Faculty of Engineering and Technology
P. K. University Shivpuri (MP)

Evaluation Scheme & Syllabus for

Department of Computer Science Engineering & IT

Diploma CS II Year

(IV Semester)

(Effective from session 2025-26)

FOURTH SEMESTER (COMPUTER SCIENCE AND ENGINEERING)

Sr. No.	CODE	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External
							INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
			L	T	P		*Th*	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
4.1	DCOMMCO401	*Communication Skill-II	3	-	*2	4	30		30	70	3			70	100
4.2	DDATACO402	Database Management System	3	-		3	30		30	70	3			70	100
4.3	DOBJECO403	Object Oriented Programming Using Java	4	-		4	30		30	70	3			70	100
4.4	DOPERCO404	Operating Systems	3	-		3	30		30	70	3			70	100
4.5	DECOMCO405	E-Commerce and Digital Marketing	3	-		3	30		30	70	3			70	100
4.6	DENERCO406	*Energy Conservation	2	-	*2	3	30		30	70	3			70	100
4.7	DUNIVCO407	Universal Human Values	2	-	-	1	30		30	70	3			70	100
4.8	DDATACO409	Database Management System LAB			4	*1*		25	25			25		25	50
4.9	DOBJECO410	Object Oriented Programming Using Java LAB			4	*1*		25	25			25		25	50
4.10	DOPERCO411	Operating Systems LAB			4	*1*		25	25			25		25	50
4.11	DECOMCO412	E-Commerce and Digital Marketing LAB			4	*1*		25	25			25		25	50
		Total	20		20	*25*	*210*	100	310	490		100		590	900

* Common course with other diploma Programmes

- 4 weeks industrial training will be organised after 4th semester

Student Centred Activities will comprise of co-curricular activities like extension lectures, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities and self study etc.

DCOMMCO401 COMMUNICATION SKILLS – II

L	T	P
3	-	*2

RATIONALE

Knowledge of English Language plays an important role in career development. This subject aims at introducing basic concepts of communication besides laying emphasis on developing listening, speaking, reading and writing skills as parts of Communication Skill.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

- Frame correct sentences with illustrations
- Comprehend the language correctly
- Interpret the language correctly
- Use given material in new situations.
- Correspond effectively using various types of writings like letters, memos etc.
- Communicate effectively in English with appropriate body language making use of correct and appropriate vocabulary and grammar in an organised set up and social context.

DETAILED CONTENTS

1. Functional Grammar (16 periods)
    - 1.1 Prepositions
    - 1.2 Framing Questions
    - 1.3 Conjunctions
    - 1.4 Tenses

2 Reading (16 periods)

- 2.1 Unseen Passage for Comprehension (Vocabulary enhancement - Prefixes, Suffixes, one word substitution, Synonym and Antonym) based upon the passage should be covered under this topic.

3 Writing Skill (24 periods)

- 3.1. Correspondence
    - a) Business Letters- Floating Quotations, Placing Orders, Complaint Letters.
    - b) Official Letters- Letters to Government and other Offices
- 3.2. Memos, Circular, Office Orders
- 3.3. Agenda & Minutes of Meeting
- 3.4. Report Writing

LIST OF PRACTICALS

Note: Teaching Learning Process should be focused on the use of the language in writing reports and making presentations.

Topics such as Effective listening, effective note taking, group discussions and regular presentations by the students need to be taught in a project oriented manner where the learning happens as a byproduct.

Speaking and Listening Skills

1. Debate
2. Telephonic Conversation: general etiquette for making and receiving calls
3. Offering- Responding to offers.
4. Requesting – Responding to requests
5. Congratulating
6. Exploring sympathy and condolences
7. Asking Questions- Polite Responses
8. Apologizing, forgiving
9. Complaining
10. Warning
11. Asking and giving information
12. Getting and giving permission
13. Asking for and giving opinions

INSTRUCTIONAL STRATEGY

Students should be encouraged to participate in role play and other student-centered activities in class rooms and actively participate in listening exercises

MEANS OF ASSESSMENT

Assignments and quiz/class tests, mid-semester and end-semester written tests Actual practical work, exercises and viva-voce

Presentation and viva-voce

RECOMMENDED BOOKS

Communicating Effectively in English, Book-I by RevathiSrinivas; Abhishek Publications, Chandigarh.

Communication Techniques and Skills by R. K. Chadha; Dhanpat Rai Publications, New Delhi.

High School English Grammar and Composition by Wren & Martin; S. Chand & Company Ltd., Delhi.

e-books/e-tools/relevant software to be used as recommended by AICTE/NITTTR, Chandigarh.

Websites for Reference:

http://www.mindtools.com/ page 8.html – 99k

http://www.letstalk.com.in

http://www.englishlearning.com

http://learnenglish.britishcouncil.org/en/

http://swayam.gov.in

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	16	28
2	16	28
3	24	44
Total	**56**	**100**

DDATACO402 DATABASE MANAGEMENT SYSTEM

L	T	P
3	-	-

RATIONALE

The diploma holders in Computer Science and Engineering need to understand about

Relational Data base to manage the data at backend for different applications. They should be able to develop basic table and write query to fetch the required data. Hence this subject.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

- understand the concept of Database system and Client Server Architecture
- understand and develop the concepts of Data Modeling, Security and Integrity.
- convert and compare the designs and differentiate between the keys
- understand and execute different SQL queries and PL / SQL programs
- convert database in the form of table
- normalize the database using normal forms.
- understand the concept of query processing and Transaction processing

DETAILED CONTENTS

1. Database System Concept & Data Modeling (10 Periods)

   Basic concepts, Advantages of a DBMS over file processing system, Data Abstraction, Database Languages, Data Independence. , Components of a DBMS and overall structure of a DBMS. ,Three views of Data (External View, Conceptual View, Internal View), Three level architecture of DBMS, Data Independence, , Client Server Architecture

2. Data Model (10 Periods)

   Define data model, Data Models : Network Model Hierarchical Model, E-R Model, Advantage & Disadvantages of each Data Model

   ER Model :

   Entity sets and relationship sets- Attributes - Keys in entity and relationship sets : (a) Super Key (b) Candidate Key (c) Primary Key (e) Unique Key - Mapping constraints, Participation Constraint, E-R diagram, Notations. Strong Entity Set and Weak Entity Set

3. Relation Model (10 Periods)

   Advantages, Disadvantages, Codd's 12 rules , Definition of Relations, Schema, Sub schema. Relational Model Constraints (Domain, Tuple Uniqueness, Key Constraints, Integrity Constraints, Entity constraints).

   Relations algebra (Basic operation: Union intersection difference and Cartesian product), Additional Relational Algebraic Operations (Projection, Selection rows, Division, rename and join) , Converting ER Model to Relational Model.

4. Relational Database Design (11 Periods)

   Purpose of Normalization, Data redundancy and updating anomalies, Functional Dependencies and Decomposition, Process of Normalization using 1NF, 2NF, 3NF, multivalued dependencies and BCNF , Forth Normal Form, Fifth Normal Form,

5. MYSQL/SQL (11 Periods)

Data definition language, Data manipulation language, SQL, Object naming conventions, Object naming guidelines, Data types, Tables (Creating , Inserting,Updating and deleting tables and using constraints), Views, Indexes,

SQL Command :- DESCRIBE, SELECT, WHERE CLAUSE, DISTINCT CLAUSE, ORDER BY,HAVING, LOGICAL OPERATIONS, SQL OPERATORS, JOIN

Aggregate functions, String functions and date time functions, Null values

6. PL-SQL (10 Periods)

User defined function, Control of flow statement of PL/SQL, Procedures/Stored procedures, transaction, triggers, cursors, granting and revoking.

7. NO-SQL: Inroducton ,Usages,And Application. (03 Periods)

8. SECURITY (05 Periods)

Authorization and View- Security constraints - Integrity Constraints- Encryption

RECOMMENDED BOOKS

1. An Introduction to Database System - C. J. Date
2. Database System Concepts - A. Silberschatz, S. Sudarshan& H. F. Korth
3. Database Concepts and Systems - LvanBayroos/SPD
4. Fundamental of Database System - R. Elmashri& S. B. Navathee-books/e-tools/relevant software to be used as recommended by AICTE/UPBTE/NITTTR.

Websites for Reference:

http://swayam.gov.in

http://spoken-tutorial.orgs

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	10	15
2	10	15
3	10	15
4	11	17
5	11	17
6	10	10
7	03	04
8	05	07
Total	**70**	**100**

DOBJECO403 OBJECT ORIENTED PROGRAMMING USING JAVA

L	T	P
4	-	-

RATIONALE

Object orientation is a new approach to understand the complexities of the real world. In contrast to the earlier approaches like procedural etc, object orientation helps to formulate the problems in a better way giving high reliability, adaptability and extensibility to the applications. The students are already familiar with this concept of programming in C which is the basic for JAVA. This course offers the modern programming language JAVA that will help the students to implement the various concept of object orientation practically. The students will be able to program in the object oriented technology with the usage of JAVA.

LEARNING OUTCOMES

After undergoing the subject, students will be able to:

- install Java IDE, Compiler, Java virtual machines
- debug and compile the program written in Java.
- explain and implement class programs.
- explain and execute the language construct concepts.
- explain and execute member functions.
- explain the concepts of OOPS
- describe and implement inheritance concepts.
- explain and implement Polymorphism using Java program.
- explain and implement the abstract class and interface.
- implement the exception handling in projects
- develop and understand multithreaded programs

DETAILED CONTENTS

1. Introduction and Features (05 Periods)

Fundamentals of object oriented programming – procedure oriented programming Vs. object oriented programming (OOP), Object oriented programming concepts – Classes, object, object reference, abstraction, encapsulation, inheritance, polymorphism, Introduction of eclipse (IDE) for developing programs in Java

2. Language Constructs (07 Periods)

variables, types and type declarations, data types : Integer, floating point type, character, boolean, all Operators, iteration and jump statement, if then else clause; conditional expressions, input using scanner class and output statement, loops, switch case, arrays, methods.

3. Classes and Objects (08 Periods)

Class fundamentals, constructors, declaring objects (Object & Object Reference), creating and accessing variables and methods, static and non static variables/methods defining packages, Creating and accessing a package, Importing packages, Understanding CLASSPATH, auto boxing , String , String Buffer

4. Inheritance (06 Periods)

   Definition of inheritance, protected data, private data, public data, constructor chaining, order of invocation, types of inheritance, single inheritance, multilevel inheritance, hierarchical inheritance, hybrid inheritance , access control (Private Vs PublicVs Protected Vs Default)

5. Abstract Class and Interface (08 Periods)

   Defining an interface, difference between classes and interface, Key points of Abstract class & interface, difference between an abstract class & interface, implementation of multiple inheritance through interface.

6. Polymorphism (06 Periods)

   Method and constructor overloading, method overriding, up-casting and down-casting.

7. Exception Handling (07 Periods)

   Definition of exception handling, implementation of keywords like try, catches, finally, throw& throws, built in exceptions, creating own exception sub classes importance of exception handling in practical implementation of live projects

8. Multithreading (09Periods)

   Difference between multi threading and multi tasking, thread life cycle, creating threads, thread priorities, synchronizing threads.

RECOMMENDED BOOKS

Programming with Java: A Primer; E. Balagurusamy

Head First Java, O-REILLY, Kathy Sierra & Bert Bates.

OCA Java SE Programmer I Certification Guide , Wiley Publisher , Mala Gupta PROGRAMMER'S GUIDE TO JAVA SE 8 , Pearson , Khalid E Mughal e-books/e-tools/relevant software to be used as recommended by AICTE/UPBTE/NITTTR.

Websites for Reference:http://www.spoken-tutorial.org , http://swayam.gov.in

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1.	5	14
2.	7	12
3.	8	13
4.	6	13
5.	8	13
6.	6	12
7.	7	12
8.	9	11
Total	**56**	**100**

DOPERCO404 OPERATING SYSTEMS

L	T	P
3	-	-

RATIONALE

The course provides the students with an understanding of human computer interface

existing in computer system and the basic concepts of operating system and its working. The students will also get hands-on experience and good working knowledge to work in windows and Linux environments. The aim is to gain proficiency in using various operating systems after undergoing this course. While imparting instructions, the teachers are expected to lay more emphasis on concepts and principles of operating systems, its features and practical utility.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

- describe various types and services of operating system
- identify the concept of process, various states in the process and their scheduling.
- classify different types of schedulers and scheduling algorithms.
- identify the significance of inter-process communication and synchronization.
- describe deadlock and the various ways to recover from deadlock
- identify memory management techniques
- describe virtual memory and its underlying concepts.
- describe the features and brief history of Linux
- use General purpose commands and filters of Linux
- use of shell scripts in Linux

DETAILED CONTENTS

1. Overview of Operating Systems (10 Periods)

   Definition of Operating Systems, Types of Operating Systems, Operating System Services, User operating system interface, System Calls, Types of System Calls, System Programs, Operating System Structure, Virtual Machine, Benefits of Virtual Machine

2. Process Management (Principles and Brief Concept) (10 Periods)

   Process concept, Process State, Process Control Block, Scheduling Queues, Scheduler, Job Scheduler, Process Scheduler, Context Switch, Operations on Processes, Interprocess Communication, Shared Memory Systems, Message-Passing Systems, CPU Scheduler, Scheduling Criteria, Scheduling Algorithms, Preemptive and Non Preemptive, First come first serve (FCFS), Shortest Job first

   (SJF), Round Robin (RR), Multiprocessor scheduling, Process Synchronization.

3. Deadlocks (Principles and Brief Concept) (06 periods)

   Deadlock, Conditions for Dead lock, Methods for handling deadlocks, Dead Prevention, Deadlock Avoidance, Deadlock detection, Recovery from deadlock.

4. Memory Management Function (Principles and Brief Concept) (10 periods)

   Definition – Logical and Physical address Space, Swapping, Memory allocation, Contiguous Memory allocation, Fixed and variable partition, Internal and External fragmentation and Compaction, Paging – Principle of operation, Page allocation, of paging,

Hardware support for paging, Protection and sharing, Disadvantages Segmentation, Virtual Memory.

5. I/O Management Functions (Principles and Brief Concept) (04 periods)

   Dedicated Devices, Shared Devices, I/O Devices, Storage Devices, Buffering, Spooling.

6. File Management (Principles and Brief Concept) (06 periods)

   Types of File System; Simple file system, Basic file system, Logical file system, Physical file system, Various Methods of Allocating Disk Space

7. Linux Operating System (10 Periods)

   History of Linux and Unix, Linux Overview, Structure of Linux, Linux releases, Open Linux, Linux System Requirements, Linux Commands and Filters: mkdir, cd,rmdir,pwd, ls, who, whoami, date, cat,chmod, cp, mv, rm,pg,more, pr, tail, head, cut, paste, nl, grep, wc, sort, kill, write, talk,mseg,wall, merge,mail, news Shell: concepts of command options, input, output,redirection,pipes, redirecting and piping with standard errors, Shell scripts,vi editing commands

RECOMMENDED BOOKS

Operating System Concepts by Silberschatz, Galvin; Wiley Publication

Operating Systems by Stallings; Tata McGraw Hill.

Operating Systems- A Concept Based Approach by DhamDhare; Tata McGraw Hill Education Pvt Ltd , New Delhi

Operating Systems by Achyut S Godbole and AtulKahate; Tata McGraw Hill

Education Pvt Ltd , New Delhi

Unleashed Linux by Tech Media Publishers, New Delhi

e-books/e-tools/relevant software to be used as recommended by AICTE/NITTTR, Chandigarh.

Websites for Reference:http://swayam.gov.in

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1.	10	18
2.	10	18
3.	06	10
4	10	18
5	04	8
6	06	10
7	10	18
Total	**56**	**100**

DECOMCO405 E-COMMERCE AND DIGITAL MARKETING

L	T	P
3	-	-

RATIONALE

The course is designed to help you master the essential disciplines in digital marketing, including search engine optimization (SEO), social media, conversion optimization, web analytics, content marketing, email and mobile marketing. Digital marketing is one of the world's fastest growing disciplines.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

- understand concepts of E-Commerce.
- identify core concepts of digital marketing and the role of digital marketing in business.
- develop marketing strategies based on product, price, place and promotion objectives.
- understand how they can use digital marketing to increase sales and grow their business
- formulate marketing strategies that incorporate psychological and sociological factors which influence consumers.
- hands on experience in using Analytics Tools eg: Google Analytics for report extraction and campaign measurement.
- analyze marketing problems and provide solutions based on a critical examination of marketing information.
- understand the opportunities for deploying emerging digital marketing media and techniques.
- implement online campaigns for your business and marketing problems within the organization by learning AdWords Campaign Management

DETAILED CONTENTS

1.Electronics Commerce (10 Periods)

, advantages and disadvantages. E-Commerce Business model B2B, B2C, C2C, E-Governance. Four C's (Convergence, collaborative, computer content management and call center), Supply Chain Management.

2. E-Commerce Payment: (06 Periods)

Payment Gateway, Modes of Electronic Payment, Threats & protections for e-commerce payment system

3. Principles of Digital Marketing (06 Periods)

Defining Digital Marketing , Setting Digital Marketing Objectives, Set of activities of digital marketing: Search Engine Optimization, SEO, Search Engine Marketing – Google AdWords, Social Media Marketing: Facebook, LinkedIn, YouTube, Display Advertising – Contextual, Behavioral, Targeted, Content Marketing & Blogging,

Lead Generation : Marketing Offer – Attractive / Relevant Offer, Landing Page –

Offer's details with form, Conversion Page – Thank you page, Email Marketing, Video Marketing, Responsive Design, Google Analytics

4. Search Engine Optimization (10 Periods)

What is SEO?, Why SEO?, How Search Engine works?, Essential SEO guidelines for website owner, designer, blogger and content writer : Keyword Research - Creating Content Hierarchy, Brainstorming – Think and discuss them, Google Suggest, Related Searches, Google Keyword Planner, Keyword Tools, Google Trends – Finding Search Trends, Most Search Terms, How to translate keywords?, Organizing the keywords, Writing Headlines (Page Titles) with examples, Writing Summary (META Descriptions) with examples, SEO for Images, Structuring the Content- SEO-friendly Domain Name, SEO-friendly URL Structure, Plan your Site's Hierarchy, Internal Linking – Site Navigation, How Google reads our pages?, Localized SEO, Website Speed Testing, HTML Improvements using Google Search Console, Links from YouTube Videos, Users' Engagement , Links to Related Stories , Enable Social Sharing , Embedding videos , Enabling site search feature

5. Google AdWords (06 Periods)

Setting up Google AdWords Campaigns – that avails high ranking at low cost, Content Structuring, Understanding Quality Score, Finding and selecting the right Keywords, Keywords Matching Options, Campaign Setup procedure, Ads and Ad Groups, Organizing Ad Groups, Creating Effective Ads, Optimizing Landing Pages, Bid Management, Negative Keywords, Analytics – Measure and fine-tune, Remarketing Campaigns – How to configure, Setup and Monitor them?, YouTube Video Ad Campaigns

6. Google Analytics (08 Periods)

Getting Started with Google Analytics, Understanding Dashboard – Audience | Advertising | Traffic Source | Content | Conversions, Taking decisions based on Analytics Reporting, Defining Business Goals and Objectives, Tracking Social Media Traffic, Tracking SEO Traffic, Integrating your Google AdWords campaigns into Google Analytics, Measuring Tools and Methods, Measuring your Site's ROI, Introduction to Goal Conversion – Tracking the Conversions, Configuring UTMs (Custom URLs), Google Tag Manager – a brief overview.

7. Social Media Marketing (10 Periods)

Social Media Marketing Strategy : Setting up Goals- Finding out where your targeted people connect, Popular Social Media Networks, KnowEm – Check Social Media Username Availability, Knowing your Audience - Google Alerts – Monitoring your brands, competitions, and industry trends using, TweetDeck – a monitoring tool similar to Google Alerts for Twitter, Hashtags – Best Practices & Tools, Facebook / Instagram / LinkedIn- Setting up a Facebook Business Page, Facebook Graph Search – SEO for Facebook, Facebook Fans vs Talking about this, Promoting your Page, Boost Post, Facebook/Instagram Advertising using Facebook Ads Manager, Remarketing/Retargeting using Facebook Custom Audiences, LinkedIn Advertising: Text Ads | Sponsored Content, Measuring Success- Fans, Likes, Comments & Share, Track performance using Google Analytics, UTMs – URL Builder, Bounce Rate, Time Spent on Site and Conversions!, Tracking Offline Conversions, Tracking your emails, Viral Videos Examples, Instagram, Facebook and Pinterest – Best Practices, Tips and Tools

INSTRUCTIONAL STRATEGY

Since the entire course content is web based, students can practice it online. The teachers should have practice on this framework. Entire course is hands-on based so practicals should be conducted in the laboratory.

MEANS OF ASSESSMENT

Assignments Viva-voce

Written examination Practical Tasks

RECOMMENDED BOOKS

Digital Marketing by Vandana Ahuja, published by Oxford Publication

Fundamentals of Digital Marketing by Puneet Bhatia, published by Pearson. E-books/e-tools/relevant software to be used as recommended by AICTE/NITTTR, Chandigarh.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Times Allocated (Hrs.)	Marks Allocated (%)
1.	10	15
2.	06	10
3.	06	08
4.	10	15
5.	06	15
6.	08	15
7.	10	22
Total	**56**	**100**

DENERCO406 ENERGY CONSERVATION

L	T	P
2	-	*2

RATIONALE

The requirement of energy has increased manifolds in last two decades due to rapid urbanization and growth in industrial/service sector. It has become challenging task to meet ever increasing energy demands with limited conventional fuels and natural resources. Due to fast depletion of fossil fuels and a tremendous gap between supply and demand of energy, it is essential to adopt energy conservation techniques in almost every field like industries, commercial and residential sectors etc. Energy conservation has attained priority as it is regarded as additional energy resource. Energy saved is energy produced. This course covers the concepts of energy management and its conservation. It gives the insight to energy conservation opportunities in general industry and details out energy audit methodology and energy audit instruments.

LEARNING OUTCOMES

After undergoing this subject, the students will be able to:

- define principles and objectives of energy management and energy audit.
- understand Energy Conservation Act 2001 and its features.
- understand various forms & elements of energy.
- identify electrical and thermal utilities. Understand their basic principle of operation and assess performance of various equipments.
- identify areas of energy conservation and adopt conservation methods in various systems.
- evaluate the techno economic feasibility of the energy conservation technique adopted.

DETAILED CONTENTS

1. Basics of Energy

1.1 Classification of energy- primary and secondary energy, commercial and non-commercial energy, non-renewable and renewable energy with special

reference to solar energy, Capacity factor of solar and wind power generators.

1.2 Global fuel reserve

1.3 Energy scenario in India and state of U.P. Sector-wise energy consumption

(domestic, industrial, agricultural and other sectors)

1.4 Impact of energy usage on climate

2. Energy Conservation and EC Act 2001

2.1 Introduction to energy management, energy conservation, energy efficiency and its need

2.2 Salient features of Energy Conservation Act 2001 & The Energy Conservation (Amendment) Act, 2010 and its importance. Prominent organizations at centre and state level responsible for its implementation.

2.3 Standards and Labeling: Concept of star rating and its importance, Types of product available for star rating

3. Electrical Supply System and Motors

3.1 Types of electrical supply system

3.2 Single line diagram

3.3 Losses in electrical power distribution system

3.4 Understanding Electricity Bill: Transformers Tariff structure, Components of power (kW, kVA and kVAR) and power factor, improvement of power factor, Concept of sanctioned load, maximum demand, contract demand and monthly minimum charges (MMC)

3.5 Transformers: Introduction, Losses in transformer, transformer Loading, Tips for energy savings in transformers

3.6 Electric Motors

Types of motors, Losses in induction motors Features and characteristics of energy efficient motors, Estimation of motor loading, Variation in efficiency and power factor with loading, Tips for energy savings in motors

4. Energy Efficiency in Electrical Utilities

4.1 Pumps: Introduction to pump and its applications, Efficient pumping system operation, Energy efficiency in agriculture pumps, Tips for energy saving in pumps

4.2 Compressed Air System: Types of air compressor and its applications, Leakage test, Energy saving opportunities in compressors.

4.3 Energy Conservation in HVAC and Refrigeration System: Introduction, Concept of Energy Efficiency Ratio (EER), Energy saving opportunities in Heating, Ventilation and Air Conditioning (HVAC) and Refrigeration Systems.

5. Lighting and DG Systems

5.1 Lighting Systems: Basic definitions- Lux, lumen and efficacy, Types of different lamps and their features, Energy efficient practices in lighting

5.2 DG Systems: Introduction, Energy efficiency opportunities in DG systems, Loading estimation

6. Energy Efficiency in Thermal Utilities

6.1 Thermal Basics: Thermal energy, Energy content in fuels, Energy Units and its conversions in terms of Metric Tonne of Oil Equivalent (MTOE)

6.2 Energy Conservation in boilers and furnaces : Introduction and types of boilers, Energy performance assessment of boilers, Concept of stoichiometric air and excess air for combustion, Energy conservation in boilers and furnaces, Do's and Don'ts for efficient use of boilers and furnaces

6.3 Cooling Towers: Basic concept of cooling towers, Tips for energy savings in cooling towers

6.4 Efficient Steam Utilization

7. Energy Conservation Building Code (ECBC)

7.1 ECBC and its salient features

7.2 Tips for energy savings in buildings: New Buildings, Existing Buildings

8. Waste Heat Recovery and Co-Generation

8.1 Concept, classification and benefits of waste heat recovery 8.2 Concept and types of co-generation system

9. General Energy Saving Tips Energy saving tips in:

9.1 Lighting

9.2 Room Air Conditioner

9.3 Refrigerator

9.4 Water Heater

9.5 Computer

9.6 Fan, Heater, Blower and Washing Machine

9.7 Colour Television

9.8 Water Pump

9.9 Cooking

9.10 Transport

10. Energy Audit

10.1 Types and methodology

10.2 Energy audit instruments

10.3 Energy auditing reporting format

PRACTICAL EXERCISES

To conduct load survey and power consumption calculations of small building.

To check efficacy of different lamps by measuring power consumption and lumens using lux meter.

To measure energy efficiency ratio (EER) of an air conditioner.

To measure effect of valve throttling and variable frequency drive (VFD) on energy consumption by centrifugal pump.

To measure and calculate energy saving by arresting air leakages in compressor.

To measure the effect of blower speed on energy consumed by it.

STUDENT ACTIVITIES ON ENERGY CONSERVATION/ENERGY EFFICIENCY

Presentations of Case Studies Debate competitions

Poster competitions

Industrial visits

Visual Aids

INSTRUCTIONAL STRATEGY

Teachers are expected to lay considerable stress on understanding the basic concepts in energy conservation, principles and their applications. For this purpose, teachers are expected to give simple problems in the class room so as to develop necessary knowledge for comprehending the basic concepts and principles. As far as possible, the teaching of the subject must be supplemented by demonstrations and practical work in the laboratory. Visits to industries must be carried out. Expert from industry must be invited to deliver talks on energy conservation to students and faculty.

RECOMMENDED BOOKS

Guide book on General Aspects of Energy Management and Energy Audit by Bureau of Energy Efficiency, Government of India. Edition 2015

Guide book on Energy Efficiency in Electrical Utilities, by Bureau of Energy Efficiency, Government of India. Edition 2015

Guide book on Energy Efficiency in Thermal Utilities, by Bureau of Energy Efficiency, Government of India. Edition 2015

Handbook on Energy Audit & Environmental Management by Y P Abbi & Shashank Jain published by TERI. Latest Edition

Important Links:

(i) Bureau of Energy Efficiency (BEE), Ministry of Power, Government of India. www.beeindia.gov.in.

(ii) Ministry of New and Renewable Energy (MNRE), Government of India. www.mnre.gov.in.

(iii) Uttar Pradesh New and Renewable Energy Agency (UPNEDA), Government of Uttar Pradesh. www.upneda.org.in.

(iv) **Central Pollution Control Board (CPCB),** Ministry of Environment, Forest and Climate Change, Government of India. www.cpcb.nic.in.

(v) Energy Efficiency Sevices Limited (EESL). www.eeslindia.org.

(vi) Electrical India, Magazine on power and electrical products industry. www.electricalindia.in.

DUNIVCO407 Universal Human Values

L	T	P
2	-	-

Course Objectives

This introductory course input is intended

1. To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity, which are the core aspirations of all human beings
2. To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way
3. To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature

Thus, this course is intended to provide a much needed orientational input in value education to the young enquiring minds.

Course Methodology

1. The methodology of this course is explorational and thus universally adaptable. It involves a systematic and rational study of the human being vis-à-vis the rest of existence.
2. It is free from any dogma or value prescriptions.
3. It is a process of self-investigation and self-exploration, and not of giving sermons. Whatever is found as truth or reality is stated as a proposal and the students are facilitated to verify it in their own right, based on their Natural Acceptance and subsequent Experiential Validation.
4. This process of self-exploration takes the form of a dialogue between the teacher and the students to begin with, and then to continue within the student leading to continuous self-evolution.
4. This self-exploration also enables them to critically evaluate their pre-conditionings and present beliefs.

UNIT 1: Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

1. Understanding the need, basic guidelines, content and process for Value Education
2. Self-Exploration–what is it? - its content and process; ‘Natural Acceptance’ and Experiential Validation- as the mechanism for self-exploration
3. Continuous Happiness and Prosperity- A look at basic Human Aspirations
4. Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority

5. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario

Method to fulfill the above human aspirations: understanding and living in harmony at various levels

UNIT 2: Understanding Harmony in the Human Being - Harmony in Myself!

1. Understanding human being as a co-existence of the sentient ‘I’ and the material the Body’

2. Understanding the needs of Self ('I') and 'Body' - *Sukh* and *Suvidha*

3. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)

2. Understanding the characteristics and activities of 'I' and harmony in 'I'

3. Understanding the harmony of I with the Body: *Sanyam* and *Swasthya*; correct appraisal of Physical needs, meaning of Prosperity in detail

4. Programs to ensure *Sanyam* and *Swasthya*

-Practice Exercises and Case Studies will be taken up in Practice Sessions.

UNIT 3: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship

1. *Understanding Harmony in the family – the basic unit of human interaction*
2. Understanding values in human-human relationship; meaning of *Nyaya* and

   program for its fulfillment to ensure *Ubhay-tripti*;

   a. Trust (*Vishwas)* and Respect (*Samman)* as the foundational values of relationship
3. Understanding the meaning of *Vishwas*; Difference between intention and competence
4. Understanding the meaning of *Samman*, Difference between respect and differentiation; the other salient values in relationship
5. Understanding the harmony in the society (society being an extension of family):

   *Samadhan, Samridhi, Abhay, Sah-astitva*as comprehensive Human Goals
5. Visualizing a universal harmonious order in society- Undivided Society (*AkhandSamaj),* Universal Order (*SarvabhaumVyawastha)*- from family to world family!

-Practice Exercises and Case Studies will be taken up in Practice Sessions.

UNIT 4: Understanding Harmony in the Nature and Existence - Whole existence as Co-existence

1. Understanding the harmony in the Nature
2. Interconnectedness and mutual fulfillment among the four orders of nature-recyclability and self-regulation in nature
3. Understanding Existence as Co-existence (*Sah-astitva*) of mutually interacting units in all-pervasive space
4. Holistic perception of harmony at all levels of existence

-Practice Exercises and Case Studies will be taken up in Practice Sessions.

UNIT 5: Implications of the above Holistic Understanding of Harmony on Professional Ethics

1. Natural acceptance of human values
2. Definitiveness of Ethical Human Conduct
3. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
4. Competence in professional ethics:

a) Ability to utilize the professional competence for augmenting universal human order

b) Ability to identify the scope and characteristics of people-friendly

and eco-friendly production systems,

c) Ability to identify and develop appropriate technologies and management patterns for above production systems.

5. Case studies of typical holistic technologies, management models and production

systems

6. Strategy for transition from the present state to Universal Human Order:

a) At the level of individual: as socially and ecologically responsible

engineers, technologists and managers

b) At the level of society: as mutually enriching institutions and

organizations

7. To inculcate Human Values among Students:The Role of self ,Parents and Teachers -Practice Exercises and Case Studies will be taken up in Practice Sessions.

Practical Session also Includes Different Yogic Exercises and Meditation Session

INSTRUCTONAL STRATEGY

The content of this course is to be taught on conceptual basis with plenty of real world examples.

MEANS OF ASSESSMENT

Assignments and quiz/class tests, Mid-term and end-term written tests Practical assessment

Reference Material

The primary resource material for teaching this course consists of

a. The text book (Latest Edition)

R.R Gaur, R Asthana, G P Bagaria, A foundation course in Human Values and professional Ethics, Excel books, New Delhi.

b. The teacher's manual (Latest Edition)

R.R Gaur, R Asthana, G P Bagaria, A foundation course in Human Values and professional Ethics – Teachers Manual, Excel books, New Delhi.

In addition, the following reference books may be found useful for supplementary reading in connection with different parts of the course:

1. B L Bajpai, 2004, *Indian Ethos and Modern Management*, New Royal Book Co., Lucknow. Reprinted 2008.
2. PL Dhar, RR Gaur, 1990, *Science and Humanism*, Commonwealth Purblishers.
3. Sussan George, 1976, *How the Other Half Dies,* Penguin Press. Reprinted 1986, 1991
4. Ivan Illich, 1974, *Energy & Equity,* The Trinity Press, Worcester, and HarperCollins, USA
5. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, limits to Growth, Club of Rome's Report, Universe Books.
6. Subhas Palekar, 2000, *How to practice Natural Farming,*Pracheen(Vaidik) Krishi Tantra Shodh, Amravati.
5. A Nagraj, 1998, *Jeevan Vidya ekParichay,*Divya Path Sansthan, Amarkantak.
6. E.F. Schumacher, 1973, *Small is Beautiful: a study of economics as if peoplemattered*, Blond & Briggs, Britain.
7. A.N. Tripathy, 2003, *Human Values*, New Age International Publishers.

Relevant websites, movies and documentaries: Value Education websites, http://uhv.ac.in, *http://www.aktu.ac.in*

1. Story of Stuff, *http://www.storyofstuff.com*
2. Al Gore, *An Inconvenient Truth*, Paramount Classics, USA
3. Charlie Chaplin, *Modern Times*, United Artists, USA
4. IIT Delhi, *Modern Technology–the Untold Story*
5. Case study Hevade Bazar Movie
6. RC Shekhar , Ethical Contradiction ,Trident New Delhi
7. *Gandhi A., Right Here Right Now, Cyclewala Production*

SUGGESTED DISTRIBUTION OF MARKS

Unit	Time Allotted (Periods)	Marks Allotted (%)
1	08	20
2	08	20
3	08	20
4	08	20
5	10	20
Total	**42**	**100**

DDATACO408 Database Management System LAB

LIST OF PRACTICALS

L	T	P
-	-	4

STRUCTURED QUERY LANGUAGE

1.Creating Database

Creating a database

Creating a table

Specifying relational data types Specifying constraints

Creating indexes

2.Table and Record Handling

INSERT statement

Using SELECT and INSERT together

DELETE, UPDATE, TRUNCATE Statement. DROP, ALTER statement

3.Retrieving Data From a Database The SELECT statement

Using the WHERE clause

Using Logical Operators in the WHERE clause

Using In, BETWEEN, LIKE, ORDER BY, GROUP BY & HAVING clause Using Aggregate Functions

Combining Tables Using JOINS

4. Design of database for any application.

INSTRUCTIONAL STRATEGY

Explanation of concepts using real time examples, diagrams etc. For practical sessions books along with CDs or learning materials with specified activities are required. Various exercises and small applications should be given along with theoretical explanation of concepts.

MEANS OF ASSESSMENT

Assignments and quiz/class tests, mid-term and end-term written tests Actual laboratory and practical work, exercises and viva-voce Software installation, operation, development and viva-voce

DOBJECO409 Object Oriented Programming Using Java LAB

LIST OF PRACTICALS

L	T	P
-	-	4

1. WAP to create a simple class to find out the area and perimeter of rectangle and box using super and this keyword.
2. WAP to design a class account using the inheritance and static that show all function of bank (withdrawal, deposit).
3. WAP to design a class using abstract methods and classes.
4. WAP to design a string class that perform string method (equal, reverse the string, change case).
5. Consider we have a Class of Cars under which Santro Xing, Alto and Wagon R represents individual Objects. In this context each Car Object will have its own, Model, Year of Manufacture, Colour, Top Speed, etc. which form Properties of the Car class and the associated actions i.e., object functions like Create(), Sold(), display() form the Methods of Car Class.
6. In a software company Software Engineers, Sr. Software Engineers, Module Lead, Technical Lead, Project Lead, Project Manager, Program Manager, Directors all are the employees of the company but their work, perks, roles, responsibilities differs. Create the Employee base class would provide the common behaviors of all types of employee and also some behaviors properties that all employee must have for that company.
7. Using the concept of multiple inheritance create classes: Shape, Circle, Square, Cube, Sphere, Cylinder. Your classes may only have the class variable specified in the table below and the methods Area and/or Volume to output their area and/or volume.

Class	Class Variable	Constructor	Base class
Shape	String name	Shape()	
Circle	double radius	Circle(double r, String n)	Shape
Square	double side	Square(double s, String n)	Shape
Cylinder	double height	Cylinder(double h, double r, String n)	Circle
Sphere	None	Sphere(double r, String n)	Circle
Cube	None	Cube(double s, String n)	Square

8. WAP to handle the exception using try and multiple catch block.
9. WAP that implement the Nested try statements.
10. WAP to create a package that access the member of external class as well as same package.
11. WAP that show the partial implementation of interface.
12. WAP to create a thread that implement the Runnable interface.

INSTRUCTIONAL STRATEGY

The subject is totally practical based. Students should be given clear idea about the basic concepts of programming. In practical session student should be asked to draw flow chart

write algorithm and then write program for algorithm and run on computer. It is required

that students should maintain records (files with printouts).

MEANS OF ASSESSMENT

Assignments and quiz/class tests, mid-term and end-term written tests Actual laboratory and practical work, exercises and viva-voce Software installation, operation, development and viva-voce

DOPERCO410 Operating Systems LAB

LIST OF PRACTICALS

L	T	P
-	-	4

1. Demonstration of all the controls provided in windows control panel.
2. Exercise on Basics of windows.
3. Installation of Linux Operating System
4. Usage of directory management commands of Linux: ls, cd, pwd, mkdir, rmdir Usage of File Management commands of Linux: cat, chmod,cp, mv, rm, pg, more, find
5. Use the general purpose commands of Linux: wc, od, lp, cal , date, who, whoami
6. Using the simple filters: pr, head, tail, cut, paste, nl, sort
7. Communication Commands: news, write, talk, mseg, mail, wall
8. Write a shell program that finds the factorial of a number.
9. Write a shell program that finds whether a given number is prime or not.
10. Write a shell program to find the average of three numbers.
11. Write a shell program that will convert all the text of the file from lowercase to uppercase.

INSTRUCTIONAL STRATEGY

This subject is both theory and practical oriental. Therefore, stress must be given on particulars along with theory. Laboratory must have windows as well as Linux operating system. Concepts of O.S. must be taught practically.

MEANS OF ASSESSMENT

Assignments and quiz/class tests, mid-term and end-term written tests Actual laboratory and practical work exercises and viva-voce

Software installation, operation, development and viva-voce

DECOMCO411 E-Commerce and Digital Marketing LAB

LIST OF PRACTICALS

L	T	P
-	-	4

1. *Create SEO Friendly Web Pages*
2. *Submit Website in various search Engines*
3. *Content Writing*
4. *Build a Network of Partner Websites to Get Influence on the SERP and Jump up to 30+ Positions*
5. *Develop a Facebook Customized Page Tab*
6. *Create and Write a blog.*
7. *Write an email newsletter*
8. *Make a video and Youtube Channel*
9. *Create infographics*
10. *Create Google Adword Account and make use of Keyword Planner*
11. *Create and Use Google Analytics Account*
12. *Create "refer-a-friend" or "bookmark this page" links on your site*
13. *Create Google Map on Places for Business*
14. *Understanding Plagiarism Checker tools*
15. *Understanding various SEO Tools like woorank, seositecheckup, seoquake, similarweb, siteliner, etc.*
16. *Creating XML Sitemap and robot.txt files*