# GANPAT UNIVERSITY

## FACULTY OF PHARMACY

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|---|---|---|---|
| Programme | Bachelor of Pharmacy | Branch/Spec. | General |
| Semester | I | Version | 3.0.0.0 |
| Effective from Academic Year | 2026-27 | Effective for the Batch admitted in | July 2026 |
| Course Code | BP111P | Course Name | Pharmaceutical Inorganic and Analytical Chemistry (Practical) |
| Teaching Scheme (Per week) | | Examination Scheme (Marks) | |

| Scheme | Teaching Scheme (Per week) | | | | | Examination Scheme (Marks) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | TU | P | TW | Total | | CE | SEE | Total |
| Credit | 0 | 0 | 1 | -- | 1 | Theory | - | - | - |
| Hours | 0 | 0 | 3 | -- | -- | Practical | 20 | 30 | 50 |

| | |
|---|---|
| Pre-requisites | Nil / Basic knowledge of Chemistry and Biology |

**COURSE OBJECTIVES**

The objectives of this course are to:

1. Gain practical knowledge on various volumetric titration techniques.
2. Learn the principles of volumetric analysis.
3. Study the preparation and assessment of inorganic compounds.
4. Determine the assay of various inorganic compounds in pharmaceutical use.
5. Develop analytical skill for the qualitative and quantitative analysis of various inorganic compounds.

**Course Outcomes**

On successful completion of the course, the students will be able to:

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|---|---|
| CO1 | Perform limit tests to detect and identify impurities in pharmaceutical substances. |
| CO2 | Prepare various pharmaceutical inorganic compounds following standard procedures. |
| CO3 | Analyze the significance of quality control in pharmaceutical products and raw materials. |
| CO4 | Demonstrate proficiency in titrimetric analysis using different volumetric techniques. |
| CO5 | Competence in applying analytical skills to qualitative and quantitative data. |

**Practical Content**

Limit Tests (Any 4 Experiments)

a) Limit test and modified limit test for Chloride as per Indian Pharmacopoeia
b) Limit test and modified limit test for Sulphate as per Indian Pharmacopoeia
c) Limit test for Iron
d) Limit test for Lead
e) Limit test for Arsenic

Preparation of Inorganic Pharmaceuticals (Any 3 Experiments)

a) Preparation of Aluminium hydroxide
b) Preparation of potash alum
c) Preparation of ferrous sulphate
d) Preparation of Magnesium sulphate from magnesium hydroxide or magnesium carbonate

Test for Purity (Any 2 Experiments)

a) Assessment of swelling power of bentonite as per Indian Pharmacopoeia

b) Evaluation of acid neutralizing capacity of aluminium hydroxide gel
c) Determination of potassium iodate and iodine in potassium Iodide

Assay of Inorganic Compounds – including standardization of titrant (Any 5 Experiments)
a) Assay of ammonium chloride by acid-base titration
b) Assay of Ferrous sulphate by Cerimetry
c) Assay of Copper sulphate by Iodometry
d) Assay of Calcium gluconate by Complexometry
e) Assay of Hydrogen peroxide by Permanganometry
f) Assay of Sodium benzoate by non-aqueous titration
g) Assay of Sodium Chloride by precipitation titration (Modified Volhard's method)

**Text Books**


1. Bentley, R. and Driver, J. Bentley and Driver's Textbook of Pharmaceutical Chemistry. Oxford University Press.
2. Vogel, A.I. Vogel's Textbook of Quantitative Chemical Analysis. Pearson Education, Essex.
3. Beckett, A.H. and Stenlake, J.B. Practical Pharmaceutical Chemistry. Parts I & II. The Athlone Press, London.


**Reference Books**


4. Kennedy, J.H. Analytical Chemistry: Principles. Saunders College Publishing, New York.
5. Schroff, M.L. Inorganic Pharmaceutical Chemistry. Oxford Book Company, New Delhi.
6. Indian Pharmacopoeia Commission. Indian Pharmacopoeia. Ghaziabad, India.


**ICT / MOOCs Reference**

7. NPTEL – Pharmaceutical Analysis
8. Virtual lab – analytical chemistry simulations (vlab.co.in)

| Mapping of CO with PO and PSO: | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PEO1 | PEO2 | PEO3 | PEO4 | PEO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | - | 3 | 1 | 1 | - | - | - | - | - | 2 | 3 | 3 | 2 | - | 2 |
| CO2 | 2 | - | 3 | 1 | 1 | - | - | - | - | – | 2 | 2 | 2 | 2 | - | 2 |
| CO3 | 3 | 2 | 3 | 1 | 1 | - | - | - | - | - | 2 | 3 | 2 | 2 | - | 2 |
| CO4 | 3 | 2 | 3 | 1 | 1 | - | - | - | - | - | 2 | 3 | 2 | 2 | - | 2 |
| CO5 | 3 | 3 | 3 | 1 | 1 | - | - | - | - | - | 2 | 3 | 2 | 2 | - | 2 |