

**STATE COUNCIL OF TECHNICAL EDUCATION AND VOCATIONAL TRAINING, ODISHA
TEACHING AND EVALUATION SCHEME FOR DIPLOMA IN ENGINEERING COURSES**

DISCIPLINE: CHEMICAL ENGINEERING						SEMESTER: 4TH						
SL NO	SUBJECT CODE	SUBJECT	PERIODS			EVALUATION SCHEME						
			L	T	P	INTERNAL EXAM			END SEM EXAM	TERM WORK	PRACTICAL EXAM	TOTAL MARKS
						TA	CT	Total				
THEORY												
1.	CHT 401	INDUSTRIAL CHEMISTRY -2	4	-	-	10	20	30	70			100
2.	CHT 402	MASS TRANSFER I	3	1	-	10	20	30	70			100
3.	CHT 403	CHEMICAL PROCESS INDUSTRIES -2	4	-	-	10	20	30	70			100
4.	CHT 404	HEAT TRANSFER	3	1	-	10	20	30	70			100
5.	CHT 405	PLANT SAFETY MANAGEMENT	3	1	-	10	20	30	70			100
PRACTICAL/TERM WORK												
5.	CHP 401	INDUSTRIAL CHEMISTRY II – 2 LABORATORY	-	-	3					25	25	50
6.	CHP 402	MASS TRANSFER I LABORATORY	-	-	3					25	-	25
7.	CHP 403	CHEMICAL TECHNOLOGY LABORATORY	-	-	3					25	-	25
8.	CHP 404	HEAT TRANSFER LABORATORY	-	-	3					25	25	50
9.	CHP 405	PLANT SAFETY MANAGEMENT LAB	-	-	3					25	25	50
10.	CHP 406	SOFT SKILL LABORATORY -2	-	-	2					25	-	25
11.	CHP 407	TECHNICAL SEMINAR	-	-	2					25	-	25
GRAND TOTAL			17	3	19	50	100	150	350	150	100	750

Total Contact hours per week: 39

Abbreviations: L-Lecture, T-Tutorial, P-Practical, TA- Teacher's Assignment, CT- Class test

Minimum Pass Mark in each Theory Subject is 35% and in Practical subject is 50%

INDUSTRIAL CHEMISTRY – II

Name of the Course: Diploma in CHEMICAL ENGINEERING			
Course code:	CHT 401	Semester	3 rd
Total Period:	60	Examination	3 hrs
Theory periods:	3 P/W	Class Test:	20
Tutorial:	1 P/W	Teacher's Assessment:	10
Maximum marks:	100	End Semester Examination:	70

Objectives :

On completion of study of chemistry II, the student should be able to:

1. Name organic compounds in IUPAC system
2. Understand the concept of isomerism
3. Acquaint themselves with method of preparation, properties & uses of common aliphatic compounds
4. Acquaint themselves with method of preparation properties & uses of common aromatic compounds
5. Acquire knowledge of preparation & uses of fats, oils, wax, carbohydrates and proteins

Topic wise distribution of periods

Sl. No.	Topics	Periods	Marks
1	Nomenclature	15	10
2.	Aliphatic compounds	25	30
3.	Aromatic compounds	15	20
4.	Fats, oils, wax	05	10
	Total	60	70

COURSE CONTENT

CHAPTER -I IUPAC Nomenclature

- 1.1 Structure of organic compounds
- 1.2 Classification of organic compounds
- 1.3 Name the aliphatic compounds as per IUPAC system
- 1.4 Name the aromatic compounds as per IUPAC system.
- 1.5 Concept of isomerism with example.

CHAPTER-II Aliphatic Compounds

- 2.1 (a) The general methods of preparation of alkanes.
(b) Methods of preparation, properties & uses of Methane and Ethane
- 2.2 (a) The general methods, preparations & properties of alkenes
(b) Explain methods of preparation, properties and uses of Ethylene.
- 2.3 (a) The general methods of preparation of alkynes.
(b) Methods of preparation, properties & uses of acetylene
- 2.4 (a) The general methods of preparation & properties of Halogen derivatives
(b) Methods of preparation, properties & uses of chloroform, carbon tetrachloride, vinyl chloride
- 2.5 (a) The general methods of preparation & properties of monohydric alcohols.

- (b) Compare primary, secondary & tertiary alcohol
- (c) Methods of preparation, properties & uses of methanol & Ethanol
- (d) Absolute alcohol, denatured alcohol & power alcohol.
- (e) Uses of glycerol and glycols.
- 2.6 (a) The general of methods of preparation, properties of ether
- (b) Methods of preparation, properties & uses of diethyl ether.
- 2.7 (a) The general methods of preparation, properties of aldehyde & ketone
- (b) Methods of preparation, properties & uses of formaldehyde, acetaldehyde & acetone
- 2.8 (a) The general methods of preparation and properties of acids
- (b) Methods of preparation, properties, uses of formic acid and acetic acid.
- 2.9 (a) The general methods of preparation, properties of ester
- (b) Methods of preparation, properties & uses of methyl acetate, ethyl acetate.
- 2.10 (a) The general methods of preparation, properties of amines
- (b) Method of preparation, properties & uses of Methyl & Ethyl amine.

CHAPTER-III Aromatic Compounds

- 3.1 The general formula of Benzene & its derivatives
- 3.2 Meaning of aromaticity.
- 3.3 Kekules structure of benzene.
- 3.4 Methods of preparation, properties & uses of
 - (a) Benzene (b) Toluene (c) Nitrobenzene
 - (d) Aniline (e) Phenol (f) Benzaldehyde
 - (g) Benzoic acid

CHAPTER - IV Fats, Oils, Wax

- 4.1 Fat, oil, wax, carbohydrate, protein
- 4.2 The sources of these compounds and explain their extraction.
- 4.3 The application of these compounds

Learning Resources:

Text Books

Sl.No	Name of Authors	Title of the Book	Name of the publisher
1.	Joginder Singh	Modern Organic Chemistry	
2.	Bahl & Bahl	Text book of Organic Chemistry:	

MASS TRANSFER – I

Name of the Course: Diploma in CHEMICAL ENGINEERING			
Course code:	CHT 401	Semester	3 rd
Total Period:	60	Examination	3 hrs
Theory periods:	3 P/W	Class Test:	20
Tutorial:	1 P/W	Teacher's Assessment:	10
Maximum marks:	100	End Semester Examination:	70

Rationale:

There are many operations in chemical engineering practices involve transfer of mass of a material from one phase (e.g. liquid) to the other phase (e.g. gaseous) associated with or without chemical reactions. Mass transfer operations such as distillation, absorption, adsorption, humidification & de-humidification, drying, extraction, crystallization, ion exchange and membrane separation are often found to constitute the most important amongst the unit operation comprising a particular process industry. Therefore, it is very important for a chemical engineer to have an idea on the fundamental principles underlying various mass-transfer operations as also understand the working principles and construction of many types of equipment effecting mass transfer in industrial situation.

Objective:

On completion of mass transfer-I the students will be able to:

1. Understand Fundamentals of mass transfer operation
2. Explain the principles used in different mass transfer operation
3. Understand the working principle and maintenance of various equipment used in different mass transfer operations like distillation, absorption and adsorption

Topic wise distribution of periods

Sl. No.	Topics	Periods	Marks
1	Fundamentals of mass transfer	10	15
2.	Distillation	25	25
3.	Absorption	15	15
4.	Adsorption	10	15
	Total	60	70

COURSE CONTENTS :

CHAPTER – I FUNDAMENTALS OF MASS TRANSFER

- 1.1 Importance of mass transfer operations
- 1.2 General principle of mass transfer operations
- 1.3 Classify mass transfer operations
- 1.4 Molecular diffusion and inter phase diffusion
- 1.5 Diffusion in gases and liquids
- 1.6 Explain Fick's law & mass transfer coefficient

CHAPTER – II DISTILLATION

- 2.1 Types of boiling point diagram and enthalpy concentration diagram
- 2.2 Vapour liquid equilibrium

- 2.3 Relative volatility and derive an expression between α & x-y
- 2.4 Draw XY data (equilibrium curve) for different system in graph paper
- 2.5 Simple distillation & Derivation of Rayleigh's equation (solve simple problems)
- 2.6 Flash distillation and material balance in flash distillation
- 2.7 Continuous rectification of binary system
- 2.8 Construction of rectification column
- 2.9 Types of trays & re-boiler
- 2.10 Channeling, weeping, entrainment and flooding
- 2.11 Analyze fractionating column by McCabe and Thiele Method and find out feed plate location
- 2.12 Reflux ratio and concept of minimum, optimum and total reflux ratio
- 2.13 Plate efficiency, Murphee's efficiency and local efficiency
- 2.14 Steam distillation and its application
- 2.15 Azeotropic distillation and extractive distillation.

CHAPTER – III ABSORPTION

- 3.1 Principles of absorption and factors affecting rates of absorption
- 3.2 Different equipments used for absorption
- 3.3 Types of packing materials used in absorption, explain regular and random packing
- 3.4 Loading, flooding and its effect on pressure drop, minimum gas-liquid ratio, HETP
- 3.5 Elementary ideas about spray tower, Venturi scrubber and wetted wall column

CHAPTER – IV ADSORPTION

- 4.1 The principles of adsorption and types of adsorption and factors affecting adsorption, Freundlich isotherm and its application
- 4.2 The different types of adsorbents and characteristic of adsorbents
- 4.3 Elutriation, percolation and industrial application of adsorption
- 4.4 Selection of adsorbents, different adsorption operation
- 4.5 Material balance in adsorption
- 4.6 Construction and operation of adsorption equipments

Learning Resources:

Text Books

Sl.No	Name of Authors	Title of the Book	Name of the publisher
1.	W.L. McCabe and J.M. Smith	Unit operations of Chemical Engineering	
2.	Badgero and Banchero	Introduction to Chemical Engineering	
3.	Richardson and Coulson	Chemical Engineering Vol. I	
4.	Treybel	Mass Transfer Operations	
5.	Binay Dutta	Separation operation	

CHEMICAL PROCESS INDUSTRIES – II

Name of the Course: Diploma in CHEMICAL ENGINEERING			
Course code:	CHT 403	Semester	3 rd
Total Period:	60	Examination	3 hrs
Theory periods:	4 P/W	Class Test:	20
Tutorial:		Teacher's Assessment:	10
Maximum marks:	100	End Semester Examination:	70

OBJECTIVES:

After completion of Chemical Process Industries -II the student will be able to

1. Understand the adequate information about raw materials.
2. Describe the chemistry involved and outlines of manufacturing of some organic chemicals and polymers which are of highly significant in daily life.

Topic wise distribution of periods

Sl. No.	Topics	Periods	Marks
1	Pesticides	06	08
2	Paints and varnishes	06	08
3	Explosives	08	08
4	Plastics	08	08
5	Synthetic fiber	08	10
6	Rubber	06	06
7	Sugar	06	06
8	Oils and fats	06	08
9	Soaps and detergent	06	08
	Total	60	70

I.0 PESTICIDES

- 1.1 Define pesticides
- 1.2 Classify different pesticides
- 1.3 Manufacture of DDT and BHC

2.0 PAINTS AND VARNISHES

- 2.1 Define paints and varnishes
- 2.2 Constituents of paints and their characteristics
- 2.3 Manufacturing process of paints and varnishes

3.0 EXPLOSIVES

- 3.1 Define explosives
- 3.2 Classify different explosives
- 3.3 Manufacture of cellulose nitrate, nitroglycerine and dynamite

4.0 PLASTICS

- 4.1 Manufacture of different plastics like phenol formaldehyde, urea formaldehyde, polyethylene, P.V.C with their properties and uses.

5.0 SYNTHETIC FIBERS

- 5.1 Classify fiber
- 5.2 Explain manufacture of different fibers like Nylon, Viscose rayon, Cupro ammonium rayon, Acetate rayon, Polyester with properties.

6.0 RUBBER

- 6.1 Natural and synthetic rubber
- 6.2 Manufacture of SBR and Nitrile rubber and their properties

7.0 SUGAR

- 7.1 Manufacture of cane sugar
- 7.2 Manufacture of industrial alcohol

- 7.3 Manufacture of Beer and wine
- 8.0 OILS AND FATS**
- 8.1 Classify different types of oil
- 8.2 Manufacture of vegetable oil
- 8.3 Hydrogenation of oil
- 8.4 Manufacture of vanaspati
- 9. SOAPS AND DETERGENTS**
- 9.1 Define soaps and detergent
- 9.2 Manufacture of soap
- 9.3 Manufacture of detergent

Learning Resources:

Text Books

Sl.No	Name of Authors	Title of the Book	Name of the publisher
1.	C. Dryden	Chemical Technology	
2.	N. Shreeve	Chemical Technology	
	Pandey and Shukla	Chemical Technology	

HEAT TRANSFER

Name of the Course: Diploma in CHEMICAL ENGINEERING			
Course code:	CHT 404	Semester	3 rd
Total Period:	60	Examination	3 hrs
Theory periods:	3 P/W	Class Test:	20
Tutorial:	1 P/W	Teacher's Assessment:	10
Maximum marks:	100	End Semester Examination:	70

OBJECTIVES:

After completion of the study of heat transfer – II the student will be able to

- 1) Distinguish the fundamental & derived units in heat transfer
- 2) Derive dimensional formula of variables in Heat Transfer.
- 3) Understand and explain various modes of Heat Transfer.
- 4) Acquaint themselves with various problems on Heat Transfer.
- 5) Understand the operation of Heat Exchanger of shell and tube, multi pass and single Pass type.
- 6) Understand the principles of evaporation and operation of evaporators.
- 7) Solve simple heat transfer problems.

Topic wise distribution of periods			
Sl. No.	Topics	Periods	Marks
1	Conduction	15	20
2	Convection & Heat Exchanger	20	20
3	Radiation	10	10
4	Evaporation	15	20
	Total	60	70

Chapter – 1 CONDUCTION

- 1.1 Heat flow concept in conduction.
- 1.2 Steady state and unsteady state heat flow.
- 1.3 State Fourier's law of conduction.
- 1.4 Heat flow through single material
- 1.5 Heat flow through composite walls.
- 1.6 Heat flow through cylinder
- 1.7 Heat flow through spheres.
- 1.8 Heat flow in single and series medium.
- 1.9 Thermal insulation and critical radius of insulation
- 1.10 Solve simple problems on conduction

Chapter – 2 CONVECTION and HEAT EXCHANGER

- 2.1 Concept of heat flow by convection
- 2.2 Natural and forced convection
- 2.3 Individual and overall heat transfer co efficient
- 2.4 Application of dimensional analysis in Convection
- 2.5 Use Empirical equations for different flow regime
- 2.6 Parallels, co current and counter current flow
- 2.7 Log mean temperature difference
- 2.8 Classify heat exchanger

- 2.9 Construction and working of shell and tube heat exchanger
- 2.10 Multi pass and single pass heat exchanger
- 2.11 Derive energy balance for shell and tube heat exchanger (simple problems)
- 2.12 Construction and operation of Finned tube heat exchanger, Plate type heat exchanger, Scrapped surface heat exchanger
- 2.13 Heat transfer in agitated vessel
- 2.14 Define condensation
- 2.15 Drop wise and film type condensation
- 2.16 Solve simple problems.

Chapter – 3 RADIATION

- 3.1 Principle in radiation heat transfer
- 3.2 Concept of black body, Gray body and emissivity
- 3.3 Mono chromatic emissive power, Derivation of total emissive power
- 3.4 State Kirchhoff's Law
- 3.5 State Stefan Boltzmann's Law.
- 3.6 State Wien's law and Plank's law.
- 3.7 Estimate heat transfer by radiation

Chapter – 4 EVAPORATION

- 4.1 Objective of Evaporation
- 4.2 Performance, capacity, economy of evaporator
- 4.3 Differentiate various types of evaporators
- 4.4 Construction and operation of standards basket evaporator , long tube forced circulation type evaporator
- 4.5 Elementary principle of single and multiple effect evaporators
- 4.6 Material and energy balance of single effect evaporators
- 4.7 Solve simple problems on evaporators
- 4.8 Boiling point elevation, Vapour recompression, mechanical recompression and thermal recompression.

Learning Resources:

Text Books

Sl.No	Name of Authors	Title of the Book	Name of the publisher
1.	Mc Cabe & J M Smith	Unit operation of Chemical Engineering	
2.	Badgero and Banchero	Introduction to Chemical Engineering	
3.	K.A. Gavane	Unit operations II	
4	Mr. B.K. Dutta.	Heat Transfer	

PLANT SAFETY MANAGEMENT

Name of the Course: Diploma in CHEMICAL ENGINEERING			
Course code:	CHT 405	Semester	3 rd
Total Period:	60	Examination	3 hrs
Theory periods:	3 P/W	Class Test:	20
Tutorial:	1 P/W	Teacher's Assessment:	10
Maximum marks:	100	End Semester Examination:	70

RATIONALE :

The present day industrial environment demands increased production, high efficiency, control of cost, stringent quality control. The production processes have become complex and capital intensive. To meet such needs of industries, the subject of safety, health and environment (S,H and E) has attained significance importance. Today safety is an integral part of any industry. The engineers are therefore expected to have firsthand knowledge of this subject.

OBJECTIVE: On completion of study of Nobel Separation Technology the student will be able to understand

1. Concept of safety management
2. Safe working practice
3. Use of Personal Protective Equipment
4. Fire Prevention & can do Fire Fighting.
5. Understand Chemical Hazards, Mechanical Hazards, Electrical Safety, Electrical Shocks

Topic wise distribution of periods

Sl. No.	Topics	Periods	Marks
1	Introduction to Industrial safety management	08	10
2.	Safe working practice	10	10
3.	Personal Protective Equipment	08	10
4.	Fire Prevention & Fire Fighting	08	10
5.	Chemical Hazards	10	10
6.	Electrical Safety, Electrical Shocks & their prevention	10	10
7.	Mechanical Hazards	06	10
	Total	60	70

COURSE CONTENT

1.0 INTRODUCTION TO INDUSTRIAL SAFETY MANAGEMENT

- 1.1 Fundamental of safety
- 1.2 Unsafe act and unsafe condition
- 1.3 Integration of Safety, Health and Environment
- 1.4 Objective and principle of Safety Management
- 1.5 Terms and definition used in safety management
- 1.6 Classification of accidents

2.0 SAFE WORKING PRACTICE

- 2.1 Good Housekeeping practice
- 2.2 Work place safety

- 2.3 Safe working environment
- 2.4 Precaution in use of ladder
- 2.5 Safety instruction during maintenance
- 2.6 Safety measures during handling of compressed system, cylinders and painting Equipments
- 2.7 Permit to work system

3.0 PERSONAL PROTECTIVE EQUIPMENT(PPE)

- 3.1 Requirement of personal protective equipment
- 3.2 Classification of Hazards
- 3.3 Personal protective equipments for different parts of body
- 3.4 Guideline to use personal protective equipment

4.0 FIRE PREVENTION AND FIRE FIGHTING

- 4.1 Fundamentals of fire, elements of fire.
- 4.2 Terms and definition in Fire Management.
- 4.3 Classification of fire and fire extinguishing technique
- 4.4 Causes of fire and its prevention
- 4.5 Different types of fire extinguisher and their application

5.0 CHEMICAL HAZARDS

- 5.1 Classification of Chemical Hazards
- 5.2 Factor influencing effects of toxic chemicals
- 5.3 Terms related to concentration level as per industrial hygiene norm
- 5.4 Control measure for Chemical hazards

6.0 ELECTRICAL SAFETY, ELECTRICAL SHOCK AND THEIR PREVENTION

- 6.1 Introduction to electrical safety
- 6.2 precaution and safety in use of electricity
- 6.3 Electrical hazards in Industrial system
- 6.4 Safety provision to prevent electrical hazards

7.0 MECHANICAL HAZARDS

- 7.1 Sources of mechanical hazards
- 7.2 Machine Guard and Safety devices
- 7.3 Pressure hazards and pressure vessel
- 7.4 Safety measures in use of gas cylinders
- 7.5 Types of maintenance(e.g Breakdown, preventive

Learning Resources:

Text Books			
Sl.No	Name of Authors	Title of the Book	Name of the publisher
1.	R.K. Jain, Sunil Rao	Industrial safety Health and Environment System	Khanna Publication
2.	Tarafdar & Tarafdar	Industrial Safety Management	Dhanpat Ray & Sons
	Amit Gupta	Industrial, safety and Environment	Laxmi Publication

INDUSTRIAL CHEMISTRY LABORATORY-II

Name of the Course: Diploma in CHEMICAL ENGINEERING			
Course code:	CHP 401	Semester	3 rd
Total Period:	45	Examination	4 hrs
Lab. periods:	3 P/W	Term Work	25
Maximum marks:	50	End Semester Examination:	25

Sl. No.	List of Experiments	No. of Periods
1.	Detect the following elements in the organic compound i) Nitrogen ii) Sulphur iii) Halogen	10
2.	Determine different functional groups of i) Acids ii) Alcohols iii) Aldehydes iv) Ketones v) Esters vi) Phenolic vii) Amines Viii Nitro ix) Amide x) Carbohydrate	15
3.	Systematic qualitative analysis of organic compound	10
4.	Determine boiling point and melting point	
5.	Prepare i) Nitrobenzene ii) Phenolphthalein iii) Methyl orange	10

MASS TRANSFER LABORATORY – I

Name of the Course: Diploma in CHEMICAL ENGINEERING

Course code:	CHP 402	Semester	3 rd
Total Period:	45	Examination	4 hrs
Lab. periods:	3 P/W	Term Work	25
Maximum marks:	25	End Semester Examination:	

List of experiments:

1. Demonstrate operation of a fractional distillation unit
2. Demonstrate operation of the differential distillation equipment and verify the Rayleigh's equation for the given sample
3. Determine the vapour liquid composition of a binary system at different temperature and plot equilibrium diagram for the same system
4. (a) Identify different components and operate the bubble cap rectification column
(b) Determine plate efficiency and plot Mc-Cabe Thiele diagram
5. (a) Identify different components and operate a steam distillation unit
(b) Determine the molecular weight of a given liquid.
6. (a) Identify different components and operate and open boiling pan
(b) Find out the overall heat transfer co-efficient.
7. (a) Identify different components and operate a single effect (Vacuum/Atmospheric) evaporator
(b) Calculate the total heat required for concentration of a given dilute solution.
8. Demonstrate and operation of a packed bed absorption tower
9. Determine the absorption isotherm of acetic acid by activated charcoal.
10. Study of adsorption of oxalic acid aqueous solution on charcoal and prove the validity of Freundlich's adsorption isotherm and Langmuir's adsorption isotherm

CHEMICAL TECHNOLOGY LABORATORY

Name of the Course: Diploma in CHEMICAL ENGINEERING			
Course code:	CHP 403	Semester	3 rd
Total Period:	45	Examination	4 hrs
Lab. periods:	3 P/W	Term Work	25
Maximum marks:	25	End Semester Examination:	

Sl. No.	Topics of experiments	Periods
1	Prepare Soap from vegetable oil	03
2	Estimate free alkali present in soap	03
3	Determine the acid value of an oil	03
4	Determine the saponification value of an oil	03
5	Determine amount of calcium and calcium oxide present in a given sample of cement	06
6	Determine the % of available chlorine in a given sample of bleaching power	03
7	To separate various pigment in extract of spinach leaves by TLC	06
8	Determine the % of nitrogen in a fertilizer sample	06
9	Prepare Urea formaldehyde and phenol formaldehyde resin in the laboratory	06
10	Determine the % of copper in Brass	06
	Total	45

HEAT TRANSFER LAB

Name of the Course: Diploma in CHEMICAL ENGINEERING			
Course code:	CHP 404	Semester	3 rd
Total Period:	45	Examination	4 hrs
Lab. periods:	3 P/W	Term Work	25
Maximum marks:	50	End Semester Examination:	25

Sl. No.	Topics of experiments	Periods
1	Demonstrate operation of single pass shell and tube heat exchanger horizontal and vertical type	03
2	Demonstrate operation of Finned heat exchanger	03
3	Demonstrate operation of multi pass, horizontal heat exchanger	06
4	Demonstrate operation of multi pass, vertical heat exchanger and determine over all heat tr. Coefficient	06
5	Demonstrate operation of double pipe heat exchanger	03
6	Demonstrate operation of Stefan's Boltzmann apparatus	06
7	Demonstrate heat transfer in forced convection and natural convention	06
8	Demonstrate operation of Boiler	06
9	Demonstrate heat transfer through composite wall	06
	Total	45

PLANT SAFETY MANAGEMENT LABORATORY

Name of the Course: Diploma in CHEMICAL ENGINEERING			
Course code:	CHP 405	Semester	3 rd
Total Period:	45	Examination	4 hrs
Lab. periods:	3 P/W	Term Work	25
Maximum marks:	50	End Semester Examination:	25

Sl. No.	Topics of experiments	Periods
1.	Demonstration of Personal Protective Equipment such as Nose Mask, various types of Safety goggles etc	06
2.	Use of Fire extinguisher	06
3.	Hazop and Hazon Study	06
4.	Analysis of cases of Industrial disaster	06
5.	Study on latest advances in PPE	06
6.	First Aid Training	15

SOFT SKILL LABORATORY-II

Name of the Course: Diploma in CHEMICAL ENGINEERING			
Course code:	CHP 401	Semester	3 rd
Total Period:	30	Examination	4 hrs
Lab. periods:	2 P/W	Term Work	25
Maximum marks:	25	End Semester Examination:	

Rationale :

After learning the basics of soft skill some more important soft skill techniques are included in this laboratory practice-II. The ability to develop and use soft skills can make the difference between the achiever and non - achiever. For years together the focus of management was on “Hard Skill”. The emphasis was centered on the technical skill necessary to effectively perform. These skills tended to be more job specific or more closely related to the actual task being performed. Today, employers want Managers with critical soft skills. These are skills key to effective performance across all job categories. These soft skills have come to play an even more crucial role in management positions in today’s environment.

Objective:

On completion of Practice of Soft skill-1 the student should be able to:

1. Understand meaning of soft skill and importance of it in their life.
2. Identify the strength, weakness, opportunity and treat to self.
3. Develop a positive attitude
4. Understand the core value of life and improve perception
5. Develop the art of listening and art of reading
6. Learn about time management

Topic wise distribution of periods

Sl. No.	Topics	Periods
1	Career Planning	02
2.	Art of speaking	06
3.	Art of writing	06
4.	E- communication	04
5.	Body language	04
6.	Team Building and Teamwork	04
7.	Etiquette and manner	04
	Total	30

COURSE CONTENT:

Classes should be divided into smaller groups of not more than twenty in each group

1.0 Career Planning

- 1.1 Benefits of Career Planning
- 1.2 Guideline for choosing a career
- 1.3 Tips for Successful career planning
- 1.4 Developing Career Goal

Assignment- Write about your career objective, prepare a plan for career development.

2.0 Art of Speaking

- 2.1 Special features of communication
- 2.2 Communication process, formal communication and informal communication

- 2.3 Tips for effective communication
- 2.4 Skill for powerful presentation
- 2.5 Art of public speaking

Assignment- Speak at least twice on two different topics.

3.0 Art of Writing

- 3.1 Importance of writing
- 3.2 Creative writing, writing tips

Assignment- Practice on creative writing

4.0 E- communication

- 4.1 Concept of E mail communication
- 4.2 Use of proper salutations
- 4.3 Tips for improvement in using email

Assignment- Practice on email writing.

5.0 Body language

- 5.1 Introduction to body language
- 5.2 Forms of body language, use of body language
- 5.3 Body language in building interpersonal relationship
- 5.4 Reason to study body language

Assignment- To be decided by teacher.

6.0 Body language

- 6.1 Introduction to body language
- 6.2 Forms of body language, use of body language
- 6.3 Body language in building interpersonal relationship
- 6.4 Reason to study body language

Assignment- To be decided by teacher.

7.0 Team Building and Team work

- 7.1 Aspects of team building
- 7.2 Skill needed for team work
- 7.3 A model of team building
- 7.4 Characteristic of effective team

Assignment- To be decided by teacher.

8.0 Etiquette and Manner

- 8.1 Meaning of etiquette and manner
- 8.2 Modern etiquette and, benefits of etiquette
- 8.3 Concept of mannerism
- 8.4 Proper manner in different occasion

Assignment- To be decided by teacher.

LEARNING RESOURCES:

Sl.No.	Author	Book	Publisher
1.	Dr K. Alex	Soft Skills- Second Edition	S. Chand Publication