	The law of Demand, its limitations
2.3	Preparation of Demand Schedule
2.4	Meaning of Supply
2.5	The law of supply, its limitations
2.6	Preparation of supply schedule
Unit : 3	**Production**
3.1	Meaning and factors of Production
3.2	Factors determining efficiency of labour
3.3	Saving, investment and capital formation
3.4	Meaning of Production Function
Unit : 4	**Money**
4.1	Meaning of Money
4.2	Types of Money
4.3	Functions of Money
Unit : 5	**Banking Organisation**
5.1	Central Bank – its functions
5.2	Commercial Banks – its functions
Unit : 6	**Pricing**
6.1	Objective of Pricing Policy
6.2	Price determinants
6.3	Price discrimination
Part B: Accountancy	
Unit : 7	**Introduction to Book Keeping and Accountancy**
7.1	Definition and objectives of Book Keeping
7.2	Need and Advantages of Book Keeping
7.3	Definition of Accounting
7.4	Difference between book keeping and accounting
7.5	Double Entry Systems – main features
7.6	Advantage and dis advantages of Double Entry System
Unit : 8	**Introduction to Computerized Accounting System**
8.1	Components of Computerized Accounting Software
8.2	Need for Computerized Accounting
8.3	Difference between computerized Accounting and Manual Accounting
Unit : 9	**Transaction**
9.1	Definition
9.2	Meaning of Account
9.3	Classification of Accounts: Traditional Approach and Modern Approach

9.4	Meaning of Debit and Credit
9.5	Rules of Debit and Credit
Unit : 10	**Journal and Ledger**
10.1	Meaning of Journal
10.2	Recording of Transaction in Journal
10.3	Meaning of Ledger
10.4	Objective and Utility of Ledger
10.5	Posting and Balancing of Ledger
10.6	Distinction between Journal and Ledger
10.7	Names of Different Books of Accounts
Unit : 11	**Cash Book**
11.1	Meaning and Importance of Cash Book
11.2	Characteristics and Advantages of Cash Book
11.3	Discount – Trade Discount and Cash Discount
11.4	Different Types of Cash Book: Single column cash book, Double column Cash Book and Triple column Cash book
11.5	Bank Reconciliation Statement – Basic Idea
Unit : 12	**Unit: 12 Trial Balance and Error in Accounting**
12.1	Meaning and Objects of Trial Balance
12.2	Main features and Advantage of Trial Balance
12.3	Preparation of Trial Balance
12.4	Types of Error in Accounting
Unit : 13	**Unit: 13 Components of Final Accounts**
13.1	Meaning and objectives of Trading Account
13.2	Contents of Trading Account
13.3	Meaning and objectives of Profit and Loss Account
13.4	Contents of Profit and Loss Account
13.5	Meaning of Depreciation, revenue expenditure and capital expenditure
13.6	Contents of Balance Sheet

Reference Books:

1. Introductory Micro Economics- Sandeep Garg- Dhanpat Rai Publication Pvt. Ltd. New Delhi.
2. Introductory Macro Economics- Sandeep Garg- Dhanpat Rai Publication Pvt. Ltd. New Delhi.
3. Theory and Practice of Accountancy-B.B. Dam, R.A. Sarda, R. Barman, B. Kalita-Capital Publishing Company, Guwahati-5.
4. Book-Keeping & Accountancy- Juneja. Chawla & Saksena- Kalyani Publisher, New Delhi-110002.
5. Tally. ERP 9 for Beginners- Tally Solutions Pvt. Ltd.-Sahaj Enterprises, Bangalore.

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Name of the Programme:	3 Years Diploma in Engineering (common paper for all departments)
Semester:	3rd

Course Code:	DHS371
Course Title:	Gender Sensitization
Course Credit:	0 (L: 0 T: 0 P: 2)

Course objective:	1. To raise and develop social consciousness among the students. 2. To sensitize the students regarding the issues of gender and the gender inequalities prevalent in society. 3. To initiate the gender perspective in all domains of understanding with the issues of their daily life.
Pre-requisites:	
Course outcomes:*	The students will be equipped and encouraged in capacity building to enable them to engage in policy decisions to remove gender biases in all fields of life in the process of gender equality for work place and in Nation building in general.

Unit/ Module no.	Topic
Unit I	**Understanding Gender and Related Concepts** ▪ House Work ▪ Gender Based Violence ▪ Sexualities ▪ InterSectionally ▪ Gender ,Caste& Class
Unit II	**Gender Sensitization** ▪ Gender Sensitization: Meaning, Nature & importance ▪ Challenges before Gender Sensitization ▪ Practices for Gender Sensitization
Unit-III	**Towards Equality: Convention & Declaration** ▪ Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW) ▪ Declaration on the Elimination of Violence Against Women (DEVAW)
Unit IV	**Towards Equality: Constitutional Provisions and Acts** ▪ Gender Equality: Constitutional Provisions ▪ Protection of Women from Domestic ViolenceAct,2005 ▪ Protection of Children from Sexual OffencesAct,2012 ▪ Sexual Harassment of Women at Workplace(Prevention, Prohibition and Redressal) Act,2013

Reference Book

1. Jane Pilcher & Imelda Whelehan :*50 Key Concepts in Gender Studies*, SAGE Publications, New Delhi
2. Bhasin,kamla:*WhatisPatriarchy?*,KaliforWomen,NewDelhi
3. V.Geetha:*Gender*,STREE-SAMYA,Kolkata
4. V.Geetha:*Patriarchy*,STREE-SAMYA,Kolkata
5. ConventionontheElimination ofAllFormsofDiscriminationagainstWomen Adopted and opened for signature, ratification and accession by General Assembly resolution 34/180 of 18 December 1979 entry into force 3 September 1981, in accordance with article 27(1)
6. Declaration on the Elimination of Violence against Women Proclaimed by General Assembly resolution 48/104 of 20 December 1993

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COURSE STRUCTURE

AND

SYLLABUS FOR

DIPLOMA PROGRAMME

IN

ELECTRONICS AND COMMUNICATION

ENGINEERING

2nd year (Semester III)

(APPLICABLE FROM AY 2024-2025 ADMITTED BATCH ONWARDS)

CENTRAL INSTITUTE OF TECHNOLOGY KOKRAJHAR

Semester-III

Module- Diploma

Course Structure

Sl. No	Code No.	Course Title	Hours per week			Total contact hrs/ week	Credits
			L	T	P		
1.	DEC301	Principles of Electronic Communication	3	0	0	3	3
2.	DEC371	Principles of Electronic Communication Lab	0	0	2	2	1
3.	DEC302	Electronic Devices and Circuits	2	1	0	3	3
4.	DEC372	Electronic Devices and Circuits Lab	0	0	2	2	1
5.	DEC303	Digital Electronics	3	0	0	3	3
6.	DEC373	Digital Electronics Lab	0	0	2	2	1
7.	DEC304	Electronic Measurements and Instrumentation	2	0	0	2	2
8.	DEC374	Electronic Measurements and Instrumentation Lab	0	0	4	4	2
9.	DEC305	Electric circuits and networks	2	1	0	3	3
10.	DHS371	Gender Sensitization	0	0	2	2	0
11.	DEC396	Summer Internship-1 (4 weeks) after 2nd Semester	0	0	0	0	2
		Total Credits :					**21**

Name of the Programme:	Diploma in Electronics and Communication Engineering
Semester:	3

Course Code:	DEC301
Course Title:	Principles of Electronic Communication
Course Credit:	3 (L: 3 T: 0 P: 2)

Course objective:	This course aims to provide a comprehensive understanding of both analog and digital modulation techniques used in communication systems. Students will learn the principles of amplitude and frequency modulation, sampling methods, and pulse analog modulation. The course also covers digital transmission techniques including PCM, delta modulation, and line coding, along with the impact of inter-symbol interference. Additionally, students will explore spread-spectrum systems like DSSS and FHSS, and their application in technologies such as CDMA. By the end, learners will be equipped to analyze, design, and evaluate modulation schemes in time and frequency domains for various communication applications.
Pre-requisites:	Basic mathematics of Class 12 level
Course outcomes:*	After completion of this course students will 1. Different modulation and demodulation techniques are used in analog communication. 2. Identify and solve basic communication problems. 3. Analyse transmitter and receiver circuits. 4. Compare and contrast design issues, advantages, disadvantages, and limitations of Analog communication systems.

Unit/ Module no.	Topic	Nos. of contact hours	Distribution of marks (out of 100)
1	**ANALOG MODULATION:** Concept of frequency translation. Amplitude Modulation: Description of full AM, DSBSC, SSB, and VSB in time and frequency domains, methods of generation & demodulation, descriptions of FM signal in time and frequency domains	10	25

2	**PULSE ANALOG MODULATION:** Ideal sampling, Sampling theorem, aliasing, interpolation, natural, and flat top sampling in time and frequency domains	8	25
3	**PCM & DELTA MODULATION SYSTEMS**: Uniform and Non-uniform quantization. PCM and delta modulation, Signal to quantization noise ratio in PCM and delta modulation.	10	25
4	**DIGITAL MODULATION:** Baseband transmission: Line coding (RZ, NRZ), inter symbol interference	6	15
5	**SPREAD-SPECTRUM MODULATION:** Introduction, Pseudo-Noise sequences, direct sequence spread spectrum (DSSS) with coherent BPSK, processing gain, probability of error, frequency-hop spread spectrum (FHSS). Application of spread spectrum: CDMA.	8	10

Text Books:

1. Tomasi, Wayne. *Advanced electronic communications systems*. Prentice Hall PTR, 1997.
2. Kennedy, George, Brendan Davis, and S. R. M. Prasanna. *Electronic communication systems*. Vol. 20. Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 1985

Reference Books:

1. Roddy, Dennis, and John Coolen. *Electronic communications*. Pearson Education India, 1977.
2. Bhagyaveni, M. A., R. Kalidoss, and K. S. Vishvaksenan. *Introduction to analog and digital communication*. River Publishers, 2022.
3. Lathi, Bhagwandas Pannalal, and Zhi Ding. *Modern digital and analog communication systems*. Vol. 3. New York: Oxford university press, 1998.

** In the context of accreditation, a course outcome (CO) is a specific, measurable statement that describes what students should know, understand, and be able to do after completing a course. The maximum number of outcomes for a course is expected to be around 6 as per NBA document. COs should reflect on the measurable outcomes towards attaining the outcomes of the Programme.*

Name of the Programme:	Diploma in Electronics and Communication Engineering
Semester:	3
Course Code:	DEC371
Course Title:	Principles of Electronic Communication Lab
Course Credit:	1 (L: 0 T: 0 P: 2)
Course objective:	This course aims to provide students with a comprehensive understanding of the principles and practical aspects of analog and digital communication systems. It focuses on the generation, modulation, transmission, and demodulation of signals such as AM, FM, PAM, PWM, PPM, and PCM. Students will analyze signal spectra, modulation indices, and study real-world systems like the superheterodyne receiver and Automatic Gain Control (AGC). The course also emphasizes the advantages of digital transmission over analog methods. Through hands-on experiments, students will develop practical skills in communication system analysis, waveform observation, and signal processing techniques relevant to modern communication technologies.
Pre-requisites:	Basic mathematics of Class 12 level
Course outcomes:*	After completion of this course students will 1. Different modulation and demodulation techniques are used in analog communication. 2 Identify and solve basic communication problems. 3 Analyse transmitter and receiver circuits. 4. Compare and contrast design issues, advantages, disadvantages, and limitations of Analog communication systems.

Unit/ Module no.	Topic	Nos. of contact hours	Distribution of marks (out of 100)
1	Harmonic analysis of a square wave of modulated waveform: measures modulation index.	2	20
2	To obtain an FM signal, modulate a high-frequency carrier with a sinusoidal signal.	1	10

3	To study and observe the operation of a superheterodyne receiver automatic gain controller (AGC).	2	10
4	Modulating a pulse carrier with sinusoidal signals is done to obtain a PWM signal and demodulate it.	1	10
5	To modulate a pulse carrier with a sinusoidal signal to obtain a PPM signal and demodulate it.	1	10
6	To observe a pulse amplitude modulated waveform and its demodulation.	1	10
7	To observe the operation of a PCM encoder and decoder.	2	10
8	To consider the reason for using digital signal x-missions of Analog signals.	2	10
9	To study & observe the amplitude response of the automatic gain controller (AGC).	1	10

Text Books:

3. 1. Tomasi, Wayne. *Advanced electronic communications systems*. Prentice Hall PTR, 1997.
4. Kennedy, George, Brendan Davis, and S. R. M. Prasanna. *Electronic communication systems*. Vol. 20. Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 1985

Reference Books:

4 Roddy, Dennis, and John Coolen. *Electronic communications*. Pearson Education India, 1977.

5 Bhagyaveni, M. A., R. Kalidoss, and K. S. Vishvaksenan. *Introduction to analog and digital communication*. River Publishers, 2022.

6 Lathi, Bhagwandas Pannalal, and Zhi Ding. *Modern digital and analog communication systems*. Vol. 3. New York: Oxford university press, 1998.

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Name of the Programme:	Diploma in Electronics and Communication Engineering
Semester:	3

Course Code:	DEC302
Course Title:	Electronics Devices and Circuits
Course Credit:	3 (L: 2 T: 1 P: 2)

Course objective:	This course aims to provide a comprehensive understanding of semiconductor devices and their applications in electronic circuits. Students will explore the principles, construction, characteristics, and working of diodes, BJTs, FETs, MOSFETs, UJTs, SCRs, DIACs, and TRIACs. Emphasis is placed on biasing, switching behavior, and amplifier configurations. The course also covers rectifier circuits, filters, feedback amplifiers, and oscillators, enabling students to analyze and design basic analog electronic circuits for signal processing and control applications.
Pre-requisites:	Nil
Course outcomes:	After completion of this course students will 1. **Explain** the behaviour and characteristics of semiconductor devices such as diodes, BJTs, FETs, MOSFETs, UJTs, SCRs, DIACs, and TRIACs. 2. **Analyse** the operation of rectifier circuits, filter designs, and their applications in power supply systems. 3. **Demonstrate** the working of various transistor configurations and evaluate their performance in amplification. 4. **Design** basic Analog circuits using amplifiers, oscillators, and switching devices. 5. **Compare** different electronic components based on construction, operating principles, and suitability for specific applications.

3rd Sem ECE Diploma Syllabus (draft)

Unit/ Module no.	Topic	Nos. of contact hours	Distribution of marks (out of 100)
1	Semiconductor and diodes- Extrinsic/Intrinsic, N-type & p-type PN Junction Diode – Forward and Reverse Bias Characteristics Zener Diode – Principle, characteristics, construction, working Diode Rectifiers – Half Wave and Full Wave, Filters – C, LC and PI Filters	8	20
2	**Bipolar Junction Transistor (BJT):** NPN and PNP Transistor, Operation and characteristics Common Base Configuration – characteristics and working Common Emitter Configuration – characteristics and working Common Base Configuration – characteristics and working High-frequency model of BJT, Classification of amplifiers, negative feedback	10	30
3	**Field Effect Transistors:** FET – Working Principle, Classification, MOSFET Small Signal model, N-Channel/ P-Channel MOSFETs – characteristics, enhancement and depletion mode, MOS- FET as a Switch, Common Source Amplifiers Uni-Junction Transistor – equivalent circuit and operation	10	20
4	**SCR DIAC & TRIAC:** SCR – Construction, operation, working, characteristics DIAC - construction, operation, working, characteristics TRIAC - Construction, operation, working, characteristics SCR and MOSFET as a Switch, DIAC as bidirectional switch Comparison of SCR, DIAC, TRIAC, MOSFET	6	15
5	**Amplifiers and Oscillators:** Feedback Amplifiers – Properties of negative Feedback, impact of feedback on different parameters. Basic Feedback Amplifier Topologies-- Voltage Series, Voltage Shunt Current Series, Current Shunt Oscillator – Basic Principles, Crystal Oscillator, Non-linear/ Pulse Oscillator	8	15

Text Books:

1. Boylestad, Robert L., and Louis Nashelsky. *Electronic devices and circuit theory*. Pearson Educación, 2002.

2. Malvino, Albert Paul, David J. Bates, and Patrick E. Hoppe. *Electronic principles*. Glencoe, 1993.

Reference Books:

1. Salivahanan, S. *Electronic devices and circuits*. Tata McGraw-Hill Education, 2011.
2. Maini, Anil K., and Varsha Agrawal. *Electronic devices and circuits*. John Wiley & Sons, 2009.
3. Raychaudhuri, Barun. *Electronics: Analog and Digital*. Cambridge University Press, 2023.
4. Millman, Jacob. *Electronic Devices and Circuits [by] Jacob Millman [and] Christos C. Halkias*. McGraw-Hill, 1967.
5. Streetman, Ben G., and Sanjay Banerjee. *Solid state electronic devices*. Vol. 4. New Jersey: Prentice hall, 2000.

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3rd Sem ECE Diploma Syllabus (draft)

Name of the Programme:	Diploma in Electronics and Communication Engineering
Semester:	3

Course Code:	DEC372
Course Title:	Electronics Devices and Circuits Lab
Course Credit:	3 (L: 0 T: 0 P: 2)

Sl. No.	Topic	Nos. of contact hours	Distribution of marks (out of 100)
1	Construct the circuit and plot the VI characteristics of the PN Junction Diode, and find the cut-in voltage	2	8
2	Construct the circuit and plot the characteristics of a Zener Diode. Find the breakdown voltage	2	8
3	Construct a Half Wave Rectifier and obtain regulation characteristics – Without Filters and with Filters. Compare the results	2	10
4	Construct a full-wave rectifier and obtain regulation characteristics, with and without filters. Compare the results	2	8
5	Study Input and Out characteristic of BJT, Biasing of transistor: Common base, Common Emitter, and common collector	2	8
6	Construct a Bridge Rectifier and obtain regulation characteristics – without filters and with filters.	2	10
7	Obtain the characteristics of DIAC and TRIAC	2	8
8	Simulate half wave, full wave, and bridge rectifier using simulation tools like PSpice/ Orcad/ Multisim	2	8

9	Develop a simulation model for Voltage Series and Voltage Shunt Feedback amplifiers.	2	8
10	Develop circuits for Voltage Series and Voltage Shunt Feedback Amplifiers and obtain output plots. Compare the results with the simulation mode	2	8
11	Develop a simulation model for the Current Series and Current Shunt Feedback amplifiers.	2	8
12	Develop circuits for Current Series and Current Shunt Feedback Amplifiers and obtain output plots. Compare the results with the simulation model.	2	8

Text Books:

1. Boylestad, Robert L., and Louis Nashelsky. *Electronic devices and circuit theory*. Pearson Educación, 2002.

2. Malvino, Albert Paul, David J. Bates, and Patrick E. Hoppe. *Electronic principles*. Glencoe, 1993.

Reference Books:

1. Millman, Jacob. *Electronic Devices and Circuits [by] Jacob Millman [and] Christos C. Halkias*. McGraw-Hill, 1967.

2. Streetman, Ben G., and Sanjay Banerjee. *Solid state electronic devices*. Vol. 4. New Jersey: Prentice hall, 2000.

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Name of the Programme:	Diploma in Electronics and Communication Engineering
Semester:	3

Course Code:	DEC303
Course Title:	Digital Electronics
Course Credit:	3 (L: 3 T: 0 P: 2)

Course objective:	This course aims to provide foundational knowledge of number systems, Boolean algebra, and digital logic circuits. Students will learn to analyze, design, and implement logic circuits using various logic gates, combinational and sequential circuits, and arithmetic logic components. The course also introduces memory devices and data conversion techniques essential for digital system design and embedded applications. Through theoretical and practical exploration, students will develop the skills necessary to understand and construct digital systems critical to computing and electronics.
Pre-requisites:	Nil
Course outcomes:	1. After completion of this course students will 2. Understand and convert between different number systems including binary, octal, decimal, and hexadecimal. 3. Apply Boolean algebra laws, De-Morgan's Theorems, and Karnaugh Maps to simplify and design logical expressions. 4. Analyze and implement arithmetic and logic circuits using basic and universal logic gates. 5. Design and evaluate combinational and sequential circuits such as multiplexers, demultiplexers, counters, and registers. 6. Explain the organization, types, and functioning of memory devices and data converters in digital systems.

Unit/ Module no.	Topic	Nos. of contact hours	Distribution of marks (out of 100)
1	**Number Systems & Boolean Algebra:** Introduction to different number systems – Binary, Octal, Decimal, Hexadecimal Conversion from one number system to another. Boolean variables – Rules and laws of Boolean Algebra De-Morgan's Theorem Karnaugh Maps and their	6	10

	use for simplification of Boolean expressions		
2	**Logic Gates:** AND, OR, NOT, NAND, NOR, XOR, XNOR: Symbolic representation and truth table Implementation of Boolean expressions and Logic Functions using gates Simplification of expressions.	4	15
3	**Arithmetic Circuits:** Addition, Subtraction, 1's 2's Complement, Half Adder, Full Adder, Half Subtractor, Full Subtractor, Parallel and Series Adders. Encoder, Decoder Multiplexer – 2 to 1 MUX, 4 to 1 MUX, 8 to 1 MUX. Applications. Demultiplexer – 1 to 2 DEMUX, 1-4 DEMUX, 1- 8 DEMUX. [	8	20
4	**Combinational Logic Circuits:** SR, JK, T, D, FF, JK-MS, Triggering, Counters – 4 bit Up – Down Counters, Asynchronous/ Ripple Counter, Decade Counter- Mod 3, Mod 7 Counter, Johnson Counter, Ring Counter. Registers – 4 bit Shift Register: Serial In Serial Out, Serial in Parallel Out, Parallel In Serial Out, Parallel In Parallel Out.	8	20
5	**Sequential Logic Circuits:** Classification of Memories – RAM Organization, Address Lines and Memory Size, Static RAM, Bipolar RAM, cell Dynamic RAM, DRAM, DDR RAM. Read Only Memory – ROM organization, Expanding memory, PROM, EPROM, EEPROM, Flash memory. Data Converters – Digital to Analog converters, Analog to Digital Converters	8	20
6	**Memory Devices and Data Converter:** Classification of Memories – RAM Organization, Address Lines and Memory Size, Static RAM, Bipolar RAM, cell Dynamic RAM, DRAM, DDR RAM. Read Only Memory – ROM organization, Expanding memory, PROM, EPROM, EEPROM, Flash memory. Data Converters – Digital to Analog converters, Analog to Digital Converters	6	15

Text Books:

1. Leach, Malvino, Saha , " Digital Principles and Applications (SIE) | 8th Edition", 2014, Tata McGraw Hill Publications.
2. Kumar, A. Anand. *Fundamentals of digital circuits*. PHI Learning Pvt. Ltd., 2016.
3. Floyd, Thomas L. *Digital fundamentals, 10/e*. Pearson Education India, 2011.

Reference Books:

1. Roth, Charles H., and Larry L. Kinney. "Fundamentals of logic design." (2004).

2. Gothmann, W. H. *Digital electronics: an introduction to theory and practice*. Vol. 1. No. 1. Prentice Hall Of India Pvt. Ltd., New Delhi, 1977.
3. Maini, Anil K. *Digital electronics: principles, devices and applications*. John Wiley & Sons, 2007.
4. Gothmann, W. H. *Digital electronics: an introduction to theory and practice*. Vol. 1. No. 1. Prentice Hall Of India Pvt. Ltd., New Delhi, 1977.

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Name of the Programme:	Diploma in Electronics and Communication Engineering
Semester:	3

Course Code:	DEC373
Course Title:	Digital Electronics Lab
Course Credit:	3 (L: 0 T: 0 P: 2)
Course objective:	This laboratory course aims to provide hands-on experience in designing, implementing, and analyzing digital circuits using logic gates and standard ICs. Students will verify logic gate truth tables using CMOS and TTL technologies, implement combinational and sequential circuits, and explore data processing units such as adders, subtractors, multiplexers, and counters. Emphasis is placed on circuit realization, practical debugging, and understanding digital memory and display systems, laying a solid foundation for advanced digital system design.
Pre-requisites:	Nil
Course outcomes:*	1. Verify and analyze truth tables of basic and universal logic gates using CMOS and TTL ICs. 2. Design and implement combinational logic circuits such as adders, subtractors, multiplexers, and demultiplexers. 3. Construct and test sequential logic circuits, including various types of flip-flops and shift registers. 4. Develop and simulate counters and display interfaces like up-down counters with 7-segment displays. 5. Interface and evaluate digital memory components for data storage and retrieval applications. 6. Apply Boolean logic to design optimized digital circuits and troubleshoot real-world digital systems.

Unit/ Module no.	Topic	Nos. of contact hours	Distribution of marks (out of 100)
1	To verify the truth tables for all logic gates – NOT, OR, AND, NAND, NOR, XOR, XNOR using CMOS Logic gates and TTL Logic Gates.	2	10
2	Implement and realize Boolean Expressions with Logic Gates.	2	10
3	Implement Half Adder, Full Adder, Half Subtractor, and Full Subtractor using ICs.	2	10
4	Implement parallel and serial full-adder using ICs.	2	10
5	Design and development of Multiplexer and Demultiplexer using multiplexer ICs.	2	10
6	Verification of the function of SR, D, JK, and T Flip Flops.	2	10
7	Design controlled shift registers.	2	10
8	Construct a Single Digit Decade Counter (0-9) with a 7 7-segment display.	2	10
9	To design a programmable Up-Down Counter with a 7-segment display.	2	10
10	Study of different memory ICs	2	10

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Name of the Programme:	Diploma in Electronics and Communication Engineering
Semester:	3

Course Code:	DEC304
Course Title:	Electronic Measurement and Instrumentation
Course Credit:	3(L: 3 T: 0 P: 4)

Course objective:	
Pre-requisites:	Nil
Course outcomes:*	

Unit/ Module no.	Topic	Nos. of contact hours	Distribution of marks (out of 100)
1	**Basics of Measurements and Bridge**s: Accuracy & precision, Resolution Types of Errors, DC Bridges – Wheatstone and Kelvin Double Bridge, AC Bridges - Maxwell's Bridge, Hay's Bridge, Anderson Bridge, De-Sauty's Bridge	8	20
2	**Potentiometer:** Basic DC slide wire Potentiometer, Crompton's DC Potentiometer Applications of DC Potentiometer AC Potentiometers, Applications of AC Potentiometers	6	15
3	**Measuring Instruments:** Permanent Magnet Moving	6	15

	Coil Instruments (PMMC) Moving Iron type Instruments (MI) Electro Dynamo Type Instruments Single Phase Energy Meter		
4	**Electronic Instruments:** Electronic Voltmeter and Digital Voltmeter Electronic Multimeters, Q – Meter, Vector Impedance Meter	6	15
5	**Cathode ray tube:** construction, operation, screens, graticules. Vertical deflection system, Horizontal deflection system, Delay line, Measurement of frequency, time delay, phase angle and modulation index (trapezoidal method), Oscilloscope probe: Structure of 1:1 and 10:1 probe Multiple Trace CRO	8	20
6	**Transducers:** Classification, Selection Criteria, Characteristics, Construction, Working Principles, and Application of the following Transducers: RTD, Thermocouple, Thermistor LVDT, Strain Gauge, Load Cell, Piezoelectric Transducers.	8	15

Text Books:

1. Sawhney, A. K. *A course in Electrical and Electronic Measurements and Instrumentation*. 2023.
2. Cooper, William David. "Electronic instrumentation and measurement techniques." *(No Title)* (1985).

Reference Books:

1. Joshi, J. G. *Electronic Measurements and Instrumentation*. KHANNA PUBLISHING HOUSE.
2. Doebelin, Ernest O., and Dhanesh N. Manik. "Measurement systems: application and design." (2007).
3. Oliver, Bernard M., and John M. Cage. "Electronic measurements and instrumentation." *(No Title)* (1971).
4. Bakshi, Uday A., and Late Ajay V. Bakshi. *Electrical Measurements*. Technical Publications, 2020.
5. Kalsi, H. S. *Electronic instrumentation*. Vol. 1000. Tata McGraw-Hill, New Delhi, 2010.

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Name of the Programme:	Diploma in Electronics and Communication Engineering
Semester:	3

Course Code:	DEC304
Course Title:	Electronic Measurement and Instrumentation Lab
Course Credit:	2 (L: 0 T: 0 P: 4)

Unit/ Module no.	Topic	Nos. of contact hours	Distribution of marks (out of 100)
1	Measure unknown inductance using the following bridges (a) Anderson Bridge (b) Maxwell Bridge Measure Low resistance by Kelvin's Double Bridge	4	20
2	Calibrate an ammeter using a DC slide wire potentiometer	4	20
3	Calibrate a voltmeter using Crompton potentiometer Study the working of Q-meter and measure Q of coils	4	20
4	Measure low resistance by Crompton potentiometer loading	4	20
5	Calibrate a single-phase energy meter by phantom	4	20

Name of the Programme:	Diploma in Electronics and Communication Engineering
Semester:	3

Course Code:	DEC305
Course Title:	Electric Circuits & Network
Course Credit:	3 (L: 3 T: 0 P: 0)

Course objective:	
Pre-requisites:	Nil
Course outcomes:*	

Unit/ Module no.	Topic	Nos. of contact hours	Distribution of marks (out of 100)
1	**Basics of Network and Network Theorem:** Node and Mesh Analysis, Superposition Theorem, Thevenin Theorem, Norton Theorem, Maximum Power transfer theorem and Reciprocity Theorem.	10	20
2	**Graph Theory:** Graph of network, tree, incidence matrix. F- Tie Set Analysis F-Cut Set Analysis. Analysis of a resistive network using cut-set and tie-set Duality	8	15
3	**Time Domain and Frequency Domain Analysis:** Solution of first and second-order differential equations for Series and parallel R-L, R-C, and R-L-C circuits. Initial and Final conditions in network elements Forced and Free response, time constants Steady State and Transient State Response. Analysis of electrical circuits using Laplace Transform for standard inputs (unit, Ramp, Step)	10	20
4	**Trigonometric and exponential Fourier series:** Discrete spectra and symmetry of waveform. Steady-state response of a network to non-sinusoidal periodic inputs, power factor, and effective values. Fourier transform and continuous spectra.	6	20
5	**Two Port Network:** Two Port Network. Open Circuit Impedance Parameters, Short Circuit Admittance Parameters, Transmission Parameters, and Hybrid Parameters. Interrelationship of Two Port Network. Interconnection of Two Port Network.	8	15

Text Books:

1. Choudhury, D. Roy. *Networks and systems*. New Age International, 1988.
2. Chakrabarti, Abhijit. *Circuit theory: Analysis and synthesis*. Dhanpat Rai & Company, 2007.

Reference Books:

1. William, H. A. R. T., Jack E. Kemmerly, and Steven M. Durbin. *Engineering circuit analysis*. McGraw-Hill Higher Education, 2007.
2. Huelsman, Lawrence P. "Basic circuit theory." *(No Title)* (1991).
3. Valkenberg, Network Analysis – 1 January 2015, Pearson publication
4. Husain, Ashfaq. *Networks and Systems*. KHANNA PUBLISHING HOUSE, 2021.

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3rd Sem ECE Diploma Syllabus (draft)

Name of the Programme:	3 Years Diploma in Engineering (common paper for all departments)
Semester:	3rd

Course Code:	DHS371
Course Title:	Gender Sensitization
Course Credit:	0 (L: 0 T: 0 P: 2)

Course objective:	1. To raise and develop social consciousness among the students. 2. To sensitize the students regarding the issues of gender and the gender inequalities prevalent in society. 3. To initiate the gender perspective in all domains of understanding with the issues of their daily life.
Pre-requisites:	
Course outcomes:*	The students will be equipped and encouraged in capacity building to enable them to engage in policy decisions to remove gender biases in all fields of life in the process of gender equality for work place and in Nation building in general.

Unit/ Module no.	Topic
Unit I	**Understanding Gender and Related Concepts** ▪ House Work ▪ Gender Based Violence ▪ Sexualities ▪ InterSectionally ▪ Gender ,Caste& Class
Unit II	**Gender Sensitization** ▪ Gender Sensitization: Meaning, Nature & importance ▪ Challenges before Gender Sensitization ▪ Practices for Gender Sensitization
Unit-III	**Towards Equality: Convention & Declaration** ▪ Convention on the Elimination of all Forms of Discrimination Against Women

	(CEDAW) ▪ Declaration on the Elimination of Violence Against Women (DEVAW)
Unit IV	**Towards Equality: Constitutional Provisions and Acts** ▪ Gender Equality: Constitutional Provisions ▪ Protection of Women from Domestic ViolenceAct,2005 ▪ Protection of Children from Sexual OffencesAct,2012 ▪ Sexual Harassment of Women at Workplace(Prevention, Prohibition and Redressal) Act,2013

Reference Book

1. Jane Pilcher & Imelda Whelehan :*50 Key Concepts in Gender Studies*, SAGE Publications, New Delhi
2. Bhasin,kamla:*WhatisPatriarchy?*,KaliforWomen,NewDelhi
3. V.Geetha:*Gender*, STREE-SAMYA,Kolkata
4. V.Geetha:*Patriarchy*, STREE-SAMYA,Kolkata
5. ConventionontheElimination ofAllFormsofDiscriminationagainstWomen Adopted and opened for signature, ratification and accession by General Assembly resolution 34/180 of 18 December 1979 entry into force 3 September 1981, in accordance with article 27(1)
6. Declaration on the Elimination of Violence against Women Proclaimed by General Assembly resolution 48/104 of 20 December 1993

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COURSE STRUCTURE

AND

SYLLABUS FOR

DIPLOMA IN

FOOD PROCESSING TECHNOLOGY

2nd year (Semester III)

(APPLICABLE FROM AY 2024-2025 ADMITTED BATCH ONWARDS)

CENTRAL INSTITUTE OF TECHNOLOGY KOKRAJHAR

2ND YEAR: 3RD SEMESTER (JULY-DEC)

A. Theory Courses						
SN	**Course Code**	**Course Name**	**L**	**T**	**P**	**C**
1	DFE301	Introduction To Food Processing and Preservation Technology	2	1	0	3
2	DFE302	Elements of Food Engineering-I	3	0	0	3
3	DFE303	Food Product Technology-I	3	0	0	3
4	DHS302	Engineering Economics & Accountancy	3	0	0	3
5	DMD302	Introduction to Web Designing	1	0	0	1
Total of A			**12**	**1**	**0**	**13**

B. Laboratory/Project/Seminar Courses						
SN	**Course Code**	**Course Name**	**L**	**T**	**P**	**C**
6	DFE371	Introduction To Food Processing and Preservation Technology Lab	0	0	2	1
7	DFE372	Elements Of Food Engineering-I Lab	0	0	2	1
8	DFE373	Food Product Technology-I Lab	0	0	2	1
9	DFE374	Professional Practice-I	0	0	2	1
10	DMD372	Introduction to Web Designing Lab	0	0	4	2
Total of B			**0**	**0**	**12**	**6**

C. Audit/Non-credit Courses						
SN	**Course Code**	**Course Name**	**L**	**T**	**P**	**C**
11	DHS371	Gender Sensitization	0	0	2	0
Total of C			**0**	**0**	**2**	**0**
Grand Total (A+B+C)			**12**	**1**	**14**	**19**

A. THEORY COURSE

Course code: DFE301
Course Title: Introduction To Food Processing and Preservation Technology
Total contact hours: 40L
Total Credit: 03 **L-T-P: 2-1-0**

Module 1: Introduction to Food constituents, viz. carbohydrates, lipids, proteins, vitamins and minerals. Types and causes of food spoilage. Contact hours:10L

Module 2: Food preservation principles and methods; Physical, Chemical and Biological; Physical: Drying, evaporation, canning and process time evaluation, irradiation, refrigeration and freezing. Contact hours:10L

Module 3: Chemical and Biochemical means of preservation viz. by addition of salt, sugar, oil spices and preservative; fermentation etc. Contact hours:10L

Module 4: Introduction to food packaging, Introduction to hygienic aspect in food handling and processing. Contact hours:10L

Books / References:

1. Food Science, N. N. Potter, CBS Publisher & Distributors
2. Foods, Facts & Principles, N. S. Many & M. Shadaksharaswamy, New Age International (p) Ltd., New Delhi.
3. Technology of food preservation, Desrosier&Desrosier, CBS Publishers & Distributors, New Delhi.
4. Food Science, B. Srilakshmi, New Age International (p) Ltd., New Delhi.

Course code: DFE302
Course Title: Elements of Food Engineering–I
Total contact hours: 40L
Total Credit: 03 **L-T-P: 3-0-0**

Module 1: Laws of thermodynamics: Zeroth, first and second laws. Concepts of enthalpy, internal energy, entropy and absolute temperature. Reversibility and irreversibility, Carnot cycle and Carnot engine. Contact hours:10L

Module 2: Introduction to heat, different methods of heat transfer, Fourier's Law, Steady State heat transfer through plain and composite slabs, cylindrical and spherical surfaces. Contact hours: 10L

Module 3: Natural and forced convection, concept of overall heat transfer coefficient, LMTD, Heat exchangers and its applications in food processing. Heat transfer by radiation. Contact hours: 10L

Module 4: Refrigeration and freezing: refrigeration cycles, heat pump. Application of refrigeration in food processing and preservation. Food freezing, freezing time calculation by Plank's equation. Contact hours: 10L

Books / References:

1. Brennan, J.G. et. Al.; Elsevier Applied Science, Amsterdam: Food Engineering Operations
2. Heldman, R.R. and R.P. Singh, CBS Publication: Food Process Engineering
3. Toledo, R.T., CBS Publication: Fundamentals of Food Engineering

4. D.G.Rao.,PHI Publication: Fundamentals of Food Engineering
5. Akash Pare and B.L.Mandhyan: Food Process Engineering & Technology
6. Chandra Gopala Rao: Essentials of Food Process Engineering

Course code: DFE303
Course Title: FOOD PRODUCT TECHNOLOGY – I
Total contact hours: 45L
Credit: 03 **L-T-P: 3-0-0**

Module 1: Production process of milled rice; Parboiling and Parboiled rice. Processing of wheat, corn/maize, millets, barley, oats. Processing of pulse. **Contact hours: 8L**

Module 2: Processing of oil seeds. Production and processing of edible vegetable oils and animal fat, refining of crude oil, production of hydrogenated fat, bakery and shortening fat and fat substitute products like Margarine. **Contact hours: 8L**

Module 3: Current status of production and processing of fruits and vegetables, chemical composition, pre harvest changes, maturity standards for storage, Equipment, cleaning methods, sorting, grading, peeling and blanching for processing of fruits and vegetables. **Contact hours: 9L**

Module 4: Post harvest handling of fresh fruits and vegetables. Preservation Methods: Drying and dehydration of fruits and vegetables, freezing of fruits and vegetables, thermal processing of fruits and vegetables; using preservatives effects of processing on the quality of fruits and vegetable products. **Contact hours: 10L**

Module 5: Processing of fruits and vegetables. Preparation of Fruits beverages such as juice, syrups, squashes, cordials, nectars, concentration and drying of juice; manufacture of jam, jellies, marmalade, pickles and chutneys. Preparation of tomato ketchup, sauce, puree and paste. FPO and FPO standards for specific fruits and vegetable products, Quality control. Utilization of by-products of fruits and vegetable processing industry. **Contact hours: 10L**

Books / References:

1. Food Science - N.N. Potter, CBS Publisher and Distributor, New Delhi
2. Technology of Food Preservation - Desrosier and Desrosier, CBS Publisher and Distributor, New Delhi
3. Agricultural Process Engineering - Singh and Sahay, Vikash Publishing House, New Delhi.
4. Fruits And Vegetable Preservation - Girdhari Lal and Sidappa.
5. Food Processing and Preservation – B. Sivasankar

Course Code: DHS302
Course Title: Engineering Economics & Accountancy
Course Credit: 03 **L-T-P : 3-0-0**

Part A: Engineering Economics

Unit: 1 Introduction of Economics

1.1 Definition of Economics, Nature and scope of the Study.
1.2 Definition of Engineering Economics
1.3 Meaning and concepts of Utility, Consumption, value, price, Goods and National income, Inflation.
1.4 Wants, Definition and Characteristics

1.5Wealth and Welfare – Definition, meaning and types.

Unit: 2 Demand And Supply

2.1 Meaning and types of Demand
2.2 The law of Demand, its limitations
2.3 Preparation of Demand Schedule
2.4 Meaning of Supply
2.5 The law of supply, its limitations
2.6 Preparation of supply schedule

Unit: 3 Production

3.1 Meaning and factors of Production
3.2 Factors determining efficiency of labour
3.3 Saving, investment and capital formation
3.4 Meaning of Production Function

Unit: 4 Money

4.1 Meaning of Money
4.2 Types of Money
4.3 Functions of Money

Unit: 5 Banking Organisation

1.5 Central Bank – its functions
1.6 Commercial Banks – its functions

Unit: 6 Pricing

6.1 Objective of Pricing Policy
6.2 Price determinants
6.3 Price discrimination

Part B: Accountancy

Unit: 7 Introduction to Book Keeping and Accountancy

7.1 Definition and objectives of Book Keeping
7.2 Need and Advantages of Book Keeping
7.3 Definition of Accounting
7.4 Difference between book keeping and accounting
7.5 Double Entry Systems – main features
7.6 Advantage and dis advantages of Double Entry System

Unit: 8 Introduction to Computerized Accounting System

8.1 Components of Computerized Accounting Software
8.2 Need for Computerized Accounting
8.3 Difference between computerized Accounting and Manual Accounting

Unit: 9 Transaction

9.1 Definition
9.2 Meaning of Account
9.3 Classification of Accounts: Traditional Approach and Modern Approach
9.4 Meaning of Debit and Credit
9.5 Rules of Debit and Credit

Unit 10: Journal and Ledger

10.1 Meaning of Journal
10.2 Recording of Transaction in Journal
10.3 Meaning of Ledger
10.4 Objective and Utility of Ledger
10.5 Posting and Balancing of Ledger
10.6 Distinction between Journal and Ledger
10.7 Names of Different Books of Accounts

Unit: 11 Cash Book

11.1 Meaning and Importance of Cash Book
11.2 Characteristics and Advantages of Cash Book
11.3 Discount – Trade Discount and Cash Discount
11.4 Different Types of Cash Book: Single column cash book, Double column Cash Book and Triple column Cash book
11.5 Bank Reconciliation Statement – Basic Idea

Unit: 12 Trial Balance and Error in Accounting

12.1 Meaning and Objects of Trial Balance
12.2 Main features and Advantage of Trial Balance
12.3 Preparation of Trial Balance
12.4 Types of Error in Accounting

Unit: 13 Components of Final Accounts

13.1 Meaning and objectives of Trading Account
13.2 Contents of Trading Account
13.3 Meaning and objectives of Profit and Loss Account
13.4 Contents of Profit and Loss Account
13.5 Meaning of Depreciation, revenue expenditure and capital expenditure
13.6 Contents of Balance Sheet

Reference Books:

1. Introductory Micro Economics- Sandeep Garg- Dhanpat Rai Publication Pvt. Ltd. New Delhi.
2. Introductory Macro Economics- Sandeep Garg- Dhanpat Rai Publication Pvt. Ltd. New Delhi.
3. Theory and Practice of Accountancy-B.B. Dam, R.A. Sarda, R. Barman, B. Kalita-Capital Publishing Company, Guwahati-5.
4. Book-Keeping & Accountancy- Juneja. Chawla & Saksena- Kalyani Publisher, New Delhi-110002.
5. Tally. ERP 9 for Beginners- Tally Solutions Pvt. Ltd.-Sahaj Enterprises, Bangalore.
6.

Course Objectives: The primary objective of this course is to The Course Objectives for Engineering Economics and Accountancy are:

1. To gain a foundational understanding of basic economic concepts and their application in engineering contexts, including supply and demand, cost structures, and economic decision-making.
2. To learn methods for accurate cost estimation and budgeting for engineering projects, including direct and indirect costs.
3. To Gain a basic understanding of fundamental accounting principles, including the accounting cycle, financial statements, and key accounting concepts.
4. To learn to perform essential accounting procedures such as recording transactions, preparing journal entries, and managing ledgers.
5. To develop skills in preparing and interpreting financial statements, including balance sheets, income statements, and cash flow statements.

Course Code: DMD302
Course Title: Introduction to Web Designing
Credit: 01 **L-T-P: 1-0-0**

1. **The Internet** – concept, types, connections – structure and features of internet – Internet and Intranet, Protocols, Browsers, Search engines, Web structure, Web structure, Web blogs. Internet services—URL, Dial—ups, ISDN, e-mail, chat, cross platform features, audio & video streaming, Internet applications—Audio & video conferencing, Internet telephony, virtual reality, artificial intelligence.
2. **Fundamentals of web designing** – tools – design techniques – Web site organization – file structure, naming conventions, pages, folders, navigation, hyperlinks and adding sound. Websites – features – portals – content- corporate sites – commercial cites—functions.
3. **Content planning** – Analysis – Objectives—Content strategies – developing content tactics – defining content matter.
4. **Web authoring tools** – Adobe Photoshop, Dream weaver and other digital tools, using peripherals for website enhancements. Adobe Dreamweaver—features – tools.
5. **Trends in web technology** – Online web applications, Responsive web design. Basics of Web hosting techniques.

Practical practices based on the theory part demonstrated and guided by the Course Instructor as per requirement of the course.

Text/Reference Books

1. "Internet for everyone, Leno et al., Lone Techworld, Chennai 1998".
2. "Building a website, Tim Worsley, Orling Kindersely, New Delhi, 2000.
3. "https://www.w3schools.com/". Online free web design and development tutorials.

B. Laboratory/Project/Seminar Courses

Course code: DFE371
Course Title: Introduction To Food Processing and Preservation Technology Lab
Credit: 01 **L-T-P: 0-0- 2**

List of Experiments

1. Determination of moisture content in food (fruits/vegetables) by hot air oven
2. Determination of water activity of a given sample.
3. Estimation of total carbohydrate content of a given sample.
4. Estimation of crude fat content of a given sample.
5. Estimation of protein content of a given sample.
6. Estimation of crude fibre content of a given sample.
7. Study the effect of blanching on dried fruits/vegetables.
8. Study the effect of Class-I preservative (sugar/salt) on fruits/vegetables.
9. Preparation of potato chips and its quality analysis.
10. Preparation of jam and its quality analysis.

Course code: DFE372
Course Title: Elements Of Food Engineering-I Lab
Credit: 01 **L-T-P: 0-0-2**

List of Experiments

1. To study the heat transfer in shell and tube heat exchanger.
2. To study the heat transfer in plate type heat exchanger.
3. Study of centrifugal pump characteristics.
4. Preparation of freeze-dried fruit products.
5. To study the drying characteristics of a solid material by using a tray dryer.
6. To determine the Reynold's no. by Reynold's apparatus.
7. To verify Bernoulli's Equation experimentally.

Course code: DFE373
Course Title: Food Product Technology-I Lab
Credit: 01 **L-T-P: 0-0-2**

List of Experiments

1. Production of rice from paddy by rice Sheller and calculate the percentage of yield.
2. Polishing of rice-by-rice husker and calculate the percentage of yield.
3. Preparation of jelly.
4. Preparation of jam.
5. Preparation of marmalade.
6. Preparation of tomato ketchup.
7. Preparation of tomato puree.
8. Preparation of mixed pickle.
9. Preparation of chilli sauce.

Paper code: DFE374
Paper name: Professional Practice-I
Credit: 01 **L-T-P: 0-0-2**

1. Seminar and Group Discussion: Prepare and present a seminar on current trends or challenges in the food industry
2. Invited Talk: To expose students or professionals to current industry trends, cutting-edge research, and real-world challenges.
3. Food Quality Testing Lab Exercise: To Perform basic tests on food samples (e.g., moisture content, pH, acidity, microbial load).

4. Ethics and Professionalism Discussion: Discuss case studies related to food adulteration, mislabeling, or unethical practices.

5. Industrial visits: To visit food processing units, dairy plants, bakeries, or cold storage facilities.

Course Code: DMD372
Course Title: Introduction to Web Designing Lab
Credit: 02 **L-T-P: 0-0-4**

1. The Internet – concept, types, connections – structure and features of internet – Internet and Intranet, Protocols, Browsers, Search engines, Web structure, Web structure, Web blogs. Internet services—URL, Dial—ups, ISDN, e-mail, chat, cross platform features, audio & video streaming, Internet applications—Audio & video conferencing, Internet telephony, virtual reality, artificial intelligence.

2. **Fundamentals of web designing** – tools – design techniques – Web site organization – file structure, naming conventions, pages, folders, navigation, hyperlinks and adding sound. Websites – features – portals – content- corporate sites – commercial cites—functions.

3. **Content planning** – Analysis – Objectives—Content strategies – developing content tactics – defining content matter.

4. **Web authoring tools** – Adobe Photoshop, Dream weaver and other digital tools, using peripherals for website enhancements. Adobe Dreamweaver—features – tools.

5. **Trends in web technology** – Online web applications, Responsive web design. Basics of Web hosting techniques.

Practical practices based on the theory part demonstrated and guided by the Course Instructor as per requirement of the course.

Text/Reference Books

1. "Internet for everyone, Leno et al., Lone Techworld, Chennai 1998".
2. "Building a website, Tim Worsley, Orling Kindersely, New Delhi, 2000.
3. "https://www.w3schools.com/". Online free web design and development tutorials.

C. Audit/Non-credit Courses

Course Code: DHS371
Course Title: Gender Sensitization
Total contact hours: 45L
Credit: 0 **L-T-P: 0-0-2**

1. To introduce gender sensitization and related issues.
2. To raise and develop social consciousness among the students.
3. To sensitize the students regarding the issues of gender and the gender inequalities prevalent in society.
4. To initiate the gender perspective in all domains of understanding Gender Studies with the issues of their daily life.
5. To encourage capacity building among the students to enable them to engage in policy decisions to remove gender biases in all fields of life in the process of gender equality for nation

building.

Unit	Content
Unit I	**Understanding Gender and Related Concepts** ▪ Gender: Sex vs. Gender, Social construction of Gender, Gender Roles, Gender Stereotypes, Gender division of Labour ▪ Patriarchy ▪ House Work ▪ Gender Based Violence ▪ Sexualities ▪ Inter Sectionally ▪ Gender, Caste& Class
Unit II	**Gender Sensitization** ▪ Gender Sensitization: Meaning, Nature & importance ▪ Challenges before Gender Sensitization ▪ Practices for Gender Sensitization
Unit-III	**Towards Equality: Convention & Declaration** ▪ Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW) ▪ Declaration on the Elimination of Violence Against Women (DEVAW)
Unit IV	**Towards Equality: Constitutional Provisions and Acts** ▪ Gender Equality: Constitutional Provisions ▪ Protection of Women from Domestic ViolenceAct, 2005 ▪ Protection of Children from Sexual OffencesAct,2012 ▪ Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act,2013

Reference Book

1. Jane Pilcher & Imelda Whelehan :*50 Key Concepts in Gender Studies*, SAGE Publications, New Delhi
2. Bhasin, kamla:*What is Patriarchy?,* Kali for Women, NewDelhi
3. V.Geetha: *Gender*, STREE-SAMYA, Kolkata
4. V.Geetha: *Patriarchy*, STREE-SAMYA, Kolkata
5. Convention on the Elimination of All Forms of Discrimination against Women Adopted and opened for signature, ratification and accession by General Assembly resolution 34/180 of 18 December 1979 entry into force 3 September 1981, in accordance with article 27(1)
6. Declaration on the Elimination of Violence against Women Proclaimed by General Assembly resolution 48/104 of 20 December 1993

COURSE STRUCTURE

AND

SYLLABUS FOR

DIPLOMA PROGRAMME

IN

CONTROL AND INSTRUMENTATION (CAI)

2nd year (Semester III)

(APPLICABLE FROM AY 2024-2025 ADMITTED BATCH ONWARDS)

CENTRAL INSTITUTE OF TECHNOLOGY KOKRAJHAR

COURSE STRUCTURE

Sl. No.	Course Code	Course Name	L	T	P	C	Department
1	DHS371	Gender Sensitization (Audit)	0	0	2	0	HSS
2	DHS302	Engineering Economics and Accountancy	2	1	0	3	HSS
3	DMA301	Mathematics -III	2	1	0	3	MATH
4	DIE301	Electrical Circuits and Networks	2	1	0	3	IE
5	DIE302	Electronics Devices and Circuits-I	2	1	0	3	IE
6	DIE303	Digital Electronics	2	1	0	3	IE
7	DIE304	Fundamentals of Instrumentation	2	0	0	2	IE
8	DIE371	Electrical Circuits and Networks Lab	0	0	2	1	IE
9	DIE372	Electronics Devices and Circuits-I Lab	0	0	2	1	IE
10	DIE373	Digital Electronics Lab	0	0	2	1	IE
		Total	**12**	**5**	**8**	**20**	

Detailed Syllabus

Course Title: Gender Sensitization (Audit)
Course Code: DHS371 **Credit: 0**

Total contact hours: 45 **L-T-P: 0-0-2**

Course Objectives:

1. To introduce gender sensitization and related issues.
2. To raise and develop social consciousness among the students.
3. To sensitize the students regarding the issues of gender and the gender inequalities prevalent in society.
4. To initiate the gender perspective in all domains of understanding Gender Studies with the issues of their daily life.
5. To encourage capacity building among the students to enable them to engage in policy decisions to remove gender biases in all fields of life in the process of gender equality for nation building.

Contents:

Unit I **Understanding Gender and Related Concepts**

- Gender: Sex vs. Gender, Social construction of Gender, Gender Roles, Gender Stereotypes, Gender division of Labour
- Patriarchy
- House Work
- Gender Based Violence
- Sexualities
- Inter Sectionally
- Gender, Caste& Class

Unit II **Gender Sensitization**

- Gender Sensitization: Meaning, Nature & importance
- Challenges before Gender Sensitization
- Practices for Gender Sensitization

Unit-III **Towards Equality: Convention & Declaration**

- Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW)
- Declaration on the Elimination of Violence Against Women (DEVAW)

Unit IV **Towards Equality: Constitutional Provisions and Acts**

- Gender Equality: Constitutional Provisions
- Protection of Women from Domestic Violence Act, 2005
- Protection of Children from Sexual OffencesAct,2012
- Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act,2013

Reference Book

1. Jane Pilcher & Imelda Whelehan :*50 Key Concepts in Gender Studies*, SAGE Publications, New Delhi
2. Bhasin, kamla:*What is Patriarchy?*, Kali for Women, NewDelhi
3. V.Geetha: *Gender*, STREE-SAMYA, Kolkata
4. V.Geetha: *Patriarchy*, STREE-SAMYA, Kolkata
5. Convention on the Elimination of All Forms of Discrimination against Women Adopted and opened for signature, ratification and accession by General Assembly resolution 34/180 of 18 December 1979 entry into force 3 September 1981, in accordance with article 27(1).
6. Declaration on the Elimination of Violence against Women Proclaimed by General Assembly resolution 48/104 of 20 December 1993

Course Title: Engineering Economics and Accountancy
Course Code: DHS302 **Credit: 03**

Total contact hours: 36 **L-T-P: 2-1-0**

Course Objectives: The Course Objectives for Engineering Economics and Accountancy are:

1. To gain a foundational understanding of basic economic concepts and their application in engineering contexts, including supply and demand, cost structures, and economic decision-making.
2. To learn methods for accurate cost estimation and budgeting for engineering projects, including direct and indirect costs.
3. To Gain a basic understanding of fundamental accounting principles, including the accounting cycle, financial statements, and key accounting concepts.
4. To learn to perform essential accounting procedures such as recording transactions, preparing journal entries, and managing ledgers.
5. To develop skills in preparing and interpreting financial statements, including balance sheets, income statements, and cash flow statements.

Part A: Engineering Economics

Unit: 1 Introduction of Economics

1.1 Definition of Economics, Nature and scope of the Study.
1.2 Definition of Engineering Economics
1.3 Meaning and concepts of Utility, Consumption, value, price, Goods and National income, Inflation.
1.4 Wants, Definition and Characteristics
1.5Wealth and Welfare – Definition, meaning and types.

Unit: 2 Demand And Supply

2.1 Meaning and types of Demand
2.2 The law of Demand, its limitations
2.3 Preparation of Demand Schedule
2.4 Meaning of Supply
2.5 The law of supply, its limitations
2.6 Preparation of supply schedule

Unit: 3 Production

3.1 Meaning and factors of Production
3.2 Factors determining efficiency of labour
3.3 Saving, investment and capital formation
3.4 Meaning of Production Function

Unit: 4 Money

4.1 Meaning of Money
4.2 Types of Money
4.3 Functions of Money

Unit: 5 Banking Organisation

1.5 Central Bank – its functions
1.6 Commercial Banks – its functions

Unit: 6 Pricing

6.1 Objective of Pricing Policy
6.2 Price determinants
6.3 Price discrimination

Part B: Accountancy

Unit: 7 Introduction to Book Keeping and Accountancy

7.1 Definition and objectives of Book Keeping
7.2 Need and Advantages of Book Keeping
7.3 Definition of Accounting
7.4 Difference between book keeping and accounting
7.5 Double Entry Systems – main features
7.6 Advantage and dis advantages of Double Entry System

Unit: 8 Introduction to Computerized Accounting System

8.1 Components of Computerized Accounting Software
8.2 Need for Computerized Accounting
8.3 Difference between computerized Accounting and Manual Accounting

Unit: 9 Transaction

9.1 Definition
9.2 Meaning of Account
9.3 Classification of Accounts: Traditional Approach and Modern Approach
9.4 Meaning of Debit and Credit
9.5 Rules of Debit and Credit

Unit 10: Journal and Ledger

10.1 Meaning of Journal
10.2 Recording of Transaction in Journal
10.3 Meaning of Ledger
10.4 Objective and Utility of Ledger
10.5 Posting and Balancing of Ledger
10.6 Distinction between Journal and Ledger
10.7 Names of Different Books of Accounts

Unit: 11 Cash Book

11.1 Meaning and Importance of Cash Book
11.2 Characteristics and Advantages of Cash Book
11.3 Discount – Trade Discount and Cash Discount
11.4 Different Types of Cash Book: Single column cash book, Double column Cash Book and Triple column Cash book
11.5 Bank Reconciliation Statement – Basic Idea

Unit: 12 Trial Balance and Error in Accounting

12.1 Meaning and Objects of Trial Balance
12.2 Main features and Advantage of Trial Balance
12.3 Preparation of Trial Balance
12.4 Types of Error in Accounting

Unit: 13 Components of Final Accounts

13.1 Meaning and objectives of Trading Account
13.2 Contents of Trading Account

13.3 Meaning and objectives of Profit and Loss Account

13.4 Contents of Profit and Loss Account

13.5 Meaning of Depreciation, revenue expenditure and capital expenditure

13.6 Contents of Balance Sheet

Reference Books:

1. Introductory Micro Economics- Sandeep Garg- Dhanpat Rai Publication Pvt. Ltd. New Delhi.
2. Introductory Macro Economics- Sandeep Garg- Dhanpat Rai Publication Pvt. Ltd. New Delhi.
3. Theory and Practice of Accountancy-B.B. Dam, R.A. Sarda, R. Barman, B. Kalita-Capital Publishing Company, Guwahati-5.
4. Book-Keeping & Accountancy- Juneja. Chawla & Saksena- Kalyani Publisher, New Delhi-110002.
5. Tally. ERP 9 for Beginners- Tally Solutions Pvt. Ltd.-Sahaj Enterprises, Bangalore.

Course Title: Mathematics -III
Course Code: DMA301 **Credit: 03**

Total contact hours: 36 **L-T-P: 2-1-0**

Course Objectives:

1. This course aims to develop a strong foundation in matrix theory and its applications, introduce different types of matrices and their properties, teach methods to compute the inverse and adjoint of matrices, explain techniques for solving simultaneous linear equations using matrices, explore rank determination and transformations for solving equations efficiently.
2. To teach the fundamental concepts of ordinary differential equations (ODE), various techniques for the solution of first and higher-order equations, based on ODEs for solving real-world problems in physics, engineering, and economics.
3. To develop a strong foundation in the mathematical tools needed for fluid dynamics, electromagnetism, and more. To enable the students to analyze and interpret scalar and vector fields, understand geometric and physical interpretations of directional derivatives, gradient, divergence, and curl. Apply differential and integral techniques to solve physical and engineering problems,

Module 1: Matrices

Definition, Operation of matrices. Special Matrices – Square, diagonal, row, column, zero or null, unit matrix, upper and lower triangular, symmetric and skew – symmetric matrices. Adjoint of a matrix, inverse of a matrix, finding inverse using adjoints and elementary transformations. Rank of a matrix. Solution of simultaneous linear equations.

Module 2: Ordinary differential equations (ODE)

Definition, order and degree of ODE, formation of ODE, solution of ODE.

First Order ODE: Separable equations, Homogeneous differential equations, Exact equations, Integrating factors, Linear first order equations, Bernoulli equation. Application of first order ODE: Orthogonal Trajectories.

Higher Order ODE: Linear equations with constant coefficients. Linear equations with variable coefficients. Cauchy-Euler differential equations. System of linear differential equations.

Module 3: Vector Calculus

Introduction to vector Calculus, Scalar field and vector field, Derivative and integration of vector functions, Partial derivative of vectors, Directional derivatives, Tangent plane and normal to a level surface, Gradient, divergence and curl.

Course Outcomes:

1. By completing this course, Students will be able to understand matrix operations and their properties, identify different types of special matrices and their applications, compute adjoint and inverse of matrices effectively, determine the rank of a matrix using different techniques, solve simultaneous linear equations using matrix methods.
2. By the end of this course, students should be able to: Identify and classify different types of Ordinary differential equations, apply appropriate solution techniques of the first order and higher order differential equations, understand the geometrical interpretation of ODEs and their applications.
3. By the end of the course, students should be able to: Apply vector calculus to solve problems in physics and engineering, Understand and differentiate between scalar and vector fields, compute directional derivatives and evaluate gradients, determine tangent planes and normal vectors to surfaces.

Text Books / References:

1. S.S. Sastry, Engineering Mathematics Vol-I, Prentice Hall of India, New Delhi Ed. 1994.
2. Thomas & Finney, Calculus and Analytical Geometry, Narosa Publishing Co. New Delhi, Ed. 1999.
3. George F. Simmons, Differential Equations with Applications and Historical Notes, McGraw Hill Education.
4. B.S. Grewal, Higher Engineering Mathematics, Krishna Publishers, New Delhi, Ed. 1999.
5. Murray R. Spiegel and Seymour Lipschutz, Vector Analysis, McGraw Hill, (Schaum's Outlines Series), 2nd edition 2009.
6. Dr. M. D. Raisinghania, Ordinary and Partial Differential Equations, S. Chand publishing, 19th Edition.
7. Shepley L. Ross, Wiley, Differential Equations, Third Edition (Wiley Student Edition).

Course Title: Electrical Circuits and Networks
Course Code: DIE301 **Credit: 03**

Total contact hours: 36 **L-T-P: 2-1-0**

Course Objective:

The objective of this course is to give students a thorough grasp of electrical circuits and networks by covering DC circuits, network theorems, transient analysis, and AC circuits. Students will learn to analyse and troubleshoot circuits using techniques like Kirchhoff's laws, Thevenin's theorem, and nodal analysis. In addition, the course covers how to solve issues involving series and parallel resonant circuits, comprehend resonance processes, and evaluate steady-state responses in AC circuits. Students will be able to forecast circuit behaviour, apply abstract ideas to real-world situations, and assess circuit performance in a variety of scenarios by the conclusion.

Module 1: D. C. Circuits **(8 Hours)**

Circuit Elements, Resistors, Inductors, Capacitors, Voltage And Current Sources, Internal Resistance, Equivalent Resistance, Voltage and Current Sources, Ideal Voltage Source or Constant Voltage Source, Real Voltage Source, Ideal Current Source, Real Current Source, Source Conversion, Ground, Ohm's Law, Series Circuit, Parallel Circuit, Features, Advantages and Applications of Series and Parallel Circuits, Series-Parallel Circuits and Their Applications, Duality Between Series and Parallel Circuits, Open Circuits and Short Circuits, Wheatstone Bridge, Kirchhoff's Laws-KCL and KVL, Sign Convention, Illustration of Kirchhoff's Laws, Matrix Algebra, Cramer's Rule, Voltage Divider Circuit, Current Divider Circuit.

Module 2: D.C. Network Theorems **(8 Hours)**

Network Terminology – Linear Circuit, Non-Linear Circuit, Bilateral Circuit, Unilateral Circuit, Active Element, Passive Element, Node, Junction, Branch, Loop, Mesh, Active and Passive Networks. Network Theorems and Techniques- Maxwell's Mesh Current Method, Nodal Analysis, Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer Theorem, Reciprocity Theorem, Millman's Theorem, Compensation Theorem, Delta-Start and Star-Delta Transformation, Tellegen's Theorem.

Module 3: D.C. Transients **(4 Hours)**

RL Circuit- Growth of Current, Decay of Current. RC Circuit- Charging A Capacitor, Discharging A Capacitor. Transient Response of RLC Circuits.

Module 4: Single Phase A.C. Circuits **(9 Hours)**

Basics of Sinusoids, Advantages of Sinusoidal Waveform, Terminologies For Alternating Quantities- Waveform and Wave shape, Period and Frequency, Phase, Phase Difference and Phase Shift. Values of Alternating Quantities - Instantaneous Value, Peak/Maximum/Crest Value, Average/Mean Value, Effective/Rms Value, Phasor Representation, Complex Number System, Phasor Representation, Phasor Diagram. Pure Resistive Circuit, Pure Inductive Circuit, Pure Capacitive Circuit, Series RL Circuit, Series RC Circuit, Series RLC Circuit, Parallel RL Circuit, Parallel RC Circuit, Parallel RLC Circuit, Power Relations in A.C. Circuits, Reactive Power, Power Triangle, Complex Power.

Module 5: Resonance **(7 Hours)**

Series Resonance - Quality Factor(Q), Sharpness of Resonance, Fractional Detuning Factor (δ), Expression of Z In Terms of Fractional Detuning Factor (δ) and Quality Factor(Q), Expression For Half Power Frequencies in RLC Series Resonant Circuits, Selectivity. Parallel Resonance - Relationship among Z, Q and δ, Resonance between Parallel RL and RC Circuits, Parallel RLC Circuits.

Text Books:

1) Network Theory: Analysis And Synthesis By Smarajit Ghosh, Phi Learning Private Limited.
2) Network Analysis and Synthesis By S P Ghosh and A K Chakraborty, Tata McGraw-Hill Education.
3) Basic Electrical Engineering By S K Sahdev, Khanna Book Publishing Co. Ltd.

Reference Books:

1) Electrical Circuit Analysis and Network Theory, By Shouri Chatterjee, All India Council for Technical Education (AICTE)
2) Electric Circuits and Networks, By Jamuna K, Nilanjan Tiwari, All India Council for Technical Education (AICTE)

Course outcomes

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

1. Establish an understanding of circuits. Be able to predict circuit configurations.
2. Troubleshoot electric circuits by applying network theorems and circuit analysis techniques.
3. Infer and evaluate steady state response of circuits for a sinusoidal ac voltage source.
4. Interpret and solve problems related to single phase circuits.
5. Analyse the series and parallel resonant circuits.

Course Title: Electronics Devices and Circuits-I
Course Code: DIE302 **Credit: 03**
Total contact hours: 36 **L-T-P: 2-1-0**

Course Objectives:

1) To discuss fundamental knowledge of diode and its applications.
2) To introduce the concept of BJT, JFET and fundamentals of MOSFET
3) To familiarize the concept of power amplifier and basic of power supplies

Module 1: Diodes **(8 Hours)**

The ideal diode, terminal characteristics of junction diodes, diode forward characteristics, operation in the reverse breakdown region-zener diodes, rectifier circuits, limiting and clamping circuits, special purpose diodes.

Module 2: Bipolar Junction Transistor **(9 Hours)**

Device structure and physical operation, I-V Characteristics, BJT as a switch and an amplifier, Biasing in BJT amplifier circuits, BJT AC Analysis, Single Stage BJT Amplifiers

Module 3: Field Effect Transistor **(7 Hours)**

Introduction, Construction, basic principle of Operation and Characteristics of JFETs, Depletion- Type MOSFET and Enhancement –Type MOSFET, FET as a switch and an amplifier, FET biasing , FET amplifier.

Module 4: Power Amplifier **(7 Hours)**

Introduction, Series-Fed and transformer-coupled Class A Amplifier, circuits and operations of Class B and Class C Amplifiers

Module 5: Power Supplies **(5 Hours)**

Introduction, Capacitor Filter, RC Filter, Discrete Transistor Voltage Regulation, IC Voltage Regulations, Regulated Power Supply Design, Adjustable Power Supply

Books / References:

1. Electronics Devices and Circuit Theory by Robert L. Boylestad and Louis Nashelsky, Pearson publication
2. Microelectronic Circuits, Theory and Applications by Adel S. Sedra and Kenneth C. Smith, Oxford publications
3. Electronic Devices and Circuits by Jacob Millman, Mcgrawhill
4. Electronics Devices and Circuits by J.B. Gupta, S.K. Kataria and Sons publication.

Course Outcome: At the end of the course students will able to:

1) Learn working principle and characteristics of diode and its applications.
2) Understand the concept of semiconductor devices like BJT, JFET and MOSFET.
3) Understand the basics of power amplifier and power supplies

Course Title: Digital Electronics

Course Code: DIE303

Total Contact Hours: 36 Hours **L-T-P-C: 2-1-0-3**

Course Objectives:

1. To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits.
2. To prepare students to perform the analysis and design of various digital electronic circuits.

Course Contents:

Module1- Number Systems: **(6 Hours)**

Introduction to Digital systems, Introduction to number systems (Binary, Decimal, Octal, Hexadecimal), Number representation in binary (Signed, One's and Two's complement), Binary Codes (BCD, Excess-3, Gray, Alphanumeric, Seven segment display code and Error detection and correction codes), Digital Arithmetic (Binary, BCD, Excess-3 arithmetic).

Module 2- Logic gates: **(4 Hours)**

Introduction to various logic systems (positive & negative), Truth Table, Logic gates (OR, AND, NOT, BUFFER, EX-OR, EX-NOR), Universal gates (NAND, NOR), Tristate logic gates.

Module3- Logic families: **(4 Hours)**

Significance and types of logic families (RTL, DTL, TTL), Characteristic parameters (Fan-out, Fan-in, Noise margin, Propagation Delay etc…).

Module 4- Boolean algebra and Simplification Techniques: **(4 Hours)**

Introduction to Boolean algebra and its postulates and theorems, SOP and POS Boolean expressions, Simplification techniques (using Boolean theorems, K-Map).

Module5- Combinational Circuits: **(7 Hours)**

Arithmetic circuits (Adder, Subtractor, parallel binary adder, BCD adder, carry-propagation-look-ahead-carry generator, magnitude comparator), Multiplexer, De-multiplexer, Encoder, Decoder, Parity generator-checker.

Module 6- Sequential Circuits: **(8 Hours)**

Concept of multivibrator, Flip-flops (R-S flip-flop, J-K flip-flop, D flip-flop, T flip-flop), flip-flop with preset and clear inputs, level and edge triggered flip-flops, race-around condition in flip-flops, Counters and Registers (asynchronous and synchronous counters, UP/DOWN counters, Ring counter).

Module 7- Programmable Devices: **(3 Hours)**

PROM, PLA, PAL.

Text Books:

1. Morris Mano, Prentice Hall of India, New Delhi: Digital Logic and Computer Design
2. Malvino, Tata McGraw Hill New Delhi: Digital Computer Electronics
3. A. Anand Kumar, PHI Learning Private Limited, Delhi: Fundamentals of Digital Circuits

Reference Books:

1. Anil K. Maini, Wiley: Digital Electronics : Principles and Integrated Circuits , Wiley, 2019.
2. V. P. Nelson, H.T. Nagle, E.D. Caroll and J.D. Irwin, Digital Logic Circuit Analysis and Design, Prentice Hall International, 1995

Course Outcomes:

1. Have a thorough understanding of the fundamental concepts and techniques used in digital electronics.
2. To understand and examine the structure of various number systems and its application in digital design.
3. The ability to understand, analyze and design various combinational and sequential circuits.
4. To develop skill to build, and troubleshoot digital circuits.

Course Title: Fundamentals of Instrumentation
Course Code: DIE304 **Credit: 02**
Total contact hours: 24 **L-T-P: 2-0-0**

Course Objective

1. To introduce students with the modern instrumentation system and different instruments for measuring various physical quantities
2. To provide knowledge about characteristics of instruments

Module 1: Introduction **(5 Hours)**

Scope and necessity of Instrumentation, typical application of instrument system, functional elements of instrumentation system, classification of instruments, name of important process variables and measurement methods, introduction to transducer and signal conditioning, standards and calibration.

Module 2: Static Performance Characteristics of Instruments. **(4 Hours)**

Static performance parameters, impedance and loading effects.

Module 3: Errors in measurements and their statistical analysis **(5 Hours)**

Limiting error, relative limiting error, combination of quantities with limiting errors, types of errors: gross, systematic and random errors.

Statistical treatment of data, arithmetic mean, measure of dispersion from the mean, deviation, standard deviation, variance, probability of errors, error estimates from normal distribution

Module 4: Dynamic Characteristics of Instruments. **(5 Hours)**

Introduction, formulation of system equation, transfer function, standard inputs to study dynamic response of instruments, zero order instruments, first order instruments, second order instruments.

Module 5: Data Presentation Elements **(3 Hours)**

Strip chart and X-Y recorders, segmental displays, dot matrices, LED and LCD Display

Module 6: Applications **(2 Hours)**

Brief study of instruments used for measurement of temperature, pressure, flow rate, level, displacement and humidity.

Text Books:

1. Instrumentation Measurement and Analysis by B.C. Nakra and K.K. Choudhry, McGraw Hill Publications.
2. Instrumentation for Process Measurement and Control by Norman A. Anderson, CRC Press
3. Electrical and Electronic Measurements and Instrumentation by A.K. Sawhney, Dhanpar Rai& Co. Publication.

Reference Books

1. Introduction to Measurements and Instrumentation by Arun K. Ghosh, PHI Publication.
2. Robert B. Northrop, Introduction to Instrumentation and Measurements, Taylor and Francis (CRC) Publisher, 2nd Edition, 2005.

Course Outcome

At the end of this course students will be able to

1. Acquire knowledge about basics of Instrumentation, Calibration methods
2. Acquire concept about static and dynamic characteristics of instruments.
3. Analyse data from instruments using various statistical techniques
4. Design instruments for measurement of various physical quantities.

Course Title: Electrical Circuits and Network Lab

Course Code: DIE371 **L-T-P-C: 0-0-2-1**

Course Objective:

1. To familiarize the use of various theorems and to learn their practical applications**.**
2. To impart knowledge about the transient response of electrical circuits of different loads
3. To introduce the 3 phase analysis and synthesis by using star, delta connections.

List of Experiments

1) State Ohm's Law and verify it experimentally. Also plot the VI Characteristics of Ohm's law.
2) To Verify DC & AC Series Circuit experimentally.
3) To Verify DC & AC Parallel Circuit experimentally
4) What is Potentiometer? Perform the Voltage Divider Circuit experimentally.
5) State Thevenin's theorem and perform it experimentally.
6) State Norton's Theorem and perform it experimentally
7) State maximum power transfer theorem and verify it experimentally. Also a graph R_L versus power Dissipation in the circuit.
8) State Superposition Theorem and verify it experimentally.
9) To study dc transient response of RC series circuit and plot the graph $V_{charging}$ versus time and $V_{discharging}$ versus time.
10) To plot the response curve of series RLC circuit under resonant condition.

Course Outcome: At the end of this course students will be able to

1. Design and analyze electrical circuits based on various network theorems.
2. Analyze the transient response of RL, RC and RLC circuits.

Course Title: Electronic Devices and Circuits-I Lab **Course Code: DIE372**
Total contact hours: 2/week **L-T-P-C: 0-0-2-1**

Course Objective:

1. To familiarize the use of diodes and transistors for various applications such as rectification, clipping, clamping, amplification, etc.
2. To provide the practical knowledge of designing filter and voltage regulator circuits
3. To impart the knowledge of designing basic power amplifier circuit.

List of experiments for Electronics Devices and Circuits-I Lab:

1. To study the forward and reverse biased V-I characteristics of a (general purpose/Zener) diode.
2. To study the input and output signal waveform of a diode based positive/ negative clipper circuit.
3. To study the input and output signal waveform of a diode based positive/ negative clamper circuit.
4. To rectify ac signal and then find out ripple factor of a half wave rectifier with and without capacitance filter.
5. To study the waveform of a centre tap full-wave rectifier with shunt capacitor filter.
6. To study the waveform of a bridge full-wave rectifier with shunt capacitance filter.
7. To design and study of a common emitter fixed biasing transistor amplifier.
8. To design and study of a common emitter voltage divider biasing transistor amplifier.
9. To study a LM-317 voltage regulator based variable power supply.
10. To design and study the LM-317 voltage regulator based constant power supply.
11. To study the LM-78XX/-79XX voltage regulator based constant power supply.
12. To study the transistor based push-pull power amplifier.

Course Outcomes:

On completion of the course the student will be able to:

1. Learn the operation and performance parameters of diodes and transistors.
2. Able to design clipper, clamper, filter and voltage regulator circuits based on diodes, transistors and ICs.

Paper code: DIE373 **Paper name: Digital Electronics Lab** **Credit: 2**
Total contact hours: 2 hours per week **L-T-P: 0-0-2**

Course Objective:

1. To provide the knowledge on design of various gates and verification of their outcome.
2. To familiarize the design of combinational and sequential circuits using discrete components
3. To familiarize the use of different electrical instruments.

LIST OF EXPERIMENTS:

1. Input-output verification of logic gates (ICs 74xx-group).
2. Practical validation of De-Morgan's theorem.
3. Practical validation of Boolean expressions and its minimized expression.
4. Implementation of various gates/Boolean expression by using universal gates only.
5. Design and study of half-adder and full-adder circuits.
6. Design and study of half-subtractor and full-subtractor circuits.
7. Design and study of digital multiplexer (4:1 / 8:1) circuit.
8. Design and study of digital de-multiplexer (1:4 / 1:8) circuit.
9. Design and study of Encoder circuit.
10. Design and study of Decoder circuit.
11. Study of Flip-flop circuits (R-S and J-K).

Course Outcomes (CO):

After the completion the course students will able to

1. Design circuits based on digital components and verify the output.
2. Design memory based circuits for the desired outcome.

COURSE STRUCTURE

AND

SYLLABUS FOR

DIPLOMA IN

ANIMATION AND MULTIMEDIA TECHNOLOGY

2nd year (Semester III)

(APPLICABLE FROM AY 2024-2025 ADMITTED BATCH ONWARDS)

CENTRAL INSTITUTE OF TECHNOLOGY KOKRAJHAR

AMT Diploma 3rd Semester Course Structure & Syllabus

(In line with AICTE / NEP)

Semester – 3

Sl. No.	Course Code	Course Name	L	T	P	C
01.	DHS371	Gender Sensitization	0	0	2	0
02.	DMD301	Art Fundamentals and Graphics Design	1	1	0	2
03.	DMD302	Introduction to Web Designing	1	0	0	1
04.	DMD303	Fundamentals of Digital Photography	1	0	0	1
05.	DMD304	Concept of Film Making	1	0	0	1
06.	DMD305	Introduction to 3D Modeling & Texturing	2	0	0	2
07.	DMD371	Art Fundamentals and Graphics Design Lab	0	0	4	2
08.	DMD372	Introduction to Web Designing Lab	0	0	4	2
09.	DMD373	Fundamentals of Digital Photography Lab	0	0	4	2
10.	DMD374	Concept of Film Making Lab	0	0	6	3
11.	DMD375	Introduction to 3D Modeling & Texturing Lab	0	0	8	4
	Contact Hours: 35		**6**	**1**	**28**	**20**

Course Title: Gender Sensitization **L-T-P-C: 0-0-2-0**

Course Code: DHS371

Course objective:	1. To raise and develop social consciousness among the students. 2. To sensitize the students regarding the issues of gender and the gender inequalities prevalent in society. 3. To initiate the gender perspective in all domains of understanding with the issues of their daily life.
Course outcomes: *	The students will be equipped and encouraged in capacity building to enable them to engage in policy decisions to remove gender biases in all fields of life in the process of gender equality for work place and in Nation building in general.

Unit/ Module no.	Topic
Unit I	**Understanding Gender and Related Concepts** ▪ House Work ▪ Gender Based Violence ▪ Sexualities ▪ InterSectionally ▪ Gender, Caste& Class
Unit II	**Gender Sensitization** ▪ Gender Sensitization: Meaning, Nature & importance ▪ Challenges before Gender Sensitization ▪ Practices for Gender Sensitization
Unit-III	**Towards Equality: Convention & Declaration** ▪ Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW) ▪ Declaration on the Elimination of Violence Against Women (DEVAW)
Unit IV	**Towards Equality: Constitutional Provisions and Acts** ▪ Gender Equality: Constitutional Provisions ▪ Protection of Women from Domestic ViolenceAct,2005 ▪ Protection of Children from Sexual OffencesAct,2012 ▪ Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act,2013

Reference Books

1. Jane Pilcher & Imelda Whelehan :*50 Key Concepts in Gender Studies*, SAGE Publications, New Delhi
2. Bhasin, Kamla: *What is Patriarchy?* Kali for Women, New Delhi
3. V. Geetha: *Gender*, STREE-SAMYA, Kolkata
4. V. Geetha: *Patriarchy*, STREE-SAMYA, Kolkata
5. Convention on the Elimination of All Forms of Discrimination against Women Adopted and opened for signature, ratification and accession by General Assembly resolution 34/180 of 18 December 1979 entry into force 3 September 1981, in accordance with article 27(1).
6. Declaration on the Elimination of Violence against Women Proclaimed by General Assembly resolution 48/104 of 20 December 1993.

Course Title: Art Fundamentals and Graphic Design **L-T-P-C: 1-1-4-4**
Course Code: DMD301 / DMD371

The Elements of Art and the Principles of Art, Introduction to elements of graphic design - Text and image, grids and layout, composition, form and function, figure and ground phenomenon, Gestalts laws.

Typographic fonts and their characters. Typographic parameters: x-height, ascenders, descenders, kerning, tracking and leading. Variations of body text, headlines and display text. Hands on practice using application of fundamentals of Graphic Design.

Introduction to Printing Technology. Introduction to Digital Media Technology.

Practical practices based on the theory part demonstrated and guided by the Course Instructor as per requirement of the course.

Text/Reference Books

1. *"Art Fundamentals: Theory and Practice"* by Otto G. Ocvirk, Robert E. Stinson, Philip R. Wigg, David L. Bone, Edition: 11th Edition, 2013, Publisher: McGraw-Hill Education.
2. *"Graphic Design: The New Basics"* by Ellen Lupton and Jennifer Cole Phillips, Edition: 2nd Edition, 2015, Publisher: Princeton Architectural Press.
3. *"The Elements of Graphic Design"* by Alex W. White, Edition: 2nd Edition, 2011, Publisher: Allworth Press.
4. *"The Fundamentals of Graphic Design"* by Gavin Ambrose and Paul Harris, Edition: 2nd Edition, 2011, Publisher: AVA Publishing.
5. "Making and Breaking the Grid: A Graphic Design Layout Workshop" by Timothy Samara: 2nd Edition, 2011, Publisher: Rockport Publishers.

Course Title: Introduction to Web Designing **L-T-P-C: 1-0-4-3**
Course Code: DMD302 / DMD372

1. **The Internet** – concept, types, connections – structure and features of internet – Internet and Intranet, Protocols, Browsers, Search engines, Web structure, Web structure, Web blogs. Internet services—URL, Dial—ups, ISDN, e-mail, chat, cross platform features, audio & video streaming, Internet applications—Audio & video conferencing, Internet telephony, virtual reality, artificial intelligence.
2. **Fundamentals of web designing** – tools – design techniques – Web site organization – file structure, naming conventions, pages, folders, navigation, hyperlinks and adding sound. Websites – features – portals – content- corporate sites – commercial cites—functions.
3. **Content planning** – Analysis – Objectives—Content strategies – developing content tactics – defining content matter.
4. **Web authoring tools** – Adobe Photoshop, Dream weaver and other digital tools, using peripherals for website enhancements. Adobe Dreamweaver—features – tools.
5. **Trends in web technology** – Online web applications, Responsive web design. Basics of Web hosting techniques.

Practical practices based on the theory part demonstrated and guided by the Course Instructor as per requirement of the course.

Text/Reference Books

1. “Internet for everyone, Leno et al., Lone Techworld, Chennai 1998”.
2. “Building a website, Tim Worsley, Orling Kindersely, New Delhi, 2000.
3. “https://www.w3schools.com/”. Online free web design and development tutorials.

Course Title: Fundamentals of Digital Photography **L-T-P-C: 1-0-4-3**
Course Code: DMD303 / DMD373

Introduction to Photography, History and Evolution of Digital Photography, Types of Digital Cameras (DSLR, Mirrorless, Compact, Smartphone), The Exposure Triangle: Aperture, Shutter Speed, ISO, Auto vs. Manual Mode: Pros and Cons, Rule of Thirds, Leading Lines, and Symmetry, Depth of Field and Background Separation, Framing and Cropping for Better Composition, Natural vs. Artificial Lighting, Golden Hour and Blue Hour Photography, Types of Photography: Portrait, Landscape, Street, Product, Event Introduction to Photo Editing Software.

Practical practices based on the theory part demonstrated and guided by the Course Instructor as per requirement of the course.

Reference Books:

1. "Digital Photography Complete Course" by DK Publication, 2021.
2. "Digital Photography an Introduction" by Tom Ang, 5th Edition, DK Publication, 2019.
3. "The Digital Photography Book: The Step-By-Step Secrets For How To Make Your Photos Look Like The Pros" by Scott Kelby, Rocky Nook, 2020.

Course Title: Concept of Film Making **L-T-P-C: 1-0-6-4**
Course Code: DMD304 / DMD374

Introduction to filmmaking: history, genres, and key elements, Scriptwriting & Pre-production: storyboarding, scripting, and planning, Production Techniques: camera work, lighting, and sound recording, Post-production & Distribution: editing, visual effects, marketing, and film release. Introduction to screen grammar: Types of Shot, The various elements of shot-taking: Image Size, Camera Angles, Movements, Lenses, Lighting, Camera Speed, Stocks, Graphics, and Colour. The Rule of Thirds & the Golden Points. Depth of Field and Selective Focus. Concept of Sound.

Practical practices based on the theory part demonstrated and guided by the Course Instructor as per requirement of the course.

Text/Reference Books

1. "Film Directing shot by shot: Visualizing from Concept to Screen." by Steve Katz, Focal Press, 1991.
2. "Cinematography for Directors: A guide for Creative Collaboration" by Jacqueline B Frost, Michael Wiese Productions, 2009.
3. "Teaching Analysis of Film Language" by David Wharton and Jeremy Grant, BFI Publishing, 2005.

Course Title: Introduction to 3D Modeling and Texturing **L-T-P-C: 2-0-8-6**
Course Code: DMD305 / DMD375

Maya Interface, Control the display of attributes in the Channel Box, Introduction to Polygon Modeling, Concept of NURBS, Combine and Separate, Extract, Fill Hole, Loft Option, Mirror Geometry, Polygons Menu, Normals, Soft Selection, Smooth Mesh, Models for Games and Production, Boolean Operation, Editing NURBS, Creating NURBS curves.
Importing and Exporting files, Use Curves in 3D Modeling, Concepts of Sculpting, The Outline, High Poly Character Model, Low Poly Model, Gaming Models, Inorganic Modeling, Organic Modeling.

Adobe Photoshop, Photoshop tool Knowledge, RGB Colour, basic Image Manipulation: Bit map Images, Vector Images, Image size and resolution Settings, Creating Images, Colour Concepts, Paint Tools Concept, Layer Basics, Masking, Definition of Textures, Introduction to UV Mapping, , Planar Mapping, Spherical Mapping, Cylindrical Mapping, Automatic Mapping, Matte Painting, Digital Painting, Ramp Shader, Displacement Map, 3D Motion Blur, Still Photography, Paint Effect.

Practical practices based on the theory part demonstrated and guided by the Course Instructor as per requirement of the course.

Text/Reference Books

1. "Getting Started in 3D with Maya: Create a Project from Start to Finish: Model, Texture, Rig, Animate, and Render in Maya" by Adam Watkins, 1st Edition, Routledge, 2017.
2. "Thinking Animation: Bridging the Gap Between 2D and CG" by Angie Jones, Jamie Oliff, 2006.
3. "Advanced Maya Texturing and Lighting" by Lee Lanier, 3rd Edition, 2015.

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