GUJARAT TECHNOLOGICAL UNIVERSITY

Pharm.D

1st year

Subject Name: Pharmaceutical Inorganic Chemistry
Subject Code: 818805

Teaching Scheme				Evaluation Scheme				Total Marks
Theory	Tutorial	Practical	Total	Theory		Practical		
				External	Internal	External	Internal	
2	1	3	6	70	30	70	30	200

Sr. No.	Course Contents	Hours	Module Weightage
1	**Errors:** Errors in Analysis: Error, Accuracy and Precision, Types of Errors, Methods of expressing precision, Test for rejection of data, Significant figures, Rounding of figures, Confidence limits	**2**	**3.5%**
2	**Volumetric analysis (Titrimetric analysis)**		
2.1	**Acid-base titrations:** Relative strength and its effect on titration, common ion effect, pH, Henderson-Hesselbach equation, buffers, neutralization curve, acid bas indicators, theory of indicators, back titrations, biphasic titrations, pharmacopoeial applications, hydrolysis of salts, ionic products of water and law of mass action.	**7**	**11.5%**
2.2	**Redox titrations :** Theory of redox titrations, redox indicators, types of redox titrations, iodometry, cerrimetry, mercurymetry, diazotization nitrite titrations, 2,6-dichlorophenol indophenol titrations, titration curve and calculations of potentials during course of titrations.	**6**	**10%**
2.3	**Nonaqueous titrations :** Nonaqueous solvents, titrants and indicators. Differentiating and leveling solvents.	**3**	**5%**
2.4	**Argentometric or precipitation titrations :** Mohrs, Fajans and Volhard methods	**3**	**5%**
2.5	**Complexometric titrations :** Theory of the titrations, titrant, indicators and pharmacopoeial applications.	**4**	**6.5%**
3	**Gravimetric analysis :** Stability, solubility products, types of precipitations, precipitation techniques, pharmacopoeial applications	**3**	**5%**
4	**Impurities in Pharmaceuticals**:	**4**	**6.5%**

	Sources of impurities, tests for purity and identity, limit tests for iron, arsenic, lead, heavy metals, chloride, sulphate.		
5	**Gases and Vapors**: Oxygen, Anesthetics and Respiratory Stimulants	**2**	**3.5%**
6	**Acidifying agents:** Dilute HCl	**1**	**1.5%**
7	**Antacids:** Types, Ideal characteristics of an antacid, Aluminium compounds, Calcium compounds, Magnesium compounds, Sodium compounds, Combination of Antacids	**2**	**3.5%**
8	**Cathartics:** Classification, Magnesium hydroxide, Magnesium sulphate, Sodium Phosphate, Dried Sodium Phosphate, Sodium Potassium tartarate, Potassium bitartarate, Mercurous chloride	**2**	**3.5%**
9	**Major intra and extra-cellular electrolytes**: Physiological ions, electrolytes used for replacement therapy, acids-base balance and combination therapy.	**4**	**6.5%**
10	**Essential and trace elements**: Transition elements and their compounds of pharmaceutical importance: Iron and haematinics, mineral supplements.	**3**	**5%**
11	**Antimicrobials**	**2**	**3.5%**
12	**Pharmaceutical Aids used in pharmaceutical industry** : Anti-oxidants, preservatives, Filter aids, Adsorbents, Diluents	**3**	**5%**
13	**Dental products**: Dentifrices, Anti-caries agents.	**2**	**3.5%**
14	**Miscellaneous agents**: Sclerosing agents, Expectorants, Emetics, poisons and Anti-dotes, Sedatives	**4**	**6.5%**
15	**Inorganic Radio pharmaceuticals:** Nuclear radiopharmaceuticals, reactions, Nomenclature, Methods of obtaining their standards and units of activity, measurements of activity, clinical applications and dosage, hazards and precautions.	**3**	**5%**

Course materials:

Text books

a. A text book Inorganic medicinal chemistry by Surendra N. Pandeya

b. A. H. Beckett and J. B. Stanlake's Practical Pharmaceutical chemistry Vol-I & Vol-II

c. Inorganic Pharmaceutical Chemistry III-Edition P.Gundu Rao

Reference books

a. Inorganic Pharmaceutical Chemistry by Anand & Chetwal

b. Pharmaceutical Inorganic chemistry by Dr.B.G.Nagavi

c. Analytical chemistry principles by John H. Kennedy

d. I.P.1985 and 1996, Govt. of India, Ministry of health

Pharm.D 1st year

PHARMACEUTICAL INORGANIC CHEMISTRY

Practical (3 Hours/ Week, 6 Credits, 90 Hours)

Sr. No.	Experiments
1	Limit tests for Cl, SO4, As, Heavy metals and Lead along with a few modifications.
2	All identification tests for pharmacopoeial inorganic pharmaceuticals and qualitative tests for cations and anions should be covered.
3	The backgrounds and systematic qualitative analysis of Inorganic mixture of up to 4 radicals. Six mixtures to be analyzed, Preferably by semi-micro methods.
4	Acid-base titrations Simple, back titrations, titrations of mixtures like NaOH+Na2CO3, borax + boric acid.
5	Redox titrations Simple, iodometry, cerrimetry, 2,6-dichlorophenol-indophenol titrations, mixtures like Fe+2 + Fe+3, oxalic acid + sodium oxalate
6	Complexometric titrations Replacement, back titrations
7	Nonaqueous titrations
8	Gravimetric assay of Barium
9	Argentometric titrations
10	Swelling power of Bentonite
11	Acid neutralizing capacity in aluminium hydroxide gel
12	Preparations: (Any Two) Boric acid, Potash Alum, Calcium lactate, Magnesium Sulphate

Scheme of Practical Examination

	Internal/ Sessional	External
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max. marks	**20**	**70**
Duration	**3 hours**	**4 hours**

Note: Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance)