

**M.Sc. Industrial Chemistry  
Choice Based Credit System**

**This course has Two Centric Electives of Specialization:  
1. Fine Chemicals (Group A) and 2. Pharmaceuticals (Group B)**

Four Semester Course  
Course Structure 2015-17

**SEMESTER I**

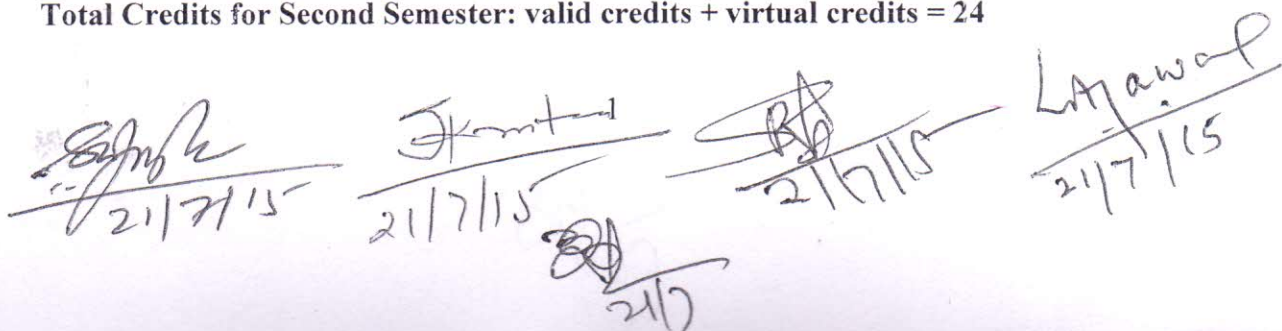
Course Code	Title of the Paper (s)	Course Type	L	T	P	Total Credit
IC-101	Analytical Chemistry	Core	3	0	0	3
IC-102	Physical Chemistry	Core	3	0	0	3
IC-103	Organic Chemistry-I	Core	3	0	0	3
IC-104 A IC-104 B	Paints & Pigments Bio-Chemicals	Elective	3	0	0	3
IC-105	Laboratory-I	Core	0	0	3	3
IC-106	Laboratory-II	Core	0	0	3	3
IC-107	Seminar	Core	0	0	1	1
IC-108	Assignment	Core	0	0	1	1
	<b>Total Valid Credits</b>					<b>20</b>
IC-109	Comprehensive Viva-voce	Virtual credit				4

**Total Credits for First Semester: valid credits + virtual credits = 24**

**SEMESTER II**

Course Code	Title of the Paper (s)	Course Type	L	T	P	Total Credit
IC-201	Chemistry of Natural Products	Core	3	0	0	3
IC-202	Organic Chemistry-II	Core	3	0	0	3
IC-203	Organic Chemistry-III	Core	3	0	0	3
IC-204 A IC-204 B	Polymer Science-I Medicinal Chemistry	Elective	3	0	0	3
IC-205	Laboratory-I	Core	0	0	3	3
IC-206	Laboratory-II	Core	0	0	3	3
IC-207	Seminar	Core	0	0	1	1
IC-208	Assignment	Core	0	0	1	1
	<b>Total Valid credits</b>					<b>20</b>
IC-209	Comprehensive Viva-voce	Virtual credit				4

**Total Credits for Second Semester: valid credits + virtual credits = 24**


  
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### SEMESTER III

Course Code	Title of the Paper (s)	Course Type	L	T	P	Total Credit
IC-301	Spectroscopy	Core	3	0	0	3
IC-302	Unit Operations	Core	3	0	0	3
IC-303 A	Polymer Science-II	Elective	3	0	0	3
IC-303 B	Medicinal Chemistry-II					
IC-304 A	Pesticides	Elective	3	0	0	3
IC-304 B	Pharmaceutics					
IC-305	Laboratory-I	Core	0	0	3	3
IC-306	Laboratory-II	Core	0	0	3	3
IC-307	Seminar	Core	0	0	1	1
IC-308	Assignment	Core	0	0	1	1
<b>Total Valid credits</b>						<b>20</b>
IC-309	Comprehensive Viva-voce	Virtual Credit				4

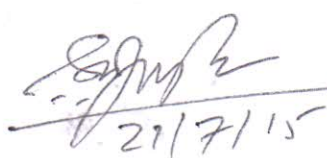
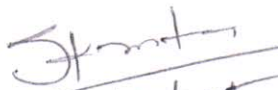
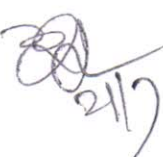
**Total Credits for Third Semester: valid credits + virtual credits = 24**


### SEMESTER IV

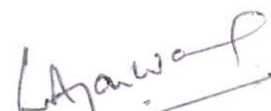
Course Code	Title of the Paper (s)	Course Type	L	T	P	Total Credit
IC-401	IPR, TQM & Technology Management	Core	3	0	0	3
IC-402	Advance Instrumental Techniques	Core	3	0	0	3
IC-403	Organic Chemistry-IV	Core	3	0	0	3
IC-404 A	Petrochemicals, Oils & Soaps	Elective	3	0	0	3
IC-404 B	Medicinal Chemistry-III					
IC-405	Industrial Training	Core	0	0	3	3
IC-406	Project Viva	Core	0	0	3	3
IC-407	Seminar	Core	0	0	1	1
IC-408	Assignment	Core	0	0	1	1
<b>Total Valid credits</b>						<b>20</b>
IC-409	Comprehensive Viva-voce	Virtual credit				4

**Total Credits for Fourth Semester: valid credits + virtual credits = 24**

**Minimum number of credits to be earned for award of Degree: 96**

  
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# SEMESTER-I

## IC 101 - ANALYTICAL CHEMISTRY

### UNIT- 1

#### Data Analysis

Types of errors, propagation of errors, accuracy and precision, significant figures, least square analysis, average, standard deviation, t test, F test, Q test, standardization of analytical methods.

#### Titrimetric Methods of Analysis

General concept, stoichiometric calculations, acid-base titrations, titration curves, acid-base indicators, complexometric titration, metal ion indicator, precipitation titrations, adsorption indicators.

### UNIT - 2

#### Gravimetric Methods of Analysis

Principles of gravimetric analysis, formation and properties of precipitates, applications of gravimetric analysis, organic precipitation.

#### Solvent Extraction

Theoretical principle, classification, factors favoring extraction, extraction equilibrium, instrumentation and application.

### UNIT - 3

#### Ion Exchange Chromatography

Theories, use of synthetic ion exchangers in separation, chelating ion exchange resins, liquid ion exchangers, experimental techniques and applications.

#### Separation Techniques

Classification of chromatographic techniques, fundamentals of paper, thin layer, column and electrophoresis, ion chromatographic techniques. Application of these techniques in qualitative and quantitative analysis.

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## UNIT - 4

### Gas Chromatography

Principles, theories, instrumentation and application of GSC and GLC, on line GC/Mass and GC/IR analysis.

### HPLC

Principles, instrumentation and role of HPLC in qualitative and quantitative analysis, comparison of GC and HPLC. Application of LC/MS in analysis.

## UNIT - 5

### Nephelometry and Turbidimetry


Introduction, general principles, instrumentation and application.

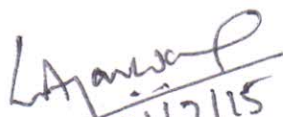
### Flame photometry

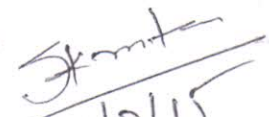

Introduction, theory, instrumentation, interferences and factors affecting flame photometry.

### Atomic Absorption Spectroscopy

Theory of atomic absorption spectroscopy, instrumentation, application in quantitative analysis: ICP-AAS.

  
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