

Proposed syllabus and Scheme of Examination
for

B.Sc. (Program) with Industrial Chemistry

Submitted

to

University Grants Commission

New Delhi

Under

Choice Based Credit System

April 2015

Details of Courses Under Undergraduate Program (B.Sc.)

Course *Credits

=====

Theory+ Practical Theory+Tutorials

I. Core Course $12 \times 4 = 48$ $12 \times 5 = 60$ **(12 Papers)**

04 Courses from each of the

03 disciplines of choice

Core Course Practical / Tutorial* $12 \times 2 = 24$ $12 \times 1 = 12$ **(12 Practical/ Tutorials*)**

04 Courses from each of the

03 Disciplines of choice

II. Elective Course $6 \times 4 = 24$ $6 \times 5 = 30$ **(6 Papers)**

Two papers from each discipline of choice

including paper of interdisciplinary nature.

Elective Course Practical / Tutorials* $6 \times 2 = 12$ $6 \times 1 = 6$ **(6 Practical / Tutorials*)**

Two Papers from each discipline of choice

including paper of interdisciplinary nature

- **Optional Dissertation or project work in place of one Discipline elective paper (6 credits) in 6th Semester**

III. Ability Enhancement Courses1. Ability Enhancement Compulsory $2 \times 2 = 4$ $2 \times 2 = 4$

(2 Papers of 2 credits each) Environmental Science English/MIL Communication

2. Skill Enhancement Course $4 \times 2 = 8$ $4 \times 2 = 8$ **(Skill Based)**

(4 Papers of 2 credits each)

Total credit= 120

Total credit= 120

Institute should evolve a system/policy about ECA/ General
Interest/Hobby/Sports/NCC/NSS/related courses on its own. *wherever there is practical there will
be no tutorials and vice -versa

**Proposed scheme for choice based credit system in B. Sc. Program with
Chemistry and Industrial Chemistry**

	CORE	Ability Enhancement		Skill	Discipline	Specific
		Compulsory	Course	Enhancement	Elective DSE (6)	
	COURSE (12)	(AECC) (2)		Course (SEC) (2)		
I	DSC-1A INDUSTRIAL CHEMICALS AND ENVIRONMENT	(English/MIL Communication)/				
	DSC- 2 A	Environmental Science				
	Atomic Structure, Bonding, General Organic Chemistry & Aliphatic hydrocarbons					
	DSC-3A Mathophysics Mechanics					

	DSC-1B INDUSTRIAL CHEMISTRY- FOSSIL FUELS, CLEANSING AGENTS AND FOOD ADDITIVES	
II	DSC- 2 B Chemical Energetics, Equilibria & Functional Group Organic Chemistry	Environmental Science /(English/MIL Communication)
	DSC- 3 B Calculus and matrices	
	DSC- 1 C Industrial Chemistry- Inorganic materials	
III	DSC- 2 C Solutions, Phase equilibrium, Conductance, Electrochemist ry & Functional Group Organic Chemistry	SEC-1

DSC- 3 C
Algebra

DSC-1D
Industrial
Chemistry:
Pharmaceuticals,
Fermentation
Pesticides &
Perfumes

IV

DSC- 2 D

SEC -2

Chemistry of
s- and p-block
Elements,
States of
Matter &
Chemical
Kinetics

DSC- 3 D
Physics Wave and
Optics

V

SEC -3

DSE-1 A

DSE-2 A

DSE-3 A

VI

SEC -4

DSE-1 B

DSE-2 B

DSE-3 B

SEMESTER	COURSE OPTED	COURSE NAME	Credits
I	Ability Enhancement Compulsory Course-I	English/MIL communications/ Environmental Science	2
	Core Course-I	DSC 1A: INDUSTRIAL CHEMICALS AND ENVIRONMENT	4
	Core Course-I Practical	Industrial Chemicals and Environment	2
	Core Course-II	DSC-2A Atomic Structure, Bonding, General Organic Chemistry & Aliphatic Hydrocarbons	4
	Core Course-II Practical/ Tutorial	DSC 2A Atomic Structure, Bonding, General Organic Chemistry & Aliphatic Hydrocarbons Lab	2
	Core Course-III	DSC 3A Mathophysics Mechanics	4
	Core Course-III Practical /Tutorial	DSC 3A Mathophysics Mechanics	2
II	Ability Enhancement Compulsory Course-II	English/MIL communications/ Environmental Science	2
	Core Course-IV	DSC 1B INDUSTRIAL CHEMISTRY-FOSSIL FUELS, CLEANSING AGENTS AND FOOD ADDITIVES	4
	Core Course-IV Practical	DSC 1B INDUSTRIAL CHEMISTRY-FOSSIL FUELS, CLEANSING AGENTS AND FOOD ADDITIVES	2
	Core Course-V	DSC-2B Chemical Energetics, Equilibria & Functional Group Organic Chemistry-I	4
	Core Course-V Practical/ Tutorial	DSC-2B Chemical Energetics, Equilibria & Functional Group Organic Chemistry-I Lab	2
	Core Course-VI	DSC 3B Calculus and Matrices	6
	III	Core Course-VII	DSC 1C INDUSTRIAL CHEMISTRY- INORGANIC MATERIALS
Core Course-VII Practical		DSC 1C INDUSTRIAL CHEMISTRY- INORGANIC MATERIALS	2
Core Course-VIII		DSC 2C Solutions, Phase Equilibria, Conductance, Electrochemistry &	4

		Functional Group Organic Chemistry-II	
	Core Course-VIII Practical/Tutorial	DSC 2C Solutions, Phase Equilibria, Conductance, Electrochemistry & Functional Group Organic Chemistry-II Lab.	2
	Core Course-IX	DSC 3C ALGEBRA	6
	Skill Enhancement Course -1	SEC-1	2
IV	Core course-X	DSC 1D INDUSTRIAL CHEMISTRY-4: PHARMACEUTICALS, FERMENTATION, PESTICIDES & PERFUMES	6
	Core Course-XI	DSC 2D Chemistry of s- and p-block elements, States of matter & Chemical kinetics	4
	Course-XI Practical/Tutorial	DSC 2D Chemistry of s- and p-block elements, States of matter & Chemical kinetics Lab	2
	Core Course-XII	DSC 3D PHYSICS -2: WAVE AND OPTICS	6
	Skill Enhancement Course -2	SEC -2	2
V	Skill Enhancement Course -3	SEC -3	2
	Discipline Specific Elective -1	DSE-1A	6

	Discipline Specific Elective -2	DSE-2A	6
	Discipline Specific Elective -3	DSE-3A	6
VI	Skill Enhancement Course -4	SEC -4	2
	Discipline Specific Elective -4	DSE-1B	6
	Discipline Specific Elective -5	DSE-2B	6
	Discipline Specific Elective-6	DSE-3B	6
Total Credits			120

Details of courses

B.Sc. Program with Chemistry

Core papers Chemistry (Credit: 06 each) (CP 1-4):

1. Atomic Structure, Bonding, General Organic Chemistry & Aliphatic Hydrocarbons (4) + Lab (4)
2. Chemical Energetics, Equilibria & Functional Group Organic Chemistry-I(4) + Lab (4)
3. Conductance, Electrochemistry & Functional Group Organic Chemistry-2(4) + Lab (4)
4. Chemistry of s- and p-block elements, States of matter and Chemical Kinetics (4) + Lab (4)

Core papers Industrial Chemistry (Credit: 06 each) (CP 1-4):

1. INDUSTRIAL CHEMICALS AND ENVIRONMENT
2. INDUSTRIAL CHEMISTRY-FOSSIL FUELS, CLEANSING AGENTS AND FOOD ADDITIVES
3. INDUSTRIAL CHEMISTRY-INORGANIC MATERIALS
4. INDUSTRIAL CHEMISTRY-4: PHARMACEUTICALS, FERMENTATION, PESTICIDES & PERFUMES

Core papers Mathophysics (Credit: 06 each)

1. Mechanics
2. Calculus and matrices
3. Algebra
4. Wave and optics

Discipline Specific Elective papers (Credit: 06 each) (DSE 1, DSE 2): Choose 2**Chemistry**

- 1.Applications of Computers in Chemistry (4) + Lab (4)
- 2.Analytical Methods in Chemistry (4) + Lab (4)
- 3.Molecular Modelling & Drug Design (4) + Lab (4)
- 4.Novel Inorganic Solids (4) + Lab (4)
5. Research Methodology for Chemistry (5) + Tutorials (1)
6. Chemistry of d-block elements, Quantum Chemistry and Spectroscopy (4) + Lab (4)
- 7.Organometallics, Bioinorganic chemistry, Polynuclear hydrocarbons and UV, IR Spectroscopy
- 8.Molecules of life (4) + Lab (4)
- 9.Dissertation

Discipline Specific Elective papers for Industrial Chemistry:

1. Green Chemistry (4) + Lab (4)
- 2.Industrial Chemicals & Environment (4) + Lab (4)
- 3.Polymer Chemistry (4) + Lab (4)
- 4.Inorganic Materials of Industrial Importance (4) + Lab (4)
- 5.
- 6 Dissertation

Discipline Specific Elective papers for Mathophysics:

Note: Universities may include more options or delete some from this list

Skill Enhancement Course (any four) (Credit: 02 each)- SEC 1 to SEC 4**Chemistry**

- 1.IT Skills for Chemists
- 2.Basic Analytical Chemistry
- 3.Chemical Technology & Society
- 4.Chemoinformatics
- 5.Business Skills for Chemists

6. Analytical Clinical Biochemistry

Skill Enhancement Course Industrial Chemistry

Green Methods in Chemistry

Intellectual Property Rights

Instrumental Methods of Analysis (4) + Lab (4)

Skill Enhancement Course Mathophysics:

Note: Universities may include more options or delete some from this list

Important:

1. Each University/Institute should provide a brief write-up about each paper outlining the salient features, utility, learning objectives and prerequisites.
2. University can add/delete some experiments of similar nature in the Laboratory papers.
3. University can add to the list of reference books given at the end of each paper.