 MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI TEACHING AND EXAMINATION SCHEME FOR POST S.S.C. DIPLOMA COURSES																
COURSE NAME : CHEMICAL ENGINEERING GROUP																
COURSE CODE : CH																
DURATION OF COURSE : 6 SEMESTERS										WITH EFFECT FROM 2009-10						
SEMESTER : THIRD										DURATION: 16 WEEKS						
PATTERN : FULL TIME										SCHEME : E						
SR. NO.	SUBJECT TITLE	Abbreviation	SUB CODE	TEACHING SCHEME			EXAMINATION SCHEME									
				TH	TU	PR	PAPER HRS	TH (01)		PR (04)		OR (08)		TW (09)		SW (16003)
								MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	
1	Applied Mathematics	AMS	12035	03	--	--	3	100	40	--	--	--	--	--	--	
2	Industrial Chemistry	ICE	12077	03	--	04	3	100	40	--	--	--	--	25@	10	
3	Stiochiometry	STI	12078	03	02	--	3	100	40	--	--	--	--	--	--	
4	Technology of Inorganic Chemicals	TIC	12079	03	--	04	3	100	40	50#	20	--	--	25@	10	
5	Mechanical Operations	MOP	12080	04	--	02	3	100	40	50#	20	--	--	25@	10	50
6	Development of Life Skills-II	DLS	12041	01	--	02	--	--	--	--	--	25#	10	25@	10	
7	Professional Practices-II	PPR	12081	--	--	04	--	--	--	--	--	--	--	50@	20	
TOTAL				17	02	16	--	500	--	100	--	25	--	150	--	50
<p>Student Contact Hours Per Week: 35 Hrs. THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH. Total Marks : 825 @ Internal Assessment, # External Assessment, No Theory Examination.</p> <p>Abbreviations: TH-Theory, TU- Tutorial, PR-Practical, OR-Oral, TW- Termwork, SW- Sessional Work.</p> <ul style="list-style-type: none"> ➤ Conduct two class tests each of 25 marks for each theory subject. Sum of the total test marks of all subjects is to be converted out of 50 marks as sessional work (SW). ➤ Progressive evaluation is to be done by subject teacher as per the prevailing curriculum implementation and assessment norms. ➤ Code number for TH, PR, OR and TW are to be given as suffix 1, 4, 8, 9 respectively to the subject code. 																

Course Name : Civil and Mechanical Engineering Group

Course Code : AE/CE/CS/CV/CR/PG/PT/ME/MH/MI/FE/CH/PS/PT

Semester : Third

Subject Title : Applied Mathematics

Subject Code : 12035

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	--	03	100	--	--	--	100

NOTE:

- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work. (SW)**

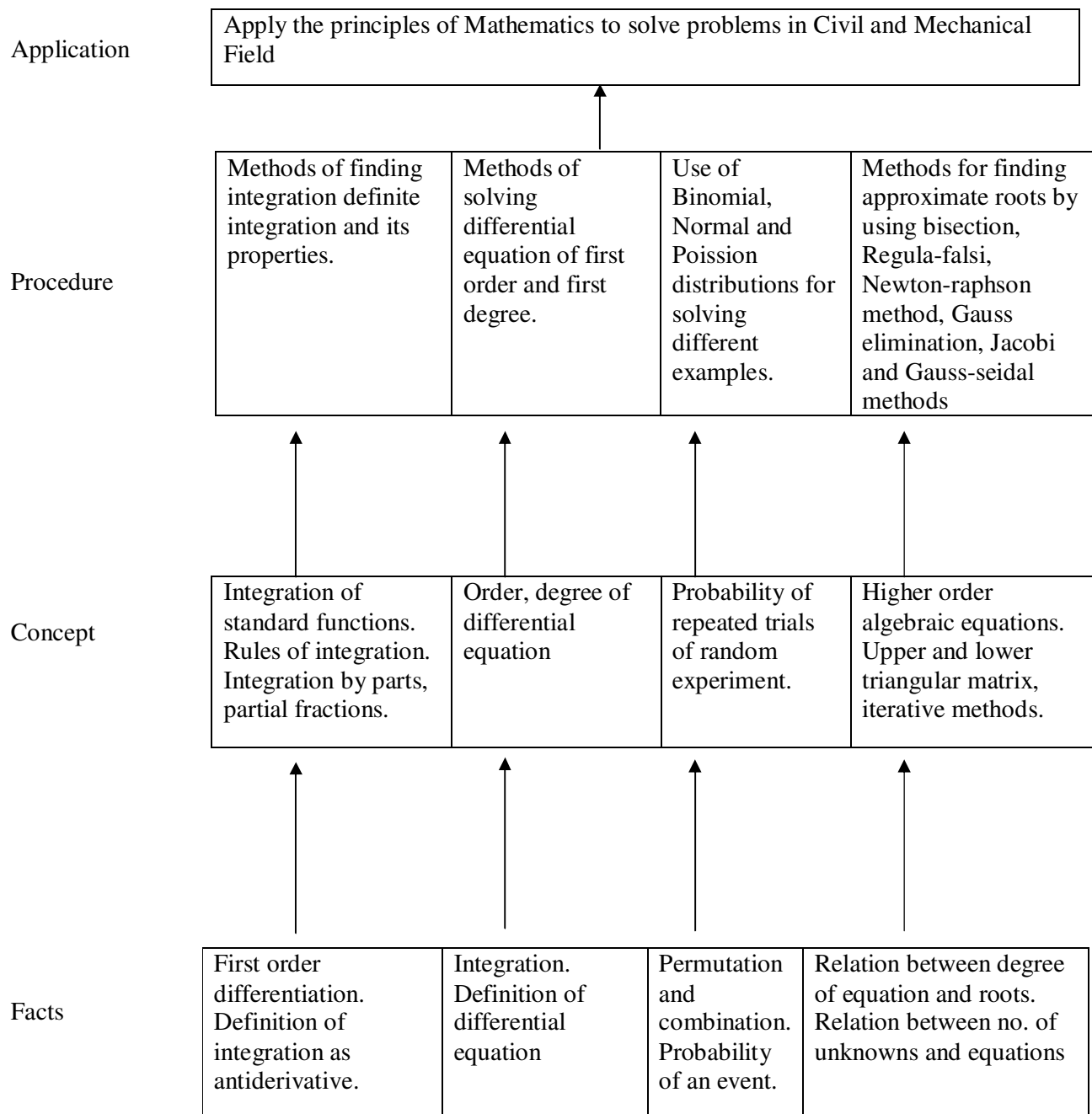
Rationale:

The study of mathematics is necessary to develop in the student the skills essential for studying new technological development. This subject introduces some applications of engineering, through which the student can understand the link of Mathematics with engineering principles.

Objective: The student will be able to:

1. Apply Mathematical term, concept, principles and different methods for studying engineering subjects
2. Apply Mathematical methods to solve technical problems,
3. Execute management plans with precision.
4. Use Mathematical techniques necessary for daily and practical problems.

Learning Structure:



CONTENTS: Theory

Chapter	Name of Topic	Hours	Marks
01	Integration: 1.1 Definition of integration as anti-derivative. Integration of standard function. 1.2 Rules of integration (Integrals of sum, difference, scalar multiplication). 1.3 Methods of Integration. 1.3.1 Integration by substitution 1.3.2 Integration of rational functions. 1.3.3 Integration by partial fractions. 1.3.4 Integration by trigonometric transformation. 1.3.5 Integration by parts.	10	18
	1.4 Definite Integration. 1.4.1 Definition of definite integral. 1.4.2 Properties of definite integral with simple problems.	04	08
	1.5 Applications of definite integrals. 1.5.1 Area under the curve. Area bounded by two curves, 1.5.2 Volume of revolution. 1.5.3 Centre of gravity of a rod, plane lamina.	06	10
02	Differential Equation 2.1 Definition of differential equation, order and degree of differential equation. Formation of differential equation for function containing single constant. 2.2 Solution of differential equations of first order and first degree such as variable separable type, reducible to Variable separable, Homogeneous, Non homogeneous, Exact, Linear and Bernoulli equations.	08	18
	2.3 Applications of Differential equations. 2.3.1 Rectilinear motion (motion under constant and variable acceleration) 2.3.2 Simple Harmonic Motion	04	10
03	3.1 Probability: 3.1.1 Definition of random experiment, sample space, event occurrence of event and types of events (impossible, mutually exclusive, exhaustive, equally likely) 3.1.2 Definition of probability, addition and multiplication theorems of probability.	04	08
	3.2 Probability Distribution 3.2.1 Binomial distribution. 3.2.2 Poisson's distribution. 3.2.3 Normal distribution 3.2.4 Simple examples corresponding to production process.	04	12

04	Numerical Methods 4.1 Solution of algebraic equations Bisection method, Regulafalsi method and Newton – Raphson method.	04	08
	4.2 Solution of simultaneous equations containing 2 and 3 unknowns Gauss elimination method. Iterative methods- Gauss Seidal and Jacobi's methods.	04	08
Total		48	100

Learning Resources:**Books:**

Sr. No.	Title	Authors	Publications
01	Mathematics for polytechnic	S. P. Deshpande	Pune Vidyarthi Griha Prakashan, Pune
02	Calculus: Single variable	Robert T. Smith	Tata McGraw Hill
03	Advanced Mathematics for Engineers and Scientist	Murray R Spiegel	Schaum outline series McGraw Hill
04	Higher Engineering Mathematics	B. S. Grewal	Khanna Publication, New Dehli
06	Introductory Methods of Numerical analysis	S. S. Sastry	Prentice Hall Of India New Dehli
07	Numerical methods for Engg. 4 th ed.	Chapra	Tata McGraw Hill
08	Numerical methods for scientific & engineering computations	M. K. Jain & others	Wiley Eastern Publication.

Course Name : Diploma in Chemical Engineering

Course Code : CH

Semester : Third

Subject Title : Industrial Chemistry

Subject Code : 12077

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	04	03	100	--	--	25@	125

NOTE:

- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Curriculum for first test and second test shall be approximately 40% and 60% respectively.**
- **Question paper for test: Q1: 4 bits of 3 marks each, option 3/4
Q2: 3 bits of 3 marks each, option 2/3
Q3: 3bits of 4 marks or 2 bits of 8 marks each, option 2/3 or 1/2**
- **Total of test marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**

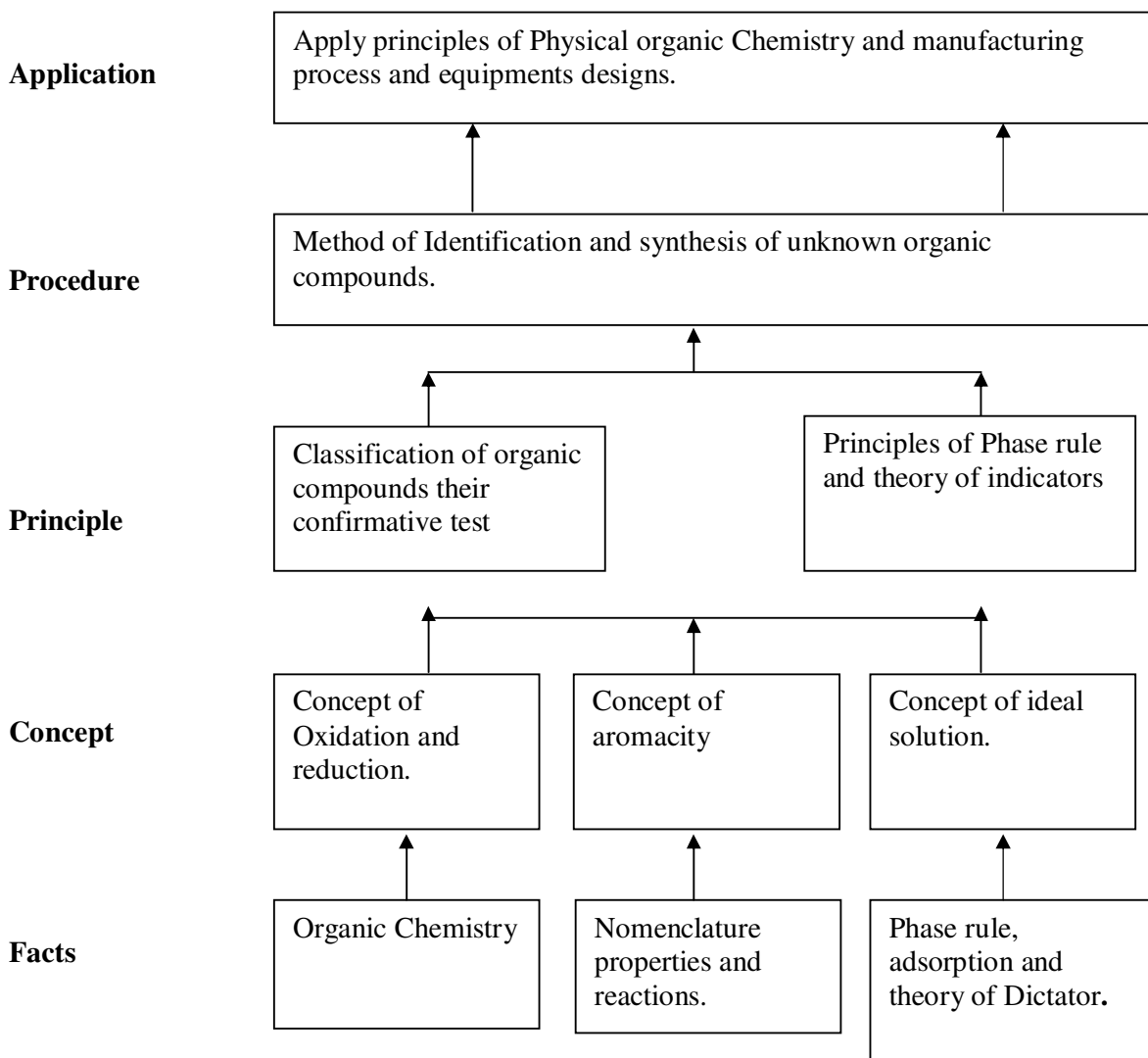
Rationale:

To develop the basic knowledge of organic compounds, their preparation, properties and uses. Physical chemistry develops the understanding of physical principals of chemical systems. It lays foundation for the understanding other chemical engineering subjects.

Objective:

After studying the subject the student will be able to.

- 1) Write the reactions for given organic compounds.
- 2) Describe reaction for alkanes, alkenes.
- 3) Identify the properties of various organic compounds.
- 4) Compare principles of Langmuir and Freudlich isotherm.
- 5) Describe the mechanism of degree of freedom.

Learning Structure:-

Note: The concerned staff member should prepare set of transparencies or P, P.T.

Contents: Theory

Chapter	Name of the Topic	Hours	Marks
1	1. Nomenclatures of organic compounds, Functional groups. 10	05	14
	2. Classification of organic compounds, Aliphatic compounds, closed chain compounds, Unsaturated compounds 04		
2	2.1 12 1. Alkanes, Alkenes, Alkynes, cycloalkanes 2. Halogenations, saturated halogenations, reaction of alkanes, oxidation, Nitration, pyrolysis, isomerisation, dehydrogenation, structures and reactivity of alkanes.	14	22
	2.2..... 10 1. Bayer's strain theory, modification of Bayer's theory. 2. Alkenes, preparation, properties and reaction, Action of ozone, Hydrolysis, halogenations, action of halogen acids, sulphuric acids, polymerization, uses of alkenes.		
3	3.1 Aromatic compounds, alkyl halides, alcohol and phenol 02	14	22
	3.2 Concept of aromaticity, structure of benzene, properties of benzene, reaction of benzene halogenations, hydrogenation, pyrolysis 04		
	3.3 Classification of alkyl halides, isomerism in alkyl halides, properties of alkyl halides, substitution reaction, elimination reaction, alcohols. 08		
	3.4 Classification of alcohols, preparation, properties and reaction, phenols preparation, properties and reaction. 08		
4	Phase rule Phase rule, phase, component, degree of freedom, one component system, two component system.	05	14
5	Adsorption Definition, nature of adsorption, types of adsorption, Langmuir adsorption isotherm, Freundlich adsorption isotherm, Application.	05	16
6	Solution and Indicators Ideal solution, non Ideal solution, Azeotropic Mixture, and Theory of indicators.	05	12
TOTAL		48	100

PRACTICAL:

Skills to be developed:

Intellectual Skills:

1. Analysis of a given solution
2. To interpret the confirmative test

- Motor Skills:**
1. Observe chemical reactions
 2. Observe readings like boiling point and melting point.
 3. Handle the apparatus carefully.

List of Practical:

To identify various organic compounds listed below by spotting.

1. Benzoic acid
2. Acetic acid
3. Aniline
4. Benzaldehyde
5. Chloroform
6. Naphthylene
7. Chlorobenzene
8. Alpha or Beta naphthelene
9. Urea
10. Thiourea
11. Nitrobenzene
12. To plot graph of adsorption of oxalic acid from solution on activated charcoal and examine the validity of Freundlich isotherm.
13. To plot a graph of adsorption of acetic acid on activated charcoal and verify Freundlich and Langmuir isotherm.
14. To construct a phase diagram for binary system, naphthelene and benzoic acid and find the melting and eutectic temperature.

LEARNING RESOURCES:

Sr. No.	Author	Title	Publisher
01	Morrison and Boyd	Organic Chemistry	Allyn and Bacon, Universal bookstall, Boston
02	Bahl and Bahl	Organic Chemistry	S Chand and company
03	P.L. Soni	Organic Chemistry	S Chand and company
04	Puri Sharma and Pathania	Physical Chemistry	S Nagin and company

Reference: en.wikipedia.org/wiki/organic-compound-03k
en.wikipedia.org/wiki/organic-chemistry-72-k
[http://en. Wikipedia.org/wiki/physical-chemistry-28k](http://en.wikipedia.org/wiki/physical-chemistry-28k)

Course Name : Diploma in Chemical Engineering

Course Code : CH

Semester : Third

Subject Name: Stiochiometry

Subject Code : 12078

Teaching and Examination Scheme

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPERS HRS	TH	PR	OR	TW	TOTAL
03	02	--	03	100	--	--	--	100

NOTE:

- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Curriculum for first test and second test shall be approximately 40% and 60% respectively.**
- **Question paper for test: Q1: 4 bits of 3 marks each, option 3/4
Q2: 3 bits of 3 marks each, option 2/3
Q3: 3bits of 4 marks or 2 bits of 8 marks each, option 2/3 or 1/2**
- **Total of test marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**

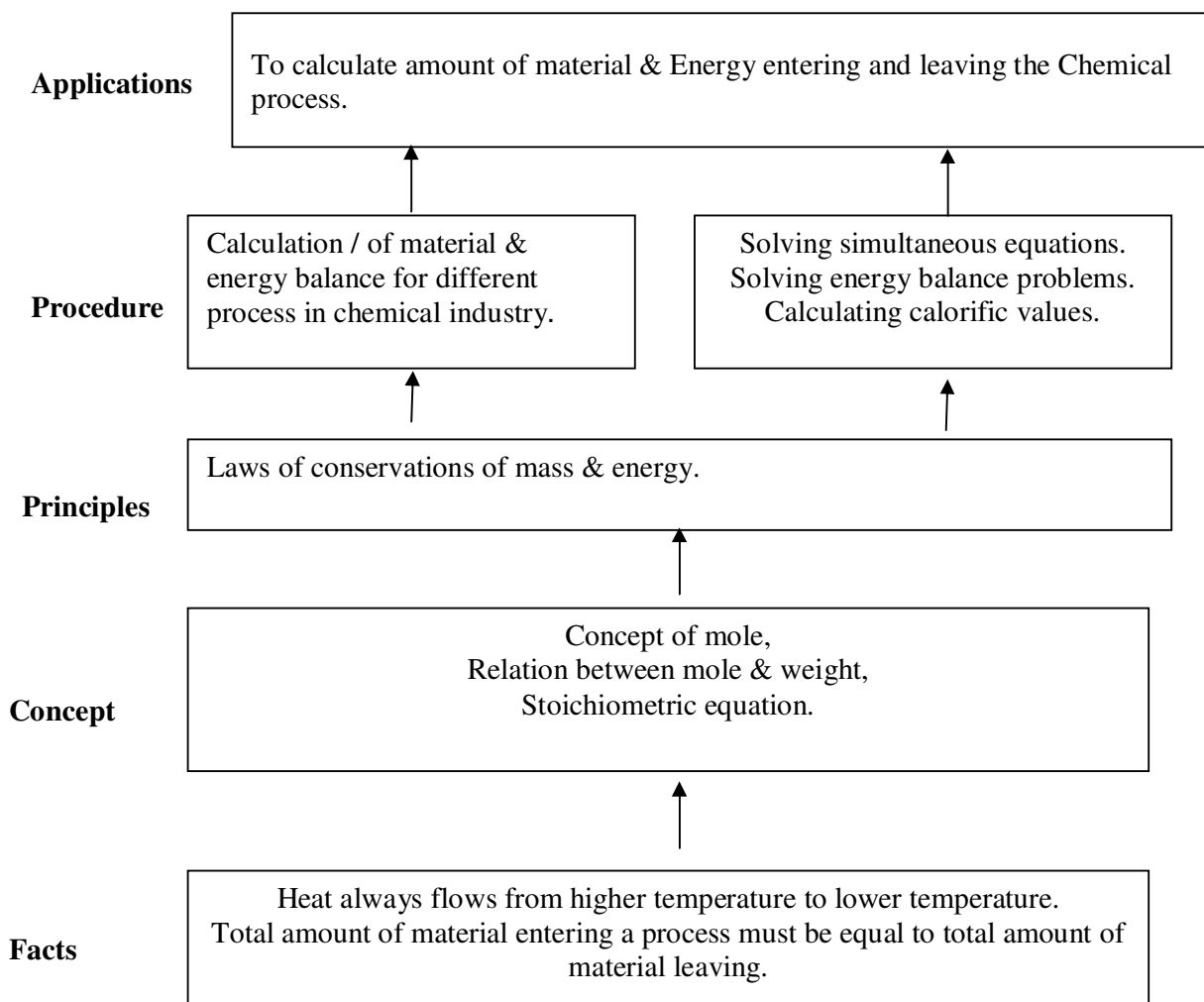
Rationale:

This subject equips the students with basic chemical engineering calculations. It is one of the core subjects. In this subject students learn the fundamental concepts on which chemical engineering design is based. This subject helps the student to prepare the material and enthalpy balance of a process. It also helps them to calculate the quantity of material input and output of a process plant.

Objectives:

The student will be able to:

1. Find the contents and properties of given analyzed gas
2. Find out quantity of material input and outputs of various unit operation equipments.
3. Calculate material input and outputs of chemical reactions, to identify excess and limiting components.
4. Calculate the enthalpy associated with a reaction, also to calculate the quantities of utility required.

Learning Structure:

Contents: Theory

Chapter	Name of the Topic	Hours	Marks
1	Gases, Gas mixtures and Gas-Liquid Mixtures. <ul style="list-style-type: none"> Definition of terms :-Ideal gas law, Boyle's law, Charle's law, Universal gas constant, Vander Waal's equation, average molecular weight of gas mixture, density of gas mixture and composition (by weight and by mole) of gas mixture, Raoult's law, Henry's Law. Solving problems using Ideal gas law, Vander Waal's equation, Raoult's law & Henry's Law. Solving problems based on average molecular weight of gas mixture, density of gas mixture and composition (by weight and by mole) of gas mixture. 	10	18
2	Material Balance without Chemical Reaction. <ul style="list-style-type: none"> Definition of terms :- material balance, drying, evaporation, crystallization, distillation, mixing/ blending, absorption, extraction, filtration. Solving material balance problems without chemical reactions, recycling & bypassing operation on above unit operations. 	14	32
3	Material Balance with Chemical reaction. <ul style="list-style-type: none"> Definition of terms:-stoichiometric equation, stoichiometric ratio, limiting component, excess component, percent excess, conversion, percent conversion, yield, selectivity, percent yield, calorific values of fuels. Solving Material balance problem with chemical reaction for calculating composition, conversion, percent conversion, yield, percent yield, percent excess. Solving Material balance problem with fuels & combustion reactions for calculating percent excess air. 	14	32
4	Energy Balance. <ul style="list-style-type: none"> Definition of terms :- Energy balance, Units of heat, heat capacity, specific heat, sensible heat, latent heat, heat of reaction, heat of combustion, heat of formation, Hess's law, Adiabatic reaction and adiabatic reaction temperature. Solving energy balance problems using heat capacity data, specific heat data, sensible heat, latent heat, heat of reaction, heat of combustion, heat of formation, Hess's law. 	10	18
TOTAL		48	100

Tutorial Assignments:

Assignment	Hours
1. Problems on Ideal Gas Law, Vander waals's equation.	03
2. Problems on average molecular weight, density and composition of gas mixture.	03
3. Material balance problems on drying, extraction.	02
4. Material balance problems on distillation, absorption.	02
5. Material balance problem on mixing, evaporation.	02
6. Material balance problems on filtration, crystallization.	02
7. Material balance problem with Chemical Reaction for calculating % excess, % conversion, % yield.	04
8. Material balance problems with Chemical Reaction for calculating % composition of feed/ product stream on mole basis and weight basis.	04
9. Material balance problems on fuel & combustion reaction for calculating % excess of air,	02
10. Energy balance problems using heat capacity data.	02
11. Energy balance problems using Hess law.	02
12. Calculate the Heat of the Reaction using Heat of Formation, Heat of Combustion data.	02
13. Calculate the Heat transferred using latent heat data, specific heat data.	04
Total	32

Learning Resources:**Books:**

Sr. No.	Name of Book	Name of Author	Name of Publisher
1.	Stoichiometry	Bhatt. B. I & Vora. S. M	Mc Graw Hill Publication.
2.	Basic principles & Calculations in Chemical Engineering	Himmelblau & David M	Prentice Hall of India.

Course Name : Diploma in Chemical Engineering

Course Code : CH

Semester : Third

Subject Title : Technology of Inorganic Chemicals

Subject Code : 12079

Teaching & Examination scheme

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	04	03	100	50#	--	25@	175

NOTE:

- Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.
- Curriculum for first test and second test shall be approximately 40% and 60% respectively.
- Question paper for test:

Q1: 3 bits of 3 marks each, option 3/4

Q2: 3 bits of 3 marks each, option 2/3

Q3: 3 bits of 4 marks or 2 bits of 8 marks each, option 2/3 or 1/2

Total of test marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).

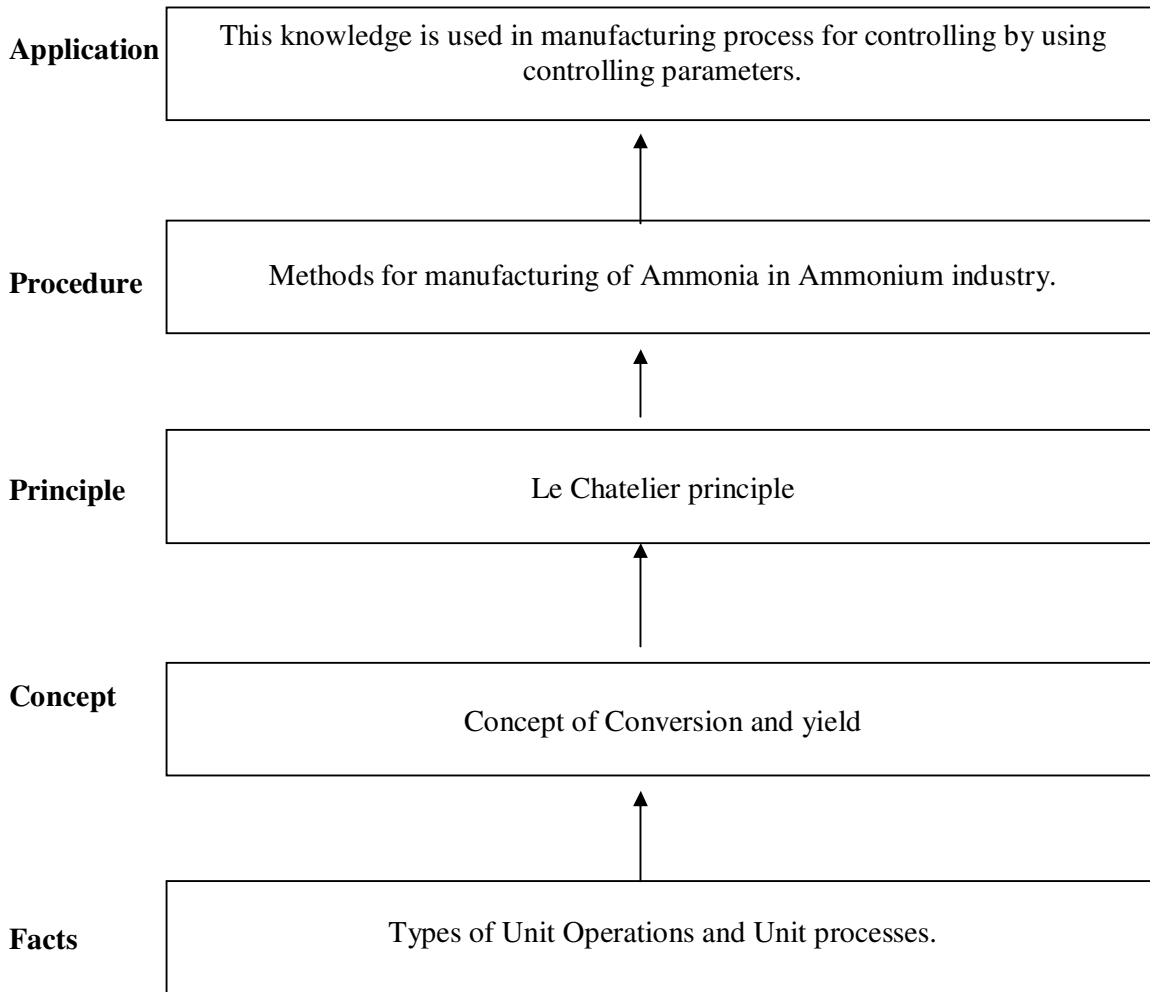
Rationale:

This subject will cover essential features of Chemical process industries regarding manufacture of various types of chemicals. The subject give the ideas about the parameters like temperature, pressure, concentration and catalyst which affect the yield of the product.

Objective: The students will be able to

1. Understand chemical reaction and chemical equilibrium.
2. Draw different types of flow sheet used in process industry.
3. State basic principles of chemical industry.
4. Describe manufacturing process and engineering consideration of chemical processes.

Learning Structure:



Content Theory:

Chapter	Name of the Topic	Hours	Marks
1	Manufacturing process of Sulphuric Acid 1.1 Contact Process	02	08
2	Technology and processes involved in the commercial manufacturing of the following chemicals 2.1 Ammonia 2.2 Nitric acid 2.3 Urea 2.4 Ammonium Nitrate 2.5 Ammonium Sulphate 2.6 Ammonium phosphate 2.7 Mixed fertilizer	14	22
3	Manufacturing process of Phosphorus 3.1 Phosphorous 3.2 Phosphoric acid(Sulphuric and Hydrochloric acid leaching) 3.3 Single Super Phosphate 3.4 Triple Super Phosphate 3.5 Phosphorous Tri Chloride 3.6 Phosphorous Penta Chloride	12	20
4	Chloroalkali industry 4.1 Manufacturing of Chlorine 4.2 Manufacturing process of Caustic Soda 4.3 Manufacturing process of Hydrochloric acid 4.4 Manufacturing process of Soda ash	08	20
5	Fuel and industrial Gases 5.1 Manufacturing process of Oxygen 5.2 Manufacturing process of Nitrogen 5.3 Manufacturing process of Hydrogen 5.4 Manufacturing process of water gas 5.5 Manufacturing process of Producer gas 5.6 Manufacturing process of Carbon di oxide 5.7 Manufacturing process of Acetelyne	08	20
6	Manufacturing process of cement 6.1 Gypsum 6.2 Plaster of Paris 6.3 Cement	04	10
TOTAL		48	100

Practical:

Intellectual Skills : 1. Analyze given solutions
2. Interpret the Purity of solutions.

Motor Skills : 1. Observe Chemical reactions
2. Measure the purity of solutions
3. Handle the apparatus carefully.

List of Experiments:

- 1 .To find percentage purity of commercial Nitric Acid.
2. To find Nitrogen content in Fertilizer (Ammonium Fertilizer)
3. Analysis and testing of Sulphuric Acid.
4. To find Potassium Content in Ammonium Sulphate/ Ammonium Phosphate.
5. To find percentage purity of commercial Hydrochloric acid
6. To find percentage purity of Caustic Soda.
7. Analysis of cement
8. Analysis of soda ash (Percentage Purity)
9. Analysis of Potassium Permanganate
10. Analysis of Hydrogen peroxide.

Learning Resources:**Books:**

Sr. No.	Author	Name of the Book	Publisher
1	M. Gopalrao and Marshal Sittig	Dryden's outlines of Chemical Technology	East West
2	Jorge Austin	Shreve's Chemical Process Industries	Mc Graw Hill
3	P. H. Groggins	Chemical process of Organic Synthesis	Mc Graw Hill

Course Name : Diploma in Chemical Engineering

Course Code : CH

Semester : Third

Subject Title : Mechanical Operation

Subject Code : 12080

Teaching & Examination Scheme

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS.	TH	PR	OR	TW	TOTAL
04	--	02	03	100	50#	--	25@	175

NOTE:

- Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.
- Curriculum for first test and second test shall be approximately 40% and 60% respectively.
- Question paper for test:

Q1: 3 bits of 3 marks each, option 3/4

Q2: 3 bits of 3 marks each, option 2/3

Q3: 3 bits of 4 marks or 2 bits of 8 marks each, option 2/3 or 1/2

Total of test marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).

Rationale:

This subject intends to equip the students with concepts & principles as well as construction of equipments used for handling Mechanical Operation in a Chemical plant. This subject gives ideas about principles of handling mixtures of solids & liquid & gases. This subject will help students for understanding principles for separation & purification techniques of solid, liquids & gases mixtures.

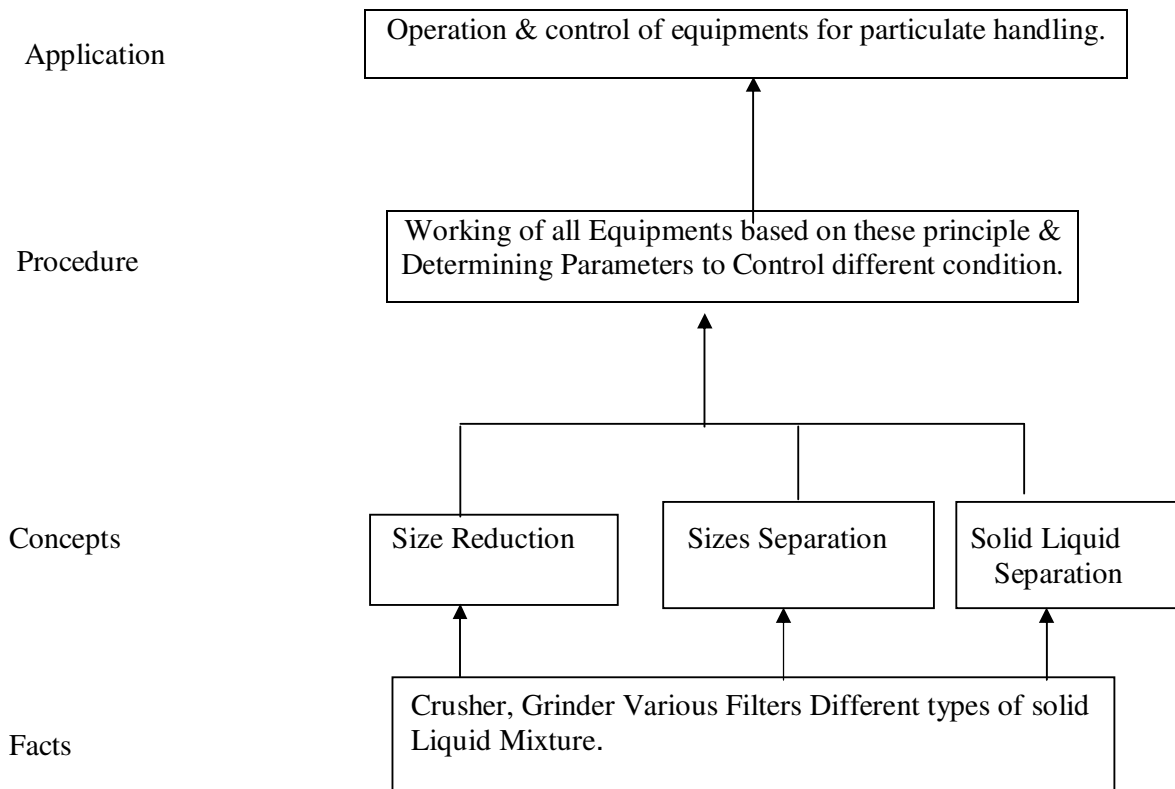
Objective:

After studying this subject's student will be able to.

1. Explain methods of size reduction and equipments working on those principles.
2. Describe various equipments used for size separation.

3. Identify various other physical properties used for purification solid-solid mixtures and equipments working on this principle.
4. Describe various method of purification of heterogeneous mixture of solid liquid, & equipments like filters, settlers, used for separation of solid liquid mixtures.
5. Identify various types of agitators used for mixing solids-liquids mixtures, power calculation of a mixer.

Learning Structure:



Contents: Theory

Chapter	Name of the Topic	Hours	Marks
1	Introduction to Mechanical Operations 1.1 04 * Introduction to unit operations & their classifications * Specifics principle involved in mechanical operation as Decantation, filtration, Settling & Sedimentation, screening, flotation, mixing and Size reduction.	04	10
	1.2 Electro Mechanical Operation 06 i) Magnetic separation ii) Electrostatics separation iii) Electro-dialysis iv) Electro-osmosis v) Electrophoresis		
2	Size reduction of solids 2.1 04 * Introduction to Size reduction operations such as Crushing, Grinding, Ultra fine grinding and Cutting. * Theory, Principle & Laws involved. * Classification & Types of crushing & grinding Equipments & principle of their working.	10	16
	2.2 12 * Principle, Construction, Working and Applications of: - a) Jaw Crusher (Blake and Dodge type) b) Smooth Roll crusher c) Hammer Mill d) Ball Mill * Selection of crushing rolls, Derivation of Angle of nip and problems * Derivation of critical speed of a Ball Mill and problems * Open circuit and closed circuit grinding.		
3	Size Separation of solid • 3.1 Introduction to Screening. 12 Classification of screens on the basis of • Performance (Ideal and Actual screens) Motion of screen surface (such as stationary, vibrating and Rotary) • Methods of screen Analysis • Derivation for finding Effectiveness of screen and problems	06	16
	• Factors affecting performance of screen 3.2 Screening Equipments 04 a) Grizzlies b) Trommel & Trommel Arrangements c) Gyrotory Screens d) Shaking and Vibrating Screen		
4	Methods of Separation of solids based on Specifics Properties 4.1 Size Separation based on particle size and density 08 a) Gravity settling tank	12	16

	b) Cone Classifier c) Cyclone Separator d) Mechanical Classifier (such as Rake classifier and Drag classifier) e) Hydraulic Classifier (such as Jig) 4.2 Separation based on behavior in magnetic and electric field and surface properties 08 a) Magnetic Separator such as Rotary drum and Ball Norton type b) Electrostatic separator such as Plate and Pipe type c) Froth Flotation		
5	Filtration 5.1 Introduction and classification of filtration operation on the basis of mode of operation, driving force and constant rate and constant rate filtration. Principle of filtration and factors which affect rate of filtration 02 5.2 Filtration Equipments 14 a) Sand Filter (Rapid sand and Pressure Sand filter) b) Plate & Frame Filter (Washing & non-washing) c) Vacuum filter (Nutsche type and Rotary vacuum filter) d) Centrifuge * Derivation of rate equation for batch filtration & various Parameter involved in the rate equation.	16	16
6	Sedimentation 6.1 Definition of sedimentation, difference between sedimentation, filtration, settling, clarification, classification and centrifugation Centrifugation 04 6.2 a) Principle involved in sedimentation 08 laboratory Settling test & its use in design of thickeners and problems based on it. b) Industrial methods of sedimentation Thickness.	08	12
7	Mixing 7.1 a) Definition, Mixing equipments, different types & applications. 04 b) Types of impellers c) Flow patterns in an agitated vessel 7.2 Study of mixer used for mixing of liquids, solids, viscous mass and combinations of above such as a) Sigma Mixer 04 b) Ribbon Blender c) Pug Mill d) Muller mixer 7.3 a) Concept of Mixing Index b) Study of power consumption of mixer 06 (Power no correlations from laminar and turbulent flow and problems.)	08	14
Total		64	100

PRACTICALS: -**Intellectual Skills:** 1) Interpretation of data.

2) Calculating efficiency.

Motor Skills: 1) Handling size reducing equipments.

2) Accuracy in measurements.

3) Handling of pressure pump and vacuum pump.

LIST OF PRACTICALS: -

- 1) To do screen analysis of product obtained from a Jaw Crusher
- 2) To find out the Screen analysis of product obtained from Pulveriser.
- 3) To Determine Variation of size reduction in ball Mill by changing the residence time, size of grinding medium and material of grinding medium .
- 4) To find Effectiveness of a screen.
- 5) To find out efficiency of froth flotation cell.
- 6) To Study & draw the of rate of filtration curve for plate and frame filter.
- 7) To Study & draw rate of filtration curve using vacuum filter.
- 8) To carry out batch sedimentation test using different concentration of calcium carbonate slurry of different concentration for calcium carbonate slurry.

Learning Resources:-**Books:**

Sr. No.	Title	Authors	Publications
1	Introduction to Chemical Engineering	Walter L. Badger Julius T. Banchero	McGraw-Hill International 1984
2	Unit Operation of Chemical Engineering	McCabe, W.L.Smith, Harriott	McGraw Hill Inc 1993
3	Introduction to Chemical Engineering	S.K. Ghosal, S.K. Sanyal and S. Dutta	Tata McGraw Hill Publication, 1993
4	Chemical Engineering	J.M. Coulson, J. F. Richardson , J.R. Backhurst and J.H. Harker (Vol.2)	Pergamon Press, 1993

Reference:- www.ssnce.ac.in/chemical/mo.htu.www.aps.an.govwww.msubbu.com/sp/mo/

Course Name : Diploma in Chemical Engineering

Course Code : AE/CE/CS/CV/CR/PG/PT/ME/MH/MI/FE/CH/PS/PT/TC/DC

Semester : Third

Subject Title : Development of Life Skills-II

Subject Code : 12041

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
01	--	02	--	--	--	25#	25@	50

Rationale:

In today's competitive world, the nature of organizations is changing at very rapid speed. In this situation the responsibility of diploma holder is not unique. He will be a part of a team in the organization. As such the individual skills are not sufficient to work at his best.

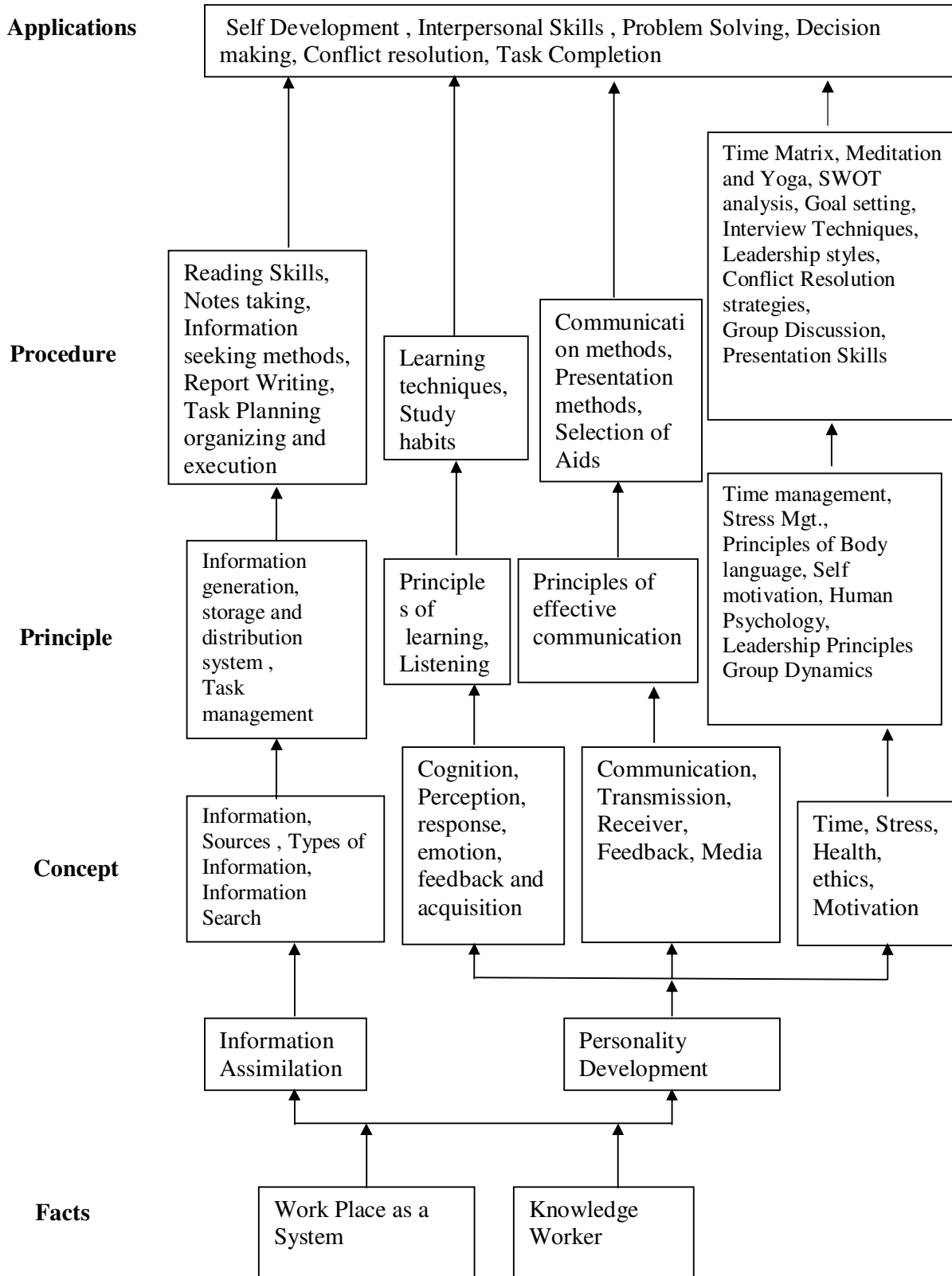
This subject will develop the student as an effective member of the team. It will develop the abilities and skills to perform at highest degree of quality as an individual as well as a member of core group or team. Such skills will enhance his capabilities in the field of searching, assimilating information, managing the given task, handling people effectively, solving challenging problems.

THE SUBJECT IS CLASSIFIED UNDER HUMAN SCIENCE.

Objectives: The students will be able to:

1. Developing working in teams
2. Apply problem solving skills for a given situation
3. Use effective presentation techniques
4. Apply techniques of effective time management
5. Apply task management techniques for given projects
6. Enhance leadership traits
7. Resolve conflict by appropriate method
8. Survive self in today's competitive world
9. Face interview without fear
10. Follow moral and ethics
11. Convince people to avoid frustration

LEARNING STRUCTURE:



CONTENTS: Theory

Chapter	Name of the Topic	HOURS
1	SOCIAL SKILLS Society, Social Structure, Develop Sympathy And Empathy.	01
2	Swot Analysis – Concept, How to make use of SWOT.	01
3	Inter personal Relation Sources of conflict, Resolution of conflict , Ways to enhance interpersonal relations.	02
4	Problem Solving I)STEPS IN PROBLEM SOLVING, 1)Identify and clarify the problem, 2)Information gathering related to problem, 3)Evaluate the evidence, 4)Consider alternative solutions and their implications, 5)Choose and implement the best alternative, 6)Review II)Problem solving technique. (any one technique may be considered) 1) Trial and error, 2) Brain storming, 3) Lateral thinking	02
5	Presentation Skills Body language -- Dress like the audience Posture, Gestures, Eye contact and facial expression. STAGE FRIGHT, Voice and language – Volume, Pitch, Inflection, Speed, Pause Pronunciation, Articulation, Language, Practice of speech. Use of aids –OHP,LCD projector, white board	03
6	Group discussion and Interview technique – Introduction to group discussion, Ways to carry out group discussion, Parameters— Contact, body language, analytical and logical thinking, decision making INTERVIEW TECHNIQUE Necessity, Tips for handling common questions.	03
7	Working in Teams Understand and work within the dynamics of a groups. Tips to work effectively in teams, Establish good rapport, interest with others and work effectively with them to meet common objectives, Tips to provide and accept feedback in a constructive and considerate way , Leadership in teams, Handling frustrations in group.	02

8	Task Management Introduction, Task identification, Task planning ,organizing and execution, Closing the task	02
TOTAL		16

CONTENTS: PRACTICAL:-**List of Assignment:** (Any Eight Assignment)

- 1) SWOT analysis:- Analyse yourself with respect to your strength and weaknesses, opportunities and threats. Following points will be useful for doing SWOT.
 - a) Your past experiences,
 - b) Achievements,
 - c) Failures,
 - d) Feedback from others etc.
- 2) Undergo a test on reading skill/memory skill administered by your teacher.
- 3) Solve the puzzles.
- 4) Form a group of 5-10 students and do a work for social cause e.g. tree plantation, blood donation, environment protection, camps on awareness like importance of cleanliness in slum area, social activities like giving cloths to poor etc. (One activity per group)
- 5) Deliver a seminar for 10-12 minutes using presentation aids on the topic given by your teacher.
- 6) Watch/listen an informative session on social activities. Make a report on topic of your interest using audio/visual aids. Make a report on the programme.
- 7) Conduct an interview of a personality and write a report on it.
- 8) Discuss a topic in a group and prepare minutes of discussion. Write thorough description of the topic discussed
- 9) Arrange an exhibition, displaying flow-charts, posters, paper cutting, photographs etc on the topic given by your teacher.

Note: - Please note that these are the suggested assignments on given contents/topic. These assignments are the guide lines to the subject teachers. However the subject teachers are free to design any assignment relevant to the topic. The **term work** will consist of any eight assignments.

Mini Project on Task Management: Decide any task to be completed in a stipulated time with the help of teacher. Write a report considering various steps in task management.

Learning Resources:**Books:**

Sr. No	Title of the book	Author	Publisher
1	Adams Time Management	Marshall Cooks	Viva Books
2	Basic Managerial Skills for All	E.H. Mc Grath , S.J.	Pretice Hall of India
3	Body Language	Allen Pease	Sudha Publications Pvt. Ltd.
4	Creativity and problem solving	Lowe and Phil	Kogan Page (I) P Ltd
5	Decision making & Problem Solving	by Adair, J	Orient Longman
6	Develop Your Assertiveness	Bishop , Sue	Kogan Page India
7	Make Every Minute Count	Marion E Haynes	Kogan page India
8	Organizational Behavior	Steven L McShane and Mary Ann Glinow	Tata McGraw Hill
9	Organizational Behavior	Stephen P. Robbins	Pretice Hall of India, Pvt Ltd
10	Presentation Skills	Michael Hatton (Canada – India Project)	ISTE New Delhi
11	Stress Management Through Yoga and Meditation	--	Sterling Publisher Pvt Ltd
12	Target setting and Goal Achievement	Richard Hale ,Peter Whilom	Kogan page India
13	Time Management	Chakravarty, Ajanta	Rupa and Company
14	Working in Teams	Harding ham .A	Orient Longman

INTERNET ASSISTANCE

1. <http://www.mindtools.com>
2. <http://www.stress.org>
3. <http://www.ethics.com>
4. <http://www.coopcomm.org/workbook.htm>
5. <http://www.mapfornonprofits.org/>
6. <http://www.learningmeditation.com> <http://bbc.co.uk/learning/courses/>
7. <http://eqi.org/>
8. <http://www.abacon.com/commstudies/interpersonal/indisclosure.html>
9. <http://www.mapnp.org/library/ethics/ethxgde.htm>
10. http://www.mapnp.org/library/grp_cnfl/grp_cnfl.htm
11. <http://members.aol.com/nonverbal2/diction1.htm>
12. http://www.thomasarmstron.com/multiple_intelligences.htm
13. <http://snow.utoronto.ca/Learn2/modules.html>
14. <http://www.quickmba.com/strategy/swot/>

Course Name : Diploma in Chemical Engineering

Course Code : CH

Semester : Third

Subject Title : Professional Practices III

Subject Code : 12081

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
--	--	04	--	--	--	--	50@	50

Rationale:

Most of the diploma holders in industries. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests.

While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.

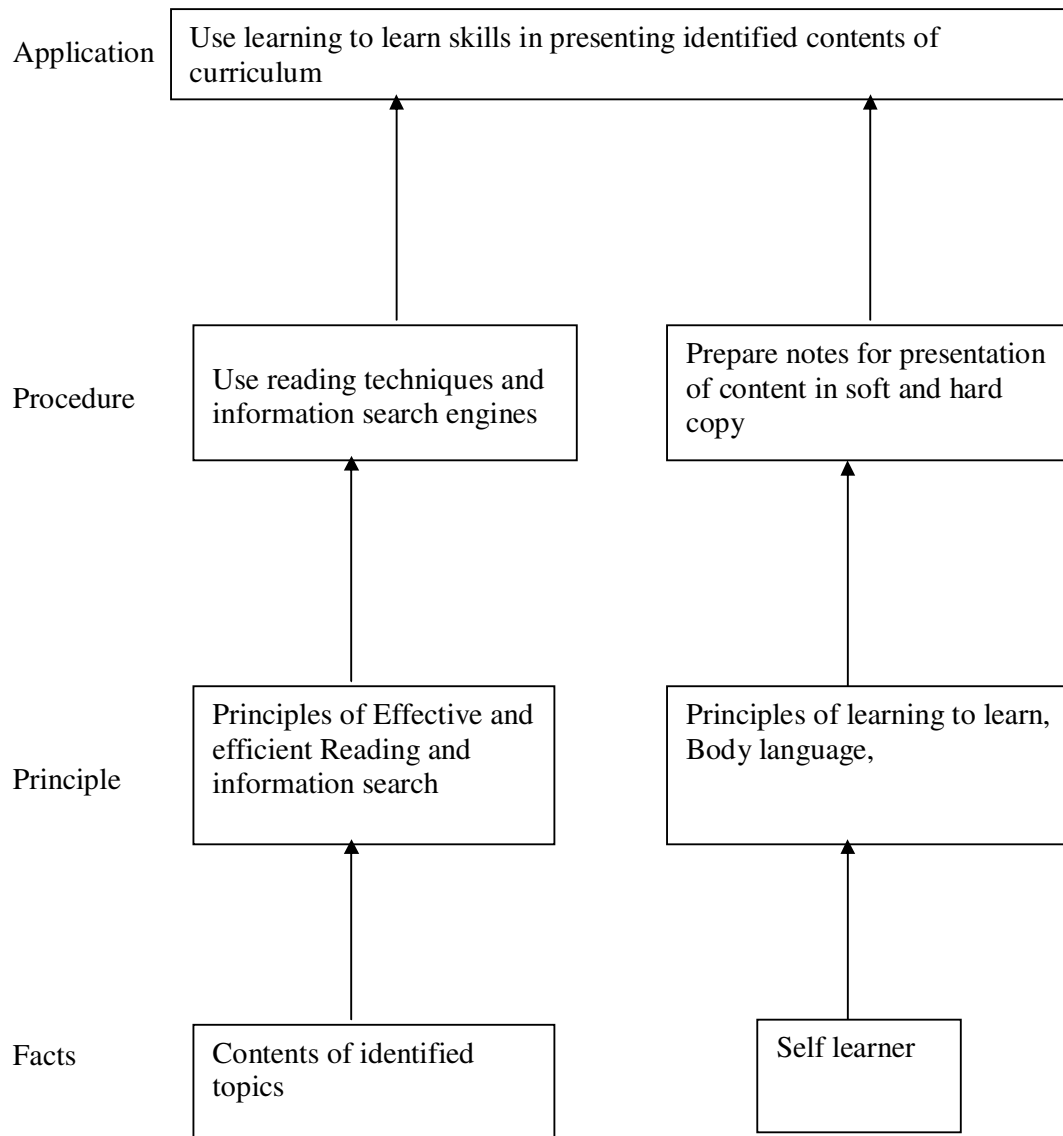
The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation of students in learning process.

Objectives:

Student will be able to:

1. Acquire information from different sources.
2. Prepare notes for given topic.
3. Present given topic in a seminar.
4. Interact with peers to share thoughts.
5. Prepare a report on industrial visit, expert lecture.

Learning Structure:



Contents:

Sr. No.	Activities
01	<p>Industrial Visit: Industrial visit be arranged and report of the same should be submitted by individual student to form part of work. Visit to any two of the Following :</p> <ol style="list-style-type: none"> i. Any dyestuff industry to know the working of various mixers size reducing equipments and size separating equipment. ii. Visit to a fertilizer industry. iii. Visit to a paper industry. iv. To visit an industry having various analytical equipments.
02	<p>Lectures by professional/ Industrial expert /student Seminar based or information search to be organized from any THREE of the following areas:</p> <ol style="list-style-type: none"> i. Recent trends of manufacturer of fertilizers in a Fertilizer industry. ii. Pollution control iii. Working of an industrial thickeners. iv. Types of impellers and their specific application in a chemical industry. v. Use of computers in mathematics. vi. Corrosion and methods to avoid the same.
03	<p>Group Discussion: Student should discuss in a group of six to eight & write brief report on the same as a part of group discussion may monitored by faculty members. Some of the suggested topics are-</p> <ol style="list-style-type: none"> i. Current topics related to chemical industry. ii. Application of computers in chemical engineering field. iii. Discipline for a chemical engineer. iv. Safety measures provided on the campus.
04	<p>Student Activity: The student group of 3 to 4 will perform any one of the following activity:</p> <ol style="list-style-type: none"> i. Get samples of five chemical mentioned in your curriculum. You should know price, commercial purity types of packing available and names of companies producing the commodities. ii. Get sample of five fertilizers. iii. Collect three samples of mixed fertilizers and find their N-P-K values. iv. Collect three samples of edible and non-edible oils.