



**Department of Pathological disease**

**Paitaxt Technical Institute**

**Subject: General Chemistry**

**Course Book – 1<sup>st</sup> year student**

**Lecturer name: Dr.Hemn Abdulqadr Smail**

**Dr. Karzan Khaleel Hameed**

**Academic Year: 2020/2021**

# Course Book

<b>1. Course name</b>	General Chemistry
<b>2. Lecturer in charge</b>	
<b>3. Department/ College</b>	Pathological disease/ Paitaxt Institute
<b>4. Contact</b>	
<b>5. Time (in hours) per week</b>	2 hours theoretical - 2 hours practical
<b>6. Office hours</b>	
<b>7. Course code</b>	
<b>8. Teacher's academic profile</b>	
<b>9. Keywords</b>	
<b>10. Course overview:</b>	This course is intended to provide General chemistry. The first part of the course covers an introduction into measurements in analytical chemistry and a short introduction into methods of chemical analysis including volumetric and gravimetric analysis. The second part provides an introduction to the basic principles of Organic. Towards the end of the course; the importance of analytical and Organic chemistry.
<b>11. Course objective:</b>	The goal of this course is to introduce you to the principles of General chemistry with emphasis on the fundamental methods used for chemical analysis. The focus is on three important aspects: how to design experiments, how to analyse data, and how the tools of measurement work. The objectives of the course are <ol style="list-style-type: none"> <li>1. Learn how to apply the analytical approach to answer scientific questions.</li> <li>2. Learn the principles of Organic chemistry.</li> <li>3. Understand the principles and use of the instruments of chemical analysis; from basic glassware to modern instruments.</li> </ol>
<b>12. Student's obligation</b>	Students are obligated to be prepared for each lecture by reading the relevant reading assignment before class (see the lecture schedule). Students should study the materials and work problems after each lecture as they are meant to reinforce your understanding of the lecture material. Work extra problems for each topic in addition to the assignments. The more problems you practice, the better you will understand the material.
<b>13. Forms of teaching</b>	PowerPoint presentation, lecture notes, and white board.
<b>14. Assessment scheme</b>	Two exams during the course period: 20% Quiz tests and homework: 10% Practical Course 20% Final Exam: 50% (20% for theoretical and 30% for practical)

### 15. Student learning outcome:

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

1. To develop expertise relevant to the professional practice of chemistry
2. To develop an understanding of the range and uses of analytical methods in chemistry and Organic.
3. To establish an appreciation of the role of chemistry in Physical chemistry.
4. To provide an understanding of chemical methods employed for elemental and compound analysis
5. To provide experience in some scientific methods employed in analytical and biochemistry
6. To develop skills in the scientific method of planning, developing, conducting, reviewing and reporting experiment.

### 16. Course Reading List and References:

1. Fundamentals of Analytical Chemistry; Eighth Edition, by Douglas A. Skoog, Donald M. West, F. James Holler and Stanley R. Crouch.
2. Quantitative Chemical Analysis, 9th ed., by Daniel C. Harris
3. Quantitative Chromatographic Analysis; by Thomas E. Beesley, Benjamin Buglio and Raymond P. W. Scott.
4. The Quantitative Analysis of Drug; by Garrat 3<sup>rd</sup>, 2005 Toppan & Co.
5. Lehninger: Principles of Biochemistry; by David Nelson, Michael Cox 4<sup>th</sup>, 2005
6. Outlines of Biochemistry; by Eric Conn & Paul K Stumpf 5<sup>th</sup>, 1987

### 17. The Topics:

### Lecturer's name

Introduction to chemistry; Measurements and units in chemistry; Matter; Properties of Matters; Classifications of Matters	Week1	
Analytical chemistry, The chemical composition of aqueous solution; Units of concentrations; Methods for the expression of concentrations of solution; Molarity	Week2	
Normality; ppm; ppb; weight percentage; Density of specific gravity	Week3	
Preparation of dilute solution from the stock solution; Stoichiometric relationship	Week4	
Chemical equilibria; Chemical equilibria for water; Chemical equilibria for slightly soluble salts; Chemical equilibria for weak acids and bases	Week5	
Density and Specific gravity of solution	Week6	
The solubility of precipitate	Week7	
Mechanism of precipitate formation	Week8	
Elements and Compounds	Week9	
THE FIRST EXAME	Week10	
Introduction to Organic Chemistry	Week11	
Hydrocarbon nomenclature	Week12	

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Physical Properties of Alkane, Alkene and Alkynes	Week13	
Physical and Chemical Properties of Aromatic compounds	Week14	
Aldehydes , Ketones and Carbonyl compounds Carboxylic acid and Alcohols	Week15	
Physical and Chemical property of alcohol and carboxylic acid	Week16	
Final exam	Week17	

<b>18. Practical Topics</b>	<b>Week</b>
chemical safety, Lab rule safety, and common chemical equipment	1
Determination of Boiling Point (b.p.)	2
Determination of Melting Point (m.p.); Physical Properties of Organic Compounds	3
Determination of density of liquids and objects	4
Separation methods: Extraction	5
Volumetric Analysis	6
Neutralization titration (Acid-base titration)	7
Preparation and standardization of approximately 0.1N sodium hydroxide by using standardized hydrochloric acid	8
Preparation and standardization of approximately 0.1N acetic acid solution by using standardized sodium hydroxide	9
THE FIRST EXAME	10
Determination of Acetic Acid in Vinegar	11
Precipitation Titrations	12
Synthesis of acetyl salicylic acid (aspirin)	13
Synthesis of acetaminophen (paracetamol)	14
Synthesis of benzocaine	15
Recrystallization	16
The second exam	17
	18
	19
THE SECOND EXAME	20
<b>19. Examinations:</b> Will be covered in the lectures	
<b>20. Extra notes:</b>	

**21. Peer review**

Curriculum and course scheduling were peer reviewed.