

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 2022)**

**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 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)

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 100 marks out of which 70 marks will be for Term End examination (University Examination) and 30 marks for Internal Assessment. Practical paper will have 100 marks out of which 70 marks will be for Term End examination and 30 marks for Internal Assessment. The candidate has to appear for internal evaluation of 30 marks and external evaluation (University Examination) of 70 marks for each theory paper. The candidate also has to appear for internal evaluation of 30 marks and external evaluation (University Examination) of 70 marks for practical paper.

I) Nature of Theory question paper:

Q.1 Multiple Choice Questions (14)

Q.2 A) Answer the following (Any Four) 08

1. 02
2. 02
3. 02
4. 02
5. 02

B) Write Notes on (Any Two) 06

1. 03
2. 03
3. 03

Q.3 A) Answer the following (Any two) 08

1. 04
2. 04
3. 04

B) Answer the following (Any One) 06

- 1.06
- 2.06

Q.4 A) Answer the following (Any Two) 10

- 1.05
- 2.05
- 3.05

B) Answer the following (Any One) 04

- 1.04
- 2.04

Q.5 Answer the following (Any two) 14

- 1.07
- 2.07
- 3.07

II) Nature of Practical question paper: Practical examination will be of 3 hours duration carrying 80 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

Staffing of pattern: Contract/CHB

Paper duration: 3hrs for Theory /3 hrs for Practical.

To be introduced from: June 2022

Structure of the Course:

Fifth 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 | | | | |
| | | Hard Core | | | | | | | |
| Sem-IX | HCT9.1 | AdvancedCosmeticTechnology-I | 70 | 30 | 100 | 4 | - | -- | 4 |
| | HCT9.2 | AdvancedCosmeticTechnology-II | 70 | 30 | 100 | 4 | - | -- | 4 |
| | HCP9.1 | AdvancedCosmeticTechnology Practical -I | 35 | 15 | 50 | - | - | 4 | 2 |
| | HCP9.2 | AdvancedCosmeticTechnology Practical -II | 35 | 15 | 50 | - | - | 4 | 2 |
| | | | | | | | | | |
| | Total for Semester –IX | | | 210 | 90 | 300 | 8 | - | 8 |
| | HCT10.1 | ResearchMethodology | 35 | 15 | 50 | 2 | - | -- | 2 |
| | | | | | | | | | |
| Sem -X | | Seminar, Presentation, Dissertation | 245 | 105 | 350 | 14 | - | -- | 14 |
| | Total for Semester – X | | 280 | 120 | 400 | - | - | -- | 16 |

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

Paper code: HCT 9.1
Advanced Cosmetic Technology-I

Unit 1: 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.

Unit 2: 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.

Unit 3: (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.

Unit 4: Introduction to nanotechnology (10L)

Preparation of Nanotechnology based vesicles Cosmetics-Skincare & 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 S.P. Vyas cosmetics by NPMQ, Rathore & Dubey

Paper code: HCT 9.2
Advanced Cosmetic Technology-II

Unit 1: 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 study of microspheres & its preparation. Evaluation of microcapsules & microspheres.

Unit 2: Nail Cosmetics: (15L)

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

Unit 3 :Liposomal delivery of cosmetics: (15L)

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

Unit 4: 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 S.P. Vyas cosmetics by NPMQ, Rathore & Dube

Paper Code: HCP 9.1

AdvancedCosmeticTechnologyI- Practical

- 1) Preparations of microcapsules usingbiodegradable polymer(Natural&synthetic)
.
- 2) Formulations and preparations of Dental cosmetics.
 - A) Tooth paste
 - B)Tooth Gel
 - C) Tooth Powders

Paper Code: HCP 9.2

AdvancedCosmeticTechnology-II Practical

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

- 3) Preparations of liposome using differentfilmformers&bases.

Semester X
Paper code: HCT 10.1
Research Methodology

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)

Unit 4: 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 | 06 | 150 |
| 3 | Result/ Conclusion | 04 | 100 |
| 4 | Dissertation, Viva Voce and Evaluation (Organization of scientific material, thesis dissertation and references) | 04 | 100 |
| Total | | 16 | 400 |