To,

Chemistry Board of Studies,

Gujarat University

Students of Chemistry at St. Xavier's College, Ahmedabad, desirous of opting for the existing Industrial Chemistry program should opt for the below mentioned Elective courses and Subject elective courses compulsorily.

Industrial Chemistry Program Structure

Semester I

EC/IC – 101 Conceptual Industrial Chemistry

Semester II

EC/IC – 102 Environment studies

Semester III

EC/IC - 201 Industrial Process Chemistry

Semester IV

EC/IC – 202 Applied Industrial Chemistry

Semester V

SEC/IC – 301 Pharmaceutical Chemistry

Semester VI

SEC/IC – 302 Medicinal Chemistry

The Course also includes Summer Trainings in the First and the Second Year, and an Entrepreneurship Project.

Industrial Chemistry Syllabus

Semester I EC/IC -101 Conceptual Industrial Chemistry

Unit 1: Aromatic Hydrocarbons

- Classification, Chemical and physical properties and preparation of aromatic hydrocarbons
- Application in industry – Pharmaceutical industries, drugs, dyes, polymer industries.

Unit 2: Material Balance calculations

- Basic chemical calculations: Atomic weight, molecular weight, equivalent Weight, mole and Composition of liquid mixtures and gaseous mixtures.
- Chemical reactions: Limiting reactant, Conversion yield, Liquid and Gas phase reactions with/without recycling or bypass operation.
- Materials in industries: Metal alloys and polymers.

Unit 3: Petroleum Products

- Petroleum products: Introduction and formation of petroleum products
- Processing of petroleum products: Natural gas, fractionation of crude oil, Cracking, Reforming, Hydro forming, Isomerization.

Unit 4: Unit Operations and Renewable Resources

- Distillation: Introduction, Batch and Continuous distillation, separation of Azeotropes, plate column and packed columns.
- Filtration: Introduction, filter media, filter aids, rotary drum filters, frame filters, match filters etc.
- Crystallization: Introduction, Solubility, nucleation, crystal growth, Equipments – Tank crystallizer, agitated crystallizer, draft tube crystallizer, evaporator crystallizer etc.
- Renewable sources: Renewable resources: Definition, Types of renewable resources, Availability and use. Cellulose and starch: properties and modifications.

REFERENCE BOOKS

1. **'Organic Chemistry'** by **I. L. Finar**, Pearson Education Pvt. Ltd, Delhi, India.
2. **'Organic Chemistry – Volume I'** by **S.M.Mukherjee**, **S. P. Singh and R.P. Kapoor**, Kurukshetra University, Published by New Age International Ltd.
3. **'Organic Chemistry'** by **Morrison and Boyd**, 6th Edition, Prentice – Hall of India Pvt. Ltd.
4. **'Organic Chemistry of Natural Products'** by **Gurdeep Chatwal**, Vol. 1.
5. **'Chemcial Engineering' by J. M. Coulson and J. F. Richardson**, 4th Edition
6. **'Introduction to Chemical Engineering'** by **Walter L. Badger and Julius T. Bancherd**, McGraw – Hill Publications.
7. **'Industrial Chemistry'** by **B. K. Sharma**, GOEG Publishing House, Meerut.
8. **'Chemical Calculations'** by **G. D. Tulsi and P. L. Soni**.

Laboratory session I

1. Determination of Normality of NaOH
2. Determination of Normality of HCl using standard solution of NaOH.
3. Purification of compounds by recrystallization
4. Calibration of thermometer
5. Study of Unsaturation in fats and oils
6. Study of light petroleum products by distillation
7. Purification by distillation

REFERENCE BOOKS

1. **'Quantitative Chemical Analysis'** by **Daniel C. Harris**, 7th Ed.

2. **'General Chemistry: A Lab Manual'** by **Slowinski Wolsey**.

Semester II EC/IC 102 Environment Studies