॥ सा विद्या या विमुक्तये ॥

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

'ज्ञानतीर्थ', विष्णुपुरी, नांदेड – ४३१ ६०६ (महाराष्ट्र राज्य) भारत

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

'Dnyanteerth', Vishnupuri, Nanded - 431 606 (Maharashtra State) INDIA

Established on 17th September, 1994, Recognized By the UGC U/s 2(f) and 12(B), NAAC Re-accredited with'B++' grade

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विज्ञान व तंत्रज्ञान विद्याशाखे अंतर्गत राष्ट्रीय शैक्षणिक धोरण २०२० नुसार पदवी प्रथम वर्षाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२४–२५ पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, या विद्यापीठा अंतर्गत येणा–या सर्व संलग्नित महाविद्यालयामध्ये शैक्षणिक वर्ष २०२४–२५ पासून पदवीस्तरावर राष्ट्रीय शैक्षणिक धोरण –२०२० लागू करण्याच्या दृष्टीकोनातून विज्ञान व तंत्रज्ञान विद्याशाखे अंतर्गत येणा–या अभ्यासमंडळांनी तयार केलेल्या पदवी प्रथम वर्षाचे अभ्यासक्रमांना मा. विद्यापरिषदेने दिनांक १५ मे २०२४ रोजी संपन्न झालेल्या बैठकीतील विषय क्रमांक १५/५९–२०२४ च्या ठरावाअन्वये मान्यता प्रदान केली आहे. त्यानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील खालील बी. एस्सी प्रथम वर्षाचे अभ्यासक्रम (Syllabus) लागू करण्यात येत आहेत.

01 B. Sc. I year - Biotechnolgy
02 B. Sc. I year – Bio-informatics
03 B. Sc. I year – Biotechnology (Vocational)
04 B. Sc. I year- Dyes and Druge
05 B. Sc. I year – Industrial Chemistry
06 B. Sc. I year – Agrochemical and Fertilizers
07 B. Sc. I year – Chemistry (General)
08 B. Sc. I year – Analytical Chemisrty
09 B. Sc. I year – Biochemistry
10 B. Sc. I year – Statistics
11 B. Sc. I year – Zoology
12 B. Sc. I year – Biotechnolgy (NMD College Hingoli)

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या **www.srtmun.ac.in** या संकेतस्थळावर उपलब्ध आहेत. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी, ही विनंती.

'ज्ञानतीर्थ' परिसर,
विष्णुपुरी, नांदेड – ४३१ ६०६.
जा.क्र.:शै–१/एनइपी/विवत्रंविपदवी/२०२४–२५/123
दिनांक २०.०६.२०२४

डॉ. सरिता लोसरवार
सहा.कुलसचिव
शैक्षणिक (१–अभ्यासमंडळ) विभाग

प्रत : १) मा. आधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.
२) मा. संचालक, परीक्षा व मुंल्यमापन मंडळ, प्रस्तुत विद्यापीठ.
३) मा. प्राचार्य, सर्व संबधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
४) मा. प्राचार्य, न्यू मॉडल डिग्री कॉलेज हिंगोली.
५) सिस्टीम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ. याना देवून कळविण्यात येते की, सदर परिपत्रक संकेतस्थळावर प्रसिध्द करण्यात यावे.

Syllabus for B. Sc. First Year

Subject: Industrial Chemistry

As Per National Education Policy- 2020

To be Implemented from

Academic Year 2024-2025

. Sc. First Year Semester I *(Level 4.5)*Sub. Code: IC

Teaching Scheme

	Course Code	Course Name	Credits Assigned			Teaching Scheme (Hrs./ week)	
			Theory	Practical	Total	Theory	Practical
Optional 1	**SICHCT1101**	**Fluid Mechanics & Lubricants**	02	--	**04**	02	--
	SICHCP1101	**Practical**	-	02			04
Generic Electives *(from other Faculty)*	**SICH**GE1101	**General & Industrial Safety Aspects-I (Basket 3)**	02	--	**02**	02	--
Skill Based Course (related to Major)	**SICH**SC1101	**Introduction to Process Calculations**	--	02	**02**	--	04

B. Sc. First Year Semester II *(Level 4.5)*Sub. Code: AGF

Teaching Scheme

	Course Code	Course Name	Credits Assigned			Teaching Scheme (Hrs./ week)	
			Theory	Practical	Total	Theory	Practical
Optional 1	**SICH**CT1151	**Heat Transfer, Fuels & Water Analysis**	02	--	**04**	02	--
	SICHCP1151	**Practical**	-	02			04
Generic Electives *(from other Faculty)*	**SICH**GE1151	**General& Industrial Safety Aspects—II (Basket 3)**	02	--	**02**	02	--
Skill Based Course (related to Major)	**SICH**SC1151	**Small Scale Industries**	--	02	**02**	--	04

Syllabus for B. Sc. First Year

Subject: Industrial Chemisery

Semester – I

As Per National Education Policy- 2020

To be Implemented from

Academic Year 2024-2025

B.Sc. Industrial Chemistry, I Year (Semester - I)

Major Core Theory Course

Course Code – SICHCT1101

Title of the Course: Fluid Mechanics & Lubricants

[Credits: 2 (Marks: 50)] **(Total Periods: 30 Hours)**

Course pre-requisite:

The courses will train students with sound theoretical and experimental knowledge that suits the need of academics and industry. The courses also offer ample skills to pursue research as career in the field of chemistry and allied areas. The core courses in Industrial Chemistry are designed to familiarize the students with the industrial processes involved in the commercial production of the organic & inorganic industrial products. The revised syllabus at B.Sc. First year has been designed with well-defined objectives.

Course objectives:

1.Aim of the Bachelor's Degree Programme in B.Sc.*in* Industrial Chemistry offers the basic concepts of Chemistry with Industrial applications.

2.The main objective of this degree course is to produce graduates with enhanced skills, knowledge and research aptitude to carry out higher studies or research and development in the various industrial areas. 3.This degree program of Industrial Chemistry prepares the students for immediate entry to the workplace with sound theoretical, experimental knowledge in the area of fuels and energy, environment, health, foods, cosmetics, pharmaceuticals, polymers, petrochemicals and related multidisciplinary fields. Overall,

4. The course offers basic foundation in chemistry which enables the students to understand the concepts in chemical manufacturing processing, engineering and industrial development.

Course outcomes:

1. Understand the fundamental concepts, Aspects of industrial chemistry , principles and processes underlying the academic field of Industrial chemistry, its different streams (*Unit operations I & II, Mass transfer, Heat transfer, Fluid mechanisc, Chemical reaction engineering, Industrial safety , process equioment design, Process instrumentation, Plant utilities, and chemical process prinicples)* and its linkages with related disciplinary areas/subjects.
2. Demonstrate the procedural knowledge that creates different types of professionals in the field of
   Industrial chemistry and related fields such as pharmaceuticals, chemical industry, teaching, research, environmental monitoring, product quality, consumer goods industry, food products, cosmetics industry, polymers & petrochemicals, etc.
3. Use chemical techniques relevant to academia and industry, generic skills and global competencies, including knowledge and skills that enable students to undertake further studies in the field of industrial chemistry or a related field and work in the chemical and non-chemical industry sectors
4. Undertake hands on lab work and practical activities which develop problem solving abilities required for successful and bright career in industry

Module No.	Unit No.	Topic	Hrs.
1.0		**Over view of Industrial chemistry**	**07**
	1.1	Scope and Importance of Industrial Chemistry,	
	1.2	Introduction to Unit Operation, Unit Processes Fluid mechanics	
	1.3	Chemical Kinetics,Material Balance, Industrial Economics	
	1.4	Introduction,general organic Chemistry, Reaction Mechanism, Chemical Bonding and molecular structure.	
2.0		**Flow of Fluids**	**08**
	2.1	Definitions of fluids, Classification of fluids, Properties of fluids,	
	2.2	Fluid Pressure, Pressure Head, Hydrostatic equilibrium for compressible and incompressible fluids	
	2.3	Application of fluid statics- Manometers, U-tube manometer, Inclined Manometer, Differential Manometer, Continuous gravity decanter, Fluid Flow Phenomena - Types of flow, Laminar flow, Shear Rate and Shear Stress, Turbulence- Reynolds number & Transition from Laminar to Turbulent flow, Reynolds experiment,	
	2.4	Basic Equations of fluid flow-Equation of Continuity, Bernoulli's equation, Pump work in Bernoulli's equation and its application**.**	
3.0		**Transportation of fluids**	**07**
	3.1	Pipe, Tubing, Fittings & valves. Pumps: Classification of Pump, Developed head, Power requirement, Suction lift and cavitations,	
	3.2	, Positive- displacement pumps, Reciprocating pumps, Rotary pumps, Centrifugal pumps, Centrifugal pump theory, Ideal pump,	
	3.3	Actual pump performance, Power consumption, Efficiency. Air Binding and Pump Priming, Losses in Centrifugal Pump, Centrifugal Pump troubles & Remedies, Pump fails to start pumping, Pump is working but not up to the capacity and pressure, Pump starts and then stop pumping, and Pump takes too much power. Metering of fluid	
	3.4	Metering of fluids: Full bore meters- Principle, Construction and Working, Advantages and Disadvantages of Venturimeter , Orifice meter , Pitot Tube, Rotameter.	

4.0		**Lubricants**	**08**
	4.1	Classification and properties of lubricants- (viscosity index, cloud point, pore point), lubricating oils (conducting and non-conducting) solid and semisolid lubricants, synthetic lubricants. Oils and Fats	
	4.2	Classification of oils, fat splitting, distillation of completely miscible and non-miscible oils, hydrogenation of oils,	
	4.3	rancidity saponification value, iodine number, acid value, soap and synthetic detergent, preparation of soap and detergent.	
	4.4	Numericals	
		Total	**30**

Text Books and Reference Books:

1. Unit Operation –I-K.A.Gavhane, Nirali Prakashan, 2000.

2.Unit Operation –Mc Cabe Smith,

3. Industrial Chemistry –B.K.Sharma, Goel publication House, Meerut,1997

4. Engineering Chemistry – S.S.Dara

B.Sc. Industrial Chemistry,
I Year (Semester - I)
Major Practical Course
Course Code – SICHCP1101
Practical

[Credits: 2 (Marks: 50)] **(Total Periods: 60 Hours)**

CURRICULUM DETAILS: SICHCP1101: Practical

Sr. No	Practical Exercises
1.	To Determine the Co-efficient of Venutrimeter
2.	To Determine the Co-efficient of Orifice meter.
3.	To Study the Characteristics of Centrifugal Pump.
4.	To Verify Hagen-Poisellue's Equation.
5.	To Study the Pipe Fittings Test Rig.
6.	Determination of Acid Value of Lubricating oil.
7.	Determination of Saponification Value of Lubricating oil.
8.	Determination of Viscosity of Lubricant by Red Wood Viscometer
9.	Determination of Flash of lubricating oil by Cleveland's Apparatus (Open Cup)
10.	Determination of Fire Point of lubricating oil by Cleveland's Apparatus (Open Cup)
11.	Determination of Flash & Fire Point of lubricating oil by Abel's Apparatus (Closed Cup)
12.	Determination of Flash & Fire Point of Lubricating oil by Pensky-Marten's Apparatus (Closed Cup).
13.	Preparation of Soap.
14.	Preparation of Detergent
15.	Determination of Acid Value of Lubricating oil.

Text Books and Reference Books: Text Books and Reference Books:

1. Unit Operation –I-K.A.Gavhane, Nirali Prakashan,

2.Unit Operation –Mc Cabe Smith,

3. Industrial Chemistry –B.K.Sharma, Goel publication House, Meerut,1997

4. Engineering Chemistry – S.S.Dara

B.Sc. Industrial Chemistry, I Year (Semester - I)

Generic Elective Course

Course Code – SICHGE 1101

Title of the Course: General & Industrial Safety Aspects-I

[No. of Credits: 2 Credit] **[Total: 30 Hours]**

CURRICULUM DETAILS: SICHGE 1101: General Safety Aspects-I

Module No.	Unit No.	Topic	Hrs.
1.0		**Introduction of Safety**	**08**
	1.1	General safety guidelines, issuing and returning of Chemicals & Glass wares, Rules for using the instruments	
	1.2	Protection against common Lab accidents from Fire, Electronic Shock	
	1.3	Explosion	
	1.4	Chemical & Thermal burns, Cuts, Absorption of Chemicals through skin, Inhalation of Chemicals, Ingestion of Chemicals	
2.0		**Identification of the Safety equipment**	**07**
	2.1	What to be done if a fire occurs, in case of electric shock,	
	2.2	In case of chemical spill	
	2.3	In case of ingenstion or inhalation of chemicals	
	2.4	In case of cuts, in case of burns, electric shock burns, in case of emergency.	
3.0		**Chemical Lab Safety Gudelines**	**07**
	3.1	Some common lab instruments like –Centrifuge, Water baths & Heating baths, Shakers, Blenders & Sonicators, Air Ovans, Vaccum Drying Ovan, Viscometer	
	3.2	Handling Glassware, Handling of Gas Cylinder, Special Precautions-Wearing Apron, Using Gloves, Using Goggles, Using Chemical Safety Fume Hoods	
	3.3	Storage of Chemicals – Flammables,Non Flammable solvents, Acids, Bases, Water Reactive Chemicals, Oxidizers, Non Oxidizing gases, Carcinogenic materia	
	3.4	Disposal of Chemicals- Solvents, Detergents, Acids & Alkalies, Dry Waste, Carcinogenic material.	

4.0		**Safety Training and First Aid:**	
	4.1	Methods of training to industrial employee	**08**
	4.2	Benefits of training employee,	
	4.3	Nature of HRD, Principal of First Aid, training in First Aid,	
	4.4	General rules of First Aid Injury and useful aids.	

Text Books and Reference Books:

1. Laboratory Safety Manual-Akanksha Sing, Mahadev Bar, Jyoti, Indian Institute of Technology-Delhi-2011
2. Introduction to Industrial Safety-**K.T.Kulkarni** Industrial Safety, Health Environment. Management System Khanna Publication by R.K.Jain.
3. Manual Of Fire Safety - N Shesh Prakash
4. Industrial Safety Management - S.M.Deshmukh

B.Sc. Industrial Chemistry, I Year (Semester - I)

Skill Enhancement Course

Course Code – SICHSC1101

Title of the Course: Introduction to Process Calculations

[No. of Credits: 2 Credit] **[Total: 60 Hours]**

: Introduction to Process Calculations

Sr. No	Practical Exercises	Hrs.
1 & 2	Introduction, Dimensions & Systems of Units, Fundamental Quantities, Derived Quantities, Conversions & Problems. Basic Chemical Calculations-Introduction, Mole, Atomic Mass & Molar Mass, Equivalent Mass, Solids, Liquids & Solutions, Important Physical, Properties of Solutions, Gases & Problems Material balances without chemical reactions	8
3	Classification of Material Balance Problems, Material balances without chemical reactions,	4
4&5	Outline of Procedure for Material Balance Calculations, Distillation, Evaporation, Absorption, Extraction, Drying, Filtration, Mixing, Crystallization and Problems on Material Balances	8
6	Introduction to Laboratory Equipments & techniques-Glass Apparatus-Flasks, Funnels, Beakers, Stirrers, Std,flasks, Drying apparatus, accessories, thermometers, distillaltion assemblies, etc.	4
7	Calibration of thermometers, measuring flasks, std, flasks, weights of samples, etc.	4
8	Preparation of Standard solutions of acids-bases-salts (Oxalic acid-1M, NaOH-1N, NaCl gm/Liter)	4
9&10	Preparation of required solutions (0.01M), (0.01N), % composition Solutions from available std. Solution of acids-bases-salts.	8
11	Determination of MPs of Solid compounds.	4
12	Determination of bps of liquid samples in the lab.	4
13	Use of Mol.Wts/Eq.wts of Chemical compound for perperationn of different strength solutions in gms/lit.	4
14	To separate a mixture of Solid +Liquid by filtration technique.	8
15	To separate a mixture of liquid + liquid by Separating funnel by using binary mixture of different density system.	8
	Total	**60**

Text Books and Reference Books:

1. *Process calculation –I-K.A.Gavhane, Nirali Prakashan,*
2. *Unit Operation –Mc Cabe Smith,*
3. *Industrial Chemistry –B.K.Sharma, Goel publication House, Meerut,1997*
4. *Engineering Chemistry – S.S.Dara*
5. *University Practical Chemistry by PC Kamboj, Vishal Publishing Company,Jalandhar.*

Syllabus for B. Sc. Industrial Chemistry, First Year

Semester – II

As Per National Education Policy- 2020

To be implemented from

Academic Year 2024-2025

B.Sc. Industrial Chemistry, I Year (Semester - II)
Major Core Theory Course
Course Code – SICHCT 1151
Title of the Course: Heat Transfer , Fuels & Water Analysis
[Credits: 2 (Marks: 50)] (Total Periods: 30 Hours)

Course objectives:

1. To acquire knowledge about various experiments by using variety of instrumental and non- instrumental experimental techniques, to make the skilful and employable personnel in the field of Industrial Chemistry.
2. To educate and produce trained Chemist and self reliant, prepare student for professional Participations in various Industry
3. Learners are able to solve most of the environmental, social and economic problems of the Society related to medicinal and health through Industrial Chemistry point of view
4. Learner Collect the Knowledge as per Industrial Requirement as well as stand on his own Foot

Course outcomes:

1. To make student practically trained and vocationally skilled to meet the upcoming challenges of unemployment. To provide practically skilled personnel in the field of Industrial Chemistry.
2. Understand safety aspect of chemicals, transfer and measurement of chemicals, preparation of solution and find out the green route for chemical reaction for sustainable development.
3. Create an awareness of the impact of industrial chemistry on the environment, society and development outside the scientific community.

CURRICULUM DETAILS: Heat Transfer, Fuels & Water Analysis

Module No.	Unit No.	Topic	Hrs.
1.0		**Conduction**:	
	1.1	Basic law of Conduction	**07**
	1.2	Thermal conductivity	
	1.3	Compound resistances in series, Heat flow through a Cylinder	
	1.4	Numerical	
2.0		**Convection Radiation**:	
	2.1	Classification of Convection.	**08**
	2.2	Absorptivity, Reflectivity and Transmissivity, Krichhoff's law, Laws of black body radiation, Steafan-Boltsmann law, Heat Transfer by radiation. Heat Exchange Equipments: Single pass tubular condenser, Double pipe heat exchanger, Counter Current and Parallel flow,	
	2.3	Energy Balances, Enthalpy balances in heat exchangers, Enthalpy balances in total condensers, Overall Heat Transfer Coefficients, LMTD, Individual Heat Transfer Coefficient, Calculation of Overall Coefficients from individual coefficients, fouling factors.	
	2.4	Numerical	
3.0		**Fuels**	
	3.1	Introduction , Calorific Value, Classification & properties of fuels.	**08**
	3.2	**Solid Fuels:** Properties , composition & Analysis of Coa	
	3.3	**Gaseous Fuels:** Classification , Natural gas , LPG	
	3.4	**Liquid Fuels:** Petroleum, composition & classification , Definition of Flash point & fire point	
4.0		**Water Analysis**	
	4.1	Chemical & physical examination of water, Chemical substances affecting potability, color, Turbidity, odor, taste, temperature, PH conductivity, suspended solid , acidity, alkalinity, free chlorine, calcuium & magnesium, Dissolved Oxygen, Biochemical Oxygen Demand, Chemical Oxygen Demand and Dissolved solid	**07**
	4.2	suspended solid , acidity, alkalinity, free chlorine, calcuium & magnesium	
	4.3	Dissolved Oxygen and Dissolved solid	
	4.4	Biochemical Oxygen Demand, Chemical Oxygen Demand	
		Total	**30**

Text Books and Reference Books:

1. *Unit Operations of Chemical Engineering- McCabe Smith,*

2. Unit Operations-I (Fluid Flow & Mechanical Operations)- K. A. Gavhane,

3. Unit Operations-II (Heat & Mass Transfer)- K. A. Gavhane

4. Heat Transfer- K. A. Gavhane,

5. Principles of Heat Transfer & Mass Transfer- S. D. Dawande 6. Industrial Chemistry- B. K. Sharma

B.Sc. Industrial Chemistry, I Year (Semester -II)
Major Practical Course
Course Code – SICHCP 1152
Title of the Course: Practical
[No. of Credits: 2 Credit] **[Total: 60 Hours]**

CURRICULUM DETAILS: SICHCP 1152: Practical

Sr. No	Practical Exercises	Hrs.
1	Determination of hardness of water.	4
2	Determination of percentage of iron in cement (Volumetrically	4
3	Determination of amount of available chlorine in Bleaching powder	4
4	Estimation of calcium in limestone	4
5	Determination of dissolved oxygen (DO),	4
6	Determination of chemical oxygen demand (COD) in given wastewater sample.	4
7	To measure the density of various liquids by pyknometer	4
8	To Determine the Chloride Content of water by Mohr's Method	4
9	Determination of Alkalinity of Water sample	4
10	To determine the thermal conductivity of Bad conductor	4
11	To determine the calarific value of coal	4
12	To determine Colour, Odour, PH, TDS of water sample..	4
13	To determine, Conductivity of water sample..	4
14	Estimation of Iodine value of oil/fat	4
15	Visit to Industry	4

Text Books and Reference Books:

1. *Unit Operation –I-K.A.Gavhane, Nirali Prakashan, 2000.*
2. *Unit Operation –Mc Cabe Smith,*
3. *Practical Engineering Chemistry – S.S.Dara*
4. *Industrial Chemistry –B.K.Sharma, Goel publication House, Meerut,1997*
5. *Practical Engineering Chemistry – S.S.Dara*

B.Sc. Industrial Chemistry, I Year (Semester - II)

Generic Elective Course

Course Code – SICHGE 1151

Title of the Course: General and Industrial Safety Aspects–II

[No. of Credits: 2 Credit] **[Total: 30 Hours]**

CURRICULUM DETAILS: SICHGE 1151: General and Industrial Safety Aspects–II

Module No.	Unit No.	Topic	Hrs.
1.0		**Introduction of Safety**	**08**
	1.1	General safety guidelines,	
	1.2	Rules for using the instruments	
	1.3	Issuing and returning of Chemicals & Glass wares	
	1.4	Protection against common Lab accidents from Fire, Electronic Shock, Explosion, Chemical & Thermal burns, Cuts, Absorption of Chemicals through skin, Inhalation of Chemicals, Ingestion of Chemicals.	
2.0		**Identification of the Safety equipment**	**07**
	2.1	What to be done if a fire occurs	
	2.2	What to be done In case of electric shock	
	2.3	What to be done In case of chemical spill, in case of ingestions or inhalation of chemicals	
	2.4	What to be done In case of cuts, in case of burns, electric shock burns, in case of emergency.	
3.0		**Fire Safety Equipments**	**08**
	3.1	Fire Extinguishers-Fixed fire fighting system, Portable fire Extingusishers-1) Soda acid type, 2) Dry chemical powder type, 3) Carbon dioxide type 4) Foam type Extinguisher	
	3.2	Personal Protective equipment-Hand protection, Foot protection, Head Protection, Eye protection, Face protection, Skin & Body protection.	
	3.3	Protection against Fall, Noise protection, Respiratory protection-Care & Precaution,	
	3.4	Selection of personal protective equipment.	
4.0		**Industrial Safety Management:**	**07**
	4.1	Introduction to Safety and management	
	4.2	Classification of Accidents, Classification of Accidents, safety organization , management safety policy	
	4.3	Qualification and characteristics of safety manager	
	4.4	auditing, training and supervision Act, Legal Aspects	
		Total	**30**

Text Books and Reference Books:

1) Introduction to Industrial safety- K.T.Kulkarni (2002) Or Concept & Practices in Industrial Safety-K.T.Kulkarni(2007),

2) Handbook of fire technology-R.S.Gupta Orient Longman publication(1992), Hazzards in Chemical units-C.I.Pandya (Oxford ISH-1991).

3) Industrial Safety, Health Environment. Management System Khanna Publication by R.K.Jain.

4) Manual Of Fire Safety by N Shesh Prakash
5) Industrial Safety Management by S.M.Deshmukh

B.Sc. Industrial Chemistry, I Year (Semester - II)
Skill Enhancement Course
Course Code – SICHSC 1151
Title of the Course: Small Scale Industries
[No. of Credits: 2 Credit] [Total: 30 Hours]

CURRICULUM DETAILS: SICHSC 1151: Small Scale Industries

Sr. No	Practical Exercises
1.	Preparation of Talcum Powder
2.	Preparation of Shampoo.
3.	Preparation of Hair Removal.
4.	Preparation of Enamel.
5.	Preparation of Face Creams.
6.	Preparation of Aspirin/Disprin.
7.	Preparation of Nail Polish
8.	Preparation of Nail Polish Removal
9.	Preparation of Mosquito Coil.
10.	Preparation of Magnecium Bisilicate(Antacids)
11.	Preparation of Hand Sanitizers
12.	Preparation of Talcum Powder
13.	Preparation of Asprin/Disprin.
14.	Preparation of Magnesium Basilicata(Antacids)
15.	Industrial Visit and Making report

Text Books and Reference Books:

1. *Unit Operation –I-K.A.Gavhane, Nirali Prakashan, 2000. 2. Unit Operation –Mc Cabe Smith*
2. *Industrial Chemistry –B.K.Sharma, Goel publication House, Meerut,1997.*
3. Practical Chemistry (for B.Sc.I, II & III Year Students of All Indian Universities) Dr.O.P.Panday, D.N. Bajpai & Dr. S. Giri, S.Chand& Company, NewDelhi
4. University Practical Chemistry by PC Kamboj, Vishal Publishing Company,Jalandhar