

St. Xavier's College (Autonomous), Ahmedabad-09



Proposed Syllabus under Autonomous system for Semester I and II B Sc Industrial Chemistry Elective Papers (2014-2017)

August 26, 2014



St. Xavier's College(Autonomous), Ahmedbad-09

B Sc Sem- I:Industrial Chemistry

Elective Paper: Conceptual Industrial Chemistry: IC1401

Effective from Dec 2014

CORE Paper: Conceptual Industrial Chemistry (Theory)

Course Code: IC 1401

No. of Credits: 02

Learning Hours: 30 hrs

I. Course Overview & Course Objectives

The main objective of the course will be to build the basic foundation for studying chemistry. By the end of the paper, a student should be able to:

- (a) To learn about the difference in aliphatic and aromatic compounds, application of aromatic compounds in various field.
- (b) To learn about basic calculation of compounds, chemical reaction and some application.
- (c) To learn about Petroleum products formation, separation and different methods.
- (d) To learn about different Unit Operations and Renewable sources.

Thus, the knowledge from the course can help in the following:

- (a) Basic knowledge of chemistry is important for higher study in the subject.
- (b) The students could pursue a career in chemistry, Industrial chemistry and Post-graduation in the field of Chemistry.
- (c) Various aspects of organic, inorganic and physical chemistry can help for the research specialization at higher study.

II. Course Content

Unit-1: Aromatic Hydrocarbons

[Prerequisites or topics for Self Study: classification of aliphatic compounds and their properties]

- (1) Classification, Chemical and physical properties, preparation of Aromatic hydrocarbons.
- (2) Application in industry – Pharmaceutical industries, drugs, dyes, Polymer industries.

Unit-2: Material Balance calculations

[Prerequisites or topics for Self Study: basic studies of states and matter and get information from the periodic table]

- (1) Basic chemical calculations: Atomic weight, molecular weight, equivalent Weight, mole and Composition of liquid mixtures and gaseous mixtures.
- (2) Introduction to Material balance with and without chemical reactions: Limiting reactant, Conversion yield, Recycling or bypass operation.

Unit-3: Petroleum Products

[Prerequisites or topics for Self Study: study of Unsaturated Aliphatic compounds name]

- (1) Petroleum products: Introduction and formation of petroleum products
- (2) Processing of petroleum products: Natural gas, fractionation of crude oil, Cracking, Reforming, Hydroforming and Isomerization.

Unit-4: Unit Operations and Renewable Resources

[Prerequisites or topics for Self Study: Get information about separation and filtration]

- (1) Renewable sources: Definition, Types of renewable resources, Availability and use. Cellulose and starch: properties and modifications
- (2) Distillation: Introduction, Batch and Continuous distillation, separation of Azeotropes, plate column and packed columns.
- (3) Crystallization: Introduction, Solubility, nucleation, crystal growth, Equipments-Tank crystallizer, agitated crystallizer, draft tube crystallizer, evaporator crystallizer etc.

III. Teaching methodologies: Apart from the conventional black board teaching, other modes of teaching that will be adopted are power points, problem solving, and group discussion. Assignments will be designed such that students inculcate the habit of reading reference books and science journals. The use of smart boards for teaching will also be promoted to enable more interaction based teaching.

B Sc Semester I

IV. Reference books: IC 1401: Conceptual Industrial Chemistry (Theory)

- (1) “Organic Chemistry – Volume I” by S.M.Mukherjee, S. P. Singh and R.P. Kapoor, Kurukshetra University, Published by New Age International Ltd.

- (2) “Organic Chemistry” by Morrison and Boyd, 6th Edition, Prentice – Hall of India Pvt. Ltd.
- (3) “Organic Chemistry of Natural Products” by Gurdeep Chatwal, Vol. 1.
- (4) “Chemical Engineering” by J. M. Coulson and J. F. Richardson, 4th Edition
- (5) “Introduction to Chemical Engineering” by Walter L. Badger and Julius T. Bancherd, McGraw – Hill Publications.
- (6) “Industrial Chemistry” by B. K. Sharma, GOEG Publishing House, Meerut.
- (7) “Chemical Calculations” by G. D. Tulsi and P. L. Soni.

B Sc Semester I

V. Paper: Industrial Chemistry (Practicals)

Course Code: IC 1402L

No. of Credits:02

Session: 2 hrs

- (1) Determination of Normality of NaOH using standard solution of HCl
- (2) Determination of Normality of HCl using standard solution of NaOH
- (3) Purification of compounds by recrystallization.
- (4) Calibration of thermometer.
- (5) To determine the amount of TDS in water sample.
- (6) Preparation of Methyl Salicylate.
- (7) Preparation of petroleum jelly.
- (8) Purification by distillation.

B Sc Semester I

VI. Reference Books: IC 1402: Industrial Chemistry (Practicals)

- (1) “Quantitative Chemical Analysis” by Daniel C. Harris, 7th Ed.
- (2) “General Chemistry: A Lab Manual” by Slowinski Wolsey.



St. Xavier's College(Autonomous), Ahmedbad-09

B Sc Sem-II: Industrial Chemistry

Elective Paper: Selected Topics in Industrial Chemistry: IC 2401

Effective from Dec 2014

CORE Paper: Selected Topics in Industrial Chemistry: (Theory)

Course Code: IC 2401

No. of Credits: 02

Learning Hours: 30 hrs

I. Course Overview & Course Objectives

The main objective of the course will be to build the basic foundation for studying chemistry. By the end of the paper, a student should be able to:

- (a) To learn about Nomenclature of Basic Chemical Compounds which are useful in the plant with the information of some equipments.
- (b) To learn about pollution control of the industries and basic information about inorganic chemicals.

Thus, the knowledge from the course can help in the following:

- (a) Basic knowledge of industrial chemistry is important for higher study in the subject.
- (b) The students could pursue a career in chemistry, Industrial chemistry and Post-graduation and also in the field of research in Chemistry.

II. Course Content

Unit-1: Basics concept of industrial material

[Prerequisites or topics for Self Study: Get information about basic chemicals and techniques]

- (1) Nomenclature of Basic Chemical Compounds
- (2) Heat Exchangers
- (3) Basics of chromatography.

Unit-2: Unit operation -1

[Prerequisites or topics for Self Study: Get basic information about types of unit operation]

- (1) Extraction
- (2) Fuels
- (3) Vacuum pumps

Unit-3: Application of industrial chemistry

[Prerequisites or topics for Self Study: Study about the inorganic component from their properties]

- (1) Pollution
- (2) Inorganic materials of industrial importance: Alumina, Silica, charcoal, diamond, Graphite, Lamp black etc.

Unit-4: Energy balance

[Prerequisites or topics for Self Study: Basic study of system and types of systems, energy and their relation]

Introduction: Types of system, general energy balance procedure, bond Energy, Heat of Formation, Heat of Reaction, Examples of heat of formation and heat of reaction calculations, Specific heat, Relation between C_p and C_v .

III. Teaching methodologies: Apart from the conventional black board teaching, other modes of teaching that will be adopted are power points, problem solving, and group discussion. Assignments will be designed such that students inculcate the habit of reading reference books and science journals. The use of smart boards for teaching will also be promoted to enable more interaction based teaching.

B Sc Semester II

IV. Reference books: IC 2401 : Selected Topics in Industrial Chemistry:(Theory)

- (1) “Chemical Engineering” by J. M. Coulson and J. F. Richardson, 4th Edition
- (2) “Introduction to Chemical Engineering” by Walter L. Badger and Julius T. Bancherd, McGraw – Hill Publications.
- (3) “Industrial Chemistry” by B. K. Sharma, GOEG Publishing House, Meerut.
- (4) “Chemical Calculations” by G. D. Tulsi and P. L. Soni.
- (5) “A text book of Plant Utilities” by D.B.Dison.

B Sc Semester II

VI. Paper: Industrial Chemistry:(Practical)

Course Code: IC 2402L

No. of Credits: 02

Session: 2 hrs

- (1) Determination of mineral and Total Acidity of water Samples.
- (2) To verify the Beer – Lambert Law by Colorimeter.
- (3) To identify amino acid present in the given sample mixture using TLC.
- (4) TLC of paracetamol drug.
- (5) To carry out assay value of given sample of H_3BO_3 (Boric acid).
- (6) To carry out assay value of given sample of $ZnSO_4 \cdot 7H_2O$.
- (7) Preparation of Hair Dye.
- (8) Preparation of Vicco Turmeric

B Sc Sem II

V. Reference books: IC 2402: Industrial Chemistry (Practical)

- (1) “Quantitative Chemical Analysis” by Daniel C. Harris, 7th Ed.
- (2) “General Chemistry: A Lab Manual” by Slowinski Wolsey.

St. Xavier's College (Autonomous), Ahmedabad-09



Proposed Syllabus under Autonomous system for Semester III and IV

B ScIndustrial Chemistry (Elective Paper)

(2015-2018)

February 07, 2015

(Modified on 19-8-2019)



St. Xavier's College (Autonomous), Ahmedbad-09
B Sc Semester III Industrial Chemistry
Elective Paper: Industrial Process Chemistry
Effective from June 2015

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CORE Paper : Industrial Process Chemistry (Theory)

Course Code: IC 3401

No. of Credits: 02

Learning Hours: 30hrs

I. Course Overview & Course Objectives

The main objective of the course will be to build the basic foundation for studying Industrial chemistry. By the end of the paper, a student should be able to:

- To learn about the difference between unit operation and unit process and different types of unit process.
- To learn about the synthesis of dyes and pigments in industry
- To learn about the usage of dyes and pigments in industry.

Thus, the knowledge from the course can help in the following:

- Basic knowledge of Industrial chemistry is important for higher study in the subject.
- The students could pursue a career in chemistry, Industrial chemistry and Post-graduation in the field of Chemistry.
- Various aspects of Industrial Chemistry, organic, inorganic and physical chemistry can help for the research specialization at higher study.

II. Course Content

Unit 1 Unit process I

(8L)[14 Marks]

[Prerequisites or topics for Self Study:- Basic chemistry of types of unit process and term related to it.]

Nitration: Introduction, kinetics and mechanism, preparation of aromatic nitro compounds.
Sulfonation: Introduction, kinetics and mechanism, preparation of aromatic nitro compounds.

Unit 2 Unit process II

(7L)[14 Marks]

[Prerequisites or topics for Self Study:- Basic chemistry and terms related to halogen compound for unit process and various catalyst.]

Halogenation: Introduction, Kinetics and mechanism of halogenation, commercial manufactures like chloromethane, chloral and Monochloro acetic acid.
Hydrogenation: Introduction, Catalyst for hydrogenation, Hydrogenation of vegetable oils, Manufacture of Methanol by hydrogenation

Unit 3 Introduction of dyes

(8L)[14 Marks]

[Prerequisites or topics for Self Study:- Basic chemistry and terms related to dyes and pigments and their characteristics]

Introduction about dyes and pigments, Classification of dyes on the basis of structure and method of application, chemistry mode of application to fibers and classification: Azodyes, Acid dyes, Basic dyes and Mordent dyes.

Unit 4 Synthetic dyes

(7L)[14 Marks]

[Prerequisites or topics for Self Study:- Basic chemistry and terms related to dyes and pigments.]

Synthesis of different dyes like Eriochrome Black T, Congo red, Methyl Orange, Mordent Yellow, and Anthraquinone dyes, Alizarin dyes, Reactive dye and disperse dyes in commercial ways.

III. Teaching methodologies: Apart from the conventional black board teaching, other modes of teaching that will be adopted are power points, problem solving, and group discussion. Assignments will be designed such that students inculcate the habit of reading reference books and science journals. The use of smart boards for teaching will also be promoted to enable more interaction based teaching.

B Sc Semester III

IV. Reference books: IC 3401: Industrial Process Chemistry (Theory)

- (1) "Study Material in Vocational Subject of Industrial Chemistry", Compiled/edited by J.K.Bhambhani, KishinchandChellaram College, Mumbai.
- (2) "Handbook of Dyes and Pigments", K.M. Smith(Volume I,II and III) 2nd Edition.
- (3) "Instrumental Analysis", by William Kemp, 3rd Edition.
- (4) "Fundamentals of Analytical chemistry", by Skoog, West, Holier and Crouch, 8th Edition.
- (5) "Analytical Chemistry", by Gary D. Christian 6th Edition
- (6) "Organic Chemistry", by I. L. Finar, Pearson Education Pvt. Ltd, Delhi, India.
- (7) "Organic Chemistry – Volume I" by S.M.Mukherjee, S. P. Singh and R.P. Kapoor Kurukshetra University, Published by New Age International Ltd.
- (8) "Organic Chemistry", by Morrison and Boyd, 6th Edition, Prentice – Hall of India Pvt. Ltd
- (9) "Organic Chemistry of Natural Products", Vol. 1, by Gurdeep Chatwal, Himalaya Publishing House, India.
- (10) "Chemical Engineering", by J. M. Coulson and J. F. Richardson, 4th Edition.
- (11) "Introduction to Chemical Engineering" by "Walter L. Badger and Julius T. Bancherd McGraw – Hill Publications.
- (12) "Industrial Chemistry", by B. K. Sharma, GOEL Publishing House, Meerut.



St. Xavier's College (Autonomous), Ahmedbad-09
B Sc Semester III Industrial Chemistry
Effective from June 2015

I. Paper: Industrial Chemistry (Practical)

Course Code: IC 3402L

No. of Credits: 02

Sessions: Two X 3hrs

II. Course Content

1. Determination of C.O.D. and D.O. value in the Industrial water samples.
2. To prepare 5- nitro salicylic acid from salicylic acid in maximum yields.
3. Preparation of anthraquinone from anthracene
4. Preparation of p-nitro acetanilide from acetanilide.
5. Preparation of methyl orange.
6. Preparation of Mordent yellow.
7. Preparation of disperse dye.
8. Preparation of diazoaminobenzene from aniline.

III. Teaching methodologies: Practical work, problem solving, and group discussion etc.

B Sc Semester III

IV. Reference books: IC 3402L: Industrial Chemistry (Practicals)

- (1) "Elementary Practical Organic Chemistry", Part I, II and III by Arthur I. Vogel.
- (2) "Practical organic Chemistry", by F. G. Mann and B. C. Saunders, 4th Edition.
- (3) "Instrumental Analysis", by William Kemp, 3rd Edition.



St. Xavier's College (Autonomous), Ahmedbad-09
B Sc Semester IV Industrial Chemistry
Elective Paper: Applied Industrial Chemistry
Effective from June 2015

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CORE Paper: Applied Industrial Chemistry (Theory)

Course Code: IC 4401

No. of Credits: 02

Learning Hours: 30 hrs

II. Course Overview & Course Objectives

The main objective of the course will be to build the basic foundation for studying Industrial chemistry. By the end of the paper, a student should be able to:

- (a) To learn about basic unit process and their mechanism.
- (b) To learn about a large group of engineering materials of increasing importance in industrial applications as polymer.
- (c) To learn about wide range of chemical and natural materials used in formulation of cosmetic Preparation.

Thus, the knowledge from the course can help in the following:

- (a) Basic knowledge of Industrial chemistry is important for higher study in the subject.
- (b) The students could pursue a career in chemistry, Industrial chemistry and Post-graduation in the field of Chemistry.
- (c) Various aspects of Industrial Chemistry, organic, inorganic and physical chemistry can help for the research specialization at higher study.

II. Course Content

Unit1 Unit Process III

(8L)[14 Marks]

[Prerequisites or topics for Self Study: - Basic chemistry and terms related to alkyl group or aralkylradical for unit process and about aminating agents]

- (a) Alkylation: Introduction, Types of alkylation, alkylating agents, Thermodynamics and Mechanism of Alkylation, Manufacture of Alkyl benzenes and Phenyl ethyl alcohol.
- (b) Ammination by Ammonolysis
- (c) Hydrolysis

Unit 2 Polymer Science

(7L)[14 Marks]

[Prerequisites or topics for Self Study: - Basic chemistry and terms related to polymers and types of polymers]

Introduction and Classification of Polymers, Nomenclature of Polymers, Mechanism of Free radical and ionic Polymerization, Polymer degradation, Properties and application of Synthetic polymers.

Unit 3 Cosmetic Chemistry

(8L)[14 Marks]

[Prerequisites or topics for Self Study: - Basics of basic raw material for the production of hair and oral care products and some for perfumery material]

Introduction, Raw Materials for Cosmetic chemistry, Perfumery Products, Dental products, Regulation of Cosmetic Products, Quality and Environmental Issues by Cosmetics.

Unit 4 Entrepreneurship

(7L)[14 Marks]

[Prerequisites or topics for Self Study:-Fundamentals of Entrepreneurship]

Creative skills, knowledge, strength or power, Investment, risk factor, economically and Financially sound, Marketing Skill.

III. Teaching methodologies: Apart from the conventional black board teaching, other modes of teaching that will be adopted are power points, problem solving, and group discussion. Assignments will be designed such that students inculcate the habit of reading reference books and science journals. The use of smart boards for teaching will also be promoted to enable more interaction based teaching.

B Sc Semester IV

IV. Reference books: IC 4401: Industrial Process Chemistry (Theory)

- (1) "Polymer Science", by V.R. Gowarikar, N.V. Viswanathan, and Jaydevshreedhar, New Age International Limited Publisher.
- (2) "Comprehensive Industrial Chemistry" by Dr. Prakash G. More, Pragati Prakashan, India.
- (3) "Polymer Chemistry" by Malcolm P. Stevens, 3rd Edition.
- (4) "A Text Book of Polymers" volume II, by M.S. Bhatnagar, S.Chand & Company Ltd, New Delhi.
- (5) "Chemistry and Technology of the Cosmetics and Toiletries Industries", by D.F. Williams, Springer International Edition.
- (6) "Entrepreneurship" by Robert D. Hisrion and Michael P. Peters, 5th Edition.
- (7) "Organic Chemistry", by I. L. Finar, Pearson Education Pvt. Ltd, Delhi, India.
- (8) "Study Material in Vocational Subject of Industrial Chemistry", compiled/edited by J.K. Bhambhani, Kishinchand Chellaram College, Mumbai.
- (9) "Organic Chemistry of Natural Products", Vol. 1, by Gurdeep Chatwal, Himalaya Publishing House, India.
- (10) "Introduction to Chemical Engineering" by Walter L. Badger and Julius T. Bancherd, McGraw - Hill Publications.
- (11) "Industrial Chemistry" by B. K. Sharma, GOEL Publishing House, Meerut.



St. Xavier's College (Autonomous), Ahmedbad-09
B Sc Semester IV Industrial Chemistry
Effective from June 2015

I. Paper: Industrial Chemistry (Practical)

Course Code: IC 4402L

No. of Credits: 02

Sessions: Two X 3 hrs

II. Course Content

1. To prepare P-amino diazo-benzene in maximum yields.
2. Preparation of p-amino benzoic acid from p-nitro benzoic acid.
3. Preparation of m-nitro aniline from m-dinitrobenzene.
4. Preparation of p-nitro benzoic acid from p-nitro toluene
5. Preparation of phenylazo- β -naphthol from aniline
6. To analyze the % of Mg in given sample of Talcum Powder.
7. Preparation of Lip Balm from olive oil.
8. Preparation of o-ace- acetophenone from resorcinol

III. Teaching methodologies: Practical work, problem solving, and group discussion etc.

B Sc Semester IV

IV. Reference books: IC 4402L: Industrial Chemistry (Practicals)

- (1) "Elementary Practical Organic Chemistry", Part I, II and III by Arthur I. Vogel.
- (2) "Practical organic Chemistry", by F. G. Mann and B. C. Saunders, 4th Edition.
- (3) "Product process Design and Principles" by J.D. Seader, Warren D. Seider and Daniel R. Lewin.
- (4) "Quantitative Chemical Analysis", by Daniel C. Harris, 7th Ed.

St. Xavier's College (Autonomous), Ahmedabad-09



Proposed Syllabus under Autonomous system for Semester V and VI

B Sc Industrial Chemistry

(2016-2019)

August 10, 2015

(Modified on 19-8-2019)



St. Xavier's College (Autonomous), Ahmedbad-09
B Sc Semester V Industrial Chemistry
Effective from June 2016

Subject Elective Paper SEC: Pharmaceutical chemistry (Theory)

Course Code: IC 5401

No. of Credits: 02

Learning Hours: 30 hrs

I. Course Overview & Course Objectives

The main objective of the course will be to build the basic foundation for studying industrial chemistry. By the end of the paper, a student should be able to:

- (a) To learn fundamentals aspects of pharmacopeia and monograph of drugs.
- (b) To learn about classification of pharmaceutical drugs
- (c) To learn about Pharmaceutical dosage Forms.
- (d) To learn about drug discovery and design.

Thus, the knowledge from the course can help in the following:

- (a) Basic knowledge of these topics in Pharmaceutical chemistry which is important for practicals and industrial applications
- (b) The students could pursue a career in chemistry, Industrial chemistry and Post-graduation and also in the field of research in Chemistry.

II. Course Content

Unit 1 Pharmacopeia and monograph of drugs

[14 marks]

[Prerequisites or topics for Self Study: - Basic terms related to pharmacopeia and monograph of drugs]

- **Pharmaceuticals:** Historical background and development of pharmaceutical industry in India in brief.
- **Pharmacopeias:** Development of Indian pharmacopeia and Introduction of I.P., U.S.P., and B.P
- **Monograph of drugs:** Paracetamol, Trimethoprim, Bisacodyl, Mebendazole, Sulphamethoxazole.
- **Various types of Excipients :** Coating agent, coloring agent

Unit 2 Classification of pharmaceutical drugs: [14 marks]

Raw materials, Process of manufacture, effluent handling of the following
Bulk drugs

[Prerequisites or topics for Self Study: - Basic terms related to classification of pharmaceutical drugs]

- Hypnotic and sedatives drug: General; Early hypnotics; Barbiturate derivatives; Non barbiturate compounds
- Antimicrobial drug: Mercurochrome, Isoniazid (INH), PAS
- Cardiovascular drug : Introduction, cardiovascular agent-Methyl dopa
- Vitamins: Introduction and biological activity of Vit-A, Vit- B₆, Vit-C

Unit 3 Pharmaceutical Dosage Forms [14 marks]

[Prerequisites or topics for Self Study:-Fundamental terms and definitions pharmaceutical dosage forms]

- Pharmaceutical Formulation
- Routes of administration: Introduction, Types & Usage.
- Pharmaceutical packaging: Introduction, Packaging material, ancillary materials, Packaging machinery, Packaging evaluation.

Unit 4 Drug discovery and Design [14 marks]

[Prerequisites or topics for Self Study: - Basic terms related to Drug discovery and Design]

- Drug discovery: Choosing diseases, choosing drug target
- Drug design: Identification of the active part, Functional group Modification

III. Teaching methodologies: Apart from the conventional black board teaching, other modes of teaching that will be adopted are power points, problem solving, and group discussion. Assignments will be designed such that students inculcate the habit of reading reference books and science journals. The use of smart boards for teaching will also be promoted to enable more interaction based teaching.

B Sc Semester V

IV. Reference books: IC 5401: Pharmaceutical chemistry (Theory)

- (1) A text book of pharmaceutical chemistry by H.Kaur.
- (2) Pharmaceutical Dosage form & Drug delivery system by Howard c. Ansel, Nicholas G. Popovich.
- (3) Medicinal chemistry by V.K.Ahluwalia
- (4) Medicinal Chemistry, 2nd edition, by Ashutosh Kar.
- (5) Medicinal Chemistry by Gurdeep Chatwal.

B Sc Semester V

V. Paper SEC: Industrial Chemistry (Practicals)

Course Code: IC 5402 L

No. of Credits: 02

Sessions: Two X 3 hrs

Laboratory Session

1. To estimate purity of Sulphamethoxazole in tablet as powder by Mohr's method.
2. To identify related substance present in Bisacodyl tablet by TLC.
3. To identify related substance present in sulfa drug tablet by TLC.
4. Preparation of paracetamol drug from p-amino phenol.
5. To determine the sulphated Ash of paracetamol tablet.
6. To carry out assay value of given sample of NH_4Cl used as mouth wash by volhard Method.
7. To determine the % of vitamin- C in given sample.
8. To carry out assay value of given sample of MnO_4 used as Germicide and Antiseptic

VI. References Book: Industrial Chemistry (Practicals)

- (1) Practical Pharmaceutical Chemistry by A.H. Beckett, J. B. Stenlake Vol-2.

St. Xavier's College (Autonomous), Ahmedabad-09



Proposed Syllabus under Autonomous system for Semester V and VI

B Sc Industrial Chemistry

(2016-2019)

August 10, 2015

(Modified on 19-8-2019)

**Syllabus for Chemistry at B. Sc. (SEC- Industrial Chemistry)
Semester VI**

(To be effective from June 2016)

- CH 6501 Organic Chemistry
- CH 6502 Inorganic Chemistry
- CH 6503 Physical Chemistry
- CH 6504 Analytical Spectroscopic Techniques
- IC 6401 Subject Elective (Medicinal chemistry)
- CH 6505L Practical:
- (I) Inorganic Qualitative Analysis
 &
 Physical Chemistry (Kinetics, Solubility and Instruments)
- (II) Organic Preparation
 &
 Analytical Chemistry (Estimations and Chromatography)

Course Structure with respect to credit, hours and marks

Type of Course	Paper No.	Credit	Total Marks	Internal	External	No. of hours per week	Exam hours
Foundation Course (FC-V)	GE 6052	2	100	30	70	3	3
Core Course	CH 6501	4	100	30	70	4	3
	CH 6502	4	100	30	70	4	3
	CH 6503	4	100	30	70	4	3
	CH 6504	4	100	30	70	4	3
Subject Elective Course (SEC)	IC 6401	2	100	30	70	3	3
Practical Core Course – I and II	CH 6505L	5	200	60	140	12	12
Total Credit		25					

N.B.: The practical batch should be maximum of 10 students with respect to the credit.



St. Xavier's College (Autonomous), Ahmedbad-09

B Sc Semester VI Industrial Chemistry
Effective from June 2016

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Subject Elective Paper SEC: Medicinal Chemistry (Theory)

Course Code: IC 6401

No. of Credits: 02

Learning Hours: 30 hrs

I. Course Overview & Course Objectives

The main objective of the course will be to build the basic foundation for studying industrial chemistry. By the end of the paper, a student should be able to:

- To learn fundamentals of Pharmacodynamic and pharmacokinetics.
- To learn about Pharmacodynamic agents
- To learn basics of pro drug and drug delivery system
- To learn combinatorial chemistry .

Thus, the knowledge from the course can help in the following:

- Basic knowledge of these topics in Medicinal chemistry is important for practical's and Industrial applications
- The students could pursue a career in chemistry, Industrial chemistry and Post-graduation and also in the field of research in Chemistry.

Unit 1 Pharmacodynamic and Pharmacokinetics

[14 Marks]

[Prerequisites or topics for Self Study:-Fundamental terms and definitions related to Pharmacodynamic and pharmacokinetics]

- Introduction
- Drug target : Protein & Enzymes as drug target
- Drug metabolism

Unit 2. Pharmacodynamic Agents

[14 Marks]

[Prerequisites or topics for Self Study:-Fundamental terms and definitions related to Pharmacodynamic Agents]

- General Anesthetic: General ;Theories of anesthesia; Physical Theories; Neurophysiologic theory, Biochemical theories; Ideal anesthetic; Volatile anesthetics; Halogenated derivatives; Gaseous anesthetics; Intravenous anesthesia.
- Analgesic Drug : General, Synthetic analgesic derivatives, derivative based on Pepperdine
- Sulfonamide drug :General, Nomenclature, S.A.R., Classification of sulfonamide

• **Unit 3. Pro drug and drug delivery system**

[14 Marks]

[Prerequisites or topics for Self Study:-Fundamental terms and definitions related to pro drug and drug delivery system]

- Basic concepts of prodrug
- Types of prodrug

Unit 4. Combinatorial chemistry

[14 Marks]

[Prerequisites or topics for Self Study:-Fundamental terms and definitions related to combinatorial chemistry]

- Introduction
- Solution phase combinatorial chemistry
- Detection and Analysis

III. Teaching methodologies: Apart from the conventional black board teaching, other modes of teaching that will be adopted are power points, problem solving, and group discussion. Assignments will be designed such that students inculcate the habit of reading reference books and science journals. The use of smart boards for teaching will also be promoted to enable more interaction based teaching.

B Sc Semester VI

IV. Reference books: IC 6401: Medicinal chemistry (Theory)

- (1) An Introduction to Medicinal Chemistry by Graham L. Patrick, 2nd, Edition
- (2) The organic chemistry of drug design & drug action by Richard B., Silverman, 2nd edition
- (3) Text book of Organic Medicinal & Pharmaceutical Chemistry by John H. Block & John M. Beale, Jr. 11th edition.
- (4) A text book of Medicinal Chemistry by P.Parimoo, CBS Publishers & Distributors.

B Sc Semester VI

V. Paper SEC: Industrial Chemistry (Practicals)

Course Code: IC 6402 L

No. of Credits: 02

Sessions: Two X 3 hrs

Laboratory Sessions

1. To Prepare Aspirin Drug from salicylic acid.
2. To determine the % of Aspirin in the given sample.
3. To estimate the amount of paracetamol on given sample by spectrophotometer.
4. To perform the Assay of ZnO by IP 95.
5. Determination of Antacid drug by titration method.
6. To carry out assay of Mebendazole drug by potentiometrically.
7. To determine the % purity of Isoniazid (INH) as antituberculosis drug

VI. References Books: Industrial Chemistry (Practicals)

- (1) Advanced practical Medicinal Chemistry by Ashutosh Kar.