Subject Code: BP104T	**Subject Title: Pharmaceutical inorganic Chemistry (Theory)**
Pre-requisite: --	

Course Objective: Upon completion of the course student shall be able to

1. Summarize the history and basics of pharmaceutical inorganic chemistry.
2. Classify various sources of contamination in pharmaceuticals.
3. Describe the limit test and its significance.
4. Interpret monograph of selected inorganic pharmaceutical compounds
5. Describe basics of radio pharmaceuticals and their therapeutic as well as diagnostic applications.

Teaching Scheme (Hours per week)			**Evaluation Scheme (Marks)**			
			Theory			**Total**
Lecture	**Tutorial**	**Credit**	**University Assessment**	**Continuous Assessment**	**Internal Assessment**	
3	1	4	75	10	15	100

Detailed Syllabus:

Sr. No.	**UNIT**	**Hours**	**Weightage (%)**
1.	**Impurities in pharmaceutical substances, General Method of preparations.** History of Pharmacopoeia, Sources and types of impurities, principle involved in the limit test for Chloride, Sulphate, Iron, Arsenic, Lead and Heavy metals, modified limit test for Chloride and Sulphate. Assay for the compounds superscripted with asterisk (*), properties and medicinal uses of inorganic compounds belonging to the following classes	**10 Hours**	**22.22%**
2.	**Acids, Bases and Buffers, Major extra and intracellular electrolytes, Dental products** **Acids, Bases and Buffers**: Buffer equations and buffer capacity in general, buffers in pharmaceutical systems, preparation, stability, buffered isotonic solutions, measurements of tonicity, calculations, and methods of adjusting isotonicity. **Major extra and intracellular electrolytes**: Functions of major physiological ions, Electrolytes used in the replacement therapy: Sodium chloride*, Potassium	**10 Hours**	**22.22%**

	chloride, Calcium gluconate* and Oral Rehydration Salt (ORS), Physiological acid base balance. **Dental products** : Dentifrices, role of fluoride in the treatment of dental caries, Desensitizing agents, Calcium carbonate, Sodium fluoride, and Zinc eugenol cement.		
3.	**Gastrointestinal agents, Acidifiers, Antacid, Cathartics, Antimicrobials.** **Acidifiers:** Ammonium chloride* and Dil. HCl **Antacid:** Ideal properties of antacids, combinations of antacids, Sodium Bicarbonate*, Aluminum hydroxide gel, Magnesium hydroxide mixture **Cathartics:** Magnesium sulphate, Sodium orthophosphate, Kaolin and Bentonite **Antimicrobials**: Mechanism, classification, Potassium permanganate, Boric acid, Hydrogen peroxide*, Chlorinated lime*, Iodine and its preparations	**10 Hours**	**22.22%**
4.	**Miscellaneous compounds: Expectorants, Emetics, Haematinics, Poison and Antidote, Astringents** **Expectorants:** Potassium iodide, ammonium chloride*. **Emetics**: Copper sulphate*, Sodium potassium tartrate **Haematinics:** Ferrous sulphate*, Ferrous gluconate **Poison and Antidote:** Sodium thiosulphate*, Activated charcoal, Sodium nitrite **Astringents**: Zinc Sulphate, Potash Alum	**8 Hours**	**17.77%**
5.	**Radiopharmaceuticals** Radio activity, Measurement of radioactivity, Properties of α, β, γ radiations, Half-life, radio isotopes and study of radio isotopes - Sodium iodide I^{131}, Storage conditions, precautions & pharmaceutical application of radioactive substances.	**7 Hours**	**15.55%**

Gandhinagar Institute of Pharmacy

Bachelor of Pharmacy (Undergraduate)

Semester I

Subject Code: BP104P	**Subject Title: Pharmaceutical Inorganic chemistry (Practical)**
Pre-requisite: --	

Course Objective: Upon completion of the course student shall be able to

1. Perform limit test as per the methods given in IP.
2. Identify given inorganic compounds through chemical tests.
3. Perform quantitative analysis of selected inorganic compounds.
4. Prepare inorganic pharmaceuticals following pharmacopeial procedures.
5. Analyze the problem, communicate suggested solution, and interpret the results.

Teaching Scheme (Hours per week)		**Evaluation Scheme (Marks)**			
		Theory			**Total**
Practical	**Credit**	**University Assessment**	**Continuous Assessment**	**Internal Assessment**	
4	2	35	5	10	50

List of Practical:

Sr. No.	**Title of the unit**
1	Limit tests for following ions
	(a) Limit test for Chlorides and Sulphates
	(b) Modified limit test for Chlorides and Sulphates
	(c) Limit test for Iron
	(d) Limit test for Heavy metals
	(e) Limit test for Lead
	(f) Limit test for Arsenic
2	Identification test
	(a) Magnesium hydroxide
	(b) Ferrous sulphate
	(c) Sodium bicarbonate
	(d) Calcium gluconate
	(e) Copper Sulphate
3	Test for purity
	(a) Swelling power of Bentonite
	(b) Neutralizing capacity of aluminium hydroxide gel
	(c) Determination of potassium iodate and iodine
4	Preparation of inorganic pharmaceuticals
	(a) Boric acid
	(b) Potash alum
	(c) Ferrous Sulphate

Recommended Study Material:

1. A.H. Beckett & J.B. Stenlake's, Practical Pharmaceutical Chemistry Vol I & II, Stahlone Press ofUniversity of London, 4th edition.
2. A.I. Vogel, Textbook of Quantitative Inorganic analysis, Longman Sc & Tech
3. P. Gundu Rao, Inorganic Pharmaceutical Chemistry, Vallabh Prakashan
4. M.L Schroff, Inorganic Pharmaceutical Chemistry, National Book Center
5. Bentley and Driver's Textbook of Pharmaceutical Chemistry, Oxford University Press
6. Anand & Chatwal, Inorganic Pharmaceutical Chemistry, Himalaya Publisher
7. Block and Roche, Inorganic, Medicinal and Pharmaceutical Chemistry, Lea and Febiger, US
8. R. A. Dav Jr. and A. L. Underwood, Quantitative analysis, Pearson education India.
9. Indian Pharmacopoeia, Ministry of Health and Family Welfare, Govt of India.