

**SARDAR PATEL UNIVERSITY  
VALLABH VIDYANAGAR**



**Programme & Subject: M.Sc (Surface Coating Technology)  
Syllabus with Effect from: June - 2017  
Semester: II**

<b>Paper Code: PS02CSCT21</b>		<b>Total Credit: 4</b>
<b>Title Of Paper: Polymer Physics &amp; Properties of Polymer</b>		
<b>Unit</b>	<b>Description in detail</b>	<b>Weightage (%)</b>
I	Chain Topology; Glass Transition Temperature; Physical, chemical, thermal, mechanical and electrical properties of polymers; Structure property relationship in polymers; Crystallinity; Concept of Cross Linking & Cross Link Density, its effect on polymer properties	70 %
II	Solubility criteria for the polymers, Solubility parameter, Solution properties, thermodynamics of polymer solutions, Phase separation in polymer solutions	20 %
III	Rheology of polymers; Degradation of Polymers	10 %

**Basic Text & Reference Books:-**

- Principles of Polymer science, by Bahadur and Sastry, Narosa Publishing House 2002.
- Polymer Science by Gowarikar, John Wiley and Sons, 1st ed., 1991.
- Encyclopedia of polymer Science and Engineering, 2nd ed., John Wiley and Sons , Inc
- Text book of Polymer Science, Billmeyer, John Wiley and Sons, .3rd ed.
- Principles of Polymer Systems, Rodriguez, Hemisphere Publishing Corp, 1982.
- Introduction to Polymer Science and Technology, H.S. Kaufman and J.J. Falcetta, Willey – Interscience Publication, 1977
- Polymer Science and Technology of Plastics and Rubbers, 1st ed., P.Ghosh, TataMcGraw – Hill Publishing Company 1990.
- Text book of polymer Science, P. Nayak and S.Lenka, Kalyani Publishers, 1986.
- Fundamentals of polymer science an introductory text, P.Painter and M. Colman, Technomic publishing Co Inc, 1994.
- Text book of Polymer Science and Engg Anilkumar and Gupta, Tata Mc Graw –Hill Publishing Co, Ltd., 1978.
- Polymer Science and Technology by J.R. Fried, Prentice- Hall, Inc 1995.
- Polymer chemistry, Seymour and Carraher, Marcel Dekker,2003.

**Programme & Subject: M.Sc (Surface Coating Technology)**  
**Syllabus with Effect from: June - 2017**  
**Semester: II**

<b>Paper Code: PS02CSCT22</b>		<b>Total Credit: 4</b>
<b>Title Of Paper: Chemistry &amp; Technology of Organic Pigments, High Performance Pigments, Additives &amp; Solvents</b>		
<b>Unit</b>	<b>Description in detail</b>	<b>Weightage (%)</b>
I	Concept of Dyes & Pigments; Lakes, Tonner, Resinated pigments, Flushed Colors, Dispersed Colors; Chemistry and Technology of Organic Pigments: Azo Pigments, Benzimidazolone dioxazines, Naphthol AS Pigments, perylenes, Phthalocyanines, Quinacridones etc.	25 %
II	Technology & Applications of High Performance Pigments & Special Effect Pigments	25 %
III	Types, preparation, and applications of Metallic Driers; Additives used in aqueous and non-aqueous paint systems for wetting and dispersion, Storage stability and application properties	40 %
IV	Solvents: Classification of Solvents, their characteristics, uses and application.	5 %
V	Plasticizers: Classification, Characterization, Theory and application	5 %

**Basic Text & Reference Books:-**

- HF Payne VOI II, Organic Coating Technology, 3rd ed John Wiley & Sons Ltd, 1967
- WM Morgan, "Outlines of Paint Technology.", 3rd ed, CBS Publishers & Distributors, 1996
- Surface Coatings – Raw Materials & Their Usage, OCCA-VOI I "Chapman and Hall", NY, 1993.
- T.C. Patton, Pigment Handbook, 3 Vols, Wiley-Interscience, New York, 1973.
- P.A. Lewis, Pigment Handbook, 3 Vols, Wiley-Interscience, New York, 1985.
- Herbst; 'Industrial Organic Pigments, Production, Properties and Application', 3rd ed., Wiley – VCH Verlag, 2004
- Swaraj Paul, 'Surface coating', 2nd ed., John Wiley & Sons Ltd, 1996.
- "High Performance Pigments", Smith, Wiley – VCH Verlag, 2002
- Stoye : Paints, Coatings and Solvents, 1st ed., Wiley – VCH, 1993
- Handbook of Coating Additives, J. Calbo, 1st ed., Vol I & II, Marcel Dekker, 1992
- Paint Additives: Recent development, G.B.Rothenberg
- Additives for waterborne coatings, D.R. Karsa
- Z.W.Wicks, Jones, Pappas; "Organic Coatings" Sci. & Tech, VOI I John Wiley and Sons, Inc., NY 1992.
- Solvents; Durrans, Thos H.

**Programme & Subject: M.Sc (Surface Coating Technology)**  
**Syllabus with Effect from: June - 2017**  
**Semester: II**

<b>Paper Code: PS02CSCT23</b>		<b>Total Credit: 4</b>
<b>Title Of Paper: Coating Properties &amp; Analysis of Coating</b>		
<b>Unit</b>	<b>Description in detail</b>	<b>Weightage (%)</b>
I	Study of important characteristics of surface coating viz. Rheological properties, Optical Properties, Adhesion and Mechanical properties, Corrosion and Chemical resisting properties, Film thickness, Liquid Paint analysis according to ASTM, BIS and BS Standards, Characterization of Varnishes according to ASTM, BIS and BSS Standards.	70 %
II	Durability of coatings- Natural and Accelerated methods.	10 %
III	Surface Coating defects: Defects in liquid paints, during application and cure and in dry film exposure.	20 %

**Basic Text & Reference Books:-**

- Organic Coatings: Properties and Evaluation, Kronstandt.
- Organic Coatings - Applications, Properties & Performance, Vol II, Wicks Z. W., Wiley Interscience Pub.ltd., 1992
- Hess's Paint film defects, 3rd ed, Hamburg,H & Morgans,W.M.
- Protective Paint coatings for metals, Fraunhofer and Boxall, Particullis Press Ltd, 2 Queensway, Surey, England.
- Surface coatings: Vol II: Paints & Their Applications, 2nd ed., OCCA, Chapman and Hall, 1984.
- "Paints and surface coatings -Theory & Practice", 2nd ed., R. Lambourne & T.A. Stevens, William Andrew Publishing, 1999.
- WM Morgan, "Outlines of Paint Technology.", 3rd ed, CBS Publishers & Distributors, 1996
- Adhesion of coatings: Theory and Practice, PROSSER
- Paint Testing Manual, 14th ed., Gardner Sward

**Programme & Subject: M.Sc (Surface Coating Technology)**  
**Syllabus with Effect from: June - 2017**  
**Semester: II**

<b>Paper Code: PS02CSCT24</b>		<b>Total Credit: 4</b>
<b>Title Of Paper: Instrumental Analysis &amp; Analysis Of Additives, Solvents &amp; Raw Material For Resin</b>		
<b>Unit</b>	<b>Description in detail</b>	<b>Weightage (%)</b>
	Instrumental analysis of various paint raw materials; Quantitative & Qualitative analysis of additives for surface coatings, various solvents and selected raw materials for different synthetic resins.	100%

**Programme & Subject: M.Sc (Surface Coating Technology)**  
**Syllabus with Effect from: June - 2017**  
**Semester: II**

<b>Paper Code: PS02CSCT25</b>		<b>Total Credit: 4</b>
<b>Title Of Paper: Practical : Analysis Of Industrial Coatings &amp; Inks</b>		
<b>Unit</b>	<b>Description in detail</b>	<b>Weightage (%)</b>
	Qualitative & quantitative analysis of various Industrial coatings like Epoxy coatings, Polyurethane coatings, Zinc rich coatings, Chlorinated rubber coatings etc. Qualitative & quantitative analysis of various inks like screen printing ink, lithographic ink, Flexographic inks etc.	100 %

**Programme & Subject: M.Sc (Surface Coating Technology)**  
**Syllabus with Effect from: June - 2017**  
**Semester: II**

<b>Paper Code: PS02ESCT21</b>		<b>Total Credit: 4</b>
<b>Title Of Paper: Chemical Engineering Operations</b>		
<b>Unit</b>	<b>Description in detail</b>	<b>Weightage (%)</b>
I	Concept of Unit Operations; Types of Pumps, Principles of Operation of Pumps; Vacuum producing devices; Compressors; Blowers; Size reduction – crushing and grinding; Filtration; Drying; Distillation; Mixing; Heat exchangers, Principles of heat transfer, types of heat transfer, different types of heating media.	100 %

**Basic Text & Reference Books:-**

- Introduction to Chemical Engg., 1st ed., By Walter L. Badger and Julius T Bancharo, Mc.Graw Hill Book Co.
- Unit Operation of Chemical Engg., 4th ed.; By Warren L Macabe and Julian C Smith , Mc. Graw Hill Book Co.
- Unit Operation (Vol I to VI), 1st ed., by JH Coulson and JF Richardson, Pergamon Press
- Mass Transfer Operations, Robert E Treybal , Mc. Graw Hill Book Co.
- Hand Book of Chemical Engg by JH Perry, 7/e, Mc. Graw Hill Book Co.
- Fundamentals of Engg. Heat and Mass Transfer by R.C. SACHEIVA, Wiley Eastern Ltd.
- Process Heat Transfer by Kern , Mc. Graw Hill Book Co.

**Programme & Subject: M.Sc (Surface Coating Technology)**  
**Syllabus with Effect from: June - 2017**  
**Semester: II**

<b>Paper Code: PS02ESCT22</b>		<b>Total Credit: 4</b>
<b>Title Of the Paper: Economics &amp; Industrial Management</b>		
<b>Unit</b>	<b>Description in detail</b>	<b>Weight age (%)</b>
I	Economics: Basic Economics Concept, Demand and Supply, Elasticity of Demand and Supply, Concept of Profit and Revenue, Concept of Equilibrium and Margin, Introduction to Micro and Macro Economics and Price theory. Commercial and Central banking; Analysis and interpretation of standard financial statements;	30 %
II	Industrial Management: Management: Concept, Nature, Functions: Planning, Organizing, Directing, Control, Decision Making	20 %
III	Business: Concept & Objectives, Forms of Business Organization	10 %
IV	Human Resource Management: Concept – Functions- Recruitment and Selection, Training and Development, remuneration and incentive schemes  Inventory Management: Meaning, Importance, Techniques	20 %
V	Quality Control: Meaning, Importance, TQM.	10 %
VI	Standardization: Concept of International standardization, Need of standardization, Understanding of Important standardizations.	10 %

**Basic Text & Reference Books:-**

- Fundamentals of Business Organization & Management by: Y.K. Bhushan.
- Projects: Planning, Analysis Selection, Implementation & Review by :Prasannanchendun.
- Industrial Engineering & Management by: O.P.Khanna.
- Personnel Management: C.B. Mamorian.
- Best Practice in Inventory Management, by Tony Wild, Elsevier Science
- Essentials of Inventory Management, by Max Muller, AMACOM
- Total Quality Management – An Introductory Text by Paul James, Prentice Hall
- Quality Control and Applications by Housen & Ghose