

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 2009-10							
SEMESTER : FIFTH										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	Process Instrumentation	9629	03	--	03	03	80	28	20	100	40	--	--	--	--	25@	10
02	Technology Of Paints-II	9630	04	--	03	03	80	28	20	100	40	50#	20	--	--	25@	10
03	Application & Evaluation Of Paints-II	9631	03	--	03	03	80	28	20	100	40	50#	20	--	--	25@	10
04	Technology Of Printing Inks	9632	03	--	03	03	80	28	20	100	40	--	--	--	--	25@	10
05	Professional Practices-II	--	--	--	05	--	--	--	--	--	--	--	--	--	--	50@	10
TOTAL			13	--	17	--	320	--	80	400	--	100	--	--	--	150	--
STUDENT CONTACT HOURS PER WEEK (FORMAL TEACHING) : 30 Hours																	
THEORY AND PRACTICAL PERIODS OF SIXTY MINUTES EACH.																	
@ - INTERNAL ASSESSMENT, # - EXTERNAL ASSESSMENT																	
TOTAL MARKS : 650																	
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 : Fifth

Subject Title : Process Instrumentation

Subject Code : 9629

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:

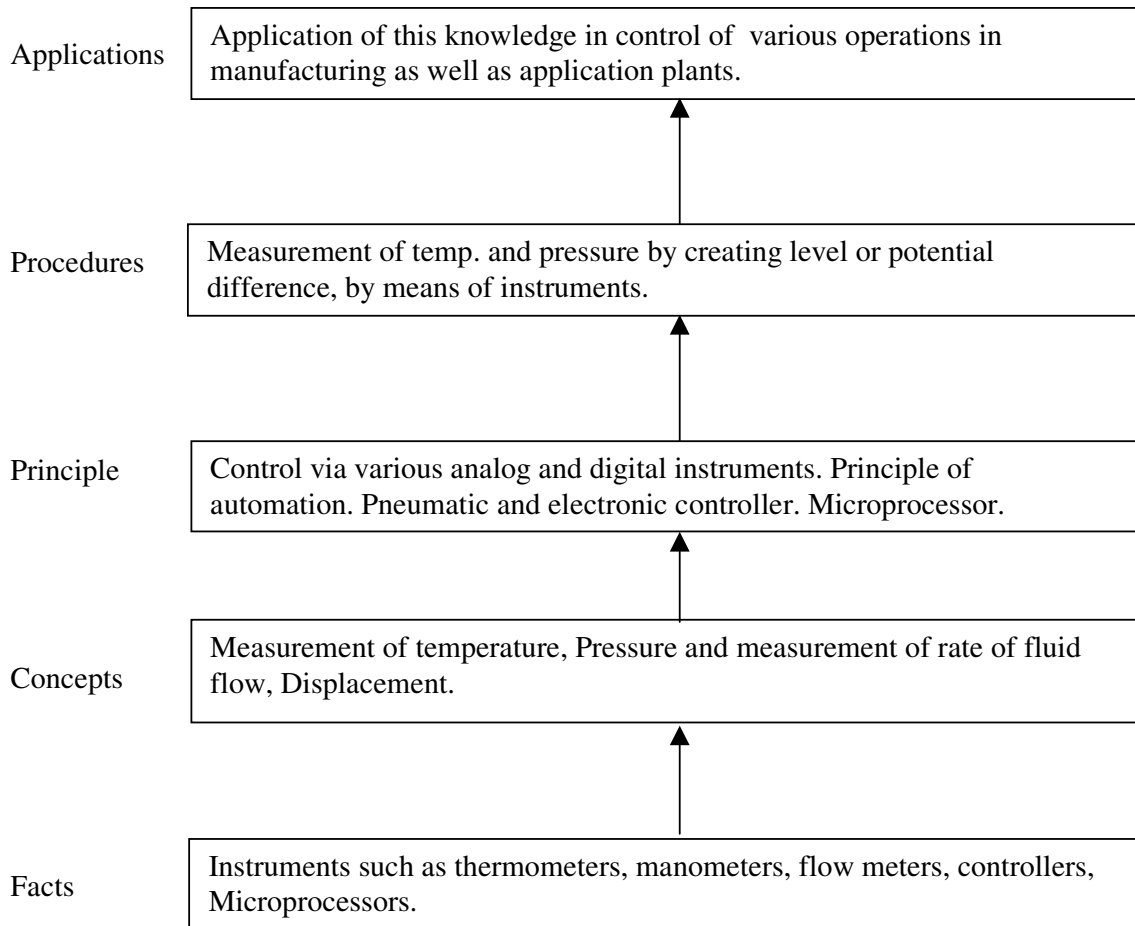
This subject will help to understand the process instruments used for various measurements like temperature, Pressure, Flow etc. These instruments are the essential part of any Chemical industry. All these measurements are as much required in Surface Coating industry. The subject will also stress the importance of automation in Process industries.

OBJECTIVES:

The students will be able to :

1. Identify instruments used for measurements of temp., Pressure flow, level etc.
2. Describe these instruments.
3. Describe applications of micro processors in process control.

Learning Structure:



Contents: Theory:

Chapter	Name of the topic	Hrs.	Marks
1	Temperature – Temp. scales, Temp. measuring devices such as Pressure thermometers, Bimetallic thermometers, Resistance temp. detectors, thermocouples, Thermistors, Pyrometers- simple construction and working principle.	10	14
2	Pressure – Pressure measuring devices such as U Tube, Inclined Tube Manometer. Dead Weight and Piston Gauge, Bourdon Tubes, Bellows, Diaphragm, Capsule - simple construction and working principle.	08	12
3	Flow & Level – 3.1 Flow measurement methods such as Electromagnetic Flow meters, Ultrasonic Flow meters. Turbine meters. Marks : 06 3.2 Level measurement methods such as : Sight Glass method, Bob & Tape method, Float gauges. Indirect mechanical method, Pneumatic method. Capacitance Level Gauge, Ultrasonic method of level measurement. Marks : 06	09	12
4	Displacements – 4.1 Displacement measurements methods such as : LVDT- principle, specifications, construction and working. Marks : 04 4.2 Synchro system. Pneumatic displacement gauge. Strain gauges – Importance of strain measurements, working principle, types of strain gauges. Strain gauge circuit. Marks : 08	06	12
5	Process Control & Microprocessor – 5.1 Advantages of automatic control system, Variables, Basic control actions – On-off control, Proportional control, Proportional plus integral control, Proportional plus derivative control. Proportional plus integral plus derivative control. Electronic controllers. Comparison between Pneumatic and Electronic controller. Actuators such as electric motor actuator, Pneumatic actuators – Spring actuator. Control valves – Valve characteristics, Pneumatic valves, Solenoid valves- Basic construction and working principle. Marks : 20 5.2 Working of Microprocessor, Microprocessor based Temp. control system. Marks : 10	15	30
Total		48	80

Practical :**Skills to be developed:**Intellectual skills :

1. Identifying proper transducer for temp., pressure, flow level measurements.
2. Understanding working principles of instruments.
3. Describing mentally experimental set up, conduct observations and inferences.

Psychomotor skills :

1. Handling measuring instruments.
2. Setting of experimental conditions.
3. Drawing the correct experimental diagrams.
4. Drawing of graphs, calculating slopes and respective calculations.

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

1. Measurement of frequency and voltage using CRO.
2. Measurement of voltage (ac, dc) using analog and digital multi-meter.
3. To plot resistance v/s temp. characteristics of RTD (PT 100).
4. To plot characteristics of thermocouple.
5. To plot LVDT characteristics.
6. To measure pressure using Bourdon gauge.
7. To measure pressure using Strain gauge.
8. Pressure measurement using Dead weight tester.
9. Operation of ON-OFF temp. controller.
10. Construction and operation of various types of valves.
11. Understanding basic components of Pneumatic system.
12. Operation of water level controller.
13. Plot response of PID controller for step, ramp input.
14. Level measurement using capacitance type level meter.
15. Plot characteristics of Synchro as an error detector.
16. Report on visit to a plant to study microprocessor based control system.

Learning Resources : Books :

Sr. No	Author	Title of the book	Publisher
1	R V Jalgaonkar	Mechanical Measurement & Control	Everest Publishing
2	Forrest C Tyson	Industrial Instrumentation	D. B. Taraporwal
3	B.C. Nakra & K. K. Chaudhari	Instrumentation Measurement & Analysis	Tata Mc Graw Hill Publishing
4	Kirk & Rimboi	Instrumentation	D. B. Taraporwal
5	W. G. Holzbock	Instrument for Measurement & Control	Affiliated East West Press
6	S. K. Singh	Industrial Instrumentation & Control	Tata Mc Graw Hill Publishing

Course Name : Diploma in Surface Coating Technology

Course Code : SC

Semester : Fifth

Subject Title : Technology of Paints-II

Subject Code : 9630

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
04	--	03	03	80	20	50 #	--	25@	175

RATIONALE:

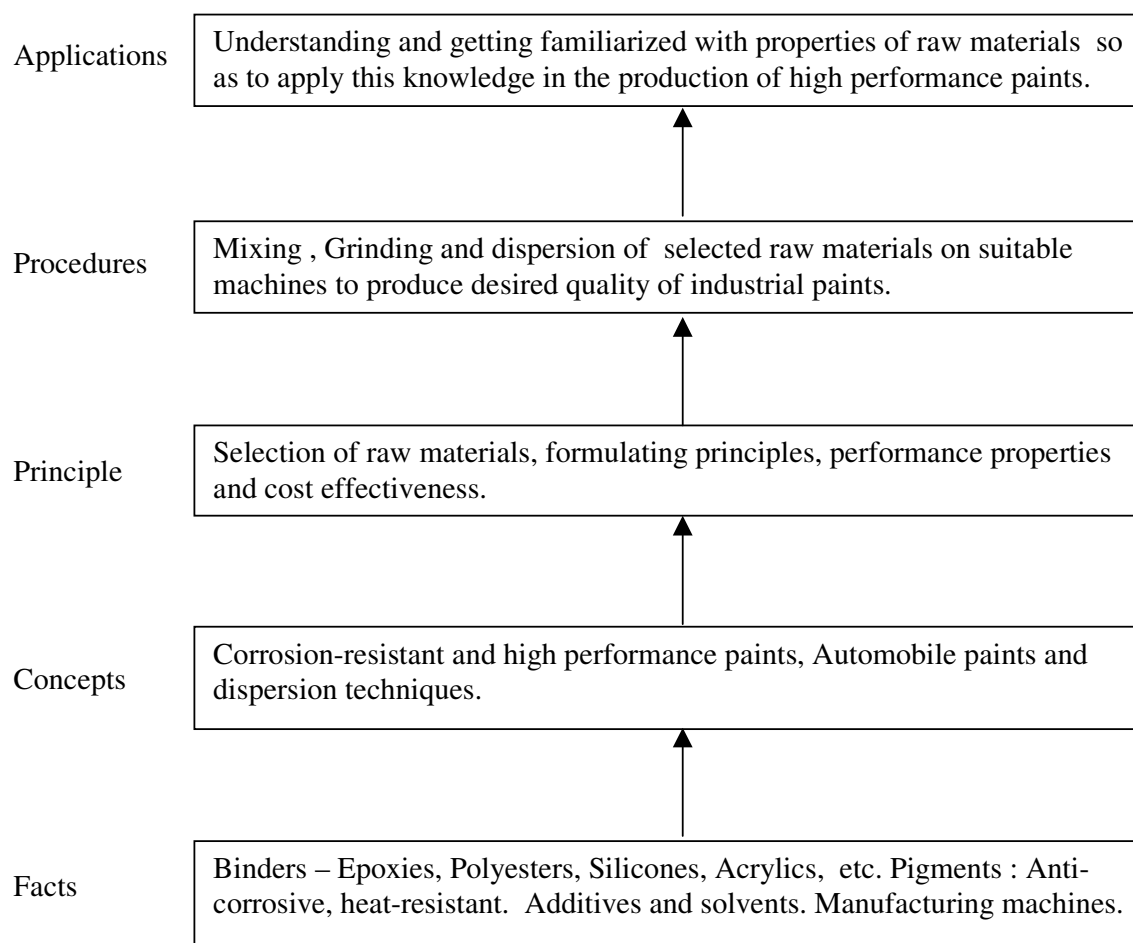
In this subject the students will learn about industrial paints and specialty coatings. The subject will deal with the protective aspects of paints. Further, the subject covers corrosion and the role of paints in reducing heavy losses due to corrosion. The subject also covers automobile paints and high performance coatings, like Marine Paints.

OBJECTIVES:

The students will be able to :

1. Describe corrosion and factors affecting corrosion.
2. Describe properties of corrosion-resistant paints.
3. Design formulations for corrosion-resistant and automobile paints.

Learning Structure:



Contents : Theory :

Chapter	Name of topic	Hours	Marks
1	Corrosion & Corrosion Resistant Paints – 1.1 Introduction to Corrosion and passivity. Various aspects of corrosion. Factors affecting rate of corrosion Marks : 06 1.2 Protection of ferrous and non-ferrous metals. Corrosion resistant paints – for locomotives, railway bridges, their formulations and properties. Marks : 10	10	16
2	Industrial Finishes – 2.1 Paints for white goods such as Refrigerators, Washing Machines, Fans, Cupboards etc. Finishes for furniture. Marks : 08 2.2 Chemical resistant paints based on epoxies, polyurethane, bitumen, vinyl and chlorinated rubber – their formulations, properties. Marks : 08	12	16
3	Automobile Paints – 3.1 Types of paints such as Primer, Surfacer, top coat, clear coat. Marks : 04 3.2 AED, CED Primers. Thermosetting acrylic, Polyester based top coat. Marks : 06 3.3 Requirements of paints for Automotive coatings, formulations. Sound deadener, Putty. Marks : 06	14	16
4	Speciality Coatings – 4.1 Heat resistant, Fire-retardant paints. Floor coatings. Marks : 08 4.2 Novelty finishes such as Hammer tone, Wrinkle, Stipple finishes. Multi-colour finishes. Aircraft finishes. Marks : 08	14	16
5	High Performance Coatings – 5.1 High built coatings, Coil coatings. Marine Paints. Marks : 08 5.2 Powder Coating – Types of powders, Formulations, Manufacturing of powders , properties and uses. Marks : 08	14	16
Total		64	80

Practical :**Skills to be developed:**Intellectual skills :

1. Understanding the requirements of industrial coatings based on service conditions.
2. Understanding the quality and properties of raw materials.
3. Understanding formulating principles of industrial coatings.
4. Selection of dispersing machinery.

Psychomotor skills :

1. Handling, weighing and sequential addition of raw materials.
2. Controlling optimum process parameters.
3. Judging the end point stage wise.
4. Enforcing safety rules.

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

1. To prepare and test a sample of Red oxide zinc chrome Primer as per IS : 2074.
2. To prepare zinc chrome Yellow Primer as per IS : 104.
3. To prepare a sample of Etch Primer for aluminium.
4. To prepare and test a sample of Aluminium paint.
5. To prepare and test a sample of stoving paint.
6. To prepare and test a sample of chemical resistant paint based on 2-pack epoxy.
7. To prepare & test a chemical resistant paint based on 2-pack polyurethane.
8. To prepare and test a sample of coal tar epoxy paint.
9. To prepare and test a sample of chlorinated rubber paint.
10. To prepare and test a sample of thermosetting acrylic paint.
11. To prepare and test a sample of epoxy-ester paint.
12. To prepare and test a sample of heat resistant paint.
13. To prepare and test a sample of fire retardant paint.
14. To prepare and test a sample of hammer tone finish.
15. To prepare and test a sample of wrinkle finish.
16. To prepare and test a sample of zinc rich primer.

Learning Resources :**Books :**

Sr. No	Author	Title of the book	Publisher
1	O C C A, Austria	Surface Coating Volume II	Tafe Educational Books
2	R Wood bridge	Principles of Paint Formulation	Chapman & Hall
3	J Boxall & Ja A Von Fraunhofer	Paint Formulation-Principles & Practice	Industrial Press, Inc.
4	Swaraj Paul	Surface Coatings	Hon Wiley & Sons
5	H. F. Payne	Organic Coatings Vol. II	V C H Publisher
6	W. M. Morgan	Outline of Paint Technology Vol. II	Charles Griffin House

Course Name : Diploma in Surface Coating Technology

Course Code : SC

Semester : Fifth

Subject Title : Applications & Evaluation of Paints-II

Subject Code : 9631

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:

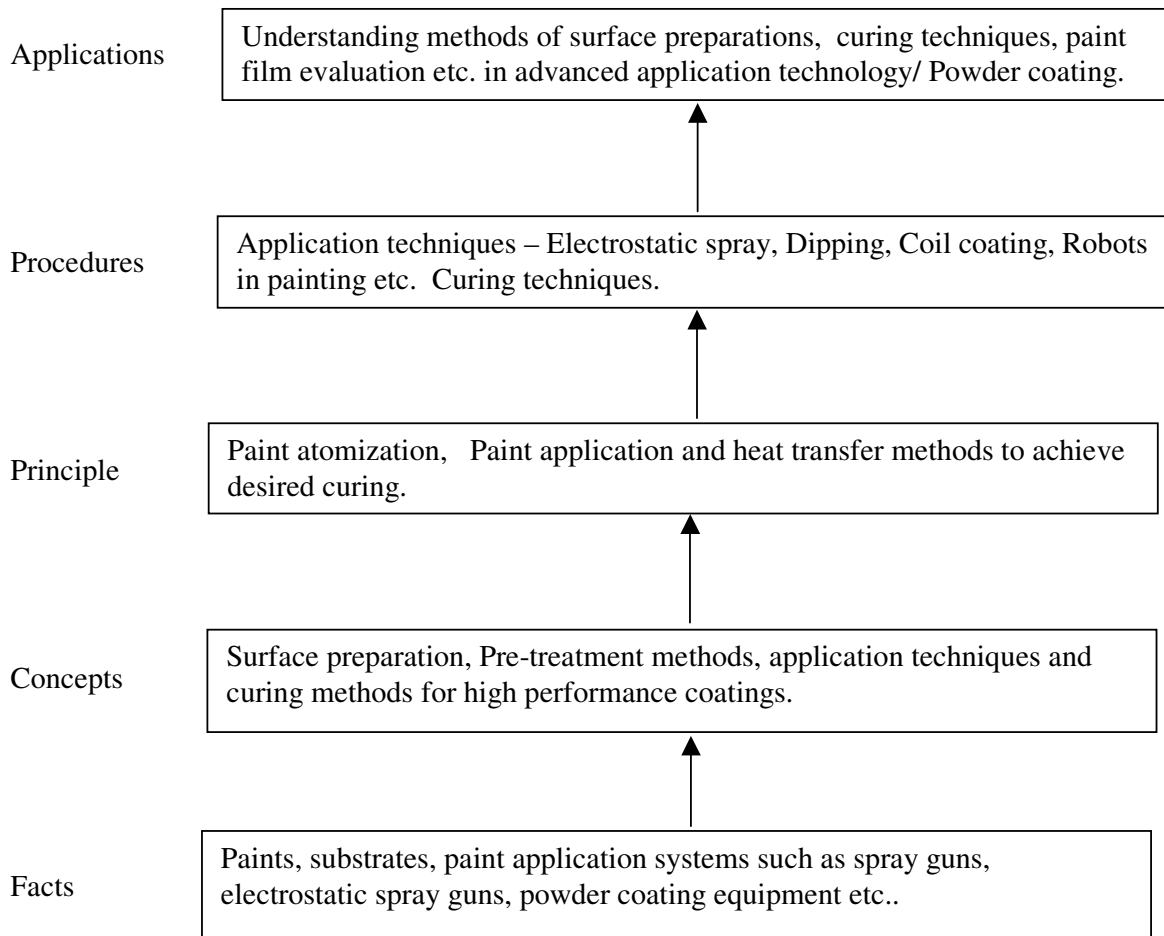
This subject will give an insight to students regarding advanced paint application methods such as Electrostatic Spray Painting, Micro Bell Paint Application, Robotic Paint Application, Powder coating etc. It will also give an insight as regards the curing methods and important properties, paint must possess in order to have excellent finish and durability.

Objectives:

The students will be able to:

1. Describe various properties of paint.
2. Describe advanced paint application techniques.
3. Identify causes of paint failure.

Learning Structure:



Contents: Theory:

Chapter	Name of the topic	Hours	Marks
1	Surface Preparation – 1.1 For industrial surfaces. Need for surface preparation, Methods of surface preparation – Mechanical and chemical. Hand cleaning, Power cleaning, Abrasive blasting, Shot blasting. Metal conditioning, Degreasing, Derusting / Descaling, Phosphating and chromatising. Marks : 12 1.2 Preparation of surfaces like Copper, brass, Aluminium and Plastic. Marks : 04	08	16
2	Application & Curing Techniques – 2.1 Industrial conventional spraying application in OEM. Paint application by Dipping, Flow coating. Electrostatic spraying of liquid paint by Bell, Micro Bell and Electrostatic Disc spraying. Airless spraying. Barreling and Electro deposition method and Coil coating. Marks : 16 2.2 Concept of curing. Curing schedule. Forced drying, Radiation curing such as UV, IR, EB and Vapo-cure. Marks : 08	12	24
3	Paint Shop – 3.1 Lay out of Paint shop. Spray booth, Jigs & Fixtures, Automation in finishing. Finishing Processes - Ovens used in drying and baking. Marks : 08 3.2 Environmental aspects - Sludge handling, Water management. Marks : 04	08	12
4	Paint Film Defects – Defects in paint film such as – Pin holing, Cissing, Popping, Craters, Sagging, Blisters, Orange peel, Yellowing, Flaking, Chalking, Cracking, Peel-off. – causes and remedies.	10	16
5	Powder Coating - 5.1 Principle of powder application. Pretreatment for powder application. Application by electrostatic spraying. Air fluidized bed application, Electrostatic Cloud Method of application. Marks : 08 5.2 Quality control and evaluation of film. Study of ISO : 13871-1993. Marks : 04	10	12
Total		48	80

Practical :**Skills to be developed:**Intellectual skills :

1. Understanding paint testing specifications.
2. Selection of material, apparatus and method for evaluation of paint.
3. Optimizing process parameters and curing schedules.

Psychomotor skills :

1. Preparation of substrates.
2. Precautions associated with respective painting processes.
3. Assembly of application equipment.
4. Handling and disposal of hazardous waste material.

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

1. Surface preparation of M.S./Aluminium/Plastic panels.
2. Chemical pretreatment by seven – tank process.
3. Paint application by conventional spraying process.
4. To check the finish by changing various parameters such as : pressure, nozzle diameter, paint : thinner ratio by volume.
5. Paint application by dipping and flow coating method, and evaluation of film.
6. Application of paint by electrostatic spray gun, and evaluation of film.
7. Application of paint by electrostatic spray gun by changing application parameters.
8. Designing of optimum curing schedule by changing parameters : temp./ duration.
9. Use of electrostatic spray for powder coating applications.
10. Powder coating and evaluation of film – epoxy powder coating.
11. Powder coating and evaluation of film – hybrid powder coating.
12. Paint testing as per IS : 2932 – 1974.
13. Aluminium Paint testing as per IS : 2339 – 1976.
14. Application and evaluation of hammer tone/ stipple/ wrinkle finishes.
15. Evaluation of road marking paints.
16. Report on factory visit – Paints / Powder coating industry.

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	Werner Rausch	The Phosphating of Metal	ASM Intrnational Finishing publication

Course Name : Diploma in Surface Coating Technology

Course Code : SC

Semester : Fifth

Subject Title : Technology of Printing Inks

Subject Code : 9632

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:

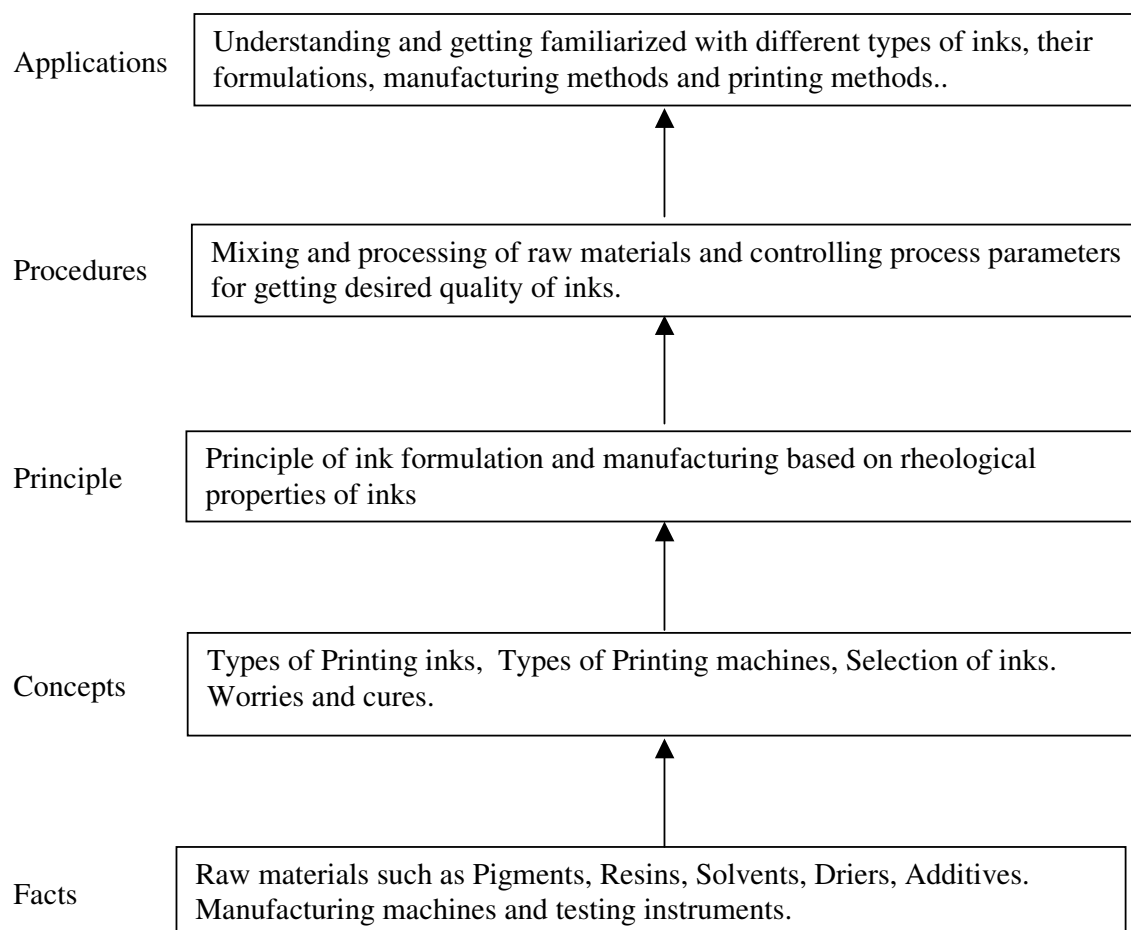
This is an important subject in Surface Coating Technology. This subject is very near to Paint Technology. The raw materials for both these surface coatings are very much common. The only difference being in formulating principles Rheological properties and application methods. The subject is easy to understand and importantly the subject enhances the job opportunities for these students in Printing ink industries as well. The Printing ink industry also finds these students useful.

OBJECTIVES:

The students will be able to :

1. describe types of printing inks and their rheological properties.
2. design formulations pf printing inks.
3. identify printing methods, problems associated and remedies.

Learning Structure:



Contents : Theory :

Chapter	Name of the topic	Hours	Marks
1	Rheology/Ink Properties – 1.1 Newtonian, Non- Newtonian flow, Thixotropy. Concept of viscosity, Flow, Livering, Dilatancy. General tests – Colour, Fineness of grind, drying time, Gloss, Length, Tack etc. Resistance to acid, alkali, solvents etc. Marks : 16 1.2 Testing instruments such as Ink Pipette, Ink Proofing Kit, Falling Bar Viscometer. – simple calculations. Marks : 08	10	24
2	Offset & Screen Inks – 2.1 Preparation, Properties and uses. Requirements of inks. Types of Lithography, Lithographic printing methods. Marks : 08 2.2 Producing screen designs. Screen printing method. Advantages and limitations of screen printing. Marks : 08	10	16
3	Gravure & Flexo Inks – 3.1 Preparation, Properties and uses. Requirements of inks. Types of Gravure Printing. Intaglio printing methods. Marks : 06 3.2 Flexographic Printing- Diagrammatic representation, Properties and applications. Marks : 06	10	12
4	Special Inks – Principle, formulation and application of special purpose inks such as Anti- forgery inks, Sensitive inks, Fluorescent inks, Rub-resistant inks, Low odour inks, Food wrapper coatings. Computer inks, Photocopier inks.	10	16
5	Ink Manufacture & Plant Layout - Machinery used in ink manufacture such as Mixers, Three-Roll Mill, Ball Mill. Lay out of Printing Ink Factory. Quality control. Safety measures and precautions, Health and welfare.	08	12
Total		48	80

Practical :
Skills to be developed:

Intellectual skills :

1. Identifying the requirements of inks suitable for printing process.
2. Describing mentally operational set-up, conduct observations and inferences.
3. Selection of paper and ink.

Psychomotor skills :

1. Handling testing instruments.
2. Weighing, measuring and setting-up experimental set-up.
3. Matching the shade visually.

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

1. To determine the physical properties of Printing ink such as colour, consistency, flow, length, tack, fineness of grind, texture etc.
2. To check colour, hue, Mass tone, Under tone of Printing inks.
3. To find out Specific Gravity and Bulk value of Printing ink using Coates' Micrometer ink pipette.
4. To take prints using Ink proofing kit.
5. To check shade difference with change of paper.
6. To check shade difference with change of thickness of printing ink.
7. To check the reduction of printing ink.
8. To check resistance of printing inks to different chemicals/ water.
9. To find out viscosity of printing ink using Falling Bar viscometer.
10. To find out viscosity of printing ink using Brook field Viscometer.
11. To find out density of Printing ink by Archimedes' principle.
12. To find out NVM in Printing ink.
13. To check the printability of screen inks using screens.
14. To prepare screens for screen printing.
15. Shade matching.
16. Report on visit to a printing press.

Learning Resources:

Books:

Sr. No	Author	Title of the book	Publisher
1	R H Leach & M J Mackenzie	Printing Ink Manual	Van Nostrand Rein Hold Com. Ltd.
2	E A Apps	Ink Technology for Printers & Students Part I-III	Leonard Hill Ltd.
3	E A Apps	Ink Technology for Printers & Students Volume III	Chemical Publishing Company
4	E A Apps	Printing Ink Technology	Leonard Hill Ltd.
5	Ronald E Todd	Printing Ink-Formulation Principles	Pira International

Course Name : Diploma in Surface Coating Technology

Course Code : SC

Semester : Fifth

Subject Title : Professional Practices-II

Subject Code : --

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
--	--	05	--	--	--	--	--	50@	50

RATIONALE:

Most of the diploma holders join 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.

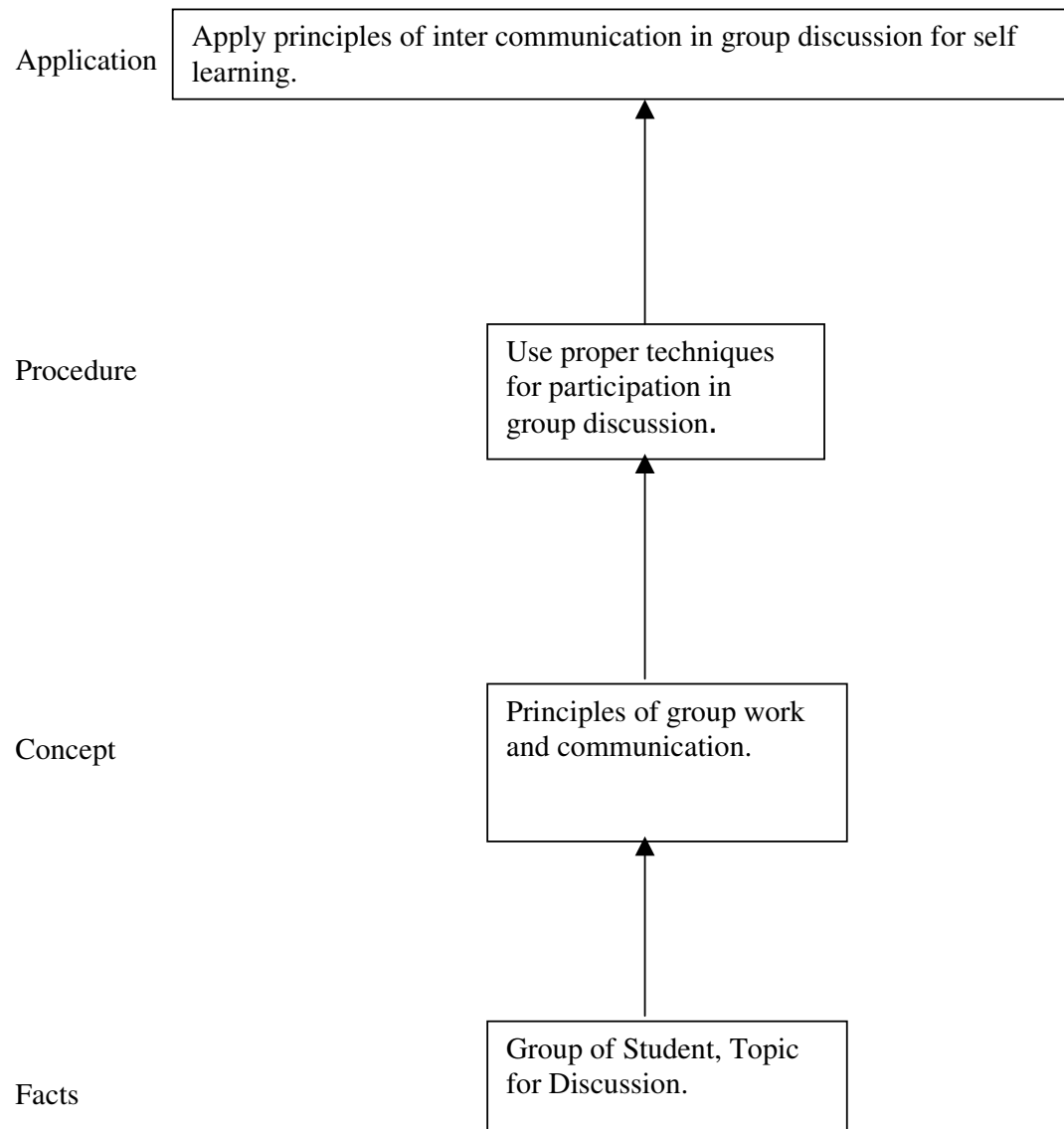
The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation 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	<p>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)</p> <p>Following are the suggested types of Industries/ Fields –</p> <ul style="list-style-type: none"> i) Automobile industry to observe paint application. ii) White goods industry to observe paint application. iii) Printing press to observe printing. iv) Electroplating unit. v) Cosmetic industry. vi) ARAI, CIRT, NCL, University of Pune. vii) Powder coating unit. 	14
02	<p>The Guest Lecture/s</p> <p>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</p> <ul style="list-style-type: none"> a. Bio technology. b. Nano technology. c. TQM. d. Packaging industry. e. Textile dyeing. f. Auto refinishing unit. g. Six Sigma. 	12
03	<p>Group Discussion :</p> <p>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)-</p> <ul style="list-style-type: none"> 1. Disaster Management. 2. New trends in Marketing. 3. Safety in Paint industry. Energy saving. 4. Automation in Paint application. 5. Energy saving. 6. Automation in Paint application. 7. Robots in Paint application. 8. Indian Paint industry V/s International Paint industry. 	14

04	<p>Mini Projects : (in a group of 6 - 8 students)</p> <ol style="list-style-type: none"> 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 	30
05	<p>Student Activities –</p> <p>Students in a group of 6 to 8 shall perform ANY TWO of the following activities (other similar activities may be considered) and write a report as a part of term work.</p> <p>Activities :-</p> <ol style="list-style-type: none"> 1. Collection of data regarding loan facilities or other facilities available through different organizations / banks to budding entrepreneurs 2. Survey and interviews of successful entrepreneurs in near by areas 3. Survey of opportunities available in thrust areas identified by Government or DIC. 4. Measuring coating thickness on ferrous / Non ferrous substrates. 5. Survey of data regarding different types of pumps with specifications from manufacturers catalogue, local markets, end users (any other engineering products may be considered for survey) 	10
Total		80

Learning Resources:**Books:**

Sr. No.	Author	Title	Publisher
01	Mark Ratner and Daniel Ratner	Nanotechnology	Pearson Education, New Delhi
02	Yoram Korem	Computer Control of Manufacturing System	Mcgraw Hill Publication
03	Sunil Chopra, Peter Meindl	Supply Chain Management	Pearson Education, 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, Newjersey.
07	Dirk Meine	European Coating Journal	--

Internet Assistance :

- 1) <http://www.bykchemie.com>
- 2) <http://www.azonano.com>
- 3) <http://www.antigraffiti.co.uk>
- 4) <http://www.indcoatings.com>
- 5) <http://www.pra.org.uk>
- 6) <http://www.coatingsgroup.com>
- 7) <http://www.coatingstech.org>
- 8) <http://www.coatings-science.com>
- 9) <http://www.spcorp.com>
- 10) <http://www.enrocorr.org>
- 11) <http://www.naceindia.org>
- 12) <http://www.hrorganochem.com>
- 13) <http://www.eocgroup.com>
- 14) <http://www.kamsom.com>
- 15) <http://www.haloX.com>