
Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur Syllabus For

MASTER OF SCIENCE COSMETIC TECHNOLOGY

Choice Based Credit System (Semester Pattern) with

effect from 2023-24 as per NEP 2020

Examination leading to Master of Science Cosmetic Technology

Scheme of teaching and examination under semester
pattern Choice Based Credit System (CBCS)

APPENDIX–A1

Semester-I: Master of Science Cosmetic Technology											
CourseCategory	Code	Theory/Practical	TeachingScheme (Hrs/week)			Credits	ExaminationScheme				
			Theory	Practical	Total		Duration(Hrs)	Max.Marks		TotalMarks	Min.Passing Marks
								SEE	CIE		
DS C	1MCT-T-1	Paper-1 Formulation &Development (FD)	4	--	4	4	3	80	20	100	40
DS C	1MCT-T-2	Paper – 2 Quality Assurance Technique (QAT)	4	--	4	4	3	80	20	100	40
DS E	1MCT-T-3	Paper -3 Elective – I Principles of Cosmetic Technology (PCT) OR Paper -3 Elective – II Concepts In Cosmetic Technology(CCT)	4	--	4	4	3	80	20	100	40
RM	1MCT-T-4	Paper-4 Research Methodology(RM)	4	--	4	4	3	80	20	100	40
DS C	1MCT-P-1	Practical-1 Formulation& Development(FD)*	--	4	4	2	4	80	20	100	50
DS C	1MCT-P-2	Practical-2 Quality Assurance Technique (QAT)*	--	4	4	2	4	40	10	50	25
RM	1MCT-P-3	Practical-3 Research Methodology(RM)	--	4	4	2	4	--	50	50	25
Total			16	12	28	22		440	160	600	260

CIE–Continuous Internal Evaluation SEE–Semester End Examination

***Practical- University Exam**

APPENDIX–A2

Semester-II: Master of Science Cosmetic Technology												
Course Category	Code	Theory/Practical	Teaching Scheme (Hrs/week)			Credits	Examination Scheme					
			Theory	Practical	Total		Duration(Hrs)	Max. Marks		Total Marks	Min. Passing Marks	
								SE E	CIE			
DSC	2MCT-T-1	Paper-1 Formulation& Development(FD)	4	--	4	4	3	80	20	100	40	
DSC	2MCT-T-2	Paper-2 Conceptsand Principles in Cosmetics Technology(CPCT)	4	--	4	4	3	80	20	100	40	
DSE	2MCT-T-3	Paper -3 Elective – I Statistics and Qualitative Techniques(SQT)O R Paper-3 Elective–II Statistical Evaluation& Analysis(SEA)	4	--	4	4	3	80	20	100	40	
OJT-FP	2MCT-T-4	Paper – 4 Natural Products(NP)	4	--	4	4	3	80	20	100	40	
DSC	2MCT-P-1	Practical-1 Formulation& Development(FD)*	--	4	4	2	6	80	20	100	50	
DSC	2MCT-P-2	Practical - 2 ConceptsAnd Principles In Cosmetics Technology(CPCT) *	--	4	4	2	6	40	10	50	25	
DSE	2MCT-P-3	Practical – 3 Elective –I Statistics and Qualitative Techniques(SQT)OR Practical – 3 Elective –II Statistical Evaluation &Analysis(SEA)	--	4	4	2	--	--	50	50	25	
Total			16	12	28	22		440	160	600	260	
Cum.Cr.for1YrPGDegree						44						

CIE–Continuous Internal Evaluation SEE– Semester End Examination

***Practical- University Exam**

APPENDIX–A3

	Semester-III: Master of Science Cosmetic Technology										
CourseCategory	Code	Theory/Practical	Teaching Scheme(Hrs/week)			Credits	Examination Scheme				
			Theory	Practical	Total		Duration(Hrs)	Max. Marks		Total Marks	Min. Passing Marks
								SEE	CIE		
DSC	3MCT-T-1	Paper-1 Advance Cosmetics Technology(ACT)	4	--	4	4	3	80	20	100	40
DSC	3MCT-T-2	Paper – 2 Perfumes & Colours in Cosmetics (PCC)	4	--	4	4	3	80	20	100	40
DSE	3MCT-T-3	Paper – 3 Elective – I Quality Assurance Technique for Skin Cosmetics (QATSC)OR Paper–3Elective–II Quality Assurance Technique for Hair Cosmetics(QATHC)	4	--	4	4	3	80	20	100	40
RP	3MCT-T-4	Paper – 4 Research Designing and Planning (RDP)	4	--	4	4	3	80	20	100	40
DSC	3MCT-P-1	Practical-1 Advance Cosmetics Technology(ACT) *	--	4	4	4	6	80	20	100	50
DSC	3MCT-P-2	Practical-2 Perfumes & Colours in Cosmetics (PCC)	--	4	4	4	6	40	10	50	25
RP	3MCT-P-3	Practical – 3 Research Designing and Planning (RDP)+ Presentation	--	4	4	2	--	00	50	50	25
	Total		16	12	28	22		440	160	600	260

CIE–Continuous Internal Evaluation

SEE–Semester End Examination

Note:-*Practical-University Exam

- 1) Every student should carry out literature survey for selection of Research topic.
- 2) Finalization of topic of Research and title in consultation with allotted guide.
- 3) Preparation of Synopsis
- 4) Presentation/Seminar to be delivered on selected Research topic.
- 5) At least one Review article is expected to be published in UGC/Refereed/peer reviewed/Web of Science/Scopus/Elsevier or ISBN numbered Journal.

APPENDIX–A4

Semester-IV: Master of Science Cosmetic Technology											
CourseCategory	Code	Theory/Practical	Teachin gScheme (Hrs/wee k)			Credits	ExaminationScheme				
			Theory	Practical	Total		Duration(Hrs)	Max.Marks		Tota lMar ks	Min.P assing Mark s
								SE E	CIE		
DSC	4MCT-T-1	Paper-1 Cosmetics Microbiology(CM)	4	--	4	4	3	80	20	100	40
DSC	4MCT-T-2	Paper-2 Cosmetics Validation (CV)	4	--	4	4	3	80	20	100	40
DSE	4MCT-T-3	Elective – I Skin Care Cosmetics (SCC) OR Elective – II Hair Care Cosmetics (HCC)	4	--	4	4	3	80	20	100	40
DSC	4MCT-P-1	Practical-1 Cosmetics Microbiology(CM)*	--	4	4	2	4	80	20	100	50
DSE	4MCT-P-2	Practical -2 Elective – I Skin Care Cosmetics (SCC) OR Elective – II Hair Care Cosmetics (HCC)	--	4	4	2	4	40	10	50	25
RP	4MCT-P-3	Practical-3 Research Project(RP)	--	6	6	6	4	100	50	150	75
Total			12	14	26	22		460	140	600	270
Cum.Cr.for2YrPGDegree						88					

CIE–ContinuousInternalEvaluationSEE–
SemesterEndExamination

***Practical- UniversityExam**

Abbreviations:Yr.:Year;Sem.:Semester;OJT:OnJobTraining;Internship/Apprenticeship;FP:
Field projects; RM: Research Methodology; Research Project: RP; Cumulative
Credits:Cum.Cr.

Program Outcome

Master of Science Cosmetic Technology

The Two year Post graduate degree course leading to **Master of Science Cosmetic Technology** (permanently run on non-grant basis), affiliated to RTM Nagpur University Nagpur and recognized by University Grants Commission, New Delhi.

Program Outcome

- 1) Being a professional course, the main aim is to develop professional, creative and skilled students for Cosmetic industry.
- 2) To develop the students who can work in all the streams of profession in the Cosmetic industry like Quality Control and Evaluation, Research and Development, Manufacturing, Packaging, Techno-Marketing of Cosmetics etc.
- 3) To use the technology for the betterment of society and self-employment as well.
- 4) The students study the regulatory affairs and Intellectual Property Rights to understand their responsibility towards citizens and society.
- 5) Students also study Research Methodology to carry out the research in scientific manner.
- 6) The Two year curriculum develops professionalism, leadership qualities and administrative capabilities in the student.
- 7) After the Post-graduation the students may pursue Research leading to Ph.D. programme as well as Post Ph. D Programme. This enables the students to work at higher position in the Academics and Industries.
- 8) As the course contents are modified and updated frequently this course is also at par with many educational institutions catering to similar courses abroad enabling our students getting admitted there for higher studies.
- 9) This course imparts qualities of understanding safety of health care products like cosmetics and inculcate the ability towards social responsibility, research and nation building.

MASTER OF SCIENCE COSMETIC TECHNOLOGY SEMESTER I

1MCT-T-1 Paper – 1 FORMULATION & DEVELOPMENT

		Total Marks –	100
		SEE -	80
		CIE -	20
1	Consideration of physical and chemical problems inherent in the formulation and development of cosmetic preparations.		
	a) Physical properties: - Physical forms, practical size, solubility, wetting of solids and flow, cohesiveness and organoleptic properties.		
	b) Chemical properties and stability of ingredients and additives.		
2	Formulation Additives : Antioxidants and preservatives, Perfumes, Colouring and diluting agents, Emulsifying and suspending agents, Basic materials for Creams/Ointment bases, Solvents and Miscellaneous additives.		
3	Formulation and Development of cream / lotion (bases) Hair remover, Powder, Lipstick, Kajal, Mascara, Tooth powder, Tooth paste, Face pack, Shampoo, Colorants, Aerosol, Nail lacquer, Aftershave lotions, Shaving cream, Soap.		
4	Packaging of cosmetics – Filling of solids, semisolids & liquids. Materials used for cosmetic packaging, Rules & regulations and legal provisions for packaging & labeling.		

Recommended books:

1. Cosmetic Science and Technology; M.S.Balsam & E. Sagarin; 2nd Ed; Vol. I, II, III
2. Harry's Cosmeticology; J.B. Wilkinson & R.J.Moore; 7th Ed; 1982
3. The theory & Practice of Industrial Pharmacy; Leon Lachman, Herberrrt Leiberman & Joseph L Kanig; 3rd Ed; 1990
4. Perfumes: History & Chemistry; Dr D.D.Wasule; Vol 1; 1st Ed; 2009
5. New Cosmetic Science; T Mitsui
6. Indian Herbs by Chopra
7. Wealth of India, published by CSIR

MASTER OF SCIENCE COSMETIC TECHNOLOGY SEMESTER I

1MCT-T-2 Paper -2 QUALITY ASSURANCE TECHNIQUES

		Total Marks –	100
		SEE -	80
		CIE -	20
1	Quality assurance management - Introduction Quality & related terms - Basic concepts Quality - quality functions, quality control, quality policy, quality objectives, quality assurance, quality management. Inspection and Test Inspection & Inspection planning, Inspection manual, Product acceptance inspection, Inspector errors. Sampling - Sampling plans, procedures		
2	Good manufacturing practices (GMP)-Schedule M, MI, MII, CGMP, Latest Amendments in GMP GLP - General provisions, organization and personnel facilities, equipment, testing facilities operation test and control articles, protocol for and conduct of a nonclinical laboratory study, records and reports. Laboratories safety planning and management, Biosafety, emergency procedures		
3	Analysis of raw materials and Evaluation of finished products giving emphasis on – Physicochemical properties, chemical analysis, identification, instrumental analysis biological toxicological testing, Raw Materials Waxes, fatty acids/ alcohols/ esters		

dispersing agents, colors, perfumes, preservatives antioxidants. Sweetening agents. Cosmetic or therapeutic agents, adsorbents etc.

Products -Emulsions (liquid, cream), suspension (lotion), powders (talcum, baby, compact) Lipsticks, Mascara, kajal, hair care products (shampoo, colorants) toothpastes, tooth powders, men's toiletries, antiperspirants deodorants, nail lacquers, aerosols etc.

- 4 Intellectual Property Right Act, its significance and importance with reference to cosmetics, ISO 9000 Systems.

Recommended books:

1. A.O.A.C. (Book published by Association of Organic and Analytical Chemistry).
2. W.A. Poucher : Perfumes, Cosmetics and Soap Volume I, II, and III – Chapman and Hall.
3. ISI booklets
4. Balsam et al : Cosmetics Science and Technology; Vol I, II and III. Wiley Interscience.
5. Standard methods of Chemical Analysis – Edited by Frant J. Welchar D. Van. Norstrand.
6. Calorimetric methods of Analysis by Z.D. Snell and C.T. – Snell - Van Norstrand Reinhold.
7. Toxicology of Drugs and Chemicals W.B. Deichman and H.W. Gerada, Academic Press.
8. Cosmetic Chemistry I; Dr.S. B. Kulkarni; Danait Publications.
9. Text Book of Toxicology – Dubols and Getting – Oxford.
10. How to practice G.M.P.; P.P. Sharma
11. Cosmetic formulation, Management and quality control by P.P. Sharma.
12. How to practice GLP; P.P. Sharma
13. Drug and Cosmetic Act. By GOI

MASTER OF COSMETIC TECHNOLOGY SEMESTER I 1MCT-T-3Paper – 3 ELECTIVE – I PRINCIPLES OF COSMETIC TECHNOLOGY(PCT)

Total Marks –	100
SEE -	80
CIE -	20

- 1 Interfacial Phenomenon:
Liquid – Liquid interface: Insoluble monolayers, surface pressure, surface potential, surface rheology and their measurement, structure and state of monolayers, mixed monolayers, Macromolecular films, Biological membranes, Liquid-solid interface, detailed study of wetting, detergency and water repellency.
- 2 Theories of dispersion Techniques :
Physical considerations, adsorption and interfacial energy, study of relevant equation, adsorption at solid surfaces, electrical phenomenon at interfaces, particle – particle interaction, influence of polymer adsorption on particle, Vehicle interaction, flocculation kinetics, controlled flocculation. Application of dispersion techniques in formulation of emulsion and suspension.
- 3 Concept of Solubilization:
Surface Active agents, Micelle formation, factors affecting micelle formation and physical methods of investigation of micellar solutions. Theory and mechanism of solubilization.
- 4 Solubilization and its applications:

Some factors in the formulation of Cosmeceuticals containing solubilized materials like choice of surface active agents, effect on the nature of the solubility, effect of cosolubilizing agents on the solubilizing action of surface active agents, effect of temperature on the solubilization, phase equilibria in systems containing surfactants, applications of solubilization, solubilization of phenolic disinfectants, Idophors, vitamin preparations, hormones solutions, steroids, flavors and perfumes etc.

Recommended books:

- 1) “Advances in Pharmaceutical Sciences” Vol. I, II, III & IV, edited by H,S Bean, A, H, Beckett & J.E.Carless.
- 2) Martin A.N. “Physical Pharmacy “, All editions
- 3) Lachman et. Al “The Theory and Practical of Industrial Pharmacy”, All editions
- 4) “Remington’s, Pharmaceutical Science”, 16th Ed
- 5) Badger W.L. & Banchemo; “Introduction of Chemical Engineering”.
- 6) Chemical Engineering by Richardson & Curdson.

OR

1MCT-T-3 Paper - 3 ELECTIVE – II CONCEPTS IN COSMETIC TECHNOLOGY (CCT)

Total Marks –	100
SEE -	80
CIE -	20

- 1 Study of Interfaces : Liquid – Liquid interface: Insoluble monolayers, surface pressure, surface potential, surface rheology and their measurement, structure and state of monolayers, mixed monolayers, Macromolecular films, Biological membranes, Liquid-solid interface, detailed study of wetting, detergency and water repellency.
- 2 Dispersion Phenomenon :
Physical considerations, adsorption and interfacial energy, study of relevant equation, adsorption at solid surfaces, electrical phenomenon at interfaces, particle – particle interaction, influence of polymer adsorption on particle, Vehicle interaction, flocculation kinetics, controlled flocculation. Application of dispersion techniques in formulation of emulsion and suspension.
- 3 Principles of Solubilization:
Surface Active agents, Micelle formation, factors affecting micelle formation and physical methods of investigation of micellar solutions. Theory and mechanism of solubilization.
- 4 Applications of Solubilization:
Some factors in the formulation of Cosmeceuticals containing solubilized materials like choice of surface active agents, effect on the nature of the solubility, effect of cosolubilizing agents on the solubilizing action of surface active agents, effect of temperature on the solubilization, phase equilibria in systems containing surfactants, applications of solubilization, solubilization of phenolic disinfectants, Idophors, vitamin preparations, hormones solutions, steroids, flavors and perfumes etc.

Recommended books:

- 7) “Advances in Pharmaceutical Sciences” Vol. I, II, III & IV, edited by H,S Bean, A, H, Beckett & J.E.Carless.
- 8) Martin A.N. “Physical Pharmacy “, All editions
- 9) Lachman et. Al “The Theory and Practical of Industrial Pharmacy”, All editions
- 10) “Remington’s, Pharmaceutical Science”, 16th Ed
- 11) Badger W.L. & Banchemo; “Introduction of Chemical Engineering”.
- 12) Chemical Engineering by Richardson & Curdson.

**MASTER OF SCIENCE COSMETIC
TECHNOLOGY**

SEMESTER I

1MCT-T-4 Paper – 4 RESEARCH METHODOLOGY (RM)

Total Marks –	100
SEE -	80
CIE -	20

- 1 Methods of sampling
Concept of sampling, Methods of sampling, probability sampling, non-probability sampling, choice of the sampling method, characteristics of a good sample.
- 2 Research tools-I: questionnaire rating scale, attitude scale and test: Introduction, scales of Data measurement, characteristics of a good research tool, validity, reliability, usability, types of tools and their uses, questionnaire and schedules, rating scale, attitude scale, tests.
- 3 Research tools –II: Interview, observation and documents :Introduction, types of tools and their uses, interview, observation, documents
- 4 Data collection: Introduction, concept of data, methods of data collection, asking questions, observation of behavior, utilizations of existing records of data, ensuring the quality of data.
- 5 Tabulation and organization of data: Introduction, types of data: quantitative and qualitative, processing of quantitative data, data processing, coding of data, preparing a master chart, tabulations and organization of quantitative data, frequency distribution, cumulative frequency distribution, contingency tables, graphical presentation of quantitative data, representation of frequency distribution, graphs for nominal and ordinal data, graphs for relation between two variables, qualitative data, organization of qualitative data.

Recommended Books:

1. Edwards: Experimental Design in Psychological Research.
2. Garrett, Henry E. (1971): Statistics in Psychology and Education, David Haley & Co.
3. Kerlinger: Foundation of Educational Research.
4. SPSS / PC for the IBM PC / XT, SPSS Inc.
5. Bandarkar, P.L. and Wilkinson T.S. (2000): Methodology and Techniques of Social Research, Himalaya Publishing House, Mumbai.
6. Stranss, A. and Corbin, J. (1990): Basis of Qualitative Research, Grounded Theory Procedures and Techniques, Sage Publications, California. Unwanted effects of cosmetics and drugs used in dermatology by J.P. Nater. Groot, & Liem.

MASTER OF SCIENCE COSMETIC TECHNOLOGY

1MCT-P-1 PRACTICAL -1 FORMULATION AND DEVELOPMENT (FD)

Total Marks –	100
SEE -	80
CIE -	20

1. Study of Physical and Chemical properties of ingredients used in Cosmetics
2. Development of following Cosmetic products and incorporation of additives like color, perfumes and study of effect of ingredients on the formulation of following products.
 - I. Emulsion – Skin cream/Lotion/Sunscreen/Skin lightening/Hair removing

- cream/any other
- II. Suspension–Kajal/Mascara/Face pack/Foundation/Calamine cream /Lotion, any other
- III. Powder- Talcum powder/Baby powder/Compact powders, any other
- IV. Hair care- Shampoo/Colorant(Synthetic /Herbal), Hair serum and Conditioner
- V. Oral care – Tooth paste and Tooth powder
- VI. Colored cosmetics – Nail lacquer, Lipsticks, Eye shadow, any other
- VII. Soaps
- VIII. Aerosol/Perfume
- IX. Men's toiletry - Shaving cream, Aftershave lotions

MASTER OF SCIENCE COSMETIC TECHNOLOGY

1MCT-P-2 PRACTICAL -2 QUALITY ASSURANCE TECHNIQUES (QAT)

Total Marks –	50
SEE -	40
CIE -	10

- 1 Carry out identification, physicochemical properties, chemical analysis, instrumental analysis, biological – toxicological testing for Raw Materials as per official standards:-

Waxes, fatty acids/ Alcohols/ esters, dispersing agents, colors, perfumes, preservatives, antioxidants, sweetening agents, cosmetic or therapeutic agents, adsorbents etc.

Finished Products :-

Emulsion, suspensions, powders (Talcum, baby and compacts). Lipsticks, mascara, Kajal, Hair care products (Shampoo, colorants), toothpaste, toothpowder's, antiperspirant and deodorants, nail lacquers, aerosols, men's toiletries (Shaving cream, after shave lotions, eue-de – colongne), soaps, perfumes,.

- 2 Evaluation (determination and detection) of the following in the finished product –
 - Color
 - Perfumes
 - Flavours

MASTER OF SCIENCE COSMETIC TECHNOLOGY

1MCT-P-3 PRACTICAL –3 RESEARCH METHODOLOGY (RM)

TotalMarks –	50
CIE -	50

1. Literature search through chemical abstract, internet, books, journals.
2. Research data collection & presentation.
3. 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 cosmetology.
4. The students will be delivering at least two seminars during the session. The seminars based on research reviews will be evaluated by the panel of experts consisting of minimum three teachers including Head of the Department.

Course Outcome and Course Specific OutcomeMaster

of Science Cosmetic Technology - Sem – I

Paper - 1 Formulation & Development (FD)

Learn about the mechanisms and various techniques of preparing and developing advance formulations of cosmetic products like soaps, colour cosmetic, astringents and tonics, face packs etc.

Paper – 2 Quality Assurance Technique (QAT)

Learn the importance of quality control in cosmetic preparations, its guidelines, ISO significance, validation of cosmetic manufacturing stability study of cosmetic and evaluation of raw material by proper analytical method using BIS standers.

Paper – 3 Elective – I Principles of Cosmetic Technology (PCT)

Encompasses all the fundamental physical properties and concepts of cosmetic with their methods of determination and their effects on cosmetic products.

Paper -3 Elective – II Concepts In Cosmetic Technology (CCT)

Covers all the concepts of cosmetics with respect to physical properties, methods of determination and their effects on cosmetic products.

Paper -4 Research Methodology (RM)

To understand the basics of statistics and research hypothesis and application thereof in practice.

MASTER OF SCIENCE COSMETIC TECHNOLOGY

SEMESTER II

2MCT-T-1 Paper - 1 FORMULATION & DEVELOPMENT (FD)

Total Marks –	100
SEE -	80
CIE -	20

- 1 Formulation and Development of Hair gels, Creams, Serums, Hair Conditioners, Hair packs, Hair oil, Eau-de – cologne, Anti perspirant and Deodorant, Shaving cream, Perfumes, Colours (formulation aspects)
- 2 Eye care – Eye shadow, Eye liners, Under eye gels, Creams and serums, Under eye concealer and High lighters, Eye shimmer, Puffy eye control, Eyebrow pencils, Dark circle control and any other .
- 3 Pilot Plant scale up Techniques: General considerations. Review of formula, Raw materials, equipments etc. Process evaluation, Preparation of Master Manufacturing process.
- 4 Establishing pilot plant, studies, scale-up the manufacture of product to intermediate and large scale production.
Requirements & Methods for Maintenance of sterile area.

Recommended books:

1. Cosmetic Science and Technology; M.S.Balsam & E. Sagarin; 2nd Ed; Vol. I, II, III
2. Harry's Cosmeticology; J.B. Wilkinson & R.J.Moore; 7th Ed; 1982
3. The theory & Practice of Industrial Pharmacy; Leon Lachman, Herbert Leiberman & Joseph L Kanig; 3rd Ed; 1990
4. Perfume:History & chemistry By Dr D.D.Wasule
5. New Cosmetic Science; T Mitsui
6. Indian Herbs by Chopra
7. Wealth of India, published by CSIR

MASTER OF SCIENCE COSMETIC TECHNOLOGY

2MCT-T-2 Paper -2 CONCEPTS AND PRINCIPLES IN COSMETIC TECHNOLOGY(CPCT)

Total Marks –	100
SEE -	80
CIE -	20

- 1 Emulsions:
Electrical theories of stabilization of emulsions, assessment and prediction of emulsion shelf life, equations, involved in emulsion stability stress conditions and physical parameters employed to evaluate emulsion stability, prevention of interaction between preservatives and emulsion ingredients like surface active agents hydrophilic polymers, suspended particles packaging materials etc. preservation of emulsion, rheological properties of emulsion, Production, equipments, Industrial processing and large-scale manufacture.
- 2 Suspensions:
Theory (Interfacial properties, DLVO theory, Theory of Sedimentation), Formulation Techniques of suspension (wetting, controlled flocculation, structured vehicle),

Rheological properties of suspension, Production, equipments, industrial processing and large-scale manufacturing.

3 Rheology :

Theoretical considerations, Thixotropy, spurs and bulges in the hysteresis loop, continuous shear rheometry of semisolids, viscoelasticity, the creep test study including principle of operation and applications of Coneplate, Stormer, Mac Michael, Brook-field viscometers. Chemical and Physical factors effecting rheological properties, Rheology and product design, Rheology and cosmeceutical processing, Rheology and biological applications.

4 Micromeritics :

Introduction and application of Micromeritics, Particle size & Size Distribution, Methods for determining particle size with more focus on recent techniques, Adsorption, air permeability techniques and determination of surface area and size of particles. Classification and evaluation of some basic properties of powders, flow properties of various powder systems.

Recommended books:

1. "Advances in Pharmaceutical Sciences" Vol. I, II, III & IV, edited by Bran, Bechettl & Carless.
2. Martin A.N. "Physical Pharmacy".
3. Lachman et. Al "The Theory and Practical of Industrial Pharmacy".
4. "Remington's, Pharmaceutical Practices".
5. Badger W.L. & Banchemo "Introduction of Chemical Engineering".
6. Chemical Engineering by Richardson & Crudson.

MASTER OF SCIENCE COSMETIC TECHNOLOGY

2MCT-T-3 Paper – 3 ELECTIVE – I STATISTICS AND QUALITATIVE TECHNIQUES (SQT)

Total Marks –	100
SEE -	80
CIE -	20

- 1 Statistics and Concepts, Classification and tabulation of data. Measurement of central tendency, measures of variation.
- 2 Frequency distribution, histogram, frequency, polygons, Oliver.
 - d. Binomial distribution
 - e. Normal distribution – use of normal probability tables
 - f. Parametric and non-parametric tests.
- 3 Hypothesis: Types and its modality. Type I and Type II errors. Levels of significance
 - a. Chi-square test. Goodness of fit. Independence of attributes 2x2 and r x c contingency tables.
 - b. Application of student 't' test for small samples. Difference in proportion for means and difference in means.
 Correlation, coefficient of correlation, rank correlation.
- 4 Statistical applications in data analysis: Regression analysis, prediction and Analysis of variance – one way and two-way classification.

Recommended Books:

- 7 Edwards: Experimental Design in Psychological Research.
- 8 Garrett, Henry E. (1971): Statistics in Psychology and Education, David Haley & Co.
- 9 Kerlinger: Foundation of Educational Research.
- 10 SPSS / PC for the IBM PC / XT, SPSS Inc.

- 11 Bandarkar, P.L. and Wilkinson T.S. (2000): Methodology and Techniques of Social Research, Himalaya Publishing House, Mumbai.
- 12 Stranss, A. and Corbin, J. (1990): Basis of Qualitative Research, Grounded Theory Procedures and Techniques, Sage Publications, California. Unwanted effects of cosmetics and drugs used in dermatology by J.P. Nater. Groot, & Liem.

OR

2MCT-T-3 Paper – 3 ELECTIVE –II STATISTICAL EVALUATION & ANALYSIS(SEA)

Total Marks –	100
SEE -	80
CIE -	20

- 1 Conceptual understanding of statistical measures. Classification and tabulation of data. Measurement of central tendency, measures of variation.
- 2 Frequency distribution, histogram, frequency, polygons, Oliver.
 - a. Binomial distribution
 - b. Normal distribution – use of normal probability tables
 - c. Parametric and non-parametric tests.
- 3 Testing of hypothesis. Type I and Type II errors. Levels of significance
 - a. Chi-square test. Goodness of fit. Independence of attributes 2x2 and r x c contingency tables.
 - b. Application of student ‘t’ test for small samples. Difference in proportion for means and difference in means.
 Correlation, coefficient of correlation, rank correlation.
- 4 Regression analysis and prediction.
Analysis of variance – one way and two-way classification.

Recommended Books:

- 1 Edwards: Experimental Design in Psychological Research.
- 2 Garrett, Henry E. (1971): Statistics in Psychology and Education, David Haley & Co.
- 3 Kerlinger: Foundation of Educational Research.
- 4 SPSS / PC for the IBM PC / XT, SPSS Inc.
- 5 Bandarkar, P.L. and Wilkinson T.S. (2000): Methodology and Techniques of Social Research, Himalaya Publishing House, Mumbai.
- 6 Stranss, A. and Corbin, J. (1990): Basis of Qualitative Research, Grounded Theory Procedures and Techniques, Sage Publications, California. Unwanted effects of cosmetics and drugs used in dermatology by J.P. Nater. Groot, & Liem.

MASTER OF SCIENCE COSMETIC TECHNOLOGY

2MCT-T-4 Paper -4 NATURAL PRODUCTS (NP)

Total Marks –	100
SEE -	80
CIE -	20

- 1 Collection and identification of Raw Herbal material, methods for identification.
- 2 Extraction of compounds from herbs- Compounds, structures and properties. Methods of extraction of compounds- Solvents, distillation, Supercritical fluid extraction.
- 3 Standardization and quality control of herbal extracts & products. Standardization QA, AC & GMP, SOP, Qualitative & quantitative analysis of herbal extracts and products. New technologies and other bioassays for screening and mechanism study.

- Key to functional mechanism study of Herbal medicines.
4. Functional evaluation & herbal actives- significance of research, characteristics of pharmacological research, design of pharmacological study on herbal medicines.
 5. Field Activity
 - Study of at least 5 plants and submission of its brief profile (Herbarium sheet)
 - Survey of at least 5/10 beauty clinic/ parlours (submission of brief report with statistical analysis)
 - Survey of at least 5 Cosmetic Products (Consumer or market) and submit report with statistical analysis.

Recommended books:

- 1) Traditional Herbal Medicine Research Methods edited by Willow L. H. Liu.
- 2) Pharmacognosy by C. K. Kokate, A.P. Purohit, S. B. Gokhale.
- 3) Pharmacognosy by Trease and Wallis
- 4) Bentley and Driver's Text book of Pharmaceutical Chemistry.
- 5) Remingtons 'The Science and Practice of Pharmacy' 21st ed., vol I,II

MASTER OF SCIENCE COSMETIC TECHNOLOGY

2MCT-P-1 Practical -1 FORMULATION & DEVELOPMENT (FD)

Total Marks –	100
SEE -	80
CIE -	20

- 1 Extraction & Isolation of active principles from important cosmeceutical/therapeutic herbs.
- 2 Incorporation of active herbal principles in various cosmetic products. (at least two products from each category – solid, semi solid, and liquid)

MASTER OF COSMETIC TECHNOLOGY

2MCT-P-2 Practical -2 CONCEPTS AND PRINCIPLES IN COSMETIC TECHNOLOGY (CPCT)

Total Marks –	50
SEE -	40
CIE -	10

1. Evaluation of stability of Emulsions through different methods.
 - a. Accelerated stability study.
 - b. Particle size analysis
 - c. Other Parameters
2. Evaluation of stability of suspensions through different methods.
 - a. Accelerated stability study
 - b. Particle size analysis
 - c. Other parameters.
3. To measure Zeta potential of emulsion and to co-relate with stability.
4. To measure Zeta potential of suspensions and to co-relate with stability.
5. To determine the cmc of surfactants by stalagmometer (Anionic, Cationic, Nonionic, Ampholytic)
6. To determine the cmc of surfactants by capillary rise method.
7. To study the effect of salts on cmc of surfactant.
8. Determination of amount of surfactants with respect to phase- volume ratio.
9. To demonstrate the effect of air-entrapment on rheology of creams.

10. Interaction between the preservatives and antioxidants, emulsifying agents.
11. Interaction of above mentioned additives on the different packaging material.
12. To study the effect of pH on partition co-efficient of weak acids.
13. To study the effect of solvents on partition co-efficient of weak acids.
14. To study the flow properties of powders.
 - a. Effect of particle size (b)Moisture content On angle of Repose
 - c. Other additives like glidants & lubricants

MASTER OF SCIENCE COSMETIC TECHNOLOGY

2MCT-P-3 Practical – 3 ELECTIVE – I STATISTICS AND QUALITATIVE TECHNIQUES(SQT)

Total Marks – 50
CIE - 50

- 1 Study of sampling methods
- 2 Collection of data for minimum two cases/ study/ survey.
- 3 Statistical analysis of data

OR

MASTER OF SCIENCE COSMETIC TECHNOLOGY

2MCT-P-3 Practical - 3 ELECTIVE –II STATISTICAL EVALUATION & ANALYSIS (SEA)

Total Marks – 50
Sessional - 50

- 1 Study of sampling methods
- 2 Collection of data for minimum two cases/ study/ survey.
- 3 Statistical analysis of data

Course Outcome and Course Specific OutcomeMaster**of Science Cosmetic Technology- Sem – II****Paper -1 Formulation & Development (FD)**

This subject aims to study all sort of sophisticated cosmetic preparations which include hair serum, deodorants, shaving and eye preparation, its formulation and development, study of various machineries used in plants, its process evaluation, plant location, site, factory building and scale-up of product to intermediate and large scale production.

Paper -2 Concepts and Principles in Cosmetics Technology (CPCT)

Teaches all the fundamental physical properties and concepts of cosmetic ingredients with their methods of determination and their effect on cosmetic products.

Paper -3 Elective – I Statistics and Qualitative Techniques (SQT)

To understand the concept of statistical measurement and application of hypothesis.

Paper -3 Elective –II Statistical Evaluation & Analysis (SEA)

To understand the statistical evaluation and analysis and its application in research

Paper – 4 Natural Products (NP)

Study of Natural ingredients for example herbs and other materials of natural sources and their logical applications in cosmetic industries.

MASTER OF SCIENCE COSMETIC TECHNOLOGY

SEMESTER III

3MCT-T-1 PAPER-I- ADVANCE COSMETICS TECHNOLOGY (ACT)

Total -100

SEE- 80

CIE - 20

1. Delivery systems – Introduction, Path ways of Delivery, Types of Delivery Systems and Application.
2. Microencapsulation: Liposome, Niosome, Transferosome- techniques of manufacturing, Safety aspects, Application, Formulation in Cosmetics and Regulatory aspects.
3. Nano technology – Nanoparticles manufacturing techniques, Safety aspects, Application, Formulation in cosmetics and Regulatory aspects.
4. Latest trend in delivery system- Microsponges, Microspheres and others

Recommended Books-

1. Cosmetic Nanotechnology Polymers And Colloids in Personal Care; Sarah E. Morgan; Published by A chemical
2. Delivery System Handbook for Personal Care And Cosmetic Product Technology, Applications and Formulations, Edited by Meyer R. Rosen, William Andrew Publishing, NY, 2005.
3. Textbook of Industrial Pharmacy, Drug Delivery Systems and Cosmetic and Herbal Drug Technology, Edited by Shobha Rani R Hiremath, Orient Longman Pvt. Ltd., 2008

MASTER OF SCIENCE COSMETIC TECHNOLOGY

3MCT-T-2 PAPER - 2 PERFUMES & COLOURS IN COSMETICS (PCC)

Total -100

SEE- 80

CIE - 20

- 1 Perfume matching and creation.
- 2 Application of Perfumes in personal care products- Antiperspirants and Deodorants ,Alcoholic preparation (After shave lotion, eua de cologne), Cream (Hand cream, Sunscreen), Personal Fragrances, Masculine fragrance, Bath products (Foam bath, Bath salts, Bath oil, Toilet soaps, Shampoos), Powders -(Talcum powder), Lotions (Suntan lotion), Baby products.
- 3 Natural perfumes – Volatile oil, Essential oil, their sources extraction techniques, incorporation and application.
- 4 Evaluation of perfumes – Design of evaluation, Statistic and judgment
- 5 Classification of Colors- synthetic and natural permitted color as per schedule of D & C act and IS4707, selection and preparation of color solutions.
- 6 Appropriate use of Natural colours / Pigments / Dyes in Formulation and development of

colored Products, Powders and Compacts, Lipsticks, Eye shadow, Rouge, Mascara, Nail lacquers, Shampoo, Hair oil, Hair gel, Hair colorants, After shave lotions, Toothpaste, Mouthwash, Soaps.

- 7 Safety and Toxicity of colors
- 8 Stability study and Evaluation of Color cosmetic products.

Recommended books

1. The Chemistry and Manufacture of Cosmetics by-Mitchell Schlossman
2. Cosmetic Science and Technology by –M Balsam and E. Sagarin.
3. Perfumery : The Psychology and Biology of Fragrance – Toller and Dodd
4. An introduction to Perfumery – 2nd ed. Tony Curtis and D.G. Williams
5. Perfumes Cosmetics & Soaps –W. A . Poucher
6. The Formulation & preparation of Cosmetics, Fragrance and Flavors

MASTER OF SCIENCE COSMETIC TECHNOLOGY 3MCT-T-3 ELECTIVE /PAPER 3- I QUALITY ASSURANCE TECHNIQUE FOR SKIN COSMETICS (QATSC)

Total -100

SEE- 80

CIE - 20

1. Complaine of Drug & Cosmetic Act 1940 with reference to provisions for packaging and labelling (Rule 150 A, schedule S), permitted colors, flavors etc.
2. Quality Assessment of packaging material, containers and closures as per BIS/IP, Recent trends and alternatives.
3. Skin testing – Study of Structure of Skin, Functions, Types, Color/ Texture/surface studies/ Moisture determination studies, Patch testing as per BIS, Recent trends and alternatives
4. Performance evaluation of cosmetic (skin care) products using sophisticated instruments like Cutometer, Corneometer, Mexameter, TEWAmeter, Conductivity meter, Skin pH meter, Elasto meter, Sebumeter, Visioscan. Tensile Tester, Trichometer, Reflectance, Combability, Static Charge.
5. **IPR** Benefits, EPC European Patent Convention, PCT Patent Co-operation Treaty, WIPO World intellectual Property Organisation, Certificate of analysis, MSDS for skin.

3MCT-T-3 ELECTIVE /PAPER 3– II QUALITY ASSURANCE TECHNIQUE FOR HAIR COSMETICS (QATHC)

Total -100

SEE- 80

CIE - 20

- 1 Complaine of Drug & Cosmetic Act 1940 with reference to provisions for packaging and labelling (Rule 150 A, schedule S), permitted colors, flavors etc.
- 2 Quality Assessment of packaging material, containers and closures as per BIS/IP, Recent trends and alternatives.
- 3 Hair Testing – Study of Structure of Hair, Functions, Types, Color/ Texture/surface studies,

- Conditioning and Tensile strength determinations, Recent trends and alternatives.
- 4 Performance evaluation of cosmetic (hair care) products using sophisticated instruments like Tensile Tester, Trichometer, Reflectance, Combability, Static Charge.
- 5 **IPR** Benefits, EPC European Patent Convention, PCT Patent Co-operation Treaty, WIPO World intellectual Property Organisation, Certificate of analysis, MSDS for hair.

Recommended books:

1. A.O.A.C. (Book published by Association of organic and Analytical Chemistry).
2. W.A. Poucher : Perfumes, Cosmetics and Soap Volume I, II, and III – Chapman and Hall.
3. Balsam et al: Cosmetics Science and Technology Mim I, II and III. Wiley Interscience.
4. Standard methods of Chemical Analysis – Edited by Frant J. Welchar D. Van. Norstrand.
5. Calorimetric methods of Analysis by Z.D. Snell and C.T. –
Snell - Van Norstrand Reinhold.
6. Toxicology of Drugs and Chemicals W.B. Deichman and H.W. Gerada, Academic Press.
7. Text Book of Toxicology – Dubols and Getting – Oxford.
8. Practical Cosmetic Microbiology by Kulkarni, Meghare Denett publications.
9. How to practice G.M.P.S. by P.P. Sharma
10. Cosmetic formulation, Management and quality control by P.P. Sharma.
11. How to practice GLP by P.P. Sharma
12. Drug and Cosmetic Act. By GOI

MASTER OF SCIENCE COSMETIC TECHNOLOGY

3MCT-T-4 RP /PAPER 4- RESEARCH DESIGNING AND PLANNING (RDP)

Total -100

SEE- 80

CIE - 20

- 1 Data Management, Analysis and presentation –Introduction, Introduction of SPSS and Features, Menu commands, basic steps in data analysis,
- 2 Data file management function, Preliminary analysis – six characteristics of a data set, data transformation and presentation.
Parametric test and non parametric test
Statistical analysis system (SAS)
- 3 Understanding the Technical terms and project overview Preparing the Research Proposal
- 4 The Project/Dissertation Report: Basic Components
- 5 Preparing the manuscript and assessment.

Recommended books

1. Edwards: Experimental Design in Psychological Research.
2. Garrett, Henry E. (1971): Statistics in Psychology and Education, David Haley & Co.
3. Kerlinger: Foundation of Educational Research.
4. SPSS / PC for the IBM PC / XT, SPSS Inc.
5. Bandarkar, P.L. and Wilkinson T.S. (2000): Methodology and Techniques of Social Research, Himalaya Publishing House, Mumbai.
6. Curriculum guidelines from IGNOU

3MCT-P-1**MASTER OF SCIENCE COSMETIC TECHNOLOGY****PRACTICAL -I- ADVANCE COSMETICS TECHNOLOGY (ACT)**

Total -100

SEE- 80

CIE - 20

- 1 Preparation of cosmetic products based on following (minimum two products of each category)
- 2 Study of different techniques for preparation of Microencapsulation – (one product of each technique)
Liposomes, Nanoparticals, Neosomes by Injection, Pan coating, any other techniques (as reported in research papers, reviews, patents)

MASTER OF SCIENCE COSMETIC TECHNOLOGY**3MCT-P-2 PRACTICAL 2 – I PERFUMES & COLOURS IN COSMETICS (PCC)**

Total -50

SEE- 40

CIE - 10

1. Matching and Creation of perfume
2. Preparation of following products using appropriate perfumes.
Alcoholic preparation (After shave lotion, eau de cologne), Cream, Personal Fragrances, Masculine fragrance, Bath products (Foam bath/ Bath salts/Bath oil/Toilet soaps/ Shampoos), Powders, Lotions, Baby products.
3. Preparation of color solutions.
4. Extraction from various sources and incorporation of natural colour and pigments in cosmetics products (creams, liquids, oils, Powders)
5. Evaluation of above colors as ingredient and products
6. Toxicity testing of above products.

MASTER OF SCIENCE COSMETIC TECHNOLOGY**3MCT-P-3 RP PRACTICAL 3- RESEARCH DESIGNING AND PLANNING (RDP) + PRESENTATION**

Total – 50

CIE - 50

- * At least two presentations BY EACH STUDENT FROM RELEVANT TOPICS IN THE FIELD OF Cosmetic Technology. Presentation should be based on Research designing, planning and methodology discussion and interpretation

**MASTER OF SCIENCE COSMETIC TECHNOLOGY
SEMESTER IV**

4MCT-T-1 PAPER -I- COSMETICS MICROBIOLOGY (CM)

Total -100
SEE- 80
CIE - 20

- 1 Microorganisms in raw materials, Risk assessment
Microorganisms in manufacturing environment, current GMP, concept of HACCP,
- 2 Microbial contamination in cosmetic products.
Microbial considerations in product formulation.
Microbiological evaluation: Various methods for microbial assay of raw materials and finished Products. Preservative efficacy tests, factors affecting preservative efficacy, modulation of preservative efficacy by G⁺ and G⁻ organisms.
Total microbial count, Isolation and identification of microorganisms specified in BIS guidelines from cosmetic products and raw materials.
- 3 sanitary practices in cosmetic manufacturing
Microbial environment of manufacturing plant
Hazard Analysis and critical control point (HACCP) protocols in cosmetic Microbiology.
- 4 Validation of Microbial testing methods
- 5 I- Global regulations of cosmetics preservatives
II- Common cosmetic preservatives (monographs)
Benzalkonium chloride, Benzoic Acid, Ethanol, Parabens, salicylic acid, zinc pyrithione.

Recommended books

- 1) Cosmetic Microbiology – Philip A Geis
- 2) Text book of Microbiology – Peltzer and Reid
- 3) Practical Cosmetic Microbiology – Meghre, Kulkarni

**MASTER OF SCIENCE COSMETIC TECHNOLOGY
4MCT-T-2 PAPER -2 COSMETICS VALIDATION (CV)**

Total -100
SEE- 80
CIE - 20

1 Raw Material Selection

Functionality based that contribute to the

- (A) Identified Characteristics of the Finished Product (Emollient, Thickener, Binder etc).
- (B) Organoleptic Characteristics (Flavour, Color, Aroma, Texture etc).
- (C) Safety Characteristics (pH, Heavy metals, Microbiological, GRAS (Generally Recognised as Safe) listing, EU CosIng (Cosmetic Ingredient) status, PCPC (Personal Care Product Council) listing, EWG Environmental Working Group status, GMO Genetically Modified status, CFR Code of Federal Regulation listing etc). Toxicity Profile. Allergen Listing and Disclosure. Naturality Index. Sustainability
- (D) Shelf life

2 Specification Creation for raw materials

(A) International Regulation Based – Regionwise characterisation of the Regulations (Americas, EU, UAE, ASEAN, Japan). Certifications – COSMOS, KOSHER, HALAL’ Impurity Profile.

(B) Supplier Based – Identification of the Supplier, TDS (technical data sheets) from the supplier, the standard of identity, comparison of different suppliers’ specifications. Sustainability. Multiple Vendor Development

3 Packaging Material –

Specific composition (MoC) material of construction. Glass, polyethylene (PET) / (MET), polypropylene (PPE), Polypropylene (PP), Nylon etc. Biodegradability. Sustainability.

4 Finished Product

(A) Prototype Development and Stress Stability studies

(B) Protocol Batches and Accelerated Stability

(C) Pilot batches

(D) Commercial Batches and Real time stability

(E) Licensing under Ayush / FDC

5 Claim Substantiation and Validation

(A) In-vitro active efficacy

(B) Stability Studies Stress, Prototype, Protocol, Pilot, Commercial batches, Toxicity study on cell lines

(C) Clinical – PIPT, HRIPT, Efficacy Studies (Diagnostic Equipments / Clinical evaluation / Consumer Response based)

6 Plant Selection

(A) OSHA Considerations, Potential biological, chemical, and physical hazards affiliated with the raw material, HACCP Hazard analysis and critical care points

(B) Facility and Equipment Capabilities (Material handling, Processing, Storage facility, Production cost / Conversion cost (In-house testing, time for changeovers, CIP)

Recommended books

1) Analytical method validation and instrument performance verification CHUNG CHAW CHAN at. al. –Wiley Blackwell

2) Rhcology Essentials of Cosmetic and food emulsions -Brummer, Rudiger

3) Analysis of Cosmetic Products, Edited by –Ampro solvatro and Alberto Chisvrnt

4) Harry’s cosmeticology, Edited by – Dr. Martin M. Rieger.

Suggested Reads -

<https://www.mdpi.com/journal/sustainability>

<https://www.wipo.int/>

ISO 16128

<http://webdictionary.personalcarecouncil.org>

<https://allured.omed.com/ct>

<https://www.ewg.org/skindeep/>

MASTER OF SCIENCE COSMETIC TECHNOLOGY
4MCT-T-3 ELECTIVE - I SKIN CARE COSMETICS (SCC)

Total -100

SEE- 80

CIE - 20

- 1 Phytochemical Screening of Natural products: General method used for isolation & purifications of natural products. Study of chromatographic techniques applied to natural products and recent trends in the field.
- 2 Study of application and mechanism of action of following categories of synthetic actives like Cleansing, Emollient & Skin Pigmentation, Antipimples & Anticellulite, Fresheners, & Perfumes, Astringents & Antibacterials, Emulgents.
- 3 Study of Natural ingredients acting on Skin in the following category :
Scrubbing: Apricot, Walnut, Pistachio
Cleansing : Olive oil, Sesame oil, Aloe vera
Emollient : Lanolin, beeswax, Cocoa/Shea butter
Skin Pigmentation: Licorice, Jesthamadh, Saffron
Antipimples : Black pepper, Daru Haldi, Nutmeg
Anticellulite : Caffeine (Tea/Coffee) Vinca, Cinchona, Withani
Fresheners, & perfumes: Chandan, Khus, Cinnamon
Astringents: Tannic acid, Ashoka, Hirda
Antibacterial : Curry leaves, Capsicum, Tea tree oil
Emulgents : Accacia, Agar, Tragacanth
- 4 Standardization of Actives in skin care herbs:
Importance of standardization (as per WHO guidelines), assessment of synthetic actives and Herbal extracts in formulations, methods employed for standardization of herbs with special reforms to industrial methods HPLC, HPTLC ; Flash chromatography, GLC etc.

Recommended books

- 1) Pharmacognosy Vol I & Vol II by Mohammed Ali
- 2) Materia medica
- 3) Herbs useful in dermatological Therapy, Behl P.N.
- 4) Dian Dinein Buchmans Herbal medicure , Gramercy, publication, company illustrated by Leaven Jarrett
- 5) Wealth of India
- 6) The Ayurvedic Encyclopedia.
- 7) Herbs, Spices, and Medicinal plants Vol I, II, III & IV by Kyle , E. Craker & James E. Simon.

OR

ELECTIVE-II –HAIR CARE COSMETICS (HCC)

Total -100

SEE- 80

CIE - 20

- 1 Nomenclature, characteristics & classification, chemical constitution, method of extraction isolation & estimation of herbs used for hair care and recent trends in the field.
- 2 Study of Natural Ingredients acting on hair in the following categories -
Hair Conditioning : Coconut Oil, Olive Oil, Egg White
Hair growth promoter : Brahmi, Fenugreek, Jatamansi
Hair Tonics: Calendula, Hibiscus, Arnica
Antidandruff : Tulsi, Neem, Wheat Gram Oil.
Hair Colorants : Amala, Heena, Bhringaraja
Hair cleansing : Ritha, Shikakai, Amla
- 3 Natural products as hair care : Apple, Apricot, Banana, Wheat, Barli, Melon, Carrot, Cucumber, Spinach, Berries, Beet root, Peach, Sweet Potato, Pudina, Tomato, Milk, Yogurt, Tea, Honey.
- 4 Standardization of Actives in hair care

Recommended books

- 1) Indian Materia Medica by Nadkarni T.B. of Pharmacognosy by Trease & Evans
- 2) Wealth of India – C.S.P. Publications.
- 3) Hand Book of Herbal Products Vol I & II by NIIR Board of Technologist.
- 4) Pharmacopoeia Standards of Herbs by Dr. C.R. Karnik.
- 5) Cosmetics Analysis Selective Methods with Techniques by P. Bare.
- 6) Pharmacognosy Vol I & II by Mohammed Ali CBS Publications, New Delhi.

MASTER OF SCIENCE COSMETIC TECHNOLOGY

4MCT-P-1 PRACTICAL 1- COSMETICS MICROBIOLOGY (CM)

Total -100

SEE- 80

CIE - 20

- 1 Microbiological evaluation: Various methods for microbial assay of raw materials and finished Products. Preservative efficacy tests, factors affecting preservative efficacy, modulation of preservative efficacy by G⁺ and G⁻ organisms.
- 2 Total microbial count, Isolation and identification of microorganisms specified in BIS guidelines from cosmetic products and raw materials.

MASTER OF SCIENCE COSMETIC TECHNOLOGY
4MCT-P-2 PRACTICAL - 1 SKIN CARE COSMETICS (SCC)

Total -50
SEE- 40
CIE - 10

- 1 Study of Morphological & Microscopic characters of Herbs used in Skin and Hair care.
- 2 Photochemical constituents identification & quality control & standardization.
- 3 Application of various methods for extraction, solvent systems & isolation of active constituents.
- 4 Study of various oils used in Aromatherapy with special reference to its applications.
- 5 Use of latest active synthetic derivatives in skin and Hair care products.

OR

PRACTICAL 2 - ELECTIVE - II HAIR CARE COSMETICS (HCC)

Total -50
SEE- 40
CIE - 10

1. Study of Morphological and Microscopic characters of various herbs used in hair care.
2. Study of Various Phytochemical Constituents and their identification (Testing)
3. Study of various Extraction methods & Isolation of active constituents from various herbs.
4. Study of various Extraction methods for active constituents from fruits.
5. Use of latest active synthetic derivatives in hair care products.

MASTER OF SCIENCE COSMETIC TECHNOLOGY **SEMESTER IV**
4MCT-P-3 PRACTICAL 3 RP - Research Project

Total -150
SEE- 100
CIE - 50

- i Submission of Research Project, Presentation and Viva-voce (SEE). Three Hard copies submitted (College 1, Guide 1 and Student -1)
- ii Internal Assessment marks should be allotted on the basis of at least three seminar/reviews during Project work. (CIE)