



M. Sc. IN INDUSTRIAL CHEMISTRY

COURSE STRUCTURE

First Semester	S.No.	Course Code	Course Name	Marks			Teaching hours/week			Credit	Duration of exams (Hrs)
				IA	ESE	Total					
				25	75	100	L	T	P		
	01	MSIC101	Analytical Techniques	25	75	100	3	1		4	3
	02	MSIC102	Inorganic Chemistry	25	75	100	3	1		4	3
	03	MSIC103	Organic Chemistry	25	75	100	3	1		4	3
	04	MSIC104	Physical Chemistry	25	75	100	3	1		4	3
05	MSIC105P	Lab Course-I	25	75	100				4	3	
Total Marks for I Semester					500				20		

Second Semester	S.No.	Course Code	Course Name	Marks			Teaching hours/week			Credit	Durati on of exams (Hrs)
				IA	ESE	Total					
				25	75	100	L	T	P		
	01	MSIC201	Environmental Chemistry & Waste Management	25	75	100	3	1		4	3
	02	MSIC202	Sugar Pulp Chemistry	25	75	100	3	1		4	3
	03	MSIC203	Polymer Chemistry	25	75	100	3	1		4	3
	04	MSIC204	Food Technology & Agro Chemicals	25	75	100	3	1		4	3
	05	MSIC205P	Lab Course-II	25	75	100				4	3
	Summer internships										
		Total Marks for II Semester				500				20	



	S.No.	Course Code	Course Name	Marks			Teaching hours/week			Credit	Duration of exams (Hrs)
				IA	ESE	Total	L	T	P		
				25	75	100					
Third Semester	01	MSIC301	Research Methodology	25	75	100	3	1		4	3
	02	MSIC302 MSIC303 MSIC304 (Any one Elective to be chosen)	01.Natural Products, Cosmetics and Perfumery 02.Pharmaceutical Chemistry 03.Soft Material and Nano composites	25	75	100	3	1		4	3
	03	MSIC305	Minor project/Industrial Visit/Industrial Training /Seminar	50	150	200	-	-	-	8	3
	05	MSIC306P	Lab Course-III	25	75	100				4	3
		Total Marks for III Semester				500				20	

Forth Semester	S.No.	Course Code	Course Name	Marks			Credit
				IA	ESE	Total	
	01	MSIC401	Research Project	200	300	500	20
			Total Marks for IV Semester = 500				

L: Lecture, T: Tutorial, C: Credit, IA: Internal Assessment, ESE: End Semester Examination.



M. Sc. in Industrial Chemistry

Semester-I - First Year

Course I - Analytical Techniques

Course Code: MSIC-101

Credits:4

Unit 1

Basics of Filtration processes

Introduction to unit processes and unit operations, Screening, Mixing, Coagulation and Flocculation Sedimentation: Type of settling, Filtration for wastewater treatment. Type of filters - rapid sand filter, slow sand filter, high- rate filter, pressure filter. Gravitational settling, Centrifugal impaction, Inertial impaction, Diffusion, Electrostatic precipitation,

Unit II

Electron Microscopy

Introduction, Principle and Instrumentation of SEM and TEM.

Unit III

Separation Techniques

Solvent extraction (liquid-liquid extraction), general principles, relationship between extraction and distribution coefficient, distribution ratio, multiple extractions, extraction of metal organic complexes and ion association complexes.

Unit IV

Chromatographic Techniques

Classification, basic principles, theory of chromatography, Ion-exchange chromatography: ion exchange process, synthesis and structure of ion-exchange resin, resolution, retention parameters, ion-exchange capacity and separation of lanthanides; Paper and thin-layer chromatography, various techniques of development, visualization and evaluation of chromatograms, Liquid-gas chromatography, HPLC: introduction, methodology, instrumentation and industrial application.

Recommended Text Books:

1. Vogel's Textbook of Quantitative Chemical Analysis, Bassette and co-workers, Longman Group UK
2. Fundamentals of molecular spectroscopy. Bunwell, C.N.
3. Instrumental methods of analysis, Willard M.H., Merrit, L.L., Dean J.A, Settle, F.A.
4. Principles and practice of analytical chemistry. Fifield F. W., Kaley D., Blackie Academic and Professional, 4th Edition, 1995.



Course II Inorganic Chemistry

Course Code: MSIC-102

Credits:4

Unit I

Chemical Bonding: Walsh diagram; Evidence of MO pictures from spectra and reactivity; Molecular term symbols (ground & excited state). σ -bonding $3C-2e$ bonding, π -bond, δ -bond.

Unit II

Coordination Chemistry: Crystal field theory, Splitting of d orbitals Crystal field stabilization energies in weak field and strong field environments, spectrochemical series, and Jahn-Teller effects on energy levels.

Unit III

Magnetochemistry: Van Vleck equation and its applications, Curie and Curie-Weiss laws, zero-field splitting, spin-orbit coupling, quenching of orbital contribution, para and diamagnetism, ferromagnetic, ferrimagnetism & antiferromagnetic coupling.

Unit IV

Metal Ligand Equilibrium: Equilibria Stability of mononuclear, polynuclear mixed ligand complexes in solution, Stepwise and overall formation constants, trends in stepwise constants factors affecting the stability of metal complexes -chelate effect, determination of stability constants.

Recommended Text Books:

1. D. F. Shriver, P. W. Atkins and C. H. Langford. Inorganic Chemistry. Oxford University Press. New York (1990)
2. B. Douglas, D. McDaniel and J. Alexander, Concepts and Models of Inorganic Chemistry, 3rd Edn, John Wiley and Sons, Inc., New York (2001).
3. J. E. Huheey, E. A. Keiter and R. L. Keiter, Inorganic Chemistry: Principles of Structure and Reactivity, Ah Ela Haroue Collier College Publishers New York (1991)



Course III - Organic Chemistry

Course Code: MSIC-103

Credits:4

Unit I

Heterocyclic synthesis & Pericyclic

Introduction, synthesis and properties of Thiophene, Furan, Pyridine, Pyrrole, Quinoline and Indole. Cycloaddition, Electrocyclic, Sigmatropic and Cheletropic reactions.

Unit II

Rearrangement and Reactions

Pinacol/Pinacolone Rearrangement, Wagner-Meerwein Rearrangement, Wolff Rearrangement, Hofmann Rearrangement, Curtius Reaction, Lossen Rearrangement, Schmidt Reaction, Beckmann Rearrangement, Favorskii Rearrangement and Claisen Rearrangements, Aldol Reaction, Perkin Reaction, Stobbe Reaction, Reimer-Tiemann Reactions,

Unit III

Reagents in Organic synthesis

Grignard reagent, NaBH₄, LiAlH₄, Gilman's reagents, Lithium dimethyl cuprate, DDQ, oxidising agents: SeO₂.

Unit IV

Organic Synthesis

Disconnection approach (one and two group), C-C, C-X disconnection, 1, 3 and 1, 5-difunctional compounds.

Recommended Text Books:

1. Carey, F.A. & Sundberg, R.J. Advanced Organic Chemistry, Parts A & B. Plenum: U.S. (2004).
2. Carruthers, W. Modern methods of Organic Synthesis. Cambridge University Press (1971).
3. Warren, S. Organic Synthesis: The Disconnection Approach, John Wiley & Sons (1984).
4. J. March. Advanced Organic Chemistry, Reaction Mechanisms and Structure, John Wiley.
5. W. Carruthers Some Modern Methods of Organic Synthesis, Cambridge University Press.
6. L. Finar, Organic Chemistry. ELBS, U.K.
7. Morrison R.T. & Boyd R. N.; Organic Chemistry, Prentice Hall India.
8. Clayden, J.; Organic Chemistry. Oxford University Press



Course IV - Physical Chemistry

Course Code: MSIC-104

Credits:4

Unit I

Colloids and Surfaces

Introduction, types of colloidal system, Characterization of colloidal particle emulsions, application of colloids in different industries (agricultural, chemical pharmaceutical, petroleum recovery, coating, painting, food and cosmetics etc.

Unit II

Reaction dynamics

Molecularity and order of reaction, Integrated rate equations, temperature dependent of reaction rate, activation energy, methods of determining reaction rates, complex reactions- chain reactions, reversible and irreversible reactions Catalysed and Enzyme catalysed reactions. Heat of reaction and Equilibrium constant from thermodynamics.

Unit III

Electrochemistry

Electrochemistry of solution, electro catalysis, Debye-Huckel theory for activity coefficient of electrolytic solution, determination of activity coefficient, ionic strength, Donnan-membrane equilibrium, Electrochemical and Concentration cells, Corrosion: classification, factors affecting corrosion and prevention, Polarization, Overvoltage, Decomposition voltage.

Unit IV

Chemical equilibrium

Introduction, Law of chemical equilibrium, Lechateliers principle, application, equilibrium constant from thermodynamics consideration, Concepts of acids and bases, pH and pOH of solutions. Buffer solution, Solubility product.

Recommended Text Books

1. Chemical kinetics, K.J Laidler, 3rd Edn. Harper International.
2. Electrochemistry, Bockris and Reddy, Vol. 1 & 2 Plenum.
3. Solid State Chemistry, H.V. Keer, Wiley Eastern.
4. Physical Chemistry, P.W. Atkins, Oxford Univ. Press. 5. Physical Chemistry of surfaces, A.W Adamson & A. Gast
6. Introduction Interfaces and Colloids. J.C. Berg.
7. Intermolecular and Surface Forces. J.N. Israelachvili



Lab Course I

Course Code: MSIC-105P

Credits:4

1. Determination of total acidity/ alkalinity of given water sample.
2. To determine the total hardness of water.
3. Determination of chloride content of a water sample by Mohr's method.
4. Purification and distillation of tap water / organic solvent.
5. Preparation of phenol formaldehyde resin.
6. To separate the given organic compounds mixture by TLC/Paper chromatography.
7. To separate the different organic compounds by column chromatography.
8. To Prepare 2, 4, 6-tribromo aniline.
9. To determine the relative viscosities of given liquids by Ostwald viscometer.
10. Determination of brix, specific gravity and pH of molasses.
11. Determination of total reducing sugar in molasses by Lane & Eynon method.
12. Determination of RS Brix / Pol/ Purity and RS (reducing sugar) in sugar.
13. Conductometric titrations of different acid-base mixtures.
14. Determination of CMC (critical micelle concentration) of a surfactant in water by surface tension measurements at different concentrations.



M. Sc. in Industrial Chemistry

Semester-II - First Year

Course I- Environmental Chemistry and Waste Management

Course Code: MSIC- 201

Credit 4

Unit 1

Basics of Sustainable Development

Scope and Importance of environmental studies, Need for public awareness, Segments of environment, biodiversities: Genetic diversity, Species diversity, Ecosystem diversity, Landscape diversity, Causes of pollution and detrimental effects, Eco systems- Types of ecosystems, energy flow in an ecosystem, Balanced ecosystem, Basics of Environmental Impact Assessment, Sustainable Development

Unit II

Energy Resources and Air Pollution

Energy Different types of energy (Renewable and Non-renewable), Conventional and non-conventional energy sources- Electromagnetic radiation, Hydro Electric, Fossil fuel based, Nuclear, Solar, Biomass and Bio-gas, Hydrogen as an alternative future source of energy Environmental pollution and their effects, Water pollution, Land Pollution, Noise Pollution, Public Health aspects Air pollution. Current environmental issues of importance and their impact on environment: Population Growth, Climate change and global warming effect, Urbanization, Automobile pollution. Acid rain, Ozone layer depletion.

Unit III

Water Quality Assessment and Treatment

Water quality assessment by DO. COD, BOD, TDS. TSS and dissolved ions determination. Hardness of water, softening of water, Reverse osmosis, Treatment of boiler feed water by Calgen process, Ion-exchange resins and Zeolites

Unit IV

Disinfection of Water and Advanced Water Treatment Techniques

Chemical unit processes for Wastewater treatment

Disinfection: Objectives, Different Types - Bleaching Powder, Ozone Treatment, UV Irradiation, Chlorination - Types, Breakpoint chlorination, Dechlorination Advanced treatment operations,



Adsorption Isotherms, Advanced Oxidation Process. Membrane processes, Reverse osmosis, Electro dialysis, Desalination, Ion exchange: Removal of specific chemical contaminants as fluorides, arsenic, nitrates and organics.

Recommended Text Bouks

1. Environment and Ecology, Gupta & M. Umesh Publications, Delhi, 2008.
2. Perspectives in Environmental Studies. Kaushik A. Kauthik CP, New Age International Publishers, 2014.
3. Environmental Engineering Science, Nuzuruff W. W. Alvarez-Cuhen L. Wiley India Pvt. Ltd., 2004.
4. Wastewater Engineering: Treatment und Reuse. Metcalf and Edily, Fourth Edition, Tata McGraw Hill



Course II- Sugar and Pulp Chemistry

Course Code: MSIC- 202

Credit 4

Unit 1

Sugar Manufacturing

General idea about sugar factory, Introduction to carbonation and sulphitation processes and their comparison.

Carbonation process: composition of juice, extraction, clarification, sedimentation, evaporation and crystallization in brief. Sulphitation process: single and double sulphitation

Unit II

Chemical Treatment of Byproducts

- i. L Molasses: composition of molasses, alcoholic fermentation of molasses -manufacture of industrial alcohol, power alcohol, absolute alcohol, rectified spirit, denatured spirit.
- ii. Bagasse characteristics of bagasse, pith and fibre, production of ferfural, production of bio-gas and bio-manure, use of bagasse as fuel and cattle food, production of pulp, paper, fibre board, card board, particle board from Bagasse,.
- iii. Colour: measurement of colour of sugar solution by ICUMSA (International Commission for Uniform Methods of Sugar Analysis) protocol.

Unit III

Distillery Industry

Fermentation: Types of fermentation, role of microorganisms and other conditions, production of grain spirit, production of alcohol from alternate feedstock viz. sugarbeat, cassava and lignocellulose.

Unit IV

Pulp and Paper Industry:

Pulp and paper industry in India, raw materials, classification and properties of fibrous materials, mechanical and chemical (acid, neutral and alkaline) pulping process, Lignin as a chemical raw material.

Recommended Text Books

1. Handbook of Cane Sugar Technology R.B.L. Mathur
2. Cane Sugar Manufacture in India-D.P. Kulkarni
3. Handbook of Cane Sugar Engineering - E. Heugut



4. Cane Sugar Engineering-Peter Rein
5. Industrial Fermentations by L.A. Under Koeffler, Chemical Pub. Co., Newyork
- 6 Pulp and Paper chemistry and Technology. Monika E. K, Goran Gellerstedt, Gunnar Heneriksson.



Course III- Polymer Chemistry

Course Code: MSIC- 203

Credit 4

Unit I

Basic Concepts, Kinetics and Rheology

Polymers and their classification, nomenclature, Types of Polymerization: condensation, addition (free radical, cationic and anionic), copolymerization, Kinetics, Polydispersity and Molecular weight distribution, practical significance and measurement of molecular weight

Unit II

Thermodynamics and Transition properties of polymer

Glass transition temperature in polymers (T_g), Melt transition (T_m), factors influencing glass transition temperature, relationship between T_g and T_m

Process of Polymer dissolution, The Flory -Higgins Theory of polymer dissolution

Unit III

Polymer Processing

Plastics, Elastomers and Fibres, Processing techniques: calendaring, casting, moulding, thermoforming, foaming, reinforcing and fiber spinning, film and laminates. Manufacturing of Thermocol.

Unit IV

Commercially Important Polymers and Applications

Commercially important Thermosetting and Thermoplastic polymers, Resins: Phenol-Formaldehyde resins, Urea- Formaldehyde resins, Epoxy resins, Melamine- Formaldehyde resins. conducting polymers, smart polymers Biomedical polymers, electrically

Recommended Text Books

1. Fried JR. Polymer Science and Technology. Prentice-Hall of India, (2000)
2. Billmeyer F.W. Textbook of Polymer Science, Wiley-Interscience: New York (1984)
3. DeGennes, P. G. Scaling Concepts in Polymer Physics. Cornell University Press (1979)
4. Young R.J. & Lovell. P.A.. Introduction to Polymers 2 Ed., Chapman & Hall (1991)



Course IV- Food Technology and Agrochemicals

Course Code: MSIC- 204

Credit 4

Unit 1

Food Chemistry

Introduction, Classification, Properties of sugar and polysaccharides in foods, Proteins and amino acids, Vitamins and Minerals, Industrial application of enzymes, Water in food, Water activity and shelf life of food, Natural food flavours, Pigments in food and their industrial application.

Unit II

Food Microbiology

Food born infections and intoxications: bacterial with examples of infective and toxic type Clostridium, Salmonella, Staphylococcus. Govt. Regulatory practices and policies, FDA, ISI. Application of microbial enzymes (proteases and lipases) in dairy industry (cheese production)

Unit III

Food Processing and Preservation

Food additives, Contaminants Food Preservation methods, Food packaging and preservation methods of fruits, vegetables, cereals and grains.

Unit IV

Agrochemicals and their effects

Introduction, Importance and general classification of agrochemicals, mode of action, Public health issues related to agrochemicals, Fertilizers.

Classification, Physical and Chemical Properties of Pesticides & Insecticides

(BHC, DDT, Parathion & from natural sources i.e neem seed etc.), Herbicides (2, 4-dichlorophenoxyacetic acid & atrazine).

Recommended Text Books

1. Food Microbiology, 2 edn.. Adams.
2. Fundamental of Dairy Microbiology: Prajapati.
3. Microbiology of Fermented Foods, Vol. 1 & II, Brian J. Wood, Elsevier Applied Science Publication.
4. Principles of Food Chemistry, John M. DeMan, Springer 1976.



Lab Course II

Course Code: MSIC- 205P

Credit 4

1. Isolation of caffeine from tea leaves.
2. Isolation of lycopene from tomato.
3. Estimation of casein in milk.
4. Determination of density of given liquid using pycnometer.
5. To determine the surface tension of given liquid by stalagmometer.
6. Determination of free CO₂ in given water.
7. Determination of dissolution of given Caplet or tablet.
8. To determine the amount of acetic acid present in a given sample of vinegar.
9. To prepare calcium stearate from stearic acid.
10. To determine the acidity of fruit provided.
11. To study the degradation of polymers through viscosity measurement (Ostwald viscometer).
12. To determine enzyme catalysis using UV-Visible spectrophotometer.
13. Extraction and identification of DNA from green peas and onions.
14. To determine the acid value of various vegetable oils.
15. To determine the non-volatile extracts of spices.
16. Determination of salt percentage in curry powder.
17. Determination of Argemone oil in mustard oil.



M. Sc. in Industrial Chemistry

Semester-III - Second Year

Course I- Research Methodology

Course Code: MSIC- 301

Credit 4

Unit I

Basics of Research Methodology

Introduction to research methodology and design, research definition, selection and formulation of research problem, types of research, formulation of hypothesis, review of literature, types of data-primary, secondary and tertiary data, research process, survey and census

Unit II

Sampling Techniques

Population and sample, Sampling theory and techniques, advantages and limitations of sampling, data collection, coding and tabulation, probability and non probability sampling techniques, field research methodology

Unit III

Statistical Analysis

Measures of central tendency: mean, mode, median, data distribution, Chebyshev's theorem, variance, standard deviation, standard error, ratio and proportion, precision and accuracy, correlation, rank correlation, significance level, t-test, paired t-test

Non-parametric tests: Chi square test for goodness of fit and relationship between two variables, Analysis of variance, F-test, Data presentation: Charts, graphs

Unit IV

Fundamentals of Computer Organization and Applications

Fundamentals of computers, Computer organization, binary numbers, flow chart, Use of data analysis tools and text editors, power point presentations, different templates for report writing and dissertations, use of computers in report preparation and presentation



Recommended Text Books:

1. Statistical Methods-SP.Gupta
2. Research Methodology, Methods and Techniques-C.P. Kothari
3. Statistics (Theory and Practice)-B.N.Gupta
4. Research Methodology Methods and statistical Techniques-Santush Gupta
5. Research Methodology and statistical Measures-Reddy and Rao
6. Research Methodology Sharma and Jain.



Elective 01 - Natural Products, Cosmetics and Perfumery

Course Code: MSIC- 302

Credit 4

Unit I

Carbohydrates

Disaccharides and Polysaccharides (Maltose, Cellulose, Lactose and Sucrose)

Unit II

Natural Products

A general introduction, isolation, synthesis and structure of

Alkaloids: Nicotine, Morphine. Terpenoids: Camphor, Menthol,

Steroids: Cholesterol and Ergocalciferol

Flavonoids: Quercetin and Kaempferol.

Unit III

Cosmetics

Raw materials, Cosmetics for Skin (toners, cleansing agents, moisturizers, sunscreens, talcum powder, bleaching products) and Hair Cosmetics (shampoos, conditioner, colorants, herbs used in hair cosmetics).

Unit IV

Perfumes

Introduction, Composition and Extraction of Perfume (flowers, clove, heena and rice bran) and Identification of compounds used in perfumery.

Recommended Text Books:

1. Carey, F.A. & Sundberg, R.J. Advanced Organic Chemistry, Parts A & B. Plenum: U.S. (2004).
2. Curruthers. W. Modern methods of Organic Synthesis. Cambridge University Press (1971).
3. Warren. S. Organic Synthesis The Disconnection Approach, John Wiley & Sons (1984).
4. J. March Advanced Organic Chemistry, Reaction Mechanisms and Structure, John Wiley.
5. W. Carruthers Some Modern Methods of Organic Synthesis, Cambridge University Press.



6. 1. L. Finar, Organic Chemistry, ELBS, U.K.
7. Morrison R.T. & Boyd R. N.; Organic Chemistry, Prentice Hall India,
8. Clayden, J.; Organic Chemistry. Oxford University Press.



Elective 02 - Pharmaceutical Chemistry

Course Code: MSIC- 303

Credit 4

Unit 1

Basics of Pharmaceutical Chemistry

Introduction: Characteristics of drug, Common drug targets, Efficacy, inhibitory concentration, lethal dose, therapeutic index, half life, pass time and frequency of dosing, agonists, antagonists, competitive and non competitive inhibitors

Unit II

Drug Synthesis and Testing Techniques

In vitro testing, Line-Weaver-Burk Plot, Pharmacokinetics and pharmacodynamics, ADME, elogical testing, natural and synthetic lead compounds, combinatorial synthesis, stereochemistry considerations and optimizing reactions

Unit III

Structure-Activity Relationships

Quantitative structure-activity relationships. Pharmacophore: skeletal and non-skeletal, substrate based drug design and target based drug design, Case study

Unit IV

Antibiotics

Synthesis of selected antibiotics, Structure, activity, resistance issues, Different classes of antibiotics: Cephalosporins, Penicillins and other beta lactam antibiotics, Fluoroquinolones and other synthetic antibiotics

Recommended Text Books

1. Fore's Principles of Medicinal Chemistry, Williams, DA, Lemke, TL, Lippincott Williams and Wilkins 2105
2. Medicinal Chemistry, Kar. A. New Age International Publishers, 2007
3. Introducivan ta Medicinal Chemistry: How drugs act and why? Gringavs, A., John Wiley and Sons, 1997,



Elective 03 – Soft Material and Nano composites

Course Code: MSIC- 304

Credit 4

UNIT I

Liquid Crystals: Mesomorphic behaviour, thermotropic liquid crystals,

positional order, bond orientation, order nematic & smectic mesophases, nematic transition & clearing temperature-homotropic, planer & schlieren textures, twisted nematic, chiral nematic, molecular arrangement in smectic A & Smectic B phases, optical properties of liquid crystals, Dielectric susceptibility & dielectric constants, Lyotropic phases & their description or ordering in liquid crystals.

UNIT II

Soft Materials: Thin Films and Langmuir-Blodgett Films, Preparation techniques, vaporation/sputtering, chemical process, MOCVD, sol-gel etc. growth technique, photolithography, properties and applications of thin and L-B films.

UNIT III

Organic Solids and Fullerenes: Conducting organics, organic superconductors, magnetism in organic materials. Fullerenes: doped fullerenes as superconductors.

UNIT IV

Nanocomposites: Introduction to Nanocomposites, Composite material, Mechanical properties of Nano composite material: stress - strain relationship, toughness, strength, plasticity. Synthetic methods for various nanocomposite materials: mechanical alloying, thermal spray synthesis etc. Nano composites for hard coatings; DLC coatings: Polymer nanocomposites; Thin film nanocomposites; Applications of nanocomposites in drug delivery.

Recommended Text Books:

1. Material science and Engineering, WD Callister, Wiley.
2. Solid State Chemistry, A R west.
3. Modern Prospective in Soid State Chemistry, CNR Rao and J Gopalakrishnaa
4. Principles of Polymer Science, Bahadur P and N.V Shastri, Narosa, New Delli, 2000.
5. Polymer Science and Engineering, D.J. Williams, Prentice Hall Inc. New Jeray, 1971.
6. Theory and Basics of Polymer Science, F.W. Billmeyer, John Wiley & Sons, N7,1984



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Khwaja Moinuddin Chishti Language University, Lucknow
(Uttar Pradesh State Government University)



Course Code: MSIC- 305

Credit 8

Minor project/Industrial Visit/Industrial Training /Seminar



Lab Course III

Course Code: MSIC- 306P

Credit 4

1. Preparation of detergent and study of the properties.
2. To prepare liquid soap and study its properties.
3. Preparation of flower extracts in water (eg. Rose water)
4. Preparation of flower extracts in oil (Itar)
5. Preparation of Hand Sanitizer.
6. Preparation of disinfectant (Phenyle)
7. Preparation of cream (cosmetics i.e. cold and vanishing)
8. Saponification of edible oil
9. Qualitative analysis of soap by foaming
10. To determine the Iodine value of soap.



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M. Sc. in Industrial Chemistry

Semester-IV - Second Year

Course

Course Code: MSIC- 401

Credit 20

Research Project