

Course specifications of Analytical chemistry II

Benghazi University

Faculty: Pharmacy

Department: Pharmaceutical chemistry

Course title: Analytical Chemistry II

Course Specifications

Program on which the course is given: Bachelor of Pharmaceutical Science

Academic year / level: Second year

Date of course specification approval:

1. Basic Information:

Title: Analytical Chemistry II

Lecture: Theory 2hrs

practical 2 hrs

Tutorial 1 hr optional

Total hrs:4-5hrs

2. Course Objectives:

- 2.1 Analyze professionally and independently pharmaceutical compounds by different methods of quantitative analysis.
- 2.2 Provide the students with a quantitative sense in chemical analysis.

3. Intended Learning Outcomes (ILOs):

a. Knowledge and understanding:

- a1 Describe different quantitative methods of analysis of organic and inorganic substances.
- a2 Demonstrate methods of drugs analysis and pharmaceutical calculations.

b. Intellectual Skills:

- b1 Classify compounds according to their chemical (acidic / basic / oxidizing / reducing) nature.
- b2 Analyze, evaluate and interpret the obtained data.
- b3 Suggest the suitable analytical methods for certain classes of pharmaceutical compounds.
- b4- Apply methods of analysis for mixtures of homogenous and heterogenous natures.

c. Professional and Practical Skills:

- c1 Handle (choice, preparation, standardization and application) standards.
- c2 Apply the suitable analytical method based on the knowledge and skills acquired.
- c3- Do pharmaceutical searches for suitable analytical methodologies.
- c4- Handle and dispose chemicals and pharmaceutical preparations safely.

d. General and Transferable Skills:

- d1 Work coherently and successfully as a part of team.
- d2 Communicate clearly by verbal and written means.
- d3 Demonstrate creativity and time management abilities.
- d4- Demonstrate critical thinking, problem- solving and decision-making abilities

4.Contents

4. Theoretical Contents:

No.	Topic	No. of hours
1.	Fundamental Background: Methods of quantitative analysis, reactions, measuring equipments, primary and secondary standards, relation between molarity, normality, weight and volume of the solution.	4
2.	Gravimetric analysis: Precipitation methods, choice of precipitate, requirements for precipitation process, requirements for weighed form ppt, particle size and types of ppt. Digestion and aging of ppt. Precipitation from homogenous solution and its advantages. Contamination of ppt. Organic precipitants.	4
3.	Acid base titration in aqueous medium: pH of acids, base and salt solutions, buffer solutions and henderson's equations. Factors affecting pH of buffers, buffer capacity. Acid base indicators, titration curves. Some applications of acid base titrations.	6

No.	Topic	No. of hours
4.	Complex formation titrations: Ligands and chelating agents. Factors affecting the stability of complex, stability constant of complex, titration curve of metal and EDTA, metallochromic indicators and applications of EDTA titrations.	4
5.	Precipitate formation titration: Solubility product constant, factors affecting it, titration curves and end point detection in Mohr's, Volhard's, Liebig's and Fajan's methods. Applications of precipitation titrations.	6
6.	Redox titrations: Types of electrochemical cells and their components, Nernst equation for electrode and oxidation potentials. Factors affecting oxidation potential. Types of indicators and redox titration curves. Applications of redox titrations.	10
7.	Titrations in non-aqueous solvents: Types of non-aqueous solvents, autoprotolysis constant, leveling and differentiating ability of solvent. Application of non-aqueous titrations.	2
8.	Water Analysis: Types of water, physical examination (color, odor, taste and pH), chemical examination of water (acidity, alkalinity, chlorides and total hardness). Pollution of water. Nitrogen cycle and detection of metals in water.	6
9.	Total	42

5. Teaching and Learning Methods:

(All methods below can be used)

5.1. Lectures using white board

5.2. Data show

5.3. Power point presentation

5.4. Tutorial Discussion

5.5. Lab Discussion

c) Weighing of Assessments:

Assessment (Quizzes) Examination	40 marks / 200	
Final Examination	120 marks/200	
Practical Examination	40 marks /200	
Other types of assessment	-----	
Total	200 marks	100%

Course co-ordinator: Isra Elnaili

Head of department: Dr. Ruwida snini

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