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	CHEMICAL ENGINEERING	C02	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	7523	501	MASS TRANSFER - II	3	3	10	10	10	30	70	03 Hrs.	4	2	20	30	03 Hrs.	5	150
2	7524	502	CHEMICAL REACTION ENGINEERING	3	3	10	10	10	30	70	03 Hrs.	4	2	20	30	03 Hrs.	5	150
3	7525	503	PROCESS CONTROL AND INSTRUMENTATION	3	3	10	10	10	30	70	03 Hrs.	0	0	0	0	0	3	100
4	7526	511	FOOD TECHNOLOGY OR	3	3	10	10	10	30	70	03 Hrs.	0	0	0	0	0	3	100
	7527	512	SAFETY IN CHEMICAL PROCESS INDUSTRIES															
5	7528	521	PLANT UTILITIES OR	3	3	10	10	10	30	70	03 Hrs.	0	0	0	0	0	3	100
	7529	522	MODERN SEPARATION TECHNIQUES															
6	7601	531	RENEWABLE ENERGY TECHNOLOGIES OR	3	3	10	10	10	30	70	03 Hrs.	0	0	0	0	0	3	100
	7602	532	INTERNET OF THINGS															
7			SUMMER INTERNSHIP-II**	0	0	0	0	0	0	0	0	0	3	20	30	03 Hrs.	3	50
8			MAJOR PROJECT***	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
9			WORKSHOP/SEMINAR/VISIT etc.	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
10			LIBERARY/RECOVERY CLASSES	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0
TOTAL				18	18				180	420		18	7	60	90		25	750

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	750

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DIPLOMA IN CHEMICAL ENGINEERING (C02)

SEMESTER V

COURSE TITLE	:	MASS TRANSFER - II
PAPER CODE	:	7523
SUBJECT CODE	:	501
TREORY CREDITS	:	03
PRACTICAL CREDITS	:	02

COURSE LEARNING OBJECTIVES:

- To impart the basic concept of conventional mass transfer operations.
- To learn the equilibrium characteristics of two phase mass transfer processes.
- To understand the hydrodynamics and operation of mass transfer equipments.
- To develop the skill in the design and analysis of mass transfer equipments in process industries.

COURSE CONTENT:

UNIT-I: Principle, theory, Vapour Liquid Equilibria calculations, Effect of Pressure and temperature on VLE, Methods of distillations, batch, continuous, flash, steam distillation.

UNIT-II: Stage-wise and continuous contactors operations, Mc-Cabe Thiele Method, Azeotropic distillation and Extractive distillation, Introduction - Multi component Flash and differential distillation.

UNIT-III: Liquid - Liquid Equilibria, Effect of Pressure and Temperature on LLE, Solubility criteria, Batch and continuous extraction towers for miscible and immiscible systems. Industrial Applications.

UNIT-IV: Theory, Mechanism, Types of leaching, Solid - Liquid equilibria, Batch and continuous extractors. Equipments and industrial applications.

UNIT-V: Types of adsorption, nature of adsorbents, Adsorption isotherms, Operation of adsorption columns. Batch and continuous operations

REFERENCE BOOKS:

1. R. E. Treybal, "Mass Transfer Operations", 3rd Edn., McGraw Hill Book Co., New York, 1981.

2. N. Anantharaman and K.M.Meera Sheriffa Begum, "Mass Transfer Theory and Practice", Printice Hall of India Pvt. Ltd., New Delhi, 2013.

3. M. Coulson and J. F. Richardson, "Chemical Engineering.", Vol - II, 5th Edn., Pergamon Press, New York, 2002.

4. W. L. Mccabe, J. C. Smith and P. Harriot, "Unit Operations in Chemical Engg.",7th Edn., McGraw Hill Book Co., New York, 2004.

COURSE OUTCOMES:

After completing the course, a student can able to

- Have an ability to apply the concepts of mass transfer in Chemical Process industries.
- Analyse the two phase transfer processes and select the transfer equipments.
- Develop equilibrium characteristics from thermodynamic fundamentals.
- Explain the industrial applications of the mass transfer equipment.

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MASS TRANSFER - II LAB

COURSE LEARNING OBJECTIVES:

To provide experience analysis of mass transfer operations.

COURSE CONTENT:

1. Diffusion
2. Wetted wall column
3. Simple Distillation
4. Steam Distillation
5. Surface evaporation
6. Liquid-Liquid Extraction
7. Leaching
8. Adsorption
9. Air drying
10. Packed Column Distillation

REFERENCE BOOKS:

1. *Lab manual*
2. *G Chandrasekhar, Laboratory Experiments in Chemical and Allied Engineering: Emphasis on Low Cost Experiments, Penram International Publishing (India) Pvt. Ltd..*

COURSE OUTCOMES:

After this Lab course, a student can able to

- Appreciate the concept of diffusion and convection
- Understand the different types of distillation
- Know the contactors used in chemical Process Industries.
- Explain the usage and employability of devices for determining the separation factors and efficiencies of the systems.

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DIPLOMA WING
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DIPLOMA IN CHEMICAL ENGINEERING (C02)

SEMESTER V

COURSE TITLE	:	CHEMICAL REACTION ENGINEERING
PAPER CODE	:	7524
SUBJECT CODE	:	502
TREORY CREDITS	:	03
PRACTICAL CREDITS	:	02

COURSE LEARNING OBJECTIVES:

- Introduce basic concepts of chemical kinetics like homogeneous and heterogeneous reactions, rate of reaction, order and molecularity of reaction, concentration and temperature dependency of rate of reaction
- Build up the concepts to analyze kinetic data and determine the rate expression for a reaction
- This course will guide students to make use of key concepts and techniques of chemical kinetics to design single reactor and multiple reactors
- Analyze multiple reactions to determine selectivity and yield
- Work together in same-discipline teams to solve engineering problems

COURSE CONTENT:

UNIT-I: Basics of Rate process and Chemical Kinetics: Introduction – Rate of a Chemical Reaction, kinetics of homogeneous reactions: Concentration dependent, Temperature dependent term of rate equation, Searching for a mechanism. Interpretation of Batch Reactor data.

UNIT-II: Types and Mechanisms of Chemical Reactions, Single Ideal Reactors, Batch, Mixed flow reactors and plug flow reactors – Performance equations

UNIT-III: Reactors for Multiple Reactions. Size comparison of single reactors for single reactions. Multiple Reactor system for single reactions. Reactions in parallel, reactions in series and series - parallel reactions of first order. Recycle reactor, auto catalytic reactions.

UNIT-IV: Heat Effects: Temperature and pressure effects on single and multiple reactions.

UNIT-V: Non - ideal flow: Residence time distribution studies: C, E, F and I curves

REFERENCE BOOKS:

1. *K. A. Gavhane Chemical Reaction Engineering -I, Nirali Prakashan Publications,Pune*
2. *S C Roy and C Guha, 'A Text book of Chemical Reaction Engineering' Dhanpat Rai & Co. (P) Ltd.,*
3. *O. Levenspiel, "Chemical Reaction Engineering", Wiley Easter Ltd., New York.*

COURSE OUTCOMES:

On completion of the course, the students:

- will understand the classification of chemical reactions, factors affecting the rate of reaction, and the effect of temperature on rate of reaction.
- will gain the knowledge on analyzing the laboratory data for determining the order of reaction and reaction rate constant Ability to relate rate of reaction with design equation for reactor sizing.
- will familiar with the comparisons of ideal reactor types (batch, plug flow, mixed flow and select the most suitable one.
- Will familiar with the determining optimal ideal reactor design for multiple reactions for particular yield or selectivity.

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CHEMICAL REACTION ENGINEERING LAB

COURSE LEARNING OBJECTIVES

To provide experience on analysis of process control and reaction engineering.

COURSE CONTENT

1. Batch reactor
2. Plug flow reactor
3. Mixed flow reactor
4. Adiabatic reactor
5. Combined reactor: Mixed flow -plug flow
6. Combined reactor: Plug flow -mixed flow
7. RTD studies
8. Photochemical reactor

REFERENCE BOOKS

1. Lab manual

COURSE OUTCOMES

After this Lab course, a student can able to

1. appreciate the concept of reactions kinetics and rate equations
2. understand the different types of reactions
3. know the types of reactors and its usage
4. conversion and yield.

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DIPLOMA IN CHEMICAL ENGINEERING (C02)

SEMESTER V

COURSE TITLE	:	PROCESS CONTROL AND INSTRUMENTATION
PAPER CODE	:	7525
SUBJECT CODE	:	503
TREORY CREDITS	:	03
PRACTICAL CREDITS	:	00

COURSE LEARNING OBJECTIVES:

- To introduce students to the terminology, concepts and practices of input/output modelling and process control.
- To impart knowledge in the design of control systems for chemical processes.

COURSE CONTENT:

UNIT-I: Laplace transforms - properties of Laplace transform, solution of linear differential equations using Laplace transform techniques, piecewise continuous functions

UNIT-II: Dynamic behaviour of systems - derivation of transfer functions for first and second order systems, liquid level, temperature, pressure, flow and concentration control processes, linearization of nonlinear systems, interacting and non-interacting systems.

UNIT-III: Transient response of first and second order systems, natural frequency, damping factor, overshoot, decay ratio, rise time and settling time.

UNIT-IV: Transient analysis of control systems - block diagram algebra, overall transfer function of closed loop control systems, regulator and servo problems, transient response of first and second order systems with P, PI and PID controller. Definition of stability of control systems, Routh test, limitations of Routh test.

UNIT-V: Principles of measurements and classification of process instruments, measurement of temperature, pressure, fluid flow, liquid weight and weight flow rate, viscosity, pH, concentration, electrical and thermal conductivity, humidity of gases.

REFERENCE BOOKS:

2. D.R. Coughanowr and S. E. LeBlanc, 'Process Systems Analysis and Control', Mc.Graw Hill, III Edition.

3. G. Stephanopoulous, 'Chemical Process Control – Theory and Practice', Prentice Hall of India Ltd.

4. D.C. Sikdar, "Instrumentation and Process Control", Khanna Publishing House

5. S. Sundaram, "Process Dynamics and Control" CENGAGE Learning.

6. K. Padmanabhan *&* S. Ananthi*, "*A Treatise on Instrumentation Engineering*" I.K International Publishing Pvt. Ltd.*

COURSE OUTCOMES:

On completion of the course, the student:

- Can construct a model of the chemical processes and other elements used in feedback control systems from first principles leading to the development of transfer function models
- Can compute the response of the developed transfer function for various forcing functions providing an understanding of the transient response of the system
- Can derive transfer function models of controllers and compute the transient response under closed loop conditions.
- Can evaluate the stability of the control system given a mathematical model of a control system including its components.
- Different Instrumentations used in Process Industries.

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DIPLOMA IN CHEMICAL ENGINEERING (C02)

SEMESTER V

COURSE TITLE	:	FOOD TECHNOLOGY
PAPER CODE	:	7526
SUBJECT CODE	:	511
TREORY CREDITS	:	03
PRACTICAL CREDITS	:	00

COURSE LEARNING OBJECTIVES:

To impart knowledge to the students about advanced technology in food science and recent trends adapted in food industry.

COURSE CONTENT:

UNIT-I: Fundamentals of Food Process Engineering, Application of Quantitative methods of Material & Energy balances in Food Engineering Practices. Constituents of Food, Quality and Nutritive aspects, Food Adulterations, Deteriorative factors and Control

UNIT-II: Fluid Flow, Thermal Process Calculations, Refrigeration, Evaporation and Dehydration operations in Food Processing

UNIT-III: Fundamentals of Food Canning Technology, Heat Sterilization of Canned food, Containers – metal, Glass and Flexible packaging. Canning Procedures for Fruits, Vegetables, Meat, Poultry and Marine Products

UNIT-IV: Preservation by Heat and Cold, Dehydration, Concentration, Drying, Irradiation, Microwave heating, Sterilization and Pasteurization, Fermentation and Pickling, Packaging Methods

UNIT-V: Cereal, Grains, Pulses, Vegetables, Fruits, Spices, Fats and Oils, Bakery, Confectionary and Chocolate Products. Soft and Alcoholic Beverages, Dairy Products, Meat, Poultry and Fish Products.

REFERENCE BOOKS:

1. B Sivasankar, 'Food Processing and Preservation,' PHI Learning Pvt. Ltd.,

2. Rao D G, 'Fundamentals of Food Engineering', PHI Learning Private Ltd.,.

3. R Paul Singh, Dennis R Heldman, 'Introduction to Food Engineering,' 4/e, Elsevier,.

4. Da-Wen Sun, 'Emerging Technologies for Food Processing', Elsevier.

COURSE OUTCOMES:

Upon successful completion of this course, the student should be able to

- Explain properties of food in relation to its quality.
- Elucidate the theory and applications of unit operations in food processing.
- Describe the various equipments used in food industry.
- Explain the factors affecting the growth and survival of food microorganisms.
- Describe various food preservation techniques.

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SEMESTER V

COURSE TITLE	:	SAFETY IN CHEMICAL PROCESS INDUSTRIES
PAPER CODE	:	7527
SUBJECT CODE	:	512
TREORY CREDITS	:	03
PRACTICAL CREDITS	:	00

COURSE LEARNING OBJECTIVES:

Students learn about implementation of safety procedures, risk analysis and assessment, hazard identification.

COURSE CONTENT:

UNIT-I: Hazard identification methodologies, risk assessment methods - PHA, HAZOP, MCA, ETA, FTA, consequence analysis,

UNIT-II: Hazards in work places - nature and type of work places, types of hazards, hazards due to improper house-keeping, hazards due to fire in multi-floor industries and buildings, guidelines and safe methods in the above situations.

UNIT-III: Workers' exposures to hazardous chemicals, TLVs of chemicals, physical and chemical properties of chemicals leading to accidents like fire explosions, ingestion and inhalation, pollution in work places due to dangerous dusts, fumes and vapours, guidelines and safe methods in chemicals handling, storage and entry into confined spaces.

UNIT-IV: Hazards peculiar to industries like fertilizer, heavy chemicals, petroleum, pulp and paper, tanneries, dyes, paints, pesticides, glass and ceramics, dairy and sugar industries, guidelines for safe-guarding personnel and safeguarding against water, land and air pollution in the above industries.

UNIT-V: Safety education and training - safety management, fundamentals of safety tenets, measuring safety performance, motivating safety performance, legal aspects of industrial safety, safety audit.

REFERENCE BOOKS:

1. Dr B.K. Bhaskara Rao, Er. R.K. Jain, and Vineet Kumar, "Safety in Chemical Plants/Industry and Its Management" Khanna Publishers.

2. S.C. Sharma, "Industrial Safety and Maintenance Management", Khanna Book Publishing Co. Private Limited, New Delhi

COURSE OUTCOMES:

On completion of the course the students will

- understand the importance of safety measures
- Know Different types of prevention techniques
- identify the risks in process management in different types of process industries.

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SEMESTER V

COURSE TITLE	:	PLANT UTILITIES
PAPER CODE	:	7528
SUBJECT CODE	:	521
TREORY CREDITS	:	03
PRACTICAL CREDITS	:	00

COURSE LEARNING OBJECTIVES:

To enable the students to understand the process plant utilities and optimization techniques to optimize various parameters in chemical industries.

COURSE CONTENT:

UNIT-I: IMPORTANT OF UTILITIES: Hard and Soft water, Requisites of Industrial Water and its uses. Methods of water Treatment such as Chemical Softening and Demineralization, Resins used for Water Softening and Reverse Osmosis. Effects of impure Boiler Feed Water.

UNIT-II: STEAM AND STEAM GENERATION: Properties of Steam, problems based on Steam, Types of Steam Generator such as Solid Fuel Fired Boiler, Waste Gas Fired Boiler and Fluidized Bed Boiler. Scaling and Trouble Shooting. Steam Traps and Accessories.

UNIT-III: REFRIGERATION: Refrigeration Cycles, Methods of Refrigeration used in Industry and Different Types of Refrigerants such as Monochlorodifluro Methane, Chlorofluro Carbons and Brins. Refrigerating Effects and Liquefaction Processes.

UNIT-IV: COMPRESSED AIR: Classification of Compressor, Reciprocating Compressor, Single Stage and Two Stage Compressor, Velocity Diagram for Centrifugal Compressor, Silp Factor, Impeller Blade Shape. Properties of Air –Water Vapors and use of Humidity Chart. Equipments used for Humidification, Dehumidification and Cooling Towers.

UNIT-V: FUEL AND WASTE DISPOSAL: Types of Fuel used in Chemical Process Industries for Power Generation such as Natural Gas, Liquid Petroleum Fuels, Coal and Coke. Internal Combustion Engine, Petrol and Diesel Engine. Waste Disposal.

REFERENCE BOOKS:

1. P. L. Ballaney, "Thermal Engineering", Khanna Publisher New Delhi.

2. Perry R. H. Green D. W. "Perry's chemical Engineer's Handbook", McGraw Hill, New York,.

3. D B DHONE, "Plant utilities" Nirali Prakashan.

4. P. N. Ananthanarayan, "Basic Refrigeration & Air-Conditioning", Tata McGraw Hill, New Delhi.

5. Sadhu Singh, Refrigeration & Air-Conditioning, Khanna Publishing House. New Delhi

COURSE OUTCOMES:

At the end of this course, the students will

- Understand the importance of health, safety and the environment in process industries.
- Steam, power, water, air are extensively used in process industries and their efficient operation is imperative for economic and
- Safe operation is essential for the survival of industries.

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SEMESTER V

COURSE TITLE	:	MODERN SEPARATION TECHNIQUES
PAPER CODE	:	7529
SUBJECT CODE	:	522
TREORY CREDITS	:	03
PRACTICAL CREDITS	:	00

COURSE LEARNING OBJECTIVES:

To identify about the kind of separation processes in general and novel separations are integral part of any process chemical industries.

COURSE CONTENT:

UNIT-I: Thermal Diffusion: Basic Rate Law, Theory of Thermal Diffusion Phenomena for gas and liquid mixtures, Equipments design and Applications. Zone Melting

UNIT-II: Chromatographic techniques, Equipment and Commercial processes, Molecular Sieves.

UNIT-III: Cryogenic, Supercritical fluid extraction and Azeotropic separation.

UNIT-IV: Principle of membrane separations process; Classification: Reverse osmosis, Ultra-filtration, Micro-filtration, Nano-filtration and Dialysis; Membrane modules and application; Electro-dialysis; Per-vaporation and gas separation using membranes; Electrophorosis; Liquid membranes.

UNIT-V: Foam and bubble separation: Principle; Classification; Separation techniques; Column operations. Surface Adsorption, Nature of foams.

REFERENCE BOOKS:

1. Schoen H. M., New Chemical Engineering Separation Techniques, 2nd Edition, Inter Science Publications, New York.

2. Seader, J.D, and Henley E.J.,Separation 'Process Principles,' John Wiley & Sons, Inc..

3. Perry R.H. and. Green D.W.,Perry's Chemical Engineers Hand book, 6th Edition. McGraw Hill, New York, .

4. King C.J. 'Separation Processes', 4th Edition, Tata McGraw Hill, New Delhi,.

COURSE OUTCOMES:

On completion of the course the students will be able to

- Differentiate the conventional techniques and modern techniques
- Understand the principles of modern separation techniques
- Application of this techniques in Industries
- Identify the importance of economics involved in its applications

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SEMESTER V

COURSE TITLE	:	RENEWABLE ENERGY TECHNOLOGIES
PAPER CODE	:	7601
SUBJECT CODE	:	531
TREORY 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 ofEnergy Utilisation; Renewable Energy Scenario in India and around the World; Potentials; Achieve-ments / Applications; Economics of renewable energy systems.

Unit-II: Solar energy: Solar Radiation; Measurements of Solar Radiation; Flat Plate and Concentrat- ing Collectors; Solar direct Thermal Applications; Solar thermal Power Generation Fundamentals ofSolar 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; Perfor- mance; Site Selection; Details of Wind Turbine Generator; Safety and Environmental Aspects.

Unit-IV: Bio-Energy: Biomass direct combustion; Biomass gasifiers; Biogas plants; Digesters; Etha-nol production; Bio diesel; Cogeneration; Biomass Applications.

Unit-V: Other Renewable Energy Sources: Tidal energy; Wave Energy; Open and Closed OTEC Cy-cles; 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, NH Ravindranath, UK Rao, BNatarajan, 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.

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SEMESTER V

COURSE TITLE	:	INTERNET OF THINGS
PAPER CODE	:	7602
SUBJECT CODE	:	532
TREORY CREDITS	:	03
PRACTICAL CREDITS	:	00

Course Content:

Unit I - Introduction to Internet of Things

- Define the term "Internet of Things"
- State the technological trends which have led to IoT.
- Describe the impact of IoT on society.

Unit II - Design consideration of IoT

- Enumerate and describe the components of an embedded system.
- Describe the interactions of embedded systems with the physical world.
- Name the core hardware components most commonly used in IoT devices.

Unit III Interfacing by IoT devices

- Describe the interaction between software and hardware in an IoT device.
- Explain the use of networking and basic networking hardware.
- Describe the structure of the Internet.

SUGGESTED LEARNING RESOURCES:

S. No.	Title of Book	Author	Publication
1	Internet of Things	Raj Kamal	McGraw Hill Education; First edition (10 March 2017) ISBN 978-9352605224
2	internet of Things: A Hands-On Approach	Arsheep Bahge and Vijay Madisetti	Orient Blackswan Private Limited - New Delhi; First edition (2015) ISBN : 978-8173719547

SUGGESTED SOFTWARE/LEARNING WEBSITES:

1. https://www.raspberrypi.org/blog/getting-started-with-iot/
2. https://www.arduino.cc/en/IoT/HomePage
3. https://www.microchip.com/design-centers/internet-of-things
4. https://learn.adafruit.com/category/internet-of-things-iot
5. http://esp32.net/

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SEMESTER V

COURSE TITLE	:	SUMMER INTERNSHIP - II
PAPER CODE	:	--
SUBJECT CODE	:	--
TREORY 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 IN CHEMICAL ENGINEERING (C02)

SEMESTER V

COURSE TITLE	:	MAJOR PROJECT
PAPER CODE	:	--
SUBJECT CODE	:	--
TREORY 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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