

# CURRICULUM

In

# CHEMISTRY

For

**UNDER GRADUATE COURSES (B.Sc.)  
(Annual System)**

**PASSED BY THE BOARD OF STUDIES  
IN CHEMISTRY**

*(Applicable w.e.f. the session 2019-2020)*



**Department of Chemistry  
Rishikesh Campus**

**Sridev Suman Uttarakhand University Badshahithaul  
Tehri-Garhwal - 249001**

**Sri Dev Suman Uttarakhand University Badshshithaul Tehri Garhwal**

## Proposed Syllabus: Chemistry Course for B.Sc (Annual System)

### B. Sc. Chemistry Syllabus

#### Objective of the course

To teach the fundamental concepts of chemistry and their applications, the syllabus pertaining to B.Sc(3 year degree course) in the subject of chemistry has been prepared as per provision of UGC module and demand of the academic environment. The syllabus concepts are duly arranged unit wise and contents are included in such a manner so that due importance is given to requisite intellectual and laboratory skills. This B. Sc course of chemistry consists of three year course (annual system). Total marks: 600(200 per year).

#### B.Sc. First Year

Paper	Paper code	Course	Max. Marks	Work Hrs
I	CH-101	Inorganic Chemistry	50	60
II	CH-102	Organic Chemistry	50	60
III	CH-103	Physical Chemistry	50	60
	CH-104	Laboratory Practical	50	60
Grand Total			200	180

#### B.Sc. Second Year

Paper	Paper code	Course	Max. Marks	Work Hrs
I	CH-201	Inorganic Chemistry	50	60
II	CH-202	Organic Chemistry	50	60
III	CH-203	Physical Chemistry	50	60
	CH-204	Laboratory Practical	50	60
Grand Total			200	180

#### B.Sc. Third Year

Paper	Paper code	Course	Max. Marks	Work Hrs
I	CH-301	Inorganic Chemistry	50	60
II	CH-302	Organic Chemistry	50	60
III	CH-303	Physical Chemistry	50	60
	CH-304	Laboratory Practical	50	60
Grand Total			200	180

**Note:** Examiner should follow the below given pattern covering all the units for each section compulsorily:

- Twelve compulsory objective type questions of one mark each,  $12 \times 1 = 12$  Marks
- Examinees to solve six short answer questions out of ten question (3 mark each)  $3 \times 6 = 18$  Marks.
- Examinees to solve four long answer questions out of seven (5 mark each)  $4 \times 5 = 20$  Marks

**Distribution of marks for Practical exam will be as follows:**

#### B.Sc. (FIRST YEAR)

(i)	Inorganic Mixture analysis (six radicals)	15
(ii)	Organic Experiment	12
(iii)	Physical Chemistry Experiment	10
(iv)	Viva-voce**	05
(v)	Annual record	08
	Total	50

**B.Sc. (SECOND YEAR)**

(i)	Inorganic Experiment	15
(ii)	Organic Experiment	12
(iii)	Physical Chemistry Experiment	10
(iv)	Viva-voce**	05
(v)	Annual record	08
	Total	50

**B.Sc. (THIRD YEAR)**

(i)	Inorganic Experiment	10
(ii)	Organic Experiment	12
(iii)	Physical Chemistry Experiment	15
(iv)	Viva-voce**	05
(v)	Annual record	08
	Total	50

\*Full credit of marks shall be given upto 0.5% error after which for each 0.1% error, two marks shall be deducted in Quantitative analysis experiments.

\*\*Viva-voce for ex-students shall carry 13 marks.

**Three Years Degree Course Syllabus for**  
**CHEMISTRY**  
**B.Sc. (FIRST YEAR)**

- Naphthalene 80-82°, Benzoic acid 121.5-122°, Urea 132.5-133°, Succinic acid 184.5-185°, Cinnamic acid 132.5-133°, Salicylic acid 157.5-158°, Acetanilide 113.5-114°, m-Dinitrobenzene 90°, p-Dichlorobenzene 52°, Aspirin 135°
- IV. Determination of boiling point:  
Ethanol 78°, Cyclohexane 81.4°, Toluene 110.6°, Benzene 80°  
Mixed melting point determination:  
Urea-Cinnamic acid mixture of various compositions (1:4, 1:1, 4:1)
- V. Distillation:  
Simple distillation of ethanol-water mixture using water condenser, Distillation of nitrobenzene and aniline using air condenser
- VI. Crystallization:  
Concept of induction of crystallization, Phthalic acid from hot water (using fluted filter paper and steamless funnel) Acetanilide from boiling water, Naphthalene from ethanol, Benzoic acid from water  
Decolorisation and crystallization using charcoal:  
Decolorisation of brown sugar (sucrose) with animal charcoal using gravity filtration.  
Crystallization and decolorisation of impure naphthalene (100g of naphthalene mixes with 0.3 g of Congo Red using 1g decolorizing carbon) from ethanol.
- VII. Sublimation (Simple and Vacuum): Camphor, Naphthalene, Phthalic acid and succinic acid.  
Qualitative Analysis:
- VIII. Detection of extra elements (N, S and halogens) and functional groups (phenolic, carboxylic, carbonyl, esters, carbohydrates, amines, amides, nitro and anilide) in simple organic compounds.  
*Physical Chemistry:*
- IX. Chemical Kinetics:  
1. To determine the specific reaction rate of the hydrolysis of methyl acetate/ethyl acetate catalyzed by hydrogen ions at room temperature.  
2. To study the effect of acid strength on the hydrolysis of an ester.  
3. To compare the strengths of HCl and H<sub>2</sub>SO<sub>4</sub> by studying the kinetics of hydrolysis of ethyl acetate.  
4. To study kinetically the reaction rate of decomposition of iodide by H<sub>2</sub>SO<sub>4</sub>.  
Distribution Law:  
1. To study the distribution of iodine between water and CCl<sub>4</sub>.  
2. To study the distribution of benzoic acid between benzene and water.
- X. Viscosity, Surface Tension:  
1. To determine the percentage composition of a given mixture (non interacting systems) by viscosity method.  
2. To determine the viscosity of amyl alcohol in water at different concentration and calculate the excess viscosity of these solutions.  
3. To determine the percentage composition of a given binary mixture by surface tension method (acetone & ethyl methyl ketone).

### B.Sc. (SECOND YEAR)

There shall be three written papers and a practical examination as follows:

Paper	Paper code	Course	Max. Marks	Work Hrs
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