SEMESTER: S8

TECHNOLOGY OF PRINTING INKS

Course Code	**PEPOT866**	**CIE Marks**	40
Teaching Hours/Week (L: T:P: R)	3:0:0:0	**ESE Marks**	60
Credits	3	**Exam Hours**	2 Hrs. 30 Min.
Prerequisites (if any)	Basic Knowledge About Paints	**Course Type**	Theory

Course Objectives

1. The student will be able to explain the manufacturing steps of printing inks with each specialisation

SYLLABUS

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Module No.	Syllabus Description	Contact Hours
1	Nature of printing Inks, drying characteristics, adhesive nature, resistance properties, printing processes, letterpress, lithographic, gravure, screen printing, non-impact printing, substrate selection, print recognition.	**9**
2	Raw materials for printing Inks, pigments, dyestuffs, Oils, resins, solvents, plasticisers, driers, chelating agents, antioxidants, deodorants and reodrants, deforming agents, laking agents Formulating principles of letterpress inks, lithographic inks, gravure inks, flexographic inks, screen inks, radiation curable systems, inks for special purposes.	**9**
3	Manufacture of inks and varnishes, processes, mixing equipment, milling equipment, handling, storage and manufacture of UV inks, manufacture of newspaper inks, handling and storage of inks, modern production trends.	**9**
4	Rheology of printing inks, viscosity, powerlaw, Newtonian and Non Newtonian fluids, tack and tack measurements, dry paint performance tests,	**9**

	analysis of printing inks, safety measures in handling printing chemicals, mechanical and operational aspects, international standards and national standards in ink manufacturing area, environmental aspects.	

Course Assessment Method

(CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Assignment/ Microproject	Internal Examination-1 (Written)	Internal Examination- 2 (Written)	Total
5	15	10	10	40

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

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Part A	Part B	Total
• 2 Questions from each module. • Total of 8 Questions, each carrying 3 marks **(8x3 =24marks)**	• Each question carries 9 marks. • Two questions will be given from each module, out of which 1 question should be answered. • Each question can have a maximum of 3 sub divisions. **(4x9 = 36 marks)**	**60**

Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO1	Summarize the nature of printing Inks.	**K2**
CO2	Distinguish the composition of different inks.	**K4**
CO3	Identify the formulation of inks of different applications	**K3**
CO4	Inspect the techniques for manufacture of inks.	**K4**
CO5	Evaluate inks based on environmental and standard tests aspects.	**K5**

Note*: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

CO-PO Mapping Table:

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	**3**											
CO2	**3**											
CO3	**3**											
CO4	**3**											
CO5	**3**											

Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Printing materials: Science and Technology.	Thompson, Robert	Pira International	2004.
2	The chemistry of inkjet inks	Magdassi, Shlomo,	. World scientific,	2009.

Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Nanomaterials for 2D and 3D Printing	Magdassi, Shlomo, and Alexander Kamyshny,	John Wiley & Sons	2017
2	Printing on polymers: fundamentals and applications	Izdebska-Podsiadły, Joanna, and Sabu Thomas	. William Andrew,	2015
3	"Optimization of dispersion and viscosity of a ceramic jet printing ink."	Teng, Wan D., Mohan J. Edirisinghe, and Julian RG Evans	Journal of the American Ceramic Society 80, no. 2	1997

Video Links (NPTEL, SWAYAM…)	
Module No.	**Link ID**
1-4	https://www.youtube.com/watch?v=IYo5WGTPahQ IIT Delhi https://www.youtube.com/watch?v=hUEHPGACW4Q IIT Delhi

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