

Punyashlok Ahilyadevi Holkar Solapur University, Solapur



NAAC Accredited-2022
'B⁺⁺' Grade (CGPA 2.96)

Name of the Faculty: Science & Technology

Syllabus: M.Tech. III (Semester- V&VI)

**Name of the Course: Five Year Integrated M. Tech.
(Cosmetic Technology)**

(Syllabus to be implemented from w. e. f. June 2022)

Punyashlok Ahilyadevi Holkar Solapur University, Solapur.

Syllabus of Five Year Integrated M. Tech. (Cosmetic Technology) (Choice Based Credit System)

Preamble:

In this course, there will be a clear study about the formulation, manufacturing, analysis and marketing of functional products. This area is mainly dependent on the subject of Pharmacy and Chemistry. The cosmetic technology course mainly revolves around industrial training and educational tours. This course includes studying raw materials, testing methods and laboratory procedures that are available worldwide.

Objective of the Course:

- 1) To formulate precise and effective cosmetic formulations by application of gained knowledge.
- 2) To apply new research and development in the field of Cosmetics to reduce environmental impacts.
- 3) To study the subjects which will have the skills, knowledge and scientific temperament for career in the field of cosmetics

Course Outcome:

- 1) Upon completion of programme students will have opportunities to work in cosmetic field related to Research & Development, Marketing & Academics of Cosmetic as well as Pharmaceutical Industries.
- 2) Students will be able to formulate a Research Design and complete a substantial work of new products.
- 3) Students will be familiar with relevant governmental regulations which will help to confirm product compliance in Domestic as well as International Market.
- 4) Programme will provide self employment opportunities.

Eligibility Criteria:

For Five Year Integrated M.Tech. Course in Cosmetic Technology following candidates are eligible.

1. Students with H.S.C. with Science Stream.
2. Students with B.Sc.(B group) subject: Chemistry, Zoology, Botany, Microbiology, Biotechnology, Biochemistry, Bioinformatics etc. are eligible for the direct admission to 3rd year after successful Completion of Orientation/ Induction program. Orientation/Induction program will be conducted by the School in V sem. of third year.
3. Students with D. Pharm are eligible for the direct admission to 2nd year.
4. Students with B. Pharm are eligible for the direct admission to 3rd year.
5. Students after completion of fourth year are eligible to award B. Tech. degree.

Title of the Course: Integrated M. Tech. (Cosmetic Technology)

Fees for Course: As per University norms.

Strength of the Students: 30

Admission/Selection procedure: As per university norms.

Duration of the Course: 4+1 (Integrated) (4 years Degree + 1 Year Post graduation)

Period of the Course: (from June to April each academic Year)

Teacher's qualifications: M. Pharm. /M.Tech. (Cosmetic Technology)/ M.Sc./PhD.

Standard of Passing: As per University norms.

Nature of question paper with scheme of marking: Each theory paper will have 50 marks out of which 40 marks will be for Term End examination (University Examination) and 10 marks for Internal Assessment. Each practical paper will have 50 marks out of which 40 marks will be for Term End examination and 10 marks for Internal Assessment. The candidate has to appear for internal evaluation of 10 marks and external evaluation (University Examination) of 40 marks for each theory paper. The candidate also has to appear for internal evaluation of 10 marks and external evaluation (University Examination) of 40 marks for each practical paper.

I) Nature of Theory question paper:

Q. No.1) Multiple choice questions (08)

1)

a)

b)

c)

d)

2)

3)

4)

5)

6)

7)

8)

Q.No.2) Answer any four of the following (08)

i)

ii)

iii)

iv)

v)

vi)

Q.No.3 Write notes on any one of the following (08)

i)

ii)

iii)

Q. No.4) Answer any Two of the following (08)

i)

ii)

iii)

Q.No.5) Answer any one of the following (08)

i)

ii)

II) Nature of Practical question paper: Practical examination will be of 2 hours duration carrying 40 marks. VIVA & record book will be for 05 marks each.

List of Laboratory Equipments Instruments, Measurements etc : Potentiometer, Colorimeter, pH meter, conductometer, Microscope etc.

Rules and regulations and ordinance if any : NA

Medium of the language: English

Allotment of workload (Theory/Practical)

Class	Intake Capacity				Subject	No of theory papers	No of lectures per week	Total theory work load	No of practical batches	No of practical per week per batch	Total practical work load	Work load	Total work load
	1 st	2 nd	3 rd	4 th									
Five Year Integrated M. Tech. In Cosmetic Technology	30	30	30	30	Cosmetic Technology	05 (SEM I)	04	20	2	16	32	52 (SEM I)	200
						06 (SEM II)	04	24	2	16	32	56 (SEM II)	
						05 (SEM III)	04	20	2	14	28	48 (SEM III)	
						06 (SEM IV)	04	24	2	14	28	52 (SEM IV)	
						05 (SEM V)	04	20	2	14	28	48 (SEM V)	
						05 (SEM VI)	04	20	2	14	28	48 (SEM VI)	
Class	Intake Capacity				Subject	No of theory papers	No of lectures per week	Total theory work load	No of practical batches	No of practical per week per batch	Total practical work load	Work load	Total work load
Five Year Integrated M. Tech. In Cosmetic Technology	30	30	30	30	Cosmetic Technology	05 (SEMVII)	04	20	2	14	28	48 (SEM VII)	200
						05 (SEM VIII)	04	20	2	14	28	48 (SEM VIII)	

Staffing of pattern: Contract/CHB

Paper duration: 2 Hrs for Theory /2 hrs for Practical.

To be introduced from: June 2022

Structure of the Course:

Third Year syllabus (according to the Semester Pattern Examination) to be effective from the Academic Year 2022-23

Semester	Code	Title of the Paper	Semester Examination			L	T	P	Credits	
			Theory	IA	Total					
Sem-V		Hard Core								
	HCT5.1	Perfume I	40	10	50	4	-	--	4	
	HCT5.2	Cosmetic Technology III	40	10	50	4	-	--	4	
	HCT5.3	Principles of Cosmeceutics - I	40	10	50	4	-	--	4	
	HCT5.4	Beauty Culture – I	40	10	50	4	-	--	4	
		Soft Core (Any one)								
	SCT5.1	Cosmetic Engineering III	40	10	50	4	-	--	4	
	SCT5.2	Pharmacology & Interaction-I	40	10	50	4	-	--	4	
		Seminar/Tutorial/ Industrial Visit/ Field Tour	---	10	10		-	1	--	1
	HCP5.1	Practical-I (HCT 5.1 & HCT 5.2)	40	10	50		-	-	4	4
	HCP5.2	Practical-II (HCT 5.3 & HCT 5.4)	40	10	50		-	-	4	4
	Total for Semester – V			280	80	360	20	1	8	29
Sem-VI		Hard Core								
	HCT6.1	Perfume II	40	10	50	4	-	--	4	
	HCT6.2	Cosmetic Technology IV	40	10	50	4	-	--	4	
	HCT6.3	Principles of Cosmeceutics - II	40	10	50	4	-	--	4	
	HCT6.4	Beauty Culture – II	40	10	50	4	-	--	4	
		Soft Core (Any one)								
	SCT6.1	Cosmetic Engineering IV	40	10	50	4	-	--	4	
	SCT6.2	Pharmacology & Interaction-II	40	10	50	4	-	--	4	
	HCP 6.1	Practical-III (HCT 6.1 & HCT 6.2)	40	10	50		-	-	4	4
	HCP 6.2	Practical-IV (HCT 6.3 & HCT 6.4)	40	10	50		-	-	4	4
		Seminar/Tutorial/ Industrial Visit/ Field Tour	---	10	10		-	1	--	1
	Total for Semester – VI			280	80	360	20	1	8	29

L=Lecture T=Tutorials P=Practical UA=University Assessment CA =College Assessment HCT=Hard Core Theory SCT=Soft Core Theory, HCP=Hard Core Practical

SEMESTER – V

HCT – 5.1 Perfumes-I

Learning Objectives:

1. To provide student with the theory, knowledge, and practical skills necessary to enhance their performance as a natural perfumer.
2. To provide support and education on an adaptable worldwide basis.
3. To provide students with the education to effectively navigate the natural perfume industry with confidence.

Learning Outcomes: At the end of the course

1. Students will learn to recognize perfumery ingredients and study classic formulas before beginning to create their own perfumes.
2. Students will learn various extraction processes for the extraction of perfumery compound present in various part of the plant, so that would be used in perfumes preparation as well as in various cosmetic products.

Unit: 1

(10 L)

A) Essential oils – Production equipment, water distillation, Steam distillation, steam and water distillation.

B) Flower oils – Extraction with cold fat and hot fat, alcoholic extracts, absolute of enfleurages and chassis. Extraction with volatile solvents, selection of solvent and extraction apparatus.

Unit: 2

(10 L)

Resins, Gum & Exedution – Their extraction processes: Soxhlet Apparatus, Percolation, Maceration. Oleo Resins – Ginger oleoresins. Oleo gum resins – Gum Styrax and Balsams – Myrrh

Unit: 3

(10 L)

Isolates – Methods of Isolation, properties & uses of following:

Eugenol, Pinene, Linalool, Citral and Geraniol.

Flavours – Sources and properties of Vanilla, Rose, Pineapple, Peppermint, Mango, Raspberry, Orange & Lemon

Unit: 4

(10 L)

Alcohols - Manufacture of ethanol, Purification of Ethanol, Deodorization of ethanol.

Books recommended:

1. Perfumes, Flavours and Essential oil Industries – SBP Board.
2. Manufacture of Perfumes, Cosmetics & Detergents – Giriraj Prasad
3. Perfumes: History & Chemistry Vol-I- Dr. D.D.Wasule
4. Cosmetics: Science & Technology – Sagarin.
5. Essential oils Vol. I by Gunther.
6. Perfumes, soups & Cosmetics – Poucher.

HCT – 5.2 Cosmetic Technology-III

Learning Objectives

Upon completion of this course the students will be familiar with:

1. The students will be familiar with specific actives used in cosmetic formulations, their technical aspects and evaluation methods.
2. Students will be familiar with chemistry involved in cosmetic formulations.
3. They will know common natural raw materials, especially the basic functional group involved, their physical and chemical properties and their applications.

Learning Outcomes : At the end of the course students will be

1. Able to formulate different kinds of skin cosmetics.
2. Able to select correct humectants and antioxidant for cosmetics.
3. Able to formulate bath preparation.

Unit: 1 **(10 L)**

Skin Creams : Introduction, classification of skin creams, cleansing creams, Night and massage creams, Moisturizing, vanishing and foundation creams, Pigmented foundation creams, hand creams, hand and body cream, all purpose creams. Manufacturing, Packing and storage of creams.

Unit:2 **(10L)**

I) Humectants – Introduction, drying out, types, hygroscopicity, stability, safety, skin moisturization, Application of humectant

II) Antioxidant: Introduction, General oxidative theory, measurement of oxidation and assessments of oxidant efficiency, choice of antioxidants and Application of antioxidants.

Unit:3 **(10L)**

Soaps –Introduction, ingredients, types of soaps-bathing, toilet soaps, antibacterial soaps transparent soaps, liquid soaps, syndates (synthetic detergent bars), Manufacturing technology, evaluation and uses.

Unit:4 **(10 L)**

Bath Preparation: Foam baths, Introduction, formulation and foam baths, types of products, product assessment, bath salts, ingredient and formulations.

Bath Oils: introduction floating and spreading oils, dispersible or blooming oils soluble oils, foaming oils.

Books Recommended:

1. Harry's Cosmetology.
2. Cosmetic Science and Technology by Sagarin E.

HCT 5.3 Principle of Cosmeceutics – I

Learning Objectives

Upon completion of this course the students will be familiar with:

1. State the physicochemical properties like solubility and interfacial phenomena.
2. They will know physicochemical concepts to be considered during formulation of solution, emulsion and suspension.
3. Students will be familiar with evaluation method and assessment of emulsion shelf life of solution, emulsion and suspension.

Learning Outcomes: At the end of the course students will be able to

1. Explain the role of surfactants and interfacial phenomenon.
2. Understand the physical properties of solutions and disperse systems.
3. Understand of physicochemical properties of drugs including solubility.
4. gain basic knowledge of pharmaceutical suspensions and emulsions.

Unit:1 (10L)

Solubility: Mechanism of solute – solvent interaction, ideal solubility and Hildebrand – wood Scatchard equation, solvation and association, quantitative approach to the factors influencing solubility of drugs.

Unit:2 (10L)

Interfacial Phenomenon:

- a) Cohesion adhesion and spreading, absorption at solid and liquid interfaces, absorption isotherm's applications.
- b) Electrical properties at interface, origin of charge, electric double layer, Nerst and Zeta potential, effect of electrolyte.

Unit:3 (10L)

Suspension: Particle interaction and behaviour, flocculation and deflocculation, sedimentation parameters, Role of wetting, controlled flocculation and structured vehicle in formulation, evaluation of suspension stability.

Unit:4 (10 L)

Emulsion: Types, detection, thermodynamic considerations, mechanism of droplet stabilization, theories of emulsification, properties and stability of emulsion, assessment of emulsion self life.

Books Recommended:

1. Martin, Swarbrick. Commerate&cuhn Physical Pharmacy.
2. Burger & Lee, Physical and Technical Pharmacy.
3. Rawlins : Bentley's Text Book of Pharmaceutics.
4. Shilton and Ridgway : Physical Pharmaceutic.
5. Remingtons Pharmaceutical Practices.

HCT 5.4 Beauty Culture-I

Learning Objectives

1. Introduction of Structure of skin and skin blemishes and their treatment
2. Introduction to common skin problems like blackhead, Whitheads, methods for removal of unwanted hairs.
3. Basic concept behind Mask therapy, aroma therapy.

Learning Objectives: At the end of the course students will be able to explain The basic procedures of mask therapy including their types, Extraction of essential oils for aroma therapy. Recognition of skin type.

Unit:1

(10 L)

Structure of skin and skin blemishes and their treatment.

a) Recognition of skin types.b) Different types of treatments suitable to skin conditions and skin types.c)various methods to remove unwanted hair i) threading ii) waxing.d)Skin care in different seasons.d) Diet and Exercises for healthy skin.Different types of skin blemishes and their treatment.

i. Black heads ii. White heads iii Acne iv. Open pores.
v. Freckles vi. Treatment for curing wrinkles.

Unit:2

(10 L)

Muscles of facial expression.

a) Bones of the Cranium and face (Only labeled diagrams)
b) Face pack ingredients and their effects
c) Facial: i. Cleaning ii. Toning, iii. Face Massage techniques
iv. Different types of facial

Unit:3

(10 L)

Mask Therapy

i. Setting masks. ii. Peel off masks.
iii. Thermal types- paraffin wax masks iv. Non-setting masks. v. Hot oil marks

Unit:4

(10 L)

Introduction to aroma therapy.

a) Methods of extraction of essential oils.
b) Blending & precautions. Properties of essential oils & carrier oils
c) Patch testing, safety & precautions.
d) Different aroma therapy formulations for skin and hair care.

Books recommended:

1. Ann Eaton and Flurence Openshaw, Cosmetic Make – Up and Manicure.
2. A Professional Guide to Hair Dressing and Beauty Therapy by VeenaPitre
3. The Science of Cosmetics by John V. Simmons
4. Complete Beauty Book by Helen Foster
5. Vogue- Body and Beauty Book by Bronwen Meredith
6. A Guide for Health & Beauty Therapist Vol.-1 Face, hands and feet by Gaynor Winyard

SCT 5.1 Cosmetic Engineering-III

Objectives:

Upon studying of the subject Cosmetic Engineering III student shall be able gain:

- 1 Handy knowledge on various processes undergoing in pharmaceutical as well as cosmetic industries such as size separation, size reduction, Filtration, Mixing
2. To know various mechanical used in processes above mentioned.

OUTCOME: At the end of the course students will be able to explain

1. Various unit operations used in Pharmaceutical industries.
2. Working principle of equipment's used in size separation, size reduction, Filtration, Mixing.
3. Advantages and Disadvantages, Classification, various factors affection of the processes mentioned above.

Unit:1: (10 L)

Size reduction: Introduction to Size reduction, theory of size reduction, energy for size reduction, factors influencing size reduction, mechanism, classification of size reduction equipment's with construction , working and uses.

Unit:2: (10L)

Size separation: Introduction, official standards, Types of screening equipment, Air separation method, cyclone separators, bag filters, classifiers, simple and mechanical classifiers, size separation by setting and difference in density.

Unit:3: (10L)

Filtration: Introduction, theory and mechanism of filtration, factors affecting filtration, filter media and aids, classification of filtration equipments, selection of filters, study of filter press, Rotary, drum leaf filters, meta filters, disc filters, membrane filters.

Unit:4: (10L)

Mixing: Introduction, mechanism, factors affecting, classification of equipments, mixing of solids, liquids, immiscible liquids and semisolids.

Book Recommended:

1. Introduction to Chemical Engineering – Badger & Banchemo.
2. Unit Operation in Chemical Engineering Mc-cabe& Smith.
3. Chemical Engineering Vol. I & II – Richarson & Coulson.

SCT 5.2 - Pharmacology & Interaction-I

Objectives: Upon studying of the subject introductory pharmacology & toxicology – I student shall be able to:

1. Understand the Pharmacodynamics and Pharmacokinetics of drug molecule (concept of Absorption, Distribution, Metabolism and Excretion)
2. To know basic cause and pathogenesis of certain disease that effect skin, teeth, hair and sweat gland etc.

OUTCOME: Students will get familiar with:

1. Exact etiology and pathogenesis of various diseases related to skin appendages.
2. Treatments available for such disease.
3. Basics Mechanism of action of drug molecule utilized to treat diseases related to Skin, teeth, Hair, Sweat gland, Inflammation etc.

Unit:1 **(10 L)**

Introduction to scope of pharmacology in cosmetics: Introduction, terminologies, pharmacokinetics, pharmacodynamics. pharmacology of cosmeceuticals: antiaging, antiwrinkle, antiacne, antiinflammerty, antidandruff, fairness- bleaching and sunscreen

Unit:2 **(10 L)**

Study of side effects of cosmetic ingredients & products coming in contact with below body parts-
i) Nails ii) Hair iii) Sweat gland iv) Sebaceous gland

Unit:3 **(10 L)**

a) Study of disorders of skin and treatment
b) Skin pigmentation, disorder of pigmentation, various pigmentary and depigmentary agents used on above disorders

Unit:4 **(10 L)**

Study of disorders and treatment of teeth. Study of side effects of dentifrices mouth wash & gargels.

Books Recommended:

1. Human Physiology – by C.C. Chatterjee.
2. Roxburis Common Skin Diseases.
3. Clinical Dermatology – An individual approach by John T. Ingrans.
4. The merck manual of Diagnosis and Therapy.
5. Unwanted Effects of Cosmetics and Drugs used in Dermatology By. J. P. Nater, Groot & Liem.
6. Harry's Cosmetology.

HCP 5.1: Practical I

Perfumes-I

- 1] Distillation of water and alcohol
- 2] Isolation of essential oil – Extraction (from bark, Flowers etc.) distillation.
- 3] Study of soxhlet apparatus & its use.
- 4] Preparation of water extracts of turmeric (Haldi), Shikaki, Ritha, Ginger.
- 5] Preparation of alcoholic extract of above herb.
- 6] Deodorization of alcohol.

Cosmetic Technology-III

Preparation of :

1. Cleansing Creams.
2. Cold Cream.
3. Vanishing Cream.
4. Emollient Cream.
5. Hand Cream.
6. Bath Preparations - Bath oils and bath foam

HCP 5.2: Practical II

Principles of Cosmeceutics-I

- 1] Determination of surface tension.
- 2] Determination of Interfacial Tension and spreading Coefficient.
- 3] To find critical micellar concentration (cmc) of the given surfactants.
- 4] Effect of phase – volume ratio on stability of emulsion.
- 5] Evaluation of Emulsion stability and shelf life.
- 6] To study and verify Freundlich Adsorption Isotherm.
- 7] To calculate sedimentation parameters of suspension.
- 8] Determination of globule size of emulsion- effect of emulgent

Beauty Culture –I

- 1) methods for eyebrow shaping
- 2) treatment for superfluous hair waxing
- 3] Facial
 - a) Skin analysis
 - b) Facial massage techniques
 - c) Use of different face pack ingredients .
- 4] General facial treatment.
- 5] Herbal facial treatment.
- 6] Fruit Facial
- 7] Different types of facial treatments
 - a) Facial for Mature skin
 - b) Facial for sensitive skin
 - c) Facial for acnified skin
- 8] Aroma Therapy
 - a) Aroma Facial for different skin type

SEMESTER -VI

Paper Code: HCT 6.1

Perfumes-II

Objectives:

1. The source, basic structure of a fragrance along with commonly used ingredients, fragrance strengths, notes and the role of perfumers.
2. The typical approach to fragrance selection, by notes or classification.
3. To know the manufacturing method (Types of reaction) involved in preparation of fragrance.

Learning Outcomes: At the end of the course students will be

1. Able to recognize perfumery ingredients.
2. Able to identify Source, role or uses, note will know that will be helpful in selecting fragrance.
3. Recognition and Utilization of proper manufacturing methods (Types of reaction) for preparation of fragrance substance.

Unit:1

(10 L)

- A) Fixatives – Sources, Classification, Chemical composition and uses -i) Animal Source – Civet, Musk, Ambergris.
ii) Resinous Fixatives – Benzoin, Balsam, Myrrh.
iii) Essential oil Fixatives – Sandalwood, Lemon, Cinnamon.
iv) Synthetic Fixatives. Diethyl Phthalate, Benzyl Benzoate.
B) Selection and uses of fixatives.
C) Building of perfumes and body of the perfumes.

Unit: 2

(10 L)

- Odorous materials manufactured synthetically by (Reaction and flow diagrams)
a) Condensation – Coumarin and cinnamic aldehyde and Esterification – Benzyl acetate, Benzyl Benzoate.

Unit:3

(10 L)

- Odorous materials manufactured synthetically by (Reaction and flow diagrams)
Nitration – Musk ambrette, musk xylene and Musk Ketone.

Unit:4

(10 L)

- Odorous materials manufactured synthetically by (Reaction and flow diagrams) Grignard's Process – Phenyl ethyl alcohol and Hydrogenation – Citronellal from citronellal.

Books recommended:

1. Perfumes, Flavours and Essential oil Industries – SBP Board.
2. Manufacture of Perfumes, Cosmetics & Detergents – Giriraj Prasad
3. Perfumes: History & Chemistry Vol-I- Dr. D.D. Wasule
4. Cosmetics: Science & Technology – Sagarin.
5. Essential oils Vol. I by Gunther.
6. Perfumes, soups & Cosmetics – Poucher.

Paper code HCT 6.2
Cosmetic Technology-IV

Learning Objectives

Upon completion of this course the students will be familiar with:

1. The students will be familiar with specific actives used in cosmetic formulations, their technical aspects and evaluation methods.
2. Students will be familiar with chemistry involved in cosmetic formulations.
3. They will know common natural raw materials, especially the basic functional group involved, their physical and chemical properties and their applications.

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course, are described:

1. Able to formulate different Productive creams and hand cleansers.
2. Able to select correct Skin Products for Babies.
3. Able to formulate Face packs and Masks.
4. Able to formulate Coloured Make-up Preparations

Unit:1 **(10 L)**

- a) Protective creams and hand cleansers: Introduction; barrier material; protective cream and gels and formulation aspects.
- b) Skin lightener of bleaches: Formulation aspects.

Unit: 2 **(10L)**

Face packs and Masks: Introduction; water based systems, Rubber – Based systems, vinyl – based systems, hydrocolloid – based systems, Earth based systems, anti-wrinkle preparation and their formulation aspects.

Unit: 3 **(10 L)**

Skin Products for Babies: introduction, skin problems in babies, functions, requirement of body products, safety of baby products, example, formulations.

Unit: 4 **(10 L)**

- a) Coloured Make-up Preparations: Lipstick- Introduction. Ingredients of lipstick, Example formulation. Manufacture of lipsticks, transparent lipstick, lip salves, liquid lipsticks. Rouge Introduction, Dry rouge, Wax based rouge, cream rouge, liquid rouge.
- b) Eye make-up, Introduction, Mascara, Eye shadow, Eyeliner, Eyebrow pencil.

Books Recommended:

1. Harry's Cosmetology.
2. Cosmetic Science and Technology by Sagarin E.

Paper code HCT 6.3
Principles of Cosmeceutics-II

Learning Objectives

Upon completion of this course the students will be familiar with:

1. State the physicochemical properties like Particle size, distribution phenomenon and rheology.
2. They will know physicochemical concepts to be considered during formulation of Colloidal Dispersion.
3. Students will be familiar with evaluation method and assessment of distribution phenomenon, Colloidal Dispersion, micromeritics and Rheology.

Learning Outcomes :

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course, are described:

1. Explain the role of distribution phenomenon and Rheology.
2. Understand the physical properties of colloidal dispersion.
3. Understand of physicochemical properties of drugs including particle size.

Unit:1: (10 L)

Distribution phenomenon: Distribution of solute between immiscible liquids, ionic dissociation and molecular association influencing partitioning, Applications of distribution phenomenon.

Unit:2 (10 L)

Colloidal Dispersion: Properties of colloids – Optical, kinetic and electrical and their applicability in determining molecular weight of polymer, stability of colloidal systems mechanism of peptization.

Unit:3 (10 L)

Rheology: Types of flow behaviour, thixotropy and thixotropic coefficient measurement of various rheological properties, factors influencing rheology of dispersed systems.

Unit:4 (10 L)

Micromeritics: Particle size, size distribution, shape and surface area and their determination in heterogeneous systems. Porosity density and packaging arrangements in flow properties and their influence on processing of solid preparations.

Books Recommended:

1. Martin, Swarbrick. Commerate&cuhn Physical Pharmacy.
2. Burger & Lee, Physical and Technical Pharmacy.
3. Rawlins : Bentley's Text Book of Pharmaceutics.
4. Shilton and Ridgway : Physical Pharmaceutic.
5. Remingtons Pharmaceutical Practices.

Paper Code HCT 6.4

Beauty Culture-II

Objectives: Upon studying of the subject Beauty Culture II student shall be able gain:

1. Different types of Makes ups along with pre-make up, and its techniques.
2. Concept of corrective make up.
3. Information regarding the general problems related with hair, nail along with its care.

Learning Outcomes: At the end of the course students will be

1. Able to learn the different types and techniques of make up
2. Able to utilize applications of cosmetics
3. Able to learn about proper hair and nail care procedure.

Unit: 1

(10 L)

- a) Beautician's attitude to client and professional ethics
- b) Different shapes of faces

Unit: 2

(10 L)

Make – up :

- a) i. Pre Make-up skin care. ii. Make-up Techniques – Complexion planning.
- b) Application of cosmetics
 - i. Cleanser ii. Toner iii. Astringent. iv. Moisturizer v. Foundation. vi. Powder. vii. Blusher. viii Lipsticks.
- c) Different types of make-ups
 - i) Day Make-up ii) Evening Make-up. iii) Party Make-up. iv) Bridal Make-up

Unit: 3

(10 L)

I) Corrective Make-up for

- a) Face shapes b) Eyes c) Lips c) Nose

II) Application of false eye lashes method and contraindication.

Unit: 4

(10 L)

Hair and nail care:

Structure and types of hair,

- a) General problems and care for hair. b) Natural Dyes and Chemical Dyes c) Shampoo & Conditioner.

Nail care: manicure, pedicure.

Books recommended:

1. Ann Eaton and Florence Openshaw, Cosmetic Make – Up and Manicure.
2. A Professional Guide to Hair Dressing and Beauty Therapy by Veena Pitre
3. The Science of Cosmetics by John V. Simmons
4. Complete Beauty Book by Helen Foster
5. Vogue- Body and Beauty Book by Bronwen Meredith
6. A Guide for Health & Beauty Therapist Vol.-1 Face, hands and feet by Gaynor Winyard.

Paper code SCT 6.1
Cosmetic Engineering-IV

Objectives: Upon studying of the subject Cosmetic Engineering IV student shall be able gain:

1. Handy knowledge on various processes undergoing in pharmaceutical as well as cosmetic industries
Distillation, Separation of azeotropes, Evaporation and Drying.
To know various mechanical devices/ equipment's used in processes mentioned above.

OUTCOME: Students will get familiar with:

1. Various unit operations used in Pharmaceutical industries and Cosmetic Industry.
2. Working principle of equipment's used in Distillation, Evaporation Drying.
3. Advantages and Disadvantages, Classification, various factors affection of the processes mentioned above.

Unit:1

10 L

Distillation :Raoult's law & Henry's law, theory of distillation of binary mixtures of miscible, immiscible and partially miscible liquids, study of distillation equipment used for simple vacuum steam, reflux & molecular distillation.

Unit:2

10 L

Separation of Azeotropes (Binary & Ternary) and liquids of similar volatility. Rectification & fractionation.

Unit:3

10 L

Evaporation: factors affecting evaporation, study of short tube long tube, agitated, film, evaporator performance of tubular evaporator, improving efficiency of evaporation.

Unit:4

10 L

Drying : Definition purpose of drying, theory of drying / loss on drying, moisture content and equilibrium moisture content, classification of dryers, study of tray, Rotary, Vacuum, fluidized bed dryers.

Book Recommended:

4. Introduction to Chemical Engineering – Badger & Banchero.
5. Unit Operation in Chemical Engineering Mc-cabe & Smith.
6. Chemical Engineering Vol. I & II – Richardson & Coulson.

Paper Code HCT 6.2
Pharmacology & Interaction-II

Objectives: Upon studying of the subject introductory pharmacology & toxicology – II student shall be able to:

1. Pharmacology of various topical applications (The preparations applied on skin surface)
2. Explain the mechanism of drug action.

OUTCOME: Students will get familiar with:

1. Mechanism of action of various drugs such as Anti-infective, Antidandruff, Antiaging, Anti-inflammatory etc.
2. Applying the basic pharmacological knowledge in the prevention and treatment of various diseases.

Unit:1 **10 L**
Allergy and antigen – antibody reaction, types of Hypersensitivity reaction and disorders due to hyper sensitivity reactions and a topic dermatitis.

Unit:2 **10 L**
a) Dermatitis – various types and their clinical feature.
Acute Toxic contact dermatitis, Allergic contact dermatitis, Irritant contact dermatitis, phototoxic contact dermatitis.
b) Dermatological testing as per BIS specification patch testing, repeated insult patch testing cumulative irritation test photo allergic test phototoxicity test.

Unit:3 **10L**
Disorders and treatment of feet, foot cosmetics.

Unit:4 **10 L**
Methods for animal testing for safety evaluation of cosmetics

Books Recommended:

- 1 Human Physiology – by C.C. Chatterjee.
- 2 Roxburgs Common Skin Diseases.
- 3 Clinical Dermatology – An individual approach by John T. Ingrans.
- 4 The Merck Manual of Diagnosis and Therapy.
- 5 Unwanted Effects of Cosmetics and Drugs used in Dermatology By. J. P. Nater, Groot & Liem.
- 6 Harry's Cosmetology.

HCP 6.1 Practicals – I

Perfumes-II

- 1] Synthesis of odorous material (Any one) by following methods
 - a) Condensation (Coumarin/Diphenyl oxide / cinnamic aldehyde)
 - b) Esterification (Benzyl acetate/ Benzyl Benzoate.
 - c) Hydrogenation (Citronellal from citronellal)
 - d) Nitration (Musk ambrette/ musk xylene /Musk Ketone)
 - e) Oxidation (Vanillin/ Heleotropins/ anisaldehyde/ Benzaldehyde)
- 2] Peppermint oil – Assay – for esters and ketones
- 3] Clove oil – determination of phenol contents
- 4] Wintergreen oil – determination of methyl salicylate content
- Test for acidity.

Cosmetic Technology-IV

- 1] Rouge.
- 2] Lipstick
- 3] Deodorant preparations
- 4] Lotions – Cleansing and moisturizing
- 5] Eye shadow, mascara
- 6] Soap Preparation

HCP 6.2 Practical – II

Principles of Cosmeceutics-II

1. Evaluation of suspension stability
2. To find out the partition coefficient & distribution of drug between two phases.
3. To determine molecular weight by viscosity measurement method
4. To verify the Hofmeister series for the flocculation of colloids.
5. Determination of globule size of emulsion – effect of internal phase.
6. To study Krafft point and Cloud point
7. Determination of Angle of repose and study the flow properties of powders.
8. To study the bulk density and porosity of powders.

Beauty Culture - II

1. Make-up.

Different make-up Techniques.

- i. Use of different make-up cosmetics
 - ii. Day make-up
 - iii. Party make-up
 - iv. Bridal make-up
 - v. Make-up interview
 - vi. Corrective make-up
 - vii. Application of false eye lashes.
2. Different formulations for Nail and Hair care Hair
 - a)Nail: manicure, pedicure
 - b)Hair: i. General hair care. ii. Treatment for hair falling and dandruff
3. Hair styles & Hair setting :
 - i. Formal ii. Informal
 - iii. Treatment for Hair.