

**Department of Chemistry**  
**Revised Syllabus of II Year Diploma Program (UG)**

**Title of Program: Processing and Packaging Household Products**  
**Syllabus Structure (UG)**

Year	Semester	Course No.	Course Code	Contact Hours	Credits (1Credit=15 H)	Total Marks	
2	III	CT III	DCT 303	30	2	75	
		CL III	DCL 303	60	2	75	
	IV	CT IV	DCT 404	30	2	75	
		CL IV	DCL 404	60	2	75	
	Annual	CP II	DCP 202	30	1	50	
	Industrial and or Incubation and or Research and or Field Training				30	1	-
	<b>Total</b>				<b>240</b>	<b>10</b>	<b>350</b>

D: Diploma, \*: Departmental Code (C: Chemistry, MI: Microbiology, CSE: Computer Science (Entire), etc)

C: Course, T: Theory, L: Lab (Practical), P: Project

Total No. of Courses: 6 (Theory: 02, Practical: 02, Project: 01)

Theory and Practical: Semester, Project: Annual

### Semester III

#### CT-III: DCT 303: Introduction to Cosmetics

(Contact Hrs: 30 Credits: 2)

#### Learning Objectives:

Students will be able to learn

1. Various emerging new areas of Chemistry and apprise them with their prevalent in their future studies and their applications in various spheres of chemical sciences.
2. Sense of enthusiasm for chemistry and to involve them in an intellectually stimulating experience of learning in a supportive environment.

#### Unit I: Introduction

(15)

Introduction, Definition, Various terms in cosmetics Classifications -i) Based on origins, ii) based on contents, iii) Based on method of preparation Cosmetics products, Ingredients i) Herbal ii) Minerals

iii) artificial. Scope of cosmetics profession :- Division of cosmetic profession academic, research, manufacturing, marketing cultivation of herbs used in cosmetic. Toxicity, Animal testing. The Federal, Food drug, cosmetic act and regulation of cosmetics.

Cosmetic safety testing as per BIS (Bureau of Indian Standards)

Indian standard specifications laid down for sampling and testing of various cosmetics

**Unit II: Herbal Cosmetics and Synthetic Cosmetics (15)**

History, definition, development and role of natural products in cosmetic. Herbs description. Different systems of classification of natural excipients, their merits and demerits. Storage and preparation of Herbal drugs for commercial market. Identification tests of Lipids. Essential oils and their importance in cosmetic industries with reference to Eugenol, Geraniol, sandalwood oil, eucalyptus, rose oil, 2-phenyl ethyl alcohol, Jasmone, Civetone, Muscone.

A general study of synthetic cosmetics including preparation, evaluation and uses of the following: Hair dye, hair spray, shampoo, suntan lotions, face powder, lipsticks, talcum powder, nail enamel, creams (cold, vanishing and shaving creams), antiperspirants and artificial flavours.

Deodorants and antiperspirants: Ingredients and mechanism of action

Baby Care: Approach to baby care formulations

**Learning Outcomes:**

After completion of the unit, Student will be able to learn

1. Fundamentals of cosmetics
2. Define scope and significance of cosmetics
3. Fundamentals of cosmetic technology
4. cosmetic act and regulation of cosmetics

**Reference Books:**

1. Natural Excipients – Dr. R.S. Gaud
2. Text Book of Pharmacognosy- Trease & Erans
3. Pharmacognosy By Claus & Tayler
4. Test book of Pharmacology T.E. Wallis.
5. Materia Medica – By Nadkarni
6. Wealth of India CSIR
7. Organic chemistry by R.T. Morrison and R. N. Boyd.

8. L.M. Atherton Bentley and Drivers text book of Pharmaceutical chemistry oxford Uni Press London.

**CL-III: DCL 303: Title: Preparation of various Cosmetics**

**(Contact Hrs: 60 Credits: 02)**

**Learning Objectives:**

Students will be able to-

1. Know extraction process of some herbal products
2. Know preparation of herbal face creams
3. Know synthesis of herbal shampoos and mouth wash
4. Preparation of different cosmetics products

**List of Practical's (15)**

1. Extraction of active principle of herbal products: Chandan, haldi, Jasmin, Reetha and Neem
2. Preparation of herbal face creams using natural resources
3. Practical based on preparation of various cosmetic products by using herbal principle: Shampoo and Mouth wash
4. Preparation of talcum powder
5. Preparation of shampoo
6. Preparation of enamels
7. Preparation of hair remover
8. Preparation of nail polish and nail polish remover
9. Preparation of hair oil
10. Preparation of hair colour
11. Preparation of hair spray
12. Preparation of hair conditioner
13. Preparation of hair gel
14. Preparation of face cream
15. Preparation of body lotion

**Learning Outcomes:**

After completion of the unit, Students will be able to understand

1. Extraction process of herbal products

2. Preparation of herbal face cream
4. Preparation of herbal shampoo and mouth wash
3. Know preparation of different cosmetic products

**Reference Books:**

1. Vogel's text book of Qualitative Chemical Analysis (Longman ELBS Edition)
2. Vogel's text book of Quantitative Analysis (Longman ELBS Edition)
3. Practical Organic Chemistry by A.I. Vogel
4. Practical Organic Chemistry by O.P. Agrawal.
5. Practical Organic Chemistry by F. G. Mann & B. C. Saunders
6. Comprehensive Practical Organic Chemistry Qualitative Analysis by V. K. Ahluwalia
7. A Text Book of Quantitative Inorganic Analysis Including Elementary Instrumental Analysis: A.I. Vogel (Third Ed.)
8. Stocchi: Industrial Chemistry, Vol -I, Ellis Horwood Ltd. UK. P.C. Jain, M. Jain:
9. Engineering Chemistry, Dhanpat Rai & Sons, Delhi. Sharma, B.K. & Gaur, H.
10. Industrial Chemistry, Goel Publishing House, Meerut (1996)

**Semester IV**

**CT-IV: DCT 404: Cosmetics-Chemistry and Packaging**  
**(Contact Hrs: 30 Credits: 2)**

**Learning Objectives:**

Students will be able to

1. Get knowledge about herbal cosmetics
2. Learn the fundamentals of packaging

**Unit I: Chemistry in Cosmetics****(15)**

- 1) Physical Properties of materials potentially used in cosmetics. Dielectric constant, including polarization of non polar molecules refractive index, molar refraction, optical activity, interfacial tension, cohesion, adhesion and spreading adsorption at solid / liquid and solid /gas interfaces and their applications in cosmetics.
- 2) Cosmetic necessities – Acids, Bases, Buffers, Topical agents. protectives and antimicrobials, Astringents.

- 3) Chemistry of emulsions in cosmetic formulation and importance of branched chain compounds in cosmetics .
- 4) Study on the quality of raw materials and general methods of analysis of raw material used in cosmetic manufacture as per BIS.
- 5) Significance of pilot plant scale up studies. Stability studies. Technology transfer of formulations from R&D to factory.

**Unit II: Packaging as a Marketing Tool**

**(15)**

Regulatory Provisions relation to manufacture of cosmetics: - License, GMP, offences & Penalties, Import & Export of Herbal/natural cosmetics, Industries involved in the production of Herbal/natural cosmetics.

Introduction to product branding. Necessary label claims on products.

Market Considerations – Importance of Demography & Psychography, Retail Market (POP), Equity & Brand Name; Package Embellishment – Graphic Design Elements – Significance of Shape, Size, Colour, Font, Texture, Lines, Balance & Unity, Symmetry & Harmony; Shelf Appeal Studies - Recall Questioning, Focus Group, Eye-Tracking, S-scope studies. 6 3 Product-Pack Packaging materials in Cosmetics.

**Learning Outcomes:**

After completion of the unit, Student will able to-

1. Define emulsions, emulsifiers etc
2. Learn fundamentals of packaging
3. Define history, significance of packaging
4. Explain strategy of packaging

**Reference Books:**

1. Natural Excipients – Dr. R.S. Gaud
2. Text Book of Pharmacognosy- Trease & Erans
3. The Wiley Encyclopedia of Packaging Technology, 3rd ed., Wiley, 2009 by K. L. Yam,
4. Fundamentals of Packaging Technology, 4th ed., IoPP, 2009 by W. Soroka
5. Handbook of Package Engineering, 3rd ed., CRC Press, 1998 by J. F. Hanlon,
6. The Packaging User’s Handbook, Springer, 1990 by F. A. Paine

**CL-IV:DCL404: Title (Practical): Preparation and analysis of various Cosmetics  
(Contact Hrs: 60 Credits: 02)**

**Learning Objectives:**

Students will be able to-

1. Synthesis of some cosmetics products
2. Analysis of cosmetics products
3. Testing of raw materials used in cosmetics
4. Handling of instruments for analysis of cosmetics products

**List of Practical's (15)**

1. Preparation of sunscreen lotion
2. Preparation of lipstick
3. Preparation of cleansing milk
4. Preparation of anti-wrinkle cream
5. Preparation of skin whitening cream
6. Preparation of moisturizer
7. Preparation of cold cream
8. Preparation of vanishing cream
9. Preparation of Kajal
10. Testing of Raw materials in cosmetics : Water, Oils, Fats, Waxes
11. Analysis of Powders, Emulsifiers, Thickeners and Gums
12. Analysis of Cosmetics Products by using GC-MS,
13. Analysis of Cosmetics Products by using HPLC
14. Analysis of Cosmetics Products by using HPTLC
15. Supercritical Extraction relating to Cosmetics

**Learning Outcomes:**

After completion of the unit, Student will able to

1. Prepare various creams
2. Test and analyse raw materials used in cosmetics
3. Analyse various cosmetic products by using various instruments
4. Understand supercritical extraction

**Reference Books:**

1. Vogel's text book of Qualitative Chemical Analysis (Longman ELBS Edition)
2. Vogel's text book of Quantitative Analysis (Longman ELBS Edition)
3. Practical Organic Chemistry by A.I. Vogel
4. Practical Organic Chemistry by O.P. Agrawal.
5. Practical Organic Chemistry by F. G. Mann & B. C. Saunders
6. Comprehensive Practical Organic Chemistry Qualitative Analysis by V. K. Ahluwalia
7. A Text Book of Quantitative Inorganic Analysis Including Elementary Instrumental Analysis: A.I. Vogel (Third Ed.).
8. Stocchi: Industrial Chemistry, Vol -I, Ellis Horwood Ltd. UK. P.C. Jain, M. Jain:
9. Engineering Chemistry, Dhanpat Rai & Sons, Delhi. Sharma, B.K. & Gaur, H.
10. Industrial Chemistry, Goel Publishing House, Meerut (1996).

**CP-II: DCP 202: Project**  
**(Contact Hrs. 60, Credits: 2)**

**Industrial and or Incubation and or Research and or Field Training**  
**(Contact Hrs. 60, Credits: 2)**

**BOS Sub-Committee**

1. Dr. A. R. Mali (Chairman)
2. Dr. P. A. Bharad Member
3. Dr. M. S. Barge Member

**Expert Committee**

1. Name of Academic Expert- Dr. Suhit Gilda
2. Name of Industrial Expert- Dr. Sagar Deshpande