MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI

TEACHING AND EXAMINATION SCHEME

COURSE NAME : DIPLOMA IN SURFACE COATING TECHNOLOGY.

COURSE CODE : SC

DURATION OF COURSE : SIX SEMESTERS/THREE YEARS **WITH EFFECT FROM 2008-09**

SEMESTER : FOURTH **DURATION: 16 WEEKS**

FULL TIME/ PART TIME: FULL TIME **SCHEME - C**

Sr. No.	SUBJECT TITLE	SUBJECT CODE	TEACHING SCHEME			EXAMINATION SCHEME											
			TH	TU	PR	PAPER HRS.	TH		TEST	TOTAL		PR		OR		TW	
							Max	Min		Max	Min	Max	Min	Max	Min	Max	Min
01	Principles of Management	9624	03	--	--	03	80	28	20	100	40	--	--	--	--	--	--
02	Technology of Paints- I	9625	03	--	03	03	80	28	20	100	40	50#	20	--	--	25@	10
03	Application & Evaluation of Paints-I	9626	03	--	03	03	80	28	20	100	40	50#	20	--	--	25@	10
04	Allied Surface Coatings	9627	03	--	03	03	80	28	20	100	40	--	--	--	--	25@	10
05	Chemical Technology	9628	03	--	03	03	80	28	20	100	40	--	--	--	--	25@	10
06	Development of Life Skills-II	--	01	--	02	--	--	--	--	--	--	--	--	25#	10	25@	10
07	Professional Practices- I	--	--	--	04	--	--	--	--	--	--	--	--	--	--	50@	20
TOTAL			**16**	**--**	**18**	**--**	**400**	**--**	**100**	**500**	**--**	**100**	**--**	**25**	**--**	**175**	**--**

STUDENT CONTACT HOURS PER WEEK (FORMAL TEACHING) : **34 HOURS**

THEORY AND PRACTICAL PERIODS FOR SIXTY MINUTES EACH.

@ - INTERNAL ASSESSMENT, # - EXTERNAL ASSESSMENT

TOTAL MARKS : **800**

ABBREVIATIONS : TH – THEORY, TU – TUTORIAL, PR – PRACTICALS, OR – ORAL, TW – TERM WORK.

All Practical, Oral & Term work assessment are to be done as per the prevailing norms for curriculum implementation & assessment.

Course Name : Diploma in Surface Coating Technology

Course Code : SC

Semester : Fourth

Subject Title : Principles of Management

Subject Code : 9624

Teaching and Examination Scheme:

Teaching Scheme			**Examination Scheme**						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
03	--	--	03	80	20	--	--	--	100

RATIONALE:

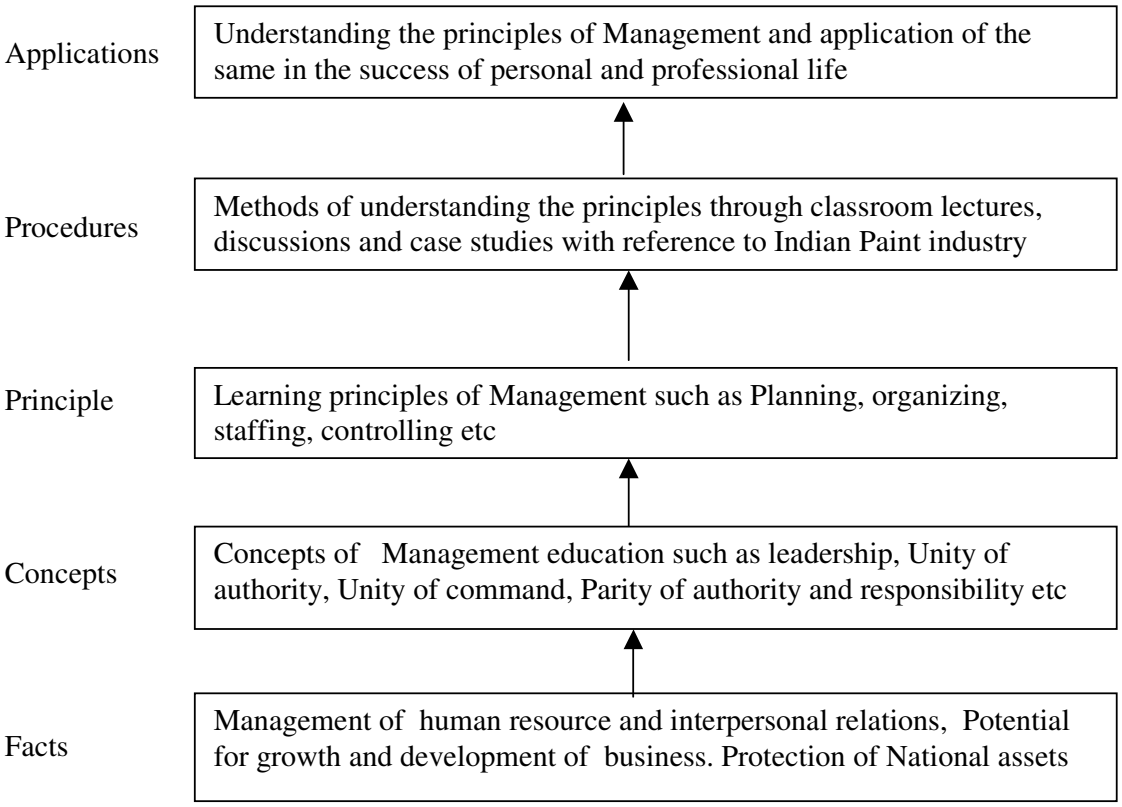
This subject will help the students in understanding principles and techniques of management and process of business development, as an entrepreneur. This subject will also stress the importance of interpersonal relations.

OBJECTIVES:

The students will be able to :

1. understand the importance of interpersonal relations.
2. develop communication skills and leadership qualities.
3. develop entrepreneurship skills.

Learning Structure :



Contents : Theory :

Chapter	Name of the topic	Hours	Marks
1	**Organization & Human Behavior** – 1.1 Introduction, History of management thought. Functions of Management. Importance of organization, Definition. Formal organization, Informal organization, Organization charts. **Marks : 08** 1.2 Authority and responsibility. Kinds of authority. Causes of conflict between line and staff. Delegation of authority, responsibility & accountability. **Marks : 08**	**10**	**16**
2	**Entrepreneurship** – 2.1 Proprietorship, Partnership, Cooperative, Public Sector, Govt. Undertaking. **Marks : 08** 2.2 Project and Feasibility report, Small scale industry, Registration and other formalities. Project planning, Technical and marketing feasibility. **Marks : 04** 2.3 Plant location esp. with respect to Paint industry. **Marks : 04**	**08**	**16**
3	**Quality Management** – 3.1 History of quality concepts. Importance of testing. Perfection at each stage, reducing wastages. **Marks : 04** 3.2 Standardization of testing methods. Working towards zero defects. **Marks : 04** 3.3 Concept and importance of Quality Circles (QC), Total Quality Management (TQM), ISO 9000 & Six Sigma. **Marks : 08**	**10**	**16**
4	**Marketing Management** – 4.1 Definition, Conceptualizing Marketing Management. Task and philosophies of Marketing Management. **Marks : 04** 4.2 Marketing system and environment. **Marks : 04** 4.3 Consumer market, industrial market and buyer's behavior. **Marks : 04** 4.4 Product Mix and brand strategy. **Marks : 04**	**10**	**16**
5	**Industrial Safety & Factory Act.** – 5.1 Causes of accident, Preventive measures. Industrial health and Welfare. **Marks :08** 5.2 Important provisions of Factory Act and Pollution Control Act. Safety regulations and safety factors particularly in Paint industry. **Marks: 08**	**10**	**16**
	Total	**48**	**80**

Learning Resources :

Books :

Sr. No	Author	Title of the book	Publisher
1	Peter F Drucker	The Practice of Management	Allied Publishers Ltd.
2	O P Khanna	Engineering & Management	Ghanpat Rai Publications Pvt. Ltd.
3	C D Mamori	Personnel Management	Himalaya Publishing.
4	K T Kulkarni	Introduction to Industrial safety.	K T Kulkarni.
5	S P Jain	Industrial & Labour laws.	Ghanpatrai Rai Publications
6	P C Shejwalkar	Principles and Practice of Management	Everest Publishing House, Pune
7	Treveor L Young	Successful Project Management.	Konya Page India Pvt. Ltd.
8	V S Ramaswamy	Marketing Management	Macmillan India Ltd.

Course Name : Diploma in Surface Coating Technology

Course Code : SC

Semester : Fourth

Subject Title : Technology of Paints-I

Subject Code : 9625

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
03	--	03	03	80	20	50#	--	25@	175

RATIONALE:

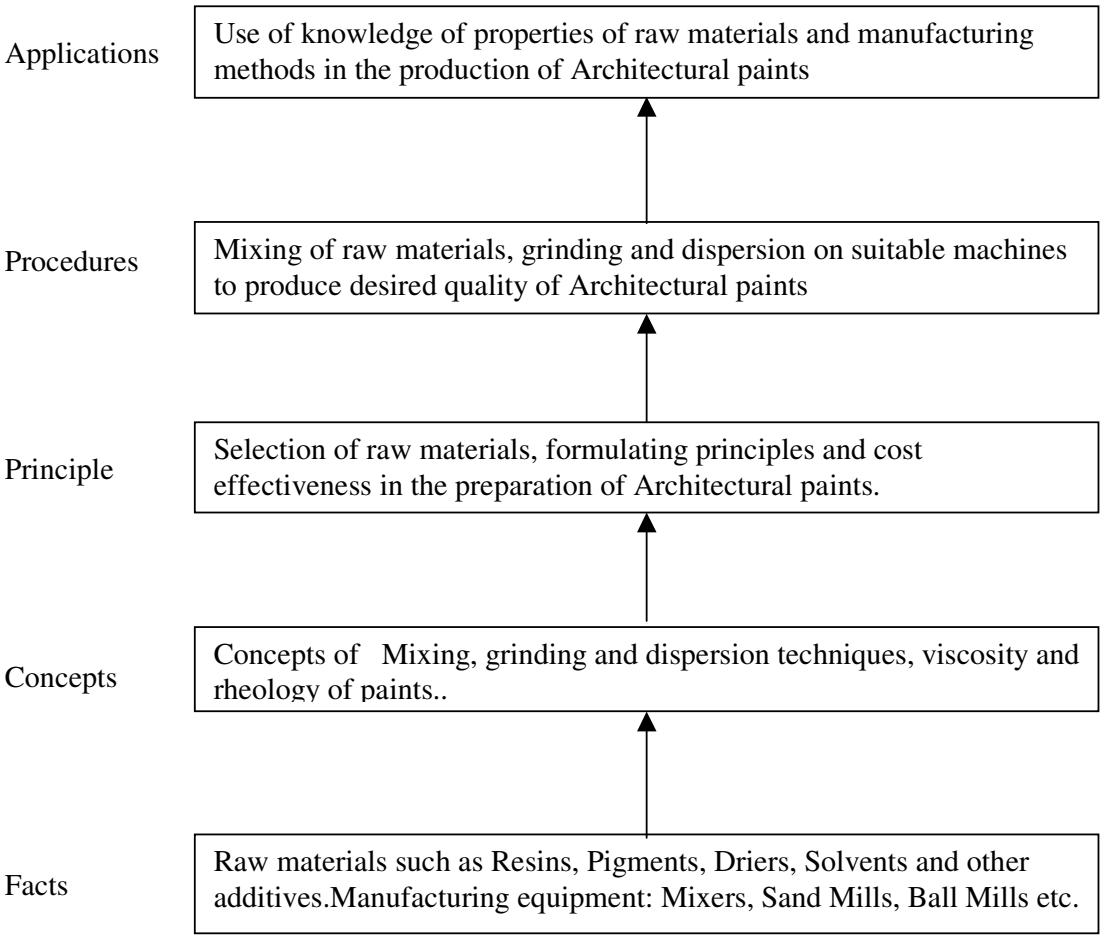
This is the core subject of the course of Surface Coating Technology. In this subject, the students will learn technological aspects in the preparation of paints. They will learn various types of paints, different raw materials, their properties and their compatibility with each other so as to produce the right type of paint as per end uses.

OBJECTIVES:

The students will be able to:

1. identify raw materials of paints.
2. describe significance of various terms such as P : B ratio, PVC, CPVC.
3. design formulations of architectural paints.

Learning Structure :



Contents: Theory

Chapter	Name of the topic	Hours	Marks
1	**Introduction** – 1.1 Raw materials used in paints and their functions. **Marks : 04** 1.2 Classification of paint such as Architectural Paints, Industrial Paints, Water based, Solvent based paints. Drying based, functional based. Types of thinners used in paints. Various types of paints such as putty, Surfacer, undercoat, top coat etc. **Marks : 08** 1.3 Psychological and cultural aspects of colour. **Marks : 04**	**08**	**16**
2	**Paint Additives** – Surface active agents – classification and their role in paints. Wetting and Dispersing agents. Anti-settling agents, Anti-skinning agents. Matting agents. Emulsifiers, Stabilizers, U.V. Stabilizers. Preservatives. Mildew inhibitors, Viscosity modifiers. Universal tinters.	**12**	**20**
3	**Paint Formulation** - 3.1 Formulating principles of paints. Formulations of Primers for wood, metals, cement. Formulations of enamels – interior, exterior. Paints for plasters and masonary.- Architectural paints. Roof coatings. **Marks : 10** 3.2 Requirement of important properties of paint – how to achieve them. Costing, P:B ratio, NVM, Coverage, PVC, CPVC and its effect on paint film properties. **Marks : 10**	**10**	**20**
4	**Paint Manufacturing & Plant Lay Out** – 4.1 Machinery used in Paint industry such as Mixers, Ball Mills, Sand Mills. Attritors. Basket Mills. Dispersion techniques. **Marks : 12** 4.2 Plant Lay out, location, material storage and handling.b Processing – horizontal, vertical. **Marks : 04**	**10**	**16**
5	**Quality Assurance** – Quality parameters. Working towards zero defect. Need for periodic testing. Durability and life of paint and important tests that must carried out frequently. Shade matching.	**08**	**08**
	Total	**48**	**80**

Practical :

Skills : Intellectual skills :

1. Selection of ingredients of paints.
2. Understanding formulating principles of paints.
3. Sequential addition of raw materials.

Psychomotor skills :

1. Measurement and weighing of raw materials.
2. Preparation of paints on dispersion mills.
3. Testing of paint properties.

List of Experiments: [Minimum 12 experiments to be completed]

* To test the basic properties of paint such as : colour, skinning, settling, consistency, viscosity, Fineness of grind, Wt./litre, drying time etc.

* To prepare and test :

1. A sample of dry distemper.
2. A sample of emulsion paint/OBD
3. A sample of Cement paint.
4. A sample of Cement Primer.
5. A sample of Wood primer.
6. A sample of Metal primer as per IS : 2074.
7. A sample of interior Enamel paint as per IS: 2932.
8. A sample of exterior Enamel paint as per IS : 2933.
9. A sample of NC wood lacquer.
10. A sample of 2 K Melamine coating.
11. A sample of texture paint.
12. A sample of lusture paint.
13. A sample of universal stainer.
14. A sample of putty/ lambi / KPF (Knifing Paste Filler).

Learning Resources : Books :

Sr.No	Author	Title of the book	Publisher
1	O C C A, Australia	Surface Coatings, Vol. II Paint & their Applications.	Tafe Educational Books.,
2	R Woodbridge	Principles of Paint Formulation.	Chapman & Hall.
3	J Boxall & J A Vonfraunhofer	Paint formulations – Principles & Practice.	Industrial Press Inc., New York
4	Gordon Fettis	Automotive Paints & Coatings.	BCH Publishers Inc.
5	Guy E Weismantel	Paint HandBook	Mcgraw Hill Inc.
6	Swaraj Paul	Surface Coatings.	Hohn Wiley & Sons.

Course Name : Diploma in Surface Coating Technology

Course Code : SC

Semester : Fourth

Subject Title : Application & Evaluation of Paints-I

Subject Code : 9626

Teaching and Examination Scheme:

Teaching Scheme			**Examination Scheme**						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
03	--	03	03	80	20	50#	--	25@	175

RATIONALE:

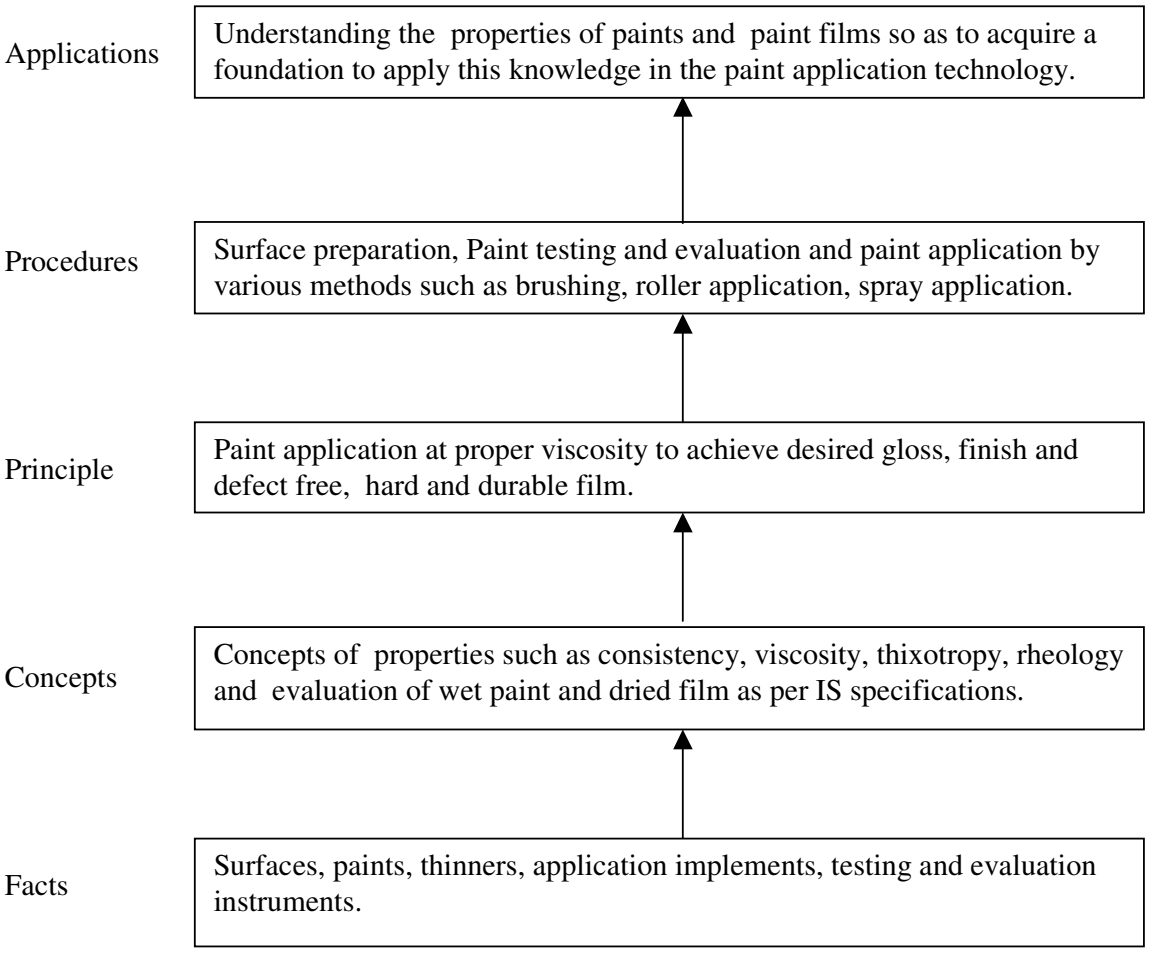
This subject will give an insight to students regarding paint application methods and procedures. It will also emphasize the importance of surface preparation and explain important properties the paint must possess in order to have excellent finishes. The subject will also outline methods of paint testing and evaluation.

OBJECTIVES:

The students will be able to:

1. compare properties of paint.
2. evaluate the quality of paint and paint film.
3. identify surface preparation methods.

Learning Structure :



Contents : Theory :

Chapter	Name of the topics	Hours	Marks
1	**Paint Properties** – 1.1 Importance of paint testing. Rheological properties of paints such as viscosity and consistency, Newtonian and non-Newtonian flow such as : Plastic, Pseudoplastic and Dilatant flow. Concept of thixotropy and its applications. Role of rheology in Paint manufacturing and application. **Marks : 06** 1.2 Physical properties such as wt. per litre, NVM, Fineness of grind, Skinning, Settling, Flash Point – its determination and significance. Wet film thickness, drying time, dilution ratio, Covering power, Hiding Power. Study of Indian Standard specifications IS : 101. **Marks : 10**	**12**	**16**
2	**Dry Film Properties** – Study of colour, Gloss, Finish, DOI. Mechanical properties such as – Paint film Adhesion - Cross-cut adhesion, tape test, Conical mandrel-Flexibility. Resistance to scratch hardness, Nail hardness, Pencil Hardness, Rocker hardness. Resistance to Impact, abrasion.	**10**	**16**
3	**Performance Properties :** 3.1 Performance properties such as resistance to Salt spray, Water immersion, Humidity. Exposure to high and low temperature. Resistance to chemicals such as acid, alkali, salt, lubricating oil, Petroleum Hydrocarbon solvent. Resistance to yellowing, Bleeding, Mould growth. **Marks : 12** 3.2 Electrical properties such as insulation resistance, Break down voltage, Pin hole testing and cut through temp. for insulating varnishes. **Marks : 04**	**10**	**16**
4	**Surface Preparation** - 4.1 For concrete, plaster, flooring. Wooden surfaces, plywood, hard wood. **Marks : 08** 4.2 Method and advantages. Failure of paint because of improper surface preparation. **Marks : 08**	**08**	**16**
5	**Application Techniques** – Types of brushes, Rollers. Application by brushing, Spraying – Spray guns – principle and working. Air assisted. Use of putty knife. Application of Dry distemper, OBD, Plastic emulsion.	**08**	**16**
	Total	**48**	**80**

Practical :

Skills to be developed:

Intellectual skills :

1. Understanding methods of paint testing.
2. Understanding equipment/instruments used for paint testing.
3. Evaluation of paint quality.
4. Interpretation of paint testing results.

Psychomotor skills :

1. Preparation of panels.
2. Setting of equipment.
3. Handling of paint testing instruments.
4. Preparations of required chemicals and solutions.

List of Experiments: [Minimum 12 experiments to be completed]

- To check the physical properties of paint such as colour, Skinning, Settling, Fineness of grind etc.

- To measure :

1. Viscosity of paint by using different Ford Cup Viscometers.
2. Viscosity of samples of paint using Brook Field Viscometer/Stormer Viscometer.
3. Wt./litre of samples of paint and to determine Opacity of paint samples.
4. Wet film thickness and drying time of samples of paint.
5. To find out dry film thickness from WFT and NVM of paint.
6. To check the sagging and dilution ratio of samples of paint.
7. Preparation of panels as per IS specifications.
8. To check colour, finish, DFT and gloss of the paint.
9. To check resistance to heat of the sample of paint.
10. To check flexibility and adhesion - Conical mandrel, Cross-cut adhesion methods.
11. To check hardness of paint - Pencil hardness, Scratch hardness, Impact hardness.
12. To check Resistance to Salt spray of paint samples.
13. To check Resistance to humidity of paint (corrosion resistance).
14. To check resistance to - water / solvents / acid / alkali of paint samples.
15. Surface preparation for architectural paints.

Learning Resources :

Books :

Sr.No	Author	Title of the book	Publisher
1	Dr. Dieter Stoye	Paints Coatings & Solvents.	Velt Publishers Inc.
2	Gordon Fettis	Automotive Paints & Coatings.	Velt Publishers Inc.
3	O CC A	Surface Coatings, Vol. II Paints & Their applications.	Macarthur Press HSW.
4	D B freeman	Phosphating & Metal Pretreatment.	Industrial Press Inc.
5	W M Morgan	Outline of Paint Technology.	CBS Publishers.
6	Zeno W Wicks	Organic Coatings	John Wieley & Sons.

Course Name : Diploma in Surface Coating Technology

Course Code : SC

Semester : Fourth

Subject Title : Allied Surface Coatings

Subject Code : 9627

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
03	--	03	03	80	20	--	--	25@	125

Rationale:

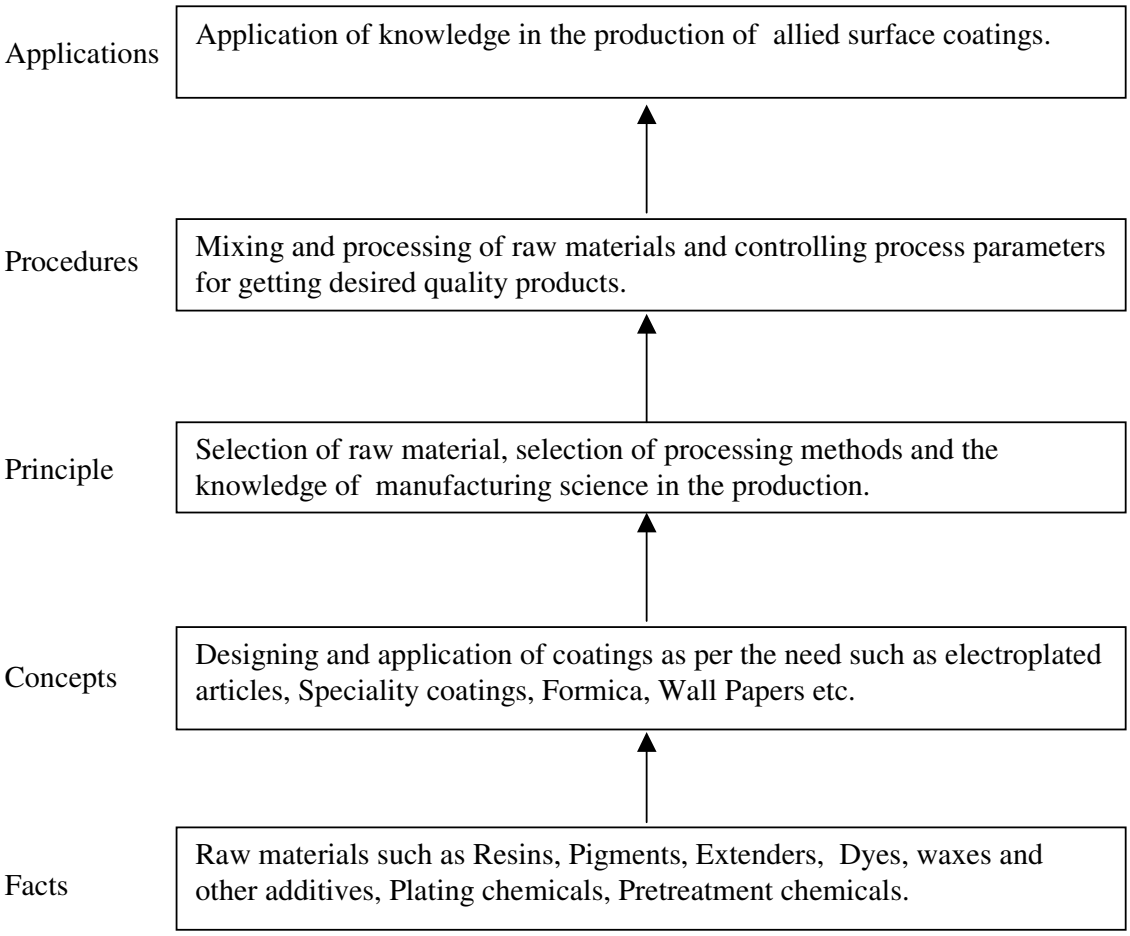
This subject includes technology and applications of allied surface coatings such as cosmetics, polishes, laminates etc. Apart from this, the subject of Electroplating will be covered in greater detail. This subject will give knowledge of other types of surface coatings and will provide opportunities to students to find employment or as entrepreneur in other related fields.

Objectives:

The students will be able to :

1. Identify allied surface coatings.
2. Describe properties and testing methods of allied surface coatings.
3. Identify application areas of allied surface coatings.

Learning Structure :



Contents : Theory :

Chapter	Name of the topic	Hours	Marks
1	**Cosmetics** – 1.1 Composition, Preparation, Properties and uses of : Talcum Powder, Nail Polishes, Lipsticks, Hair dyes, Cold creams, Vanishing Creams. **Marks : 08** 1.2 Toxicity and skin allergies and other troubles. Provisions of Food & Drug Act. **Marks : 04**	**08**	**12**
2	**Decorative Laminates** – 2.1 Manufacturing process, Composition, Printing methods – Gravure printing – Choice of designs. Inks for printing laminates such as Sun-mica, Floor carpets. **Marks : 06** 2.2 Wall Papers – Composition, type of papers, Printing and application. Surface preparation required. Adhesives. Life and cost. **Marks :06**	**08**	**12**
3	**Polishes** – 3.1 Composition, Preparation and uses of : Shoe Polishes, Wax polishes, Metal polishes, Liquid polishes. **Marks : 08** 3.2 Wood lacquers – Preparation and application methods Costs. **Marks : 04**	**08**	**12**
4	**Speciality Coatings** – 4.1 FRP : Composition, mold design, mold making, processing, finishing. **Marks : 06** 4.2 Water proofing chemicals, Teflon coatings. Scratch-proof coatings on automobiles. **Marks : 08**	**08**	**14**
5	**Electroplating** – 5.1 Electrochemistry. **Marks : 06** 5.2 Pretreatment and Processes such as : Nickel, Copper, Chromium, Zinc Plating, Silver, Gold plating and process like Anodization. Plating on non-metals – Plastics etc. **Marks : 12** 5.3 Testing of following properties : Corrosion resistance, Resistance to Salt spray, abrasion resistance, thickness. IS specifications. **Marks : 12**	**16**	**30**
	Total	**48**	**80**

Practical :
Skills : Intellectual skills :

1. Study of allied surface coatings.
2. Applications of such surface coatings.
3. Preparation of allied surface coatings.
4. Testing and evaluation of such surface coatings.

Psychomotor skills :

1. Handling of raw materials.
2. Weighing and sequential addition of raw materials.
3. Setting of glass-wares for experimental work.
4. Disposal of corrosive and hazardous chemicals.

List of Experiments : [Minimum 12 experiments to be completed]

1. Preparation and testing of talcum powder.
2. Preparation and testing of nail polishes.
3. Preparation and testing of vanishing cream.
4. Preparation and testing of cold cream.
5. Preparation and testing of hair dye.
6. Preparation and testing of shoe polish.
7. Preparation and testing of wax polish.
8. Pre-treatments for Electroplating.
9. Nickel electroplating and testing.
10. Copper electroplating and testing.
11. Zinc electroplating and testing.
12. Analysis of bath solutions.
13. Anodization of aluminium articles.
14. Report on industrial visits.

Learning Resources :
Books :

Sr.No	Author	Title of the book	Publisher
1	Dr. J Stephan Jellinek	Formulations & functions of Cosmetics.	John Wiley & Sons.
2	M M Brever	Cosmetics Science, Vol. I	Academic Press.
3	Gir Raj Prasad	Manufacture of Perfumes, Cosmetics & detergents.	SIR Institute, Delhi.
4	K S Rajgopalan	Introduction to Electroplating & Metal Finishing.	Colour Publication. shing Pvt. Ltd.
5	Canning	The Canning Hand Book Surface Finishing Technology.	W Canning Plc.
6	W G Wood	Metals Hand Book Surface Cleaning Finishing & Coating, Vol. VI	Americal Society for Metals Park, Ohio

Course Name : Diploma in Surface Coating Technology

Course Code : SC

Semester : Fourth

Subject Title : Chemical Technology.

Subject Code : 9628

Teaching and Examination Scheme:

Teaching Scheme			**Examination Scheme**						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
03	--	03	03	80	20	--	--	25@	125

RATIONALE:

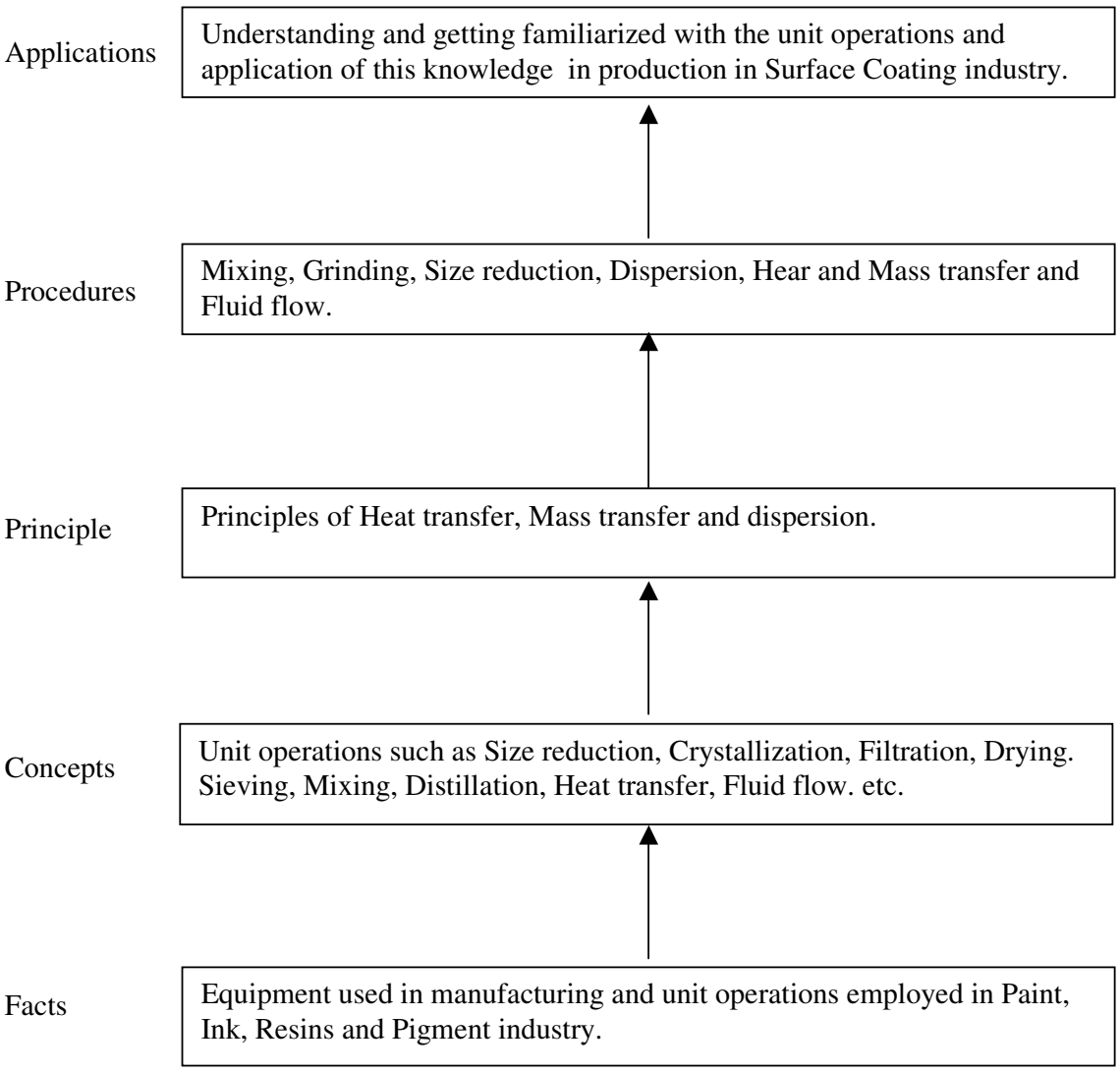
This is a very important subject as it covers all the major unit operations in the Surface Coating industry such as Mixing, Grinding, Filtration, Drying etc. Besides, other important processes like Fluid flow, Heat transfer etc. are covered in this subject. The subject will help the students to understand basic operations that are involved in the production and applications of paints and other surface coatings.

OBJECTIVES:

The students will be able to :

1. Define unit operations in Surface Coating industry.
2. Identify applications of unit operations.
3. Describe equipment used in various operations.

Learning Structure:



Contents: Theory :

Chapter	Name of the topic	Hours	Marks
1	**Fluid Flow** – 1.1 Nature of fluid – Laminar and turbulent flow, Reynold's No. Bernoulli's theorem. Methods of flow measurements such as Manometers, Orifice meter, Venturi Meter, Rotameter. **Marks : 12** 1.2 Pumps – Reciprocating and Centrifugal Pumps, Blowers and Compressors. Valves – Construction and working. **Marks : 08**	**10**	**20**
2	**Heat Transfer** – 1.1 Mechanism of heat transfer – Conduction, Convection, Radiation. Heat transfer equipment – Heat Exchangers, Condensers, Evaporators – Horizontal, Vertical Type, Multiple Effect Evaporation. **Marks : 12** 1.2 Distillation - Vacuum distillation – Distillation Columns - simple construction and working. **Marks : 04**	**10**	**16**
3	**Mixing** - Solid-liquid, Liquid-liquid, Solid-solid. Mixing viscous masses, Types of mixers such as Banbury Mixer, Sigma Blade Mixer. High Speed stirrers.	**8**	**12**
4	**Size Reduction** - 4.1 Intermediate Crushers, Crushing Rolls. Fine Size reduction equipment – Ball Mills, Tube Mills. **Marks : 06** 4.2 Screens – Simple Screen equipment such as Trommels, Grizzalies. Sieve analysis. **Marks : 06**	**8**	**12**
5	**Crystallization, Filtration & Drying** – 5.1 Tank Crystallization, Batch Crystallizers, Vacuum Crystallizers, Rate of crystal growth. **Marks : 06** 5.2 Classification of Filters, Filter Press, Continuous Rotary Drum Filter, Vacuum Filter – simple construction and working. **Marks : 08** 5.3 Type of Dryers such as Tray Dryer, Rotary Dryer, Spray Dryer - **Marks : 06**	**12**	**20**
	Total	**48**	**80**

Practical :
Skills to be developed:

Intellectual skills :

1. Understanding the concepts of unit operations and unit processes.
2. Application of principles of conservation of mass and energy.
3. Understanding transportation of liquids and solids.

Psychomotor skills :

1. Setting-up of apparatus.
2. Learning uses of measuring devices.
3. Accurate measurement of chemicals.

List of Experiments : [Minimum 12 experiments to be completed]

1. To determine porosity of pigments/extenders.
2. To observe size/ shape of pigment particles using Microscope.
3. To determine rate of settling in pigments by Sedimentation.
4. To determine effect of temperature on viscosity of liquids using Red Wood Viscometer.
5. To determine Flash point of solvents using Able's Flash Point Apparatus.
6. To determine Flash point of solvents using Cleveland Flash Point Apparatus.
7. To determine Flash Point of solvents using Pensky Martin's Apparatus.
8. To determine Fire point of solvents by open cup method.
9. To determine residue on sieve by sieve analysis of pigments.
10. To prepare dry distemper using Ball Mill
11. Separation of solid-liquid mixture using Centrifuge.
12. Separation of mixture of solvents by simple distillation.
13. Separation of mixture of solvents by steam distillation.
14. To determine NVM in Resins/Paints by heating.
15. To determine rate of crystallization with and without seeding.
16. Visit to industry to understand unit operations.

Learning Resources : Books :

Sr. No	Author	Title of the book	Publisher
1	Badger & Banchero	Introduction to Chemical Engineering.	Mc Graw Hill Book Co.
2	McCabe & Smith	Unit Operations of Chemical Engg.	Mc Graw Hill Book Co.
3	Richardson & Coulson	Chemical Engineering, Vol. I	E.L.B.S. & Pergamon Press
4	Richardson & Coulson	Chemical Engineering, Vol. II	Asian Book Pvt. Ltd.
5	R N Shreve	Chemical Process Industries.	McGraw Hills Kogakusha Ltd.
6	R H Perry	Chemical Engineer's Hand Book.	McGraw International.

Course Name : Diploma in Surface Coating Technology

Course Code : SC

Semester : Fourth

Subject Title : Development of Life Skills-II

Subject Code : --

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS	TH	TEST	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 .

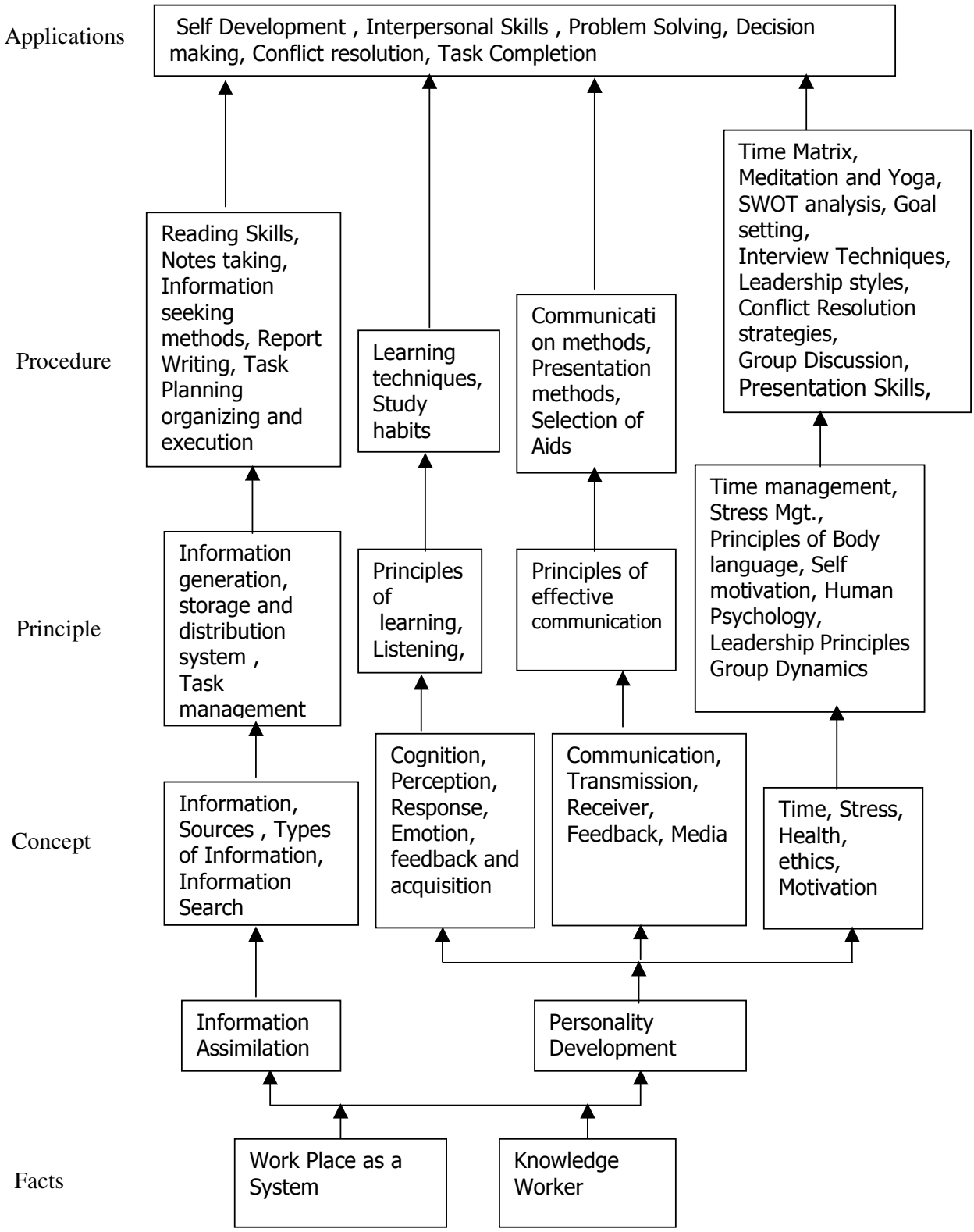
The Subject Is classified under Human Science .

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. Presentation Skill – 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 assignments)

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 slump 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, Pvt Ltd
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.learningmeditition.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 Surface Coating Technology

Course Code : SC

Semester : Fourth

Subject Title : Professional Practices-I

Subject Code : --

Teaching and Examination Scheme:

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

RATIONALE:

Most of the diploma holders jin 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.

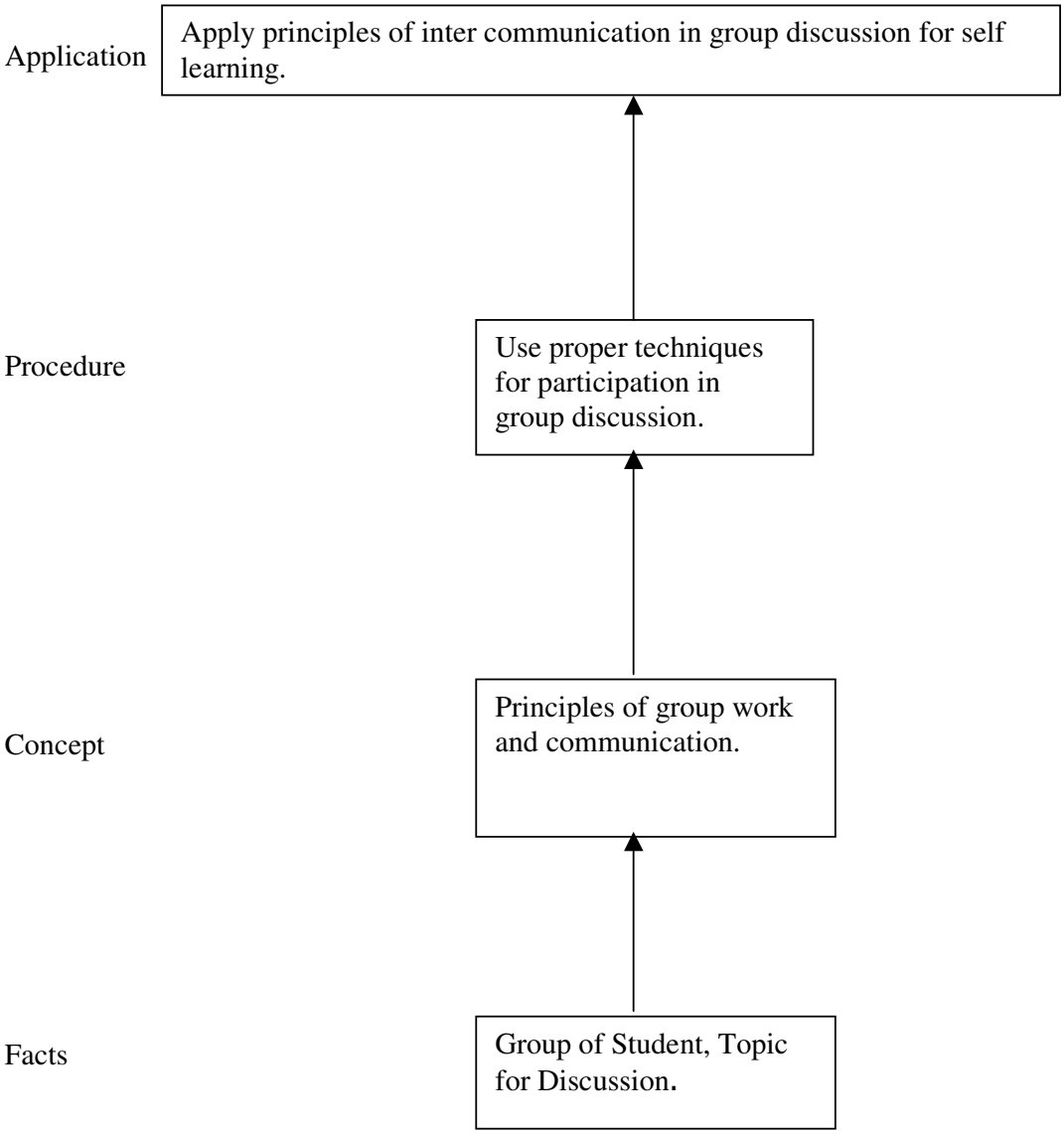
The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation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



Serial No.	Activities	Hours
01	**Industrial Visits** Structured industrial visits be arranged and report of the same shall be submitted by the individual student, to form a part of the term work. (**2 visits**) Following are the suggested types of Industries/ Fields – i) Paint manufacturing unit to observe mixing and dispersion. ii) Printing ink manufacturing unit to observe mixing and dispersion. iii) Pigment manufacturing unit to observe quality control. iv) Resin manufacturing industry to observe manufacturing process. v) Petroleum industry to observe distillation process. vi) Paint India exhibition. vii) Safety museum at Central Labour Institute, Sion, Mumbai	**14**
02	**The Guest Lecture/s** From field/industry experts, professionals to be arranged (2 Hrs duration), minimum 4 nos. from the following or alike topics. The brief report to be submitted on the guest lecture by each student as a part of Term work a) Vacuum impregnation plant. b) Wire enameling plant. c) Construction chemicals. d) Environmental pollution and control. e) Hand made paper manufacturing unit. f) Formulating principles of paints. g) Paint manufacturing machinery. h) Advanced paint dispersion machines.	**12**
03	**Group Discussion :** The students should discuss in group of six to eight students and write a brief report on the same, as a part of term work. The topic of group discussions may be selected by the faculty members. Some of the suggested topics are (any one)**-** Paint V/s Powder coating. Epoxy V/s Polyurethane. Solvents V/s Plasticizer. Water borne V/s solvent borne coatings. Soaps V/s driers.	**08**

04	**Seminar** : (any 2 topics) **Seminar topic should be related to the subjects of fifth semester / topics from guest lectures. Students shall submit a report of at least 10 pages and deliver a seminar (Presentation time – 10 minutes for a group of 2 students)**	**18**
05	Mini Projects **: (in a group of 6 - 8 students)** 1) Design/drawing of Paint Manufacturing unit. 2) Design/drawing of Ink Manufacturing Plant lay out 3) Design/drawing of Electroplating shop. 4) Design/drawing of Paint shop. 5) Design/drawing Powder coating shop. 6) Thermocouple based temp. controller. 7) Models of valves. 8) Models of material handling systems	12
	OR **Modular Course on any one of the suggested or alike relevant topic be undertaken by a group of students** (Min 10) : a) JIT – Just in time technique. b) Non traditional manufacturing methods. c) 3 D Modeling. d) Piping technology.	
	Total	**64**

Learning Resources:
Books:

Sr. No.	Author	Title	Publisher
01	Mark Ratner and Daniel Ratner	Nanotechnology	Pearson Educatuion, New Delhi
02	Yoram Korem	Computer Control of Manufactring System	Mcgraw Hill Publication
03	Sunil Chopra, Peter Meindl	Supply Chain Management	Pearson Educatuion, New Delhi
04	Dilip Raghavan, Editor	Paint India	Colour Publications Pvt. Ltd., Mumbai.
05	Dilip Raghavan, Editor	Colourage	Colour Publications Pvt. Ltd., Mumbai.
06	Tim Wright, Editor	Coating World	A Rodman Publications, Newjercy.
07	Dirk Meine	European Coating Journal	--

Internet Assistance :

1) http://www.afcona.com
2) http://www.uniqueenterprises.com
3) http://www.encorenaturalpolymers.com
4) http://www.dow corning.com
5) http://www.SUplasto.chem.com
6) http://www.arihantchemicals.com
7) http://www.indofilcc.com
8) http://www.drcoatsinksandresins.com
9) http://www.bisen.com