

E.M.G. YADAVA WOMENS COLLEGE, MADURAI -14.**(An Autonomous Institution – Affiliated to Madurai Kamaraj University)****Re –accredited (3rd cycle) with Grade A⁺ and CGPA 3.51 by NAAC****CBCS****DEPARTMENT OF CHEMISTRY – UG****VALUE ADDED COURSE***(w.e.f. 2023 – 2024 onwards)***Paints and Biofuels**

1. This Course is taken up by third year chemistry students
2. Period of study: V Semester

COURSE STRUCTURE**Contact Hours: 30 hrs****Credit: 1**

S.No.	Sem	Subject Code	Title of the Paper
1.	V	23CHVAC1	Theory: Paints and Biofuels
2.	V	23CHVAC1P	Practical: Lab in Paints and Biofuels

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CBCS**DEPARTMENT OF CHEMISTRY – UG****VALUE ADDED COURSE**

(w.e.f. 2023 – 2024 onwards)

Title of the Paper: Paints and Biofuels

Semester : V

Contact Hours: 30 Hrs

Subject Code : 23CHVAC1

Objectives:

1. To learn about various equipment's and its operations
2. To gain knowledge on chemistry behind the industries.
3. To acquired knowledge about paints and pigments.
4. To study about sources of energy
5. To get employment in petrochemical industries.

Unit: I Basic equipment operations - advanced equipment operations - various types of equipment's -valves-pipelines -reactors -heaters -evaporators heat exchangers - boiler-cooling tower - distillation column –condensers.

Unit: II Paint definition- paints and their general ingredients-function of ingredients-classification of paints-curing mechanism of paints.

Unit: III Drying oils- natural resins-prime pigments-inorganic and pigments-chemical composition and properties of solvents-drying catalysts-additives for solvent-borne and water-borne paints- Manufacturing process of Water based paints.

Unit: IV Sources of energy: Solar energy, Hydrogen, geothermal, Tidal and hydel - Types of fuels and their calorific values. Coal, Petrol and natural gas-Uses of coal (fuel and non-fuel) in various industries-carbonization of coal-coal gas, producer gas and water gas – composition and uses.

Unit: V Reforming petroleum and non-petroleum fuels (LPG, CNG, LNG, biogas, fuel derived from biomass), fuel from waste, synthetic fuels (gaseous and liquids), clean fuels - Petroleum Testing Analysis - Manufacturing of Biofuels- How to enter the industry as an Employee - Industrial Basic Skills

Reference Books:

1. Morgan W.M., “*Outline of Paint Technology*”, 2nd Edition, John Wiley & Sons Incorporated, 1985.
2. Malshe V.C., “*Basics of Paint Technology Part I*”, reprint, Prakash C. Malshe, Mumbai 2010.
3. Dos Santos Bernardes M.A., “*Biofuel Production- Recent Developments and Prospects*,” InTech, Croatia, 2011.
4. Chattopadhyay P.K., “*Handbook on Biofuel Ethanol and Bioenergy Based Products*,” 1st Edition, “Niir Project Consultancy Services guides entrepreneurs,” 2022.

Website(S):

1. <https://tutorialstipscivil.com/civil-topics/composition-of-paint/>
2. <https://www.fivestarpainting.com/blog/2016/december/ultimate-guide-to-water-based-paints/>
3. https://en.wikipedia.org/wiki/Fossil_fuel
4. <https://www.intertek.com/biofuels/>

PRACTICAL

Title of the Paper: Lab in Paints and Biofuels

Subject Code: 23CHVAC1P

LIST OF PRODUCTS

Paints (water based paints)

1. Primer
2. Emulsion
3. Biofuels