DIPLOMA WING

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA,BHOPAL

SCHEME OF STUDIES & EXAMINATIONS (IMPLEMENTED FROM SESSION : JULY 2023)

SCHEME	NAME OF BRANCH	BRANCH CODE	SEMESTER
OCBC JULY 2022/2023	INFORMATION TECHNOLOGY	I04	FIFTH (V)

S.N.	PAPER CODE	SUBJECT CODE	SUBJECT NAME	THEORY COMPONENT								PRACTICAL COMPONENT					TOTAL CREDITS	TOTAL MARKS
				HRS PER WEEK	CREDITS	TERM WORK				THEORY PAPER		HRS PER WEEK	CREDITS	LAB WORK	PRACTICAL EXAM/VIVA			
						QUIZ/ASSIGNMENT	MID TERM TEST*		TOTAL	MARKS	DURATION				MARKS	DURATION		
							I	II										
1	7503	501	CLOUD IoT	5	5	10	10	10	30	70	03 Hrs.	2	1	20	30	03 Hrs.	6	150
2	7504	502	INTRODUCTION TO DATA SCIENCE	4	4	10	10	10	30	70	03 Hrs.	2	1	20	30	03 Hrs.	5	150
3	7493	511	INFORMATION SECURITY OR	3	3	10	10	10	30	70	03 Hrs.	4	2	20	30	03 Hrs.	5	150
	7500	512	FREE AND OPEN SOURCE SOFTWARE (FOSS)															
4	7495	521	ADVANCE COMPUTER NETWORKS OR	3	3	10	10	10	30	70	03 Hrs.	0	0	0	0	0	3	100
	7505	522	E-GOVERNANCE AND DIGITAL MARKETING															
5	7601	531	RENEWABLE ENERGY TECHNOLOGIES OR	3	3	10	10	10	30	70	03 Hrs.	0	0	0	0	0	3	100
	7606	532	ENGINEERING ECONOMICS AND ACCOUNTANCY															
6			SUMMER INTERNSHIP-II**	0	0	0	0	0	0	0	0	0	3	20	30	03 Hrs.	3	50
7			MAJOR PROJECT***	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
8			WORKSHOP/VISITS etc.	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0
9			RECOVERY CLASSES/LIBERARY etc.	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0
TOTAL				18	18				150	350		18	7	80	120		25	700

NOTE - (1)* Two Best, out of Three Mid Term Tests (Progressive Tests) Marks should be entered here.

(2)** 4-6 Weeks Summer Internship after IV Semester.

(3)***One Credit will be carried forward to the Six semester major project evaluation.

GRAND TOTAL OF CREDITS	GRAND TOTAL OF MARKS
25	700

DIPLOMA WING

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

DIPLOMA IN INFORMATION TECHNOLOGY (I04)

SEMESTER V

COURSE TITLE	:	CLOUD IoT
PAPER CODE	:	7503
SUBJECT CODE	:	501
THEORY CREDITS	:	05
PRACTICAL CREDITS	:	01

Course Learning Objectives:

- Understand the fundamentals of IoT.
- Learn about various component of IoT
- Explore various IoT communication protocol and cloud computing fundamental and services.
- Develop skills to integrate IoT with cloud platforms.
- Explore latest IoT trends and security concern with real-world use cases.

Course Content:

UNIT 1: IoT Fundamental

IoT: Definition, Characteristics, Applications, Layered Architecture, Communication Models, Challenges and opportunities

UNIT 2: IoT Component

- IoT devices, sensors and actuators: Types and applications
- Microcontrollers and Microprocessors: IoT Platforms(Arduino, Raspberry Pi, ESP8266), Hardware Interfacing and Programming for IoT platforms.

UNIT 3: IoT Communication Protocol and Cloud Computing

- IoT Protocols: MQTT, CoAP, AMQP
- IoT Wireless Communication technologies: Wi-Fi, Bluetooth, Zigbee, RFID, 6LoWPAN, LoRa
- Cloud Computing: Definition Characteristics
- Cloud Service Models: IaaS, PaaS, SaaS
- Cloud Deployment Models: Public, Private, Hybrid

UNIT 4: Cloud IoT Core

- Core Cloud Services: Compute, Storage, Database, Networking
- IoT and Cloud Integration: Benefits of IoT-Cloud Integration
- IoT Data Processing and Analytics: Data Ingestion and Processing Techniques, Developing IoT Applications using Node-RED, Integration with Cloud Services
- Case Study on Cloud Platforms for IoT: AWS IoT/Azure IoT/Google Cloud IoT

UNIT 5: Trends and Security

- Security and Privacy in IoT: Challenges and Solutions
- Emerging trends in IoT and Cloud: IoT in 5G Networks, AI and ML in IoT, Future of IoT and Cloud Computing
- Case Studies on Industry Use case: Healthcare, Agriculture, Smart Cities

Suggested Quiz/Assignment Work:

1. Explore different IoT applications through case studies.

2. Create a simple IoT system overview diagram
3. Explore various IoT sensors and actuators.
4. Functioning of popular IoT platforms like Arduino, Raspberry Pi, and ESP8266.
5. Comparison & Importance of Wi-Fi, Bluetooth, Zigbee, RFID, 6LoWPAN, LoRa for IOT.
6. Understand the benefits of IoT-Cloud integration.
7. Investigate IoT in 5G networks, AI and Machine Learning applications in IoT.
8. Steps and Tools for Data Ingestion and Processing in IoT

Reference Books and Resources:

1. "Internet of Things: A Hands-On Approach" by Arshdeep Bahga and Vijay Madisetti
2. "Architecting the Internet of Things" by Dieter Uckelmann, Mark Harrison, Florian Michahelles
3. “Internet of Things by Dr. Jeeva Jose, Khanna Publishing House (Edition 2017)
4. “Internet of Things: Architecture and Design Principles, Raj Kamal, McGraw Hill
5. "Cloud Computing: Concepts, Technology & Architecture" by Thomas Erl, Zaigham Mahmood, Ricardo Puttini
6. Online Resources: IoT and Cloud platform documentation (AWS, Azure, Google Cloud)
7. Research papers

Course outcomes:

Students will get good understanding of various aspect of IoT and Cloud Computing, know some tools and have basic implementation skills

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CLOUD IoT LAB

Suggested Lab Work:

1. Interface a temperature sensor with an Arduino board and display readings.
2. Program an Arduino to read sensor data and control an actuator (e.g., LED).
3. Implement a simple MQTT communication between two devices.
4. Set up a Bluetooth communication between a Raspberry Pi and a smartphone.
5. Create and configure a virtual machine on a cloud platform (e.g., AWS, Azure).
6. Connect an IoT device to a cloud service and send data for processing.
7. Use Node-RED to create a flow for processing IoT data and storing it in a cloud database.
8. Develop an IoT application using Node-RED and integrate it with cloud services for data storage and analytics.
9. Use a cloud AI service (e.g., AWS IoT Analytics) to analyze IoT data and derive insights.
10. Develop a project based on a real-world use case, integrating IoT devices with cloud services for a specific application (e.g., smart agriculture monitoring system).

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DIPLOMA WING

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

DIPLOMA IN INFORMATION TECHNOLOGY (I04)

SEMESTER V

COURSE TITLE	:	INTRODUCTION TO DATA SCIENCE
PAPER CODE	:	7504
SUBJECT CODE	:	502
THEORY CREDITS	:	04
PRACTICAL CREDITS	:	01

Course Learning Objectives:

To learn fundamental concepts, techniques, and tools required to analyze data and extract meaningful insights by data collection, cleaning, visualization, statistical analysis of data science

Course Content:

Unit 1: Data Science Basic

- Concept, Process Life Cycle, Objectives and Application

Unit 2: Introduction to Statistics

- Statistical concept: Mean, Mode, Median, Variance, Standard Deviation
- Probability distribution function
- Hypothesis testing method and its steps
- Confidence intervals

Unit 3: Exploratory Data Analysis (EDA)

- Concept, Importance, Types (Univariate, Bivariate, Multivariate)
- Steps for performing EDA
- Case study on EDA tools for python libraries (Matplotlib and Seaborn)

Unit 4: Data Collection and Cleaning

- Data collection
  - Concept, Need, Methods, Tools, Challenges
- Data cleaning
  - Steps and Techniques

Unit 5: Data Visualization

- Concept, Principal, Importance
- Advantage and Disadvantages
- Data Visualization techniques

Suggested Assignment Work:

1. Define Data Science and describe its importance in today's data-driven world.
2. What are the key steps process involved in a data science workflow?
3. What is the difference between structured and unstructured data? Give examples of each type.
4. Why is data visualization important in Data Science?
5. What are some common technique of data visualizations?
6. What is Matplotlib, and how is it used in Data Science?
7. What is Exploratory Data Analysis (EDA)?
8. Describe the steps involved in performing EDA.
9. Explain hypothesis testing method
10. Explain Mean Mode Median with a numerical problem?

Reference book:

1. Python for Data Analysis" by Wes McKinney
2. Data Science from Scratch: First Principles with Python" by Joel Grus
3. Practical Statistics for Data Scientists: 50 Essential Concepts" by Peter Bruce and Andrew Bruce
4. Web Resource: www.geeksforgeek.org

Course Outcome:

- Understand the data science process and its components.
- Understand the importance of statistics in data science
- Learn how to collect, clean, and preprocess data.
- Develop skills in data visualization and exploratory data analysis.
- Apply data science techniques to real-world problems.

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INTRODUCTION TO DATA SCIENCE LAB

Suggested Lab work:

1. **Recall Python Exercises:**
   - Write a Python program to calculate the factorial of a number.
   - Write a Python program to find the maximum and minimum in a list.
   - Write a Python program to check if a given string is a palindrome.
2. **Data Structures:**
   - Implement a Python program to demonstrate the use of lists, tuples, sets, and dictionaries.
   - Perform basic operations like adding, removing, and updating elements in these data structures
3. **Working with Dataset with Pandas Library using available tools framework (Jupyter notebook etc.)**
   - Perform data collection by questionnaire collection in google form to create your own dataset in csv format for given problem statement.
   - Load a CSV file into a Pandas DataFrame.
   - Display the first and last five rows of the dataset.
   - Perform basic manipulation operation on dataset
4. **Data Cleaning:**
   - Handle missing values by filling with mean/median/mode or by removing rows/columns.
   - Remove duplicate rows from the DataFrame.
5. **Data Analysis:**
   - Compute summary statistics (mean, median, mode, standard deviation) for numeric columns.
   - Group data by a categorical column and compute aggregated statistics.
6. **Data Visualization with Matplotlib and Seaborn**
   I. **Basic Plots with Matplotlib:**
      - Create line plots, bar charts, histograms, and scatter plots.
      - Customize plots with titles, labels, legends, and colors.
      - Interactive visualizations with Plotly library

   II. **Advanced Plots with Seaborn:**
      - Create a pair plot to visualize relationships between multiple variables.
      - Use a heatmap to visualize a correlation matrix.

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DIPLOMA WING

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

DIPLOMA IN INFORMATION TECHNOLOGY (I04)

SEMESTER V

COURSE TITLE	:	INFORMATION SECURITY
PAPER CODE	:	7493
SUBJECT CODE	:	511
THEORY CREDITS	:	03
PRACTICAL CREDITS	:	02

Course Learning Objectives:

To learn how to evaluate and enhance information security of IT infrastructure and organizations.

Course Content:

UNIT 1:
Introduction to Information Security, Various aspects of information security (PAIN), Security Features of Operating Systems – Authentication, Logs, Audit Features, File System Protection, User Privileges, RAID options, Anti-Virus Software, etc.

UNIT 2:
Understanding security weaknesses in popular networking protocols – IP, TCP, UDP, RIP, OSPF, HTTP, SMTP, etc.; security weaknesses in common networking devices – Hub, switch, router, WiFi; Security solutions to mitigate security risk of networking protocols (IPSec, HTTPS, etc) and devices (VLAN, VPN, Ingress Filtering, etc)

UNIT 3:
Basics of Cryptography, PKI, Security considerations while developing softwares

UNIT 4:
Network Security Products – Firewall, IDS/IPS, VPN Concentrator, Content Screening Gateways, etc.

UNIT 5 :
Introduction to Security Standards – ISO 27001, Indian IT Act, IPR Laws; Security Audit procedures; Developing Security Policies; Disaster Recovery, Business Continuity Planning

Suggested Lab Work:

This is a skill course. Topics/tools taught in the class should be practiced in the Lab same week and practiced regularly during the semester till student becomes confident about it. Students should explore features of various tools/applications introduced during the course. Teacher should give weekly tasks as assignment.

Reference Books:

1. Information Security and Cyber Laws, Sarika Gupta, Khanna Publishing House
2. RFCs of protocols listed in content(https://www.ietf.org)
3. Various Acts, Laws and Standards (IT Act, ISO27001 Standard, IPR and Copyright Laws, etc.)
4. Security Guideline documents of Operating Systems (OS Manual, Man Pages, etc)
5. https://www.cert-in.org.in/
6. https://www.sans.org/

Course outcomes:

Understanding of security needs and issues of IT infrastructure. Have basic skills on security audit of networks, operating systems and application software

DIPLOMA WING

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

DIPLOMA IN INFORMATION TECHNOLOGY (I04)

SEMESTER V

COURSE TITLE	:	FREE AND OPEN SOURCE SOFTWARE (FOSS)
PAPER CODE	:	7500
SUBJECT CODE	:	512
THEORY CREDITS	:	03
PRACTICAL CREDITS	:	02

Course Learning Objectives:

Exposure to free and open source software philosophy and tools.

Course Content:

UNIT 1: FOSS Philosophy
Understanding the FOSS Community and FOSS Philosophy, Benefits of Community based Software Development, Guidelines for working with FOSS community, Requirements for being open, free software, open source software, FOSS Licensing Models, FOSS examples

UNIT 2: LINUX
Linux Installation and Hardware Configuration, Boot Process, Dual-Booting Linux and other Operating Systems, Kernel Options during Boot, X Windows System Configuration, System Administration (Server Administration, Backup and Restore Procedures, Strategies for keeping a Secure Server)

UNIT 3: Programming Tools and Techniques
Libreoffice Tools; Samba: Cross platform; Introduction about LAMP; Brief Introduction to Programming using languages like Java /Python / Perl; Database Systems Mysql, PostgreSQL or equivalent; Open Source UML Tools; Introduction to Mobile Programming; Version Control Systems like SVN, Git or equivalent; Project Management Tools; Bug Tracking Systems; Package Management Systems

UNIT 4: FOSS Case Studies
Some example case studies of FOSS implementation

Suggested Lab Work:

This is a skill course. Topics/tools taught in the class should be practiced in the Lab same week and practiced regularly during the semester till student becomes confident about it. Students should explore features of various FOSS tools/applications on a Linux system. Teacher should give weekly tasks as assignment. Learnings from this course should be used in the major project.

Reference Books:

1. Linux in a Nutshell, by Ellen Siever
2. Philosophy of GNU URL: http://www.gnu.org/philosophy/.
3. Linux Administration URL: http://www.tldp.org/LDP/lame/LAME/linux-admin-madeeasy/.
4. Version control system URL: http://git-scm.com/.
5. Samba: URL : http://www.samba.org/.
6. Libre office: http://www.libreoffice.org/

Course outcomes:
Student will be able to work with FOSS tools, find and evaluate FOSS alternatives for any software requirement.

DIPLOMA WING

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

DIPLOMA IN INFORMATION TECHNOLOGY (I04)

SEMESTER V

COURSE TITLE	:	ADVANCE COMPUTER NETWORKS
PAPER CODE	:	7495
SUBJECT CODE	:	521
THEORY CREDITS	:	03
PRACTICAL CREDITS	:	00

Course Learning Objectives:

Introduce Advance Networking Concepts, Theories and Tools

Course Content:

UNIT 1:
Review of Networking Basics; Advance Topics in IPv4 – Subnetting, Multicasting, Multicast Routing Protocols (IGMP, PIM, DVMRP); Advance Topics in TCP – flow management, congestion avoidance, protocol spoofing; IPv6

UNIT 2:
Telecom Networks, Switching Techniques; Introduction to Frame Relay, ATM, MPLS; VSAT Communication – Star and Mesh architectures, bandwidth reservation;
Wireless Networks – WiFi, WiMax, Cellular Phone Technologies – GSM, CDMA, 3G, 4G

UNIT 3:
Network Redundancy, Load Balancers, Caching, Storage Networks; QoS; Network Monitoring – SNMP, RMON;

UNIT 4:
Introduction to Network Security – VLAN, VPN, Firewall, IPS, Proxy Servers

UNIT 5:
Network Simulation, Network design case studies and exercises, IP Addressing schema, Protocol Analysers (Wireshark, etc)

Reference Books:

1. RFCs and Standards Documents (www.ietf.org and other standard body websites)
2. Communication Networking – An Analytical Approach, Anurag-Manjunath-Joy
3. TCP/IP Illustrated (Vol.1,2), Stevens
4. Data Networks, Bertsekas-Gallager
5. An Engineering Approach to Computer Networking, S. Keshav

Course Outcomes:

1. Understanding core concepts/theories/algorithms of computer networks
2. Some hands-on capability on various network devices and tools
3. Capability to design and implement a computer network

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DIPLOMA WING

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DIPLOMA IN INFORMATION TECHNOLOGY (I04)

SEMESTER V

COURSE TITLE	:	E-GOVERNANCE AND DIGITAL MARKETING
PAPER CODE	:	7505
SUBJECT CODE	:	522
THEORY CREDITS	:	03
PRACTICAL CREDITS	:	00

Course Learning Objectives:

To explain the concepts of e-Governance and how IT technologies and business models help improving citizen services and bring in transparency. To understand the concepts of E-Commerce and Digital Marketing, Search Engine Optimization (SEO), Search Engine Marketing (SEM), Social Media Optimization (SMO) and Social Media Marketing (SMM) and learn Digital Marketing tools

Course Content:

UNIT 1: E - Governance

E-Governance: Introduction, Models: G2B, G2C, G2G, G2E
E-Governance lifecycle, PPP (Public Private Partnership)
Overview of emerging trends in ICT for E-Governance
Understanding of design and implementation of e-Government projects
National e-Governance Plan (NeGP) for India, SMART Government
Major issue in e-governance: corruption, resistance for change, e-security and cyberlaws
M-Governance: Concept, advantages
Visit e-governance sites (Eg. CSC, e-Sewa, Digilocker, Passport Seva, MPe-district, MPe-services, MP-Online etc)

UNIT 2: E-Commerce

Electronics Commerce: Introduction, advantages and disadvantages.
E-Commerce Business model: B2B, B2C, C2C
E-Commerce Payment: Payment Gateway, Modes of Electronic Payments, Threats & Protections
E-Marketplace (Visit GeM Portal)

UNIT 3: Digital Marketing Overview

Digital Marketing: Concept, Process, Application, Advantages, Limitation, Examples
Digital marketing Verses Traditional marketing
Digital marketer: Definition, Role, Challenges
Visitors Engagement: Concept, Landing page and Conversion Page
Digital Marketing Channels: Search Engine Marketing, Social Media Marketing, Email Marketing, Mobile marketing (Bulk SMS) Affiliate marketing
AI in Digital Marketing

UNIT 4: Search Engine

Search Engine: Definition and Working (Crawling, Indexing and Ranking)
Search Engine Optimization (SEO): Concept, Importance
SEO Terminologies: Definition of SERP, On Page SEO, Off Page SEO, Technical SEO
Keyword: Research Process, Types of keyword (Informational, Navigational, Transactional), Category of keyword (short tail, mid tail, long tail)

Backlinks: Concept, Importance, Dofollow & Nofollow links
On Page SEO Techniques: URL, meta tags, content, Keywords, internal links, sitemap,404 error, 301 redirect.
Off Page SEO Techniques: RSS Feeds (Rich Site Summary), Building backlinks, increasing share on social media.
Search Engine Marketing (SEM): Concept, Importance, Techniques
Search Engine Optimization (SEO) Verses Search Engine Marketing (SEM)
Measuring and Tracking traffic: UTM (Urchin tracking module), UTM commands as part of Tutorials
Case Study on available SEO Tools (Google Search Console, Semrush) as part of Tutorials

UNIT 5: Social Media

Social media: Concept, platforms
Social Media Optimization (SMO): Concept, Advantages, Disadvantage, Strategy
Social Media Marketing (SMM): Concept, Advantages, Disadvantage, Strategy
Social Media Terminology: hashtag, trends, pin, tweet, post, shorts, like, comment, subscribe, tag, share
Social Media Analytics: Concept, Advantage
Advertising cost on social media platforms: CPC (cost per click), CTR (click through rate), CPA (cost per conversion)
Conversion Rate Optimization (CRO): Definition, Advantages
Visit social media platforms (Facebook, Linkedin, Instagram, Twitter, Whatsapp)
Visit marketing tools (Google Ads, Canva, vidIQ, BuzzSumo)
Visit analytics tools (Google analytics, talkwalker)

Reference Books:

1. Information Technology And E-Governance – N Gopalsamy , published by New Age International (P) Ltd
2. Fundamentals of Digital Marketing - Puneet Bhatia, published by Pearson.
3. Digital Marketing - Vandana Ahuja, published by Oxford Publication
4. Digital Marketing: From Fundamentals to Future -Swaminathan T. N and Karthik Kumar
5. Online Web material https://www.javatpoint.com/digital-marketing and Video Tutorials

Course outcomes:

Through introductory ideas and practices followed in a selected number of e-Governance initiatives in India, the course will help students to understand and appreciate the essence of e-Governance also able to evaluate new product or service ideas, apply conceptual knowledge and analytical tools to forecast market potential. Communicate the detailed analysis of product and branding problems

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DIPLOMA WING

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

DIPLOMA IN INFORMATION TECHNOLOGY (I04)

SEMESTER V

COURSE TITLE	:	RENEWABLE ENERGY TECHNOLOGIES
PAPER CODE	:	7601
SUBJECT CODE	:	531
THEORY CREDITS	:	03
PRACTICAL CREDITS	:	00

Course Learning Objectives:

- To understand present and future scenario of world energy use.
- To understand fundamentals of solar energy systems.
- To understand basics of wind energy
- To understand bio energy and its usage in different ways.
- To identify different available non-conventional energy sources.

Course Content:

UNIT-I: Introduction: World Energy Use; Reserves of Energy Resources; Environmental Aspects of Energy Utilisation; Renewable Energy Scenario in India and around the World; Potentials; Achievements / Applications; Economics of renewable energy systems.

UNIT-II: Solar energy: Solar Radiation; Measurements of Solar Radiation; Flat Plate and Concentrating Collectors; Solar direct Thermal Applications; Solar thermal Power Generation Fundamentals of Solar Photo Voltaic Conversion; Solar Cells; Solar PV Power Generation; Solar PV Applications.

UNIT-III: Wind Energy: Wind Data and Energy Estimation; Types of Wind Energy Systems; Performance; Site Selection; Details of Wind Turbine Generator; Safety and Environmental Aspects.

UNIT-IV: Bio-Energy: Biomass direct combustion; Biomass gasifiers; Biogas plants; Digesters; Ethanol production; Bio diesel; Cogeneration; Biomass Applications.

UNIT-V: Other Renewable Energy Sources: Tidal energy; Wave Energy; Open and Closed OTEC Cycles; Small Hydro-Geothermal Energy; Hydrogen and Storage; Fuel Cell Systems; Hybrid Systems.

Reference Books:

1. O.P. Gupta, Energy Technology, Khanna Publishing House, Delhi (ed. 2018)
2. Renewable Energy Sources, Twidell, J.W. & Weir, A., EFN Spon Ltd., UK, 2006.
3. Solar Energy, Sukhatme. S.P., Tata McGraw Hill Publishing Company Ltd., New Delhi, 1997.
4. Renewable Energy, Power for a Sustainable Future, Godfrey Boyle, Oxford University Press, U.K., 1996.
5. Fundamental of Renewable Energy Sources, GN Tiwari and MK Ghoshal, Narosa, New Delhi, 2007.
6. Renewable Energy and Environment-A Policy Analysis for India,NHRavindranath, UK Rao, B Natarajan, P Monga, Tata McGraw Hill.
7. Energy and The Environment, RA Ristinen and J J Kraushaar, Second Edition, John Willey & Sons, New York, 2006.
8. Renewable Energy Resources, JW Twidell and AD Weir, ELBS, 2006.

Course outcomes:

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

CO1	Understand present and future energy scenario of the world
CO2	Understand various methods of solar energy harvesting.
CO3	Identify various wind energy systems.
CO4	Evaluate appropriate methods for Bio energy generations from various Bio wastes.
CO5	Identify suitable energy sources for a location

DIPLOMA WING

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

DIPLOMA IN INFORMATION TECHNOLOGY (I04)

SEMESTER V

COURSE TITLE	:	ENGINEERING ECONOMICS AND ACCOUNTANCY
PAPER CODE	:	7606
SUBJECT CODE	:	532
THEORY CREDITS	:	03
PRACTICAL CREDITS	:	00

Course Learning Objectives:

- To acquire knowledge of basic economics to facilitate the process of economic decision making.
- To acquire knowledge on basic financial management aspects.
- To develop the basic skills to analyze financial statements.

Course Content:

UNIT-I: Introduction: Managerial Economics; Relationship with other disciplines; Firms: Types, objectives and goals; Managerial decisions; Decision analysis

UNIT-II: Demand & Supply Analysis: Demand; Types of demand; Determinants of demand; Demand function; Demand elasticity; Demand forecasting; Supply; Determinants of supply; Supply function; Supply elasticity

UNIT-III: Production and Cost Analysis: Production function; Returns to scale; Production optimization; Least cost input; Isoquants; Managerial uses of production function; Cost Concepts; Cost function; Types of Cost; Determinants of cost; Short run and Long run cost curves; Cost Output Decision; Estimation of Cost

UNIT-IV: Pricing: Determinants of Price; Pricing under different objectives and different market structures; Price discrimination; Pricing methods in practice; Role of Government in pricing control.

UNIT-V: Financial Accounting (Elementary Treatment): Balance sheet and related concepts; Profit & Loss Statement and related concepts; Financial Ratio Analysis; Cash flow analysis; Funds flow analysis; Comparative financial statements; Analysis & Interpretation of financial statements; Investments; Risks and return evaluation of investment decision; Average rate of return; Payback Period; Net Present Value; Internal rate of return,

Reference Books:

1. Premvir Kapoor, Sociology & Economics for Engineers, Khanna Publishing House, New Delhi, 2018
2. McGuigan, Moyer and Harris, 'Managerial Economics; Applications, Strategy and Tactics', Thomson South Western, 10th Edition, 2005.
3. Prasanna Chandra. 'Fundamentals of Financial Management', Tata Mcgraw Hill Publishing Ltd., 4th edition, 2005.
4. Samuelson. Paul A and Nordhaus W.D., 'Economics', Tata Mcgraw Hill Publishing Company Limited, New Delhi, 2004.
5. Paresh Shah, 'Basic Financial Accounting for Management', Oxford University Press, New Delhi, 2007.
6. Salvatore Dominick, 'Managerial Economics in a global economy'. Thomson South Western, 4th Edition, 2001.

Course outcomes:

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

CO1	Understand the macro-economic environment of the business and its impact on enterprise
CO2	Understand cost elements of the product and its effect on decision making
CO3	Prepare accounting records and summarize and interpret the accounting data for managerial decisions
CO4	Understand accounting systems and analyze financial statements using ratio analysis
CO5	Understand the concepts of financial management and investment

DIPLOMA WING

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

DIPLOMA IN INFORMATION TECHNOLOGY (I04)

SEMESTER V

COURSE TITLE	:	SUMMER INTERNSHIP - II
PAPER CODE	:	--
SUBJECT CODE	:	--
THEORY CREDITS	:	00
PRACTICAL CREDITS	:	03

SUMMER INTERNSHIP – II

4-6 weeks summer internship after IVth Semester.

It should be undertaken in an Industry only.

Evaluation is based on work done, quality of report, performance in viva-voce, presentation etc.

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DIPLOMA WING

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

DIPLOMA IN INFORMATION TECHNOLOGY (I04)

SEMESTER V

COURSE TITLE	:	MAJOR PROJECT
PAPER CODE	:	--
SUBJECT CODE	:	--
THEORY CREDITS	:	00
PRACTICAL CREDITS	:	00 (ONE CREDIT WILL BE CARRIED FORWARD TO THE VI SEM. MAJOR PROJECT EVALUATION

MAJOR PROJECT

It should be based on real/live problems of the Industry/Govt./NGO/MSME/Rural Sector or an innovative idea having the potential of a Startup.

Evaluation is based on work done, quality of report, performance in viva-voce, presentation etc.

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