PG DEPARTMENT OF CHEMISTRY

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VALUE ADDED COURSE

SYLLABUS

FACULTY MEMBERS

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SCHEME OF EXAMINATION

SEM	Course Code	Title of the Paper	Total hours	Examination				Credits
				Hours	CIA	ESE	Total	
I	19PCV101	Cosmetics chemistry: An Introduction	30	2			50	Grade
I	19PCV102	Chemistry of Industrial Process: An Introduction	30	2			50	Grade

19 PCV101-COSMETICS CHEMISTRY: AN INTRODUCTION

Scope

- The students will be familiar with the physical and chemical properties and reactions of commonly used raw materials in cosmetics.
- Students will be familiar with chemistry (especially the reactivity and stability of an organic molecules based on structure and isomerism) of commonly used chemicals.
- They will know common natural raw materials in cosmetics, especially the basic functional group involved, their properties and applications.

Objectives

This course is designed to provide foundation knowledge of cosmetic principles to address the needs of cosmetic industry.

Provide practical skills in the area of biology, formulation science, cosmeceuticals (cosmetics with¬ skin, hair and oral care benefits) and personal care and hygiene products.

Provide knowledge on cosmetics, and related sciences,

Provide with knowledge on marketing approaches on studying consumer need, need gaps,¬ managing competition and global markets.

Employability

- To provide worldwide opportunity to study cosmetic science
- Students have the opportunity to undertake an optional placement and enhance their entrepreneur skill by offering valuable experience.

Nature of Course

Value added certificate course

Advantages

Students will be familiar with the different exposure of chemicals used in the cosmetics and one can design and practice ecofriendly cosmetics of their own.

Course Outcomes

- The student will acquire basic information about the possibilities and limitations of cosmetic products, their importance and marketing.
- To know the prohibited, regulated and authorized ingredients for cosmetic products, their origin, chemical nature and importance.
- To familiar with the principles of production as well as composition of cosmetics and products.

UNIT-I

L	P	T	
20	**10**	**30**	hrs

Cosmetics- Classification, significance, quality control and its importance, stability of product forms and its significance. Physical and chemical properties of agents and designing of different product forms. Review of current product forms in market.

UNIT-II

Basic raw materials, preparation and uses of Hair dye, Shampoo, Lipsticks, Handmade herbal Soap, Herbal tooth powder, Phenyl making, liquid soap and detergents.

UNIT-III

Essential oils and their importance in cosmetic industries with reference to Eugenol, Geraniol, sandalwood oil, eucalyptus, rose oil, Civetone and Muscone. Surfactants- Introduction, physical and chemical properties, its types, HLB scale and its application in cosmetics. Review of commercialized surfactants.

Text Books

1.Gaurav Kumar Sharma, Jayesh Gadiya and Meenakshi Dhanawat Textbook of Cosmetic Formulations, 2018.

2. Perry Romanowski Randy Schueller, Beginning Cosmetic Chemistry, 3rd Edition 1973,

Reference Books:

1. E. Stocchi: Industrial Chemistry, Vol -I, Ellis Horwood Ltd. UK. •

2. P.C. Jain, M. Jain: Engineering Chemistry, Dhanpat Rai & Sons, Delhi.

3. B.K. Sharma: Industrial Chemistry, Goel Publishing House, Meerut.

4. D.F. Williams "Chemistry and Technology of the Cosmetics and Toiletries Industries" Springer International Edition.

5. Robert D. Hisrion and Michael P. Peters, "Entrepreneurship" 5th Edition.

19PCV102- CHEMISTRY OF INDUSTRIAL PROCESS: AN INTRODUCTION

Scope

- This course will train participants with the knowledge, skills and competencies required for success in the practical operation of water treatment plants.
- This course is designed to expertise regulations governing industrial wastes, sources of wastes, methods for preventing and minimizing wastes at the source, and industrial waste monitoring.

Objectives

Upon completion, the participant should be able to:

- Define and implement cleaner production activities, industrial water management strategies for pollution and toxicity prevention.
- To Select the most appropriate treatment technology and design a wastewater treatment methods to treat an industrial effluent stream for a selected industry.
- Integrate cleaner production, industrial water management, wastewater treatment processes, and disposal in the design on an industrial waste treatment process for a selected industry.

Employability

- Graduates will be qualified to work in Wastewater Treatment Plants as operators to the expected industry standard.
- Students have the opportunity to undertake an optional placement and enhance their entrepreneur skill by offering valuable experience.

Nature of Course

- Value added

Advantages

- To reduce, recycle and reuse water for different purposes

Course Outcomes

- To teach the students the essential role of water in industries
- To study the various methods involved in analytical techniques
- The pupil will learn about the characteristics of water, water pollution and how to manage and prevent water pollution.

UNIT - I

10 Hrs

Characteristics of Water

Introduction – sources of water – Characteristics of water, Water Analysis- study of water samples - acidity, alkalinity, Hardness, free chlorine, chlorine demand, calcium, magnesium, iron, manganese, zinc, ammonia, nitrate, sulphate and fluoride, DOC, BOD, COD and their importance- Disadvantages of hard water – Scale and sludge formation in boiler – Boiler Corrosion - Softening methods –desalination of Brackish water: Distillation, Electro dialysis and reverse osmosis.

UNIT-II **10 Hrs**

Water Pollution

Introduction –water Pollutants – physical and chemical pollution of water – ground water pollution – harmful effects of ground water pollution – surface water. River water and sea water pollution. Oil pollution of water. Effects oil pollution in marine water – Radioactive materials in water- Role of pollution control boards.

UNIT-III **10 Hrs**

Physico chemical Examination of water

Collection of samples – colour – odour Turbidity pH – temperature – Soilds: Total Solids, Dissolved solids, suspended solids, settable solids – Acidity — Alkalinity – Hardness – calcium, Magnesium, Sodium - Potassium - Iron–*Dissolved Oxygen, BOD, COD,* biological and chemical treatments.

Text books:

1.Mark C. M. van Loosdrecht, Per Halkjaer Nielsen, C. M. Lopez-Vazquez, Damir Brdjanovic, (2016). Experimental methods in waste water treatment, IWA Publishing.

Vivek V. Ranade, Vinay M. (2014). Industrial Wastewater Treatment, Recycling and Reuse. Bhandari Butterworth-Heinemann Publications,

Reference Books:

1. Mukhlyonov. I(1979) *Chemical Technology*, Moscow, 3rd Edition. Mir publication
2. Norris Shreve. R &. Brink, J.A (1977) *Chemical Process Industries.* 4th Edition. McGraw Hill Tokyo.
3. Agarwal. S.K. (2005) *Water Pollution,* APH Publishing.
4. Chakrabarty, B.N. (1981) *Industrial Chemistry*, Oxford & IBH Publishing Co., New Delhi.
5. Singh, P.P. Joseph, T.M. Dhavale, R.G (1983) *College Industrial Chemistry*, Himalaya Publishing House, Bombay, 4th Edition
6. De. A.K. (1989) *Environmental Chemistry*, 11th Edition, Wiley Eastern Ltd. Meerut.

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