

Punyashlok Ahilyadevi Holkar Solapur University Solapur



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

Name of the Faculty: Science & Technology

**Syllabus: M.Tech. V (Semester- IX & X)
(Syllabus to be implemented from w.e.f. June 2024)**

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

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 FiveYear 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)

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

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

Standard of Passing: As per University norms

Nature of question paper with scheme of marking: Each theory paper will have 100 marks out of which 80 marks will be for Term End examination (University Examination) and 20 marks for Internal Assessment. Practical paper will have 100 marks out of which 80 marks will be for Term End examination and 20 marks for Internal Assessment. The candidate has to appear for internal evaluation of 20 marks and external evaluation (University Examination) of 80 marks for each theory paper. The candidate also has to appear for internal evaluation of 20 marks and external evaluation (University Examination) of 80 marks for practical paper.

I) Nature of Theory questionpaper:

1) Q nos. 1 and 2 are compulsory

2) Attempt any three questions from Q No. 3 to Q No. 7

Q. No.1) A. **Choose Correct alternative (MCQ) (10 Marks)**

B. **Fill in the blanks or write true of false (6Marks)**

Q.No.2) Answer the following (16 Marks)A)

B)

C)

D)

Q.No.3) Answer the following. (16 Marks)A)

B)

Q. No.4) Answer the following (16 Marks)A)

B)

Q.No.5) Answer of the following (16 Marks)A)

B)

Q.No.6) Answer of the following (16 Marks)A)

B)

Q.No.7) Answer of the following (16 Marks)A)

B)

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

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

Rules and regulations and ordinance if any: NA

Medium of the language: English

Staffing of pattern: Contract/CHB

Paper duration: 3hrsforTheory/3hrsfor Practical.

To be introduced from: June2024

Structure of the Course:

Fifth Year syllabus(according to the Semester Pattern Examination)to be effective fromthe Academic Year 2024-25

Semester	Code	Title of the Paper	Semester Examination			L	T	P	Credits
			Theory	IA	Total				
Sem-IX		Hard Core							
	HCT9.1	Advanced Cosmetic Technology-I	80	20	100	4		--	4
	HCT9.2	Advanced Cosmetic Technology-II	80	20	100	4		--	4
	HCP9.1	Advanced Cosmetic Technology Practical-I	40	10	50	-		4	2
	HCP9.2	Advanced Cosmetic Technology Practical-II	40	10	50	-		4	2
	Total for Semester –IX			240	60	300	8		8
	HCT10.1	Research Methodology	40	10	50	2		--	2
Sem-X		Seminar, Presentation, Dissertation	245	105	350	14		--	14
	Total for Semester –X		285	115	400	16		--	16

L=Lecture T=Tutorials
CA=College Assessment
HCP=Hard Core Practical

P=Practical UA=University Assessment
HCT=Hard Core Theory SCT=Soft Core Theory,

Paper code: HCT 9.1
Advanced Cosmetic Technology-I

Learning Objectives

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

1. The students will be familiar with various unit operations related to the cosmetics such as emulsification, mixing etc.
2. The students will be familiar with novel delivery system for cosmetics.
3. The students will be familiar with preparation and techniques for advanced cosmetics formulation thorough the chemical and physical properties of ingredients, as well as the interactions that occur during the formulation process.
4. The students will be familiar with various regulations such as EU regulations.

Learning Outcomes:

At the end of the course students will be able to

1. To select the stable and effective ingredients.
2. Gain knowledge of various techniques (unit operation) such as emulsification, homogenization, etc. to create safe, effective, and aesthetically pleasing cosmetic products.
3. Develop cosmetic products based on regulatory requirements.

Unit1: Unit Operations:

(15L)

Unit operations related to manufacturing of cosmetics: Emulsification, mixing, compaction, moulding, study of machines used in unit operations. Raw materials commonly used: water, preservatives, antioxidants, humectants, oils, fats & waxes. Control of microbial contamination in manufacturing of cosmetics and use of cyclodextrins in cosmetic preparations.

Unit2: Topical active delivery system

(15L)

Percutaneous absorption, factors affecting vehicles in cosmetic preparation, enhancers in control release of cosmetics. General consideration, design & formulation options as microencapsulation, Liposome, nanoparticles.

Unit3:

(20L)

A) Antimicrobials used as preservatives, their merits and demerits .Factors affecting microbial preservative efficacy.

B) Perfumes; Classification of perfumes. Perfume ingredients listed as allergens in EU regulations and BIS. Controversial ingredients: Parabens, formaldehyde liberators, dioxane.

C) Review of guidelines for herbal cosmetics by private bodies like cosmos with respect to preservatives, emollients, foaming agents, emulsifiers and rheology modifiers. Challenges in formulating herbal cosmetics.

Unit4: Introduction to nanotechnology

(10L)

Preparation of Nanotechnology based vesicles Cosmetics-Skin care & Hair Care Products.

Books Recommended

- 1) Cosmetics science & Technology vol I, II IV by sqqrix
- 2) Harry's Cosmetology
- 3) New Cosmetics science
- 4) Novel Cosmetic Market & Dehairker
- 5) Cosmetics technology by Nanda &Khar
- 6) Theory & Practicals in Novel Drug Delivery Systems
- 7) Text Book of cosmetics by S.P. Vyas, NPMQ, Rathore &Dubey

Paper code: HCT 9.2
Advanced Cosmetic Technology-II

Learning Objectives

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

1. The students will be familiar with novel delivery system and techniques for cosmetics formulation.
2. The students will be familiar with preparation and techniques for advanced cosmetics formulation thorough the chemical and physical properties of ingredients, as well as the interactions that occur during the formulation process.
3. The students will be familiar with formulation aspects of nail cosmetic and their quality control.
4. The students will be familiar with concepts for development of new cosmetics and safety concerns of cosmetics.

Learning Outcomes:

At the end of the course students will be able to

1. Formulate advanced cosmetics formulation.
2. Formulate nail products correctly and effectively.
3. Know the safety concerns of cosmetics.

Unit1: Microencapsulation technique in Cosmetics: - (15L)

Definition of microcapsules study of core & coating materials used in microencapsulation along with its advantages& disadvantages. Various methods used to prepare microcapsules like polymerization technique, phase separation coacervation technique(s), spray drying & congealing etc. study of microspheres & its preparation. Evaluation of microcapsules & microspheres.

Unit2: Nail Cosmetics: (15L)

Cuticle cream, oils &removers, nail bleaches .Nail polish using film forming polymers as basic materials, Their Quality control and testing.

Unit3: Liposomal delivery of cosmetics: (15L)

Definition, advantages, disadvantages, composition, classification, loading techniques. Preparations of liposomes by various methods, characterization of liposomes, Niosomes, discomes, organogels & detailed study related to cosmetics

Unit4: Development of New Cosmetics: (15L)

Steps involved in development of new cosmetics, abstracts to its evaluation, limitation of screening procedures, skin toxicity test. Safety concerns of Cosmetics, Role of MNC's in Neutracosmetics,

Books Recommended

- 1) Cosmetics science &Technology vol I, II IV by sqqrix
- 2) Harry's Cosmetology
- 3) New Cosmetics science
- 4) Novel Cosmetic Market &Dehairker
- 5) Cosmetics technology by Nanda &Khar
- 6) Theory &Practicals in Novel Drug Delivery Systems
- 7) Text Book of cosmetic by S.P. Vyas, NPMQ, Rathore & Dube

Paper Code: HCP9.1

Advanced Cosmetic Technology I-Practical

- 1) Preparations of liposome.

- 2) Formulations and preparations of Dental cosmetics.
 - A) Toothpaste
 - B) Tooth Gel
 - C) Tooth Powders

Paper Code: HCP9.2

Advanced Cosmetic Technology-II Practical

- 1) Preparations of microcapsules using biodegradable polymer (Natural & synthetic)

- 2) Formulations and preparation of Cosmetics for Nails:
 - A) Cuticle creams
 - B) Cuticle oils and removers
 - C) Nail bleaches
 - D) Nail Polish
 - E) Nail Polish Removers

Semester X
Paper code: HCT10.1 Research Methodology

Learning Objectives

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

1. Some basic concepts of research and its methodologies.
2. Organization and conduction of research in a more appropriate manner.
3. Research problem and parameters.
4. Research report and thesis writing.

Learning Outcomes:

At the end of the course students will be able to

1. Understand the basics in research methodology and applying them in research/ project work.
2. To select an appropriate research design.
3. Take up and implement a research project/ study.
4. Develop skills in qualitative and quantitative data analysis and presentation.
5. Demonstrate the ability to choose methods appropriate to research objectives.

Unit 1: Introduction to Research Methodology– Importance of research in decision making, defining research problem and formulation of scientific experimental design. Data Collection and Measurement:- Methods and techniques of data collection sampling and sampling designs.

Data Presentation and Analysis: - Data processing statistical analysis and interpretation of data non-parametric tests multivariate analysis of data model building and decision making. **(10L)**

Unit 2: Research Design - The nature of research design, formulation of research design, classification of research designs: Descriptive, experimental, exploratory, diagnostic, correlative, action and evaluation, developing a research plan; determining experimental and sample designs, Pilot Study **(10L)**

Unit 3: Report Writing: - Structure and components of scientific reports, types of report, Significance, Different steps in the preparation, layout, structure and language of typical reports, illustrations and tables, bibliography, Webliography, referencing, perfect pages, prefectural quotation, different report writing manuals, Appendices, plagiarism. **(10L)**

Unit4: Research Paper: Preparation of research paper, presentation of research **(10L)**

Reference Books:-

- 1) Methodology of Economic Research by A.K.Dasgupta.
- 2) An introduction to Research Methodology; Garg B.L., Karadia, R., Agarwal, F. and Agarwal, U.K., 2002., RBSA Publishers.
- 3) Research Methodology: Methods and Techniques, Kothari C.R., 1990. New Age International.
- 4) Research Methodology; Sinha S.C. and Dhiman, A.K., 2002. Ess Publications. 2 volumes.
- 5) Research Methods: The concise knowledge base; Trochim W.M.K., 2005. Atomic Dog Publishing. 270p.
- 6) Research Methodology; Panneerselvam R., PHI, Learning Pvt. Ltd., New Delhi –2009
- 7) Research Methodology: Concepts and cases, Chawala D. and N.Sondhi; Vikas Publishing House Pvt. Ltd

Dissertation:

Every student for the degree of 5 years Integrated M. Tech. in Cosmetic Technology (Part V/ Sem X) should undertake a dissertation work involving Methodical research under the supervision of School Faculty and submit three copies of the report of the dissertation work, duly certified by the Faculty and Director of School of Technology.

Seminar:

The candidate shall deliver seminar during the session, on selected topics of current research interest as reported in the research journals in the field of Cosmetic Technology. The candidate shall deliver Presentation after completion of dissertation work.

Viva-Voce: Viva-voce shall be based on dissertation work.

Seminar, Dissertation & Viva-voce

Contents Credits

Sr. No.	Content	Credits	Marks
1	Introduction, Literature review	02	50
2	Experimental Work	04	100
3	Result/ Conclusion	04	100
4	Dissertation, Viva Voce and Evaluation (Organization of scientific material, thesis dissertation and references)	04	100
Total		14	350