Course Description Form

1. Course Name:
Medical terminology
2. Course Code:
PH1104
3. Semester / Year:
First semester/ first level
4. Description Preparation Date:
1/1/2026
5. Available Attendance Forms:
Full-time and official attendance hours
6. Number of Credit Hours (Total) / Number of Units (Total)
15h / 1 unit
7. Course administrator's name (mention all, if more than one name)
Name: MSC.Ramiz Talib Email: Ramiz.talb@alayen.edu.iq
8. Course Objectives

Course Objectives	1. Scientific preparation of the student with regard to medical and scientific terminology related to his studies for the purpose of preparing a student capable of dealing with all medical terminology used in his studies. 2. In this course, students will learn the pronunciation, spelling, and definition of medical and pharmaceutical terms used in health care. They will use a word-building strategy that helps them discover connections. Relationships between word roots, prefixes and suffixes. 3. They will learn the meaning of each part of a complex medical and pharmaceutical term. Ability to put parts together and define a term.

9. Teaching and Learning Strategies	
Strategy	1- Whiteboard, multimedia lectures, power point presentation 2- Class discussion 3- Handouts 4- Brainstorming

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	1	Define common medical word roots and suffixes and correctly use them to interpret basic medical terms.	Basic word roots and common suffixes	1- Whiteboard, multimedia lectures,	1- Short MCQs 2- Oral exam and direct

2-3	2	Identify and apply advanced pharmaceutical prefixes, roots, and suffixes to understand terminology used in pharmacy-related disciplines.	More word roots, suffixes and prefixes related to pharmaceutical sciences (pharmacognosy, clinical pharmacy, pharmaceutics,…etc)	power point presentation 2- Class discussion 3- Handouts 4- Brainstorming	questions i the class 3- Midterm exam 4- Electron c exams on the electronic platform 5- Final exam
4	1	Recognize standard anatomical terms and describe common abnormal conditions using correct medical terminology. Apply anatomical terminology to explain disease states and abnormalities affecting body systems.	Basic anatomical terms and abnormal conditions		
5	1	Describe the structure and function of the genital and urinary systems and interpret related medical terms.	The genitals and urinary tract		
6	1	Identify parts of the gastrointestinal tract and use medical terminology to describe digestive disorders and procedures.	The gastrointestinal tract		
7	1	Explain cardiovascular anatomy and physiology and correctly use terminology related to heart diseases and treatments.	The heart and cardiovascular system		
8-9	2	Distinguish between symptoms, diagnoses, and treatments, and interpret medical communication qualifiers and basic statistics. Accurately use clinical terminology to describe patient conditions,	Symptoms, diagnoses, treatments, communication qualifiers, and statistics		

		medical decisions, and healthcare outcomes.			
10	1	Describe stages of human growth and development and correctly use terms related to body orientation and position.	Growth and development, and body orientation		
11	1	Identify terminology related to female reproductive health, pregnancy, and childbirth processes	Gynecology, pregnancy, and childbirth		
12	1	Explain the anatomy and function of the eye and respiratory system and apply relevant medical terms to disorders and treatments.	The eye and the respiratory tract		
13	1	1. Identify basic structures and functions of the nervous system. 2. Use correct medical terminology related to neurological and behavioral disorders. 3. Recognize common neurological and behavioral conditions. 4. Interpret symptoms, diagnoses, and treatments related to nervous system disorders.	The nervous system and behavioral disorders		
14	1	• Identify the main components and	Blood and immunity		

		functions of blood and the immune system. • Use basic medical terminology related to blood and immunity. • Recognize common blood and immune disorders.			
15	1	• Understand basic concepts and terminology used in pharmaceutical sciences. • Identify key principles of pharmacognosy, pharmaceutics, and clinical pharmacy. • Apply pharmaceutical terminology to drug development, preparation, and us	Pharmaceutical sciences		

11. Course Evaluation

20% Midterm exam, 10% (Quizzes, attendance, active participation in class, assignment), 70% final

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Medical Terminology: An Illustrated Guide, the lasted edition, by Barbara Janson Cohen Introduction to Medical Terminology, 1st Edition
Main references (sources)	Medical Terminology: An Illustrated Guide, the lasted edition, by Barbara Janson Cohen Introduction to Medical Terminology, 1st Edition A Short Course in Medical Terminology: Enhanced Reprint (Point (Lippincott Williams & Wilkins)

Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	• MedlinePlus Medical Dictionary (NIH) – https://medlineplus.gov • Merriam-Webster Medical Dictionary – https://www.merriam-webster.com/medical • Taber's Medical Dictionary (Online) – https://www.tabers.com • Dorland's Medical Dictionary – https://www.dorlands.com • Drugs.com Medical Dictionary – https://www.drugs.com/dictionary • Online Etymology Dictionary (for word roots) – https://www.etymonline.com

Course Description Form

1. Course Name:
Analytical chemistry
2. Course Code:
PH1101
3. Semester / Year:
First semester / first level
4. Description Preparation Date:
2025-2026
5. Available Attendance Forms:
Full-time and official attendance hours
6. Number of Credit Hours (Total) / Number of Units (Total)
2x15= 45 hrs. (theoretical) 2x15=30 hrs. (practical) /number of units = 4
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Mohamed Mohamed Shahin Email: MohamedShahin.pharm@gmail.com
8. Course Objectives

Course Objectives	• By the end of this course, students will be able to: Understand the fundamentals of classical and instrumental analytical techniques. • Apply statistical tools in interpreting analytical data. • Recognize the role of pharmacopoeias in pharmaceutical quality control. • Perform basic titrimetric and gravimetric analyses relevant to pharmaceutical compounds

9. Teaching and Learning Strategies	
Strategy	1-lectures included multimedia lectures 2- power point presentation 3- practical work 4- open discussion

	5- class activity 6-Self learning 7- Quizzes and assignments

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2	3	1. Define analytical chemistry and its importance in pharmacy. 2. Differentiate between qualitative and quantitative analysis. 3. List common classical and instrumental analytical techniques. 4. Explain the role of analytical chemistry in drug development stages. 5. Describe how analytical chemistry supports pharmaceutical quality control.	Introduction to Analytica Chemistry: Types and roles in drug development and QC	1-lectures included multimedia lectures 2- power point presentation 3- open discussion 5- class activity 6-Self learning	1-written exam 2- Quiz 3-midterm exam 4- final exam
3-5	4	By the end of this topic, students should be able to: 1. List common units of concentration. 2. Explain the difference between primary and secondary standards. 3. Describe the steps to prepare a standard solution.	Review of Basic Concepts: Concentration units, standards, solution preparation.		

5–7	4	By the end of this topic, students should be able to: 1. Say what a pharmacopoeia is and why it is important. 2. Name examples like USP and BP. 3. Explain what a monograph is and what it includes. 4. Understand what specifications are in medicine quality control.	Introduction to Pharmacopoeias: USP, BP, monographs, specifications		
8–9	2	By the end of this case study, students should be able to: 1. Explain what a pharmacopoeial monograph is and what it includes. 2. Identify key tests and limits in a monograph. 3. Understand why method validation is important. 4. List basic ICH Q2(R1) validation parameters.	Case Study: Interpreting pharmacopoeial monographs and ICH Q2(R1) overview		
9–12	5	By the end of this topic, students should be able to: 1. Define gravimetric analysis. 2. Describe the steps: precipitation, filtration,	Gravimetric Analysis: Precipitation, weighing, error sources.		

		drying, and weighing. 3. List common sources of error in gravimetric analysis.			
13-15	5	By the end of this topic, students should be able to: 1. Define volumetric analysis and titration. 2. Explain how acid-base titrations work. 3. Identify common indicators and their color changes. 4. Understand the pH scale. 5. Use the titration formula to calculate unknown concentrations.	Volumetric Analysis I: Acid-base titrations, indicators, pH, calculatic		
16,17	3	By the end of this topic, students should be able to: 1. Describe what precipitation and complexometric titrations are. 2. Explain the Mohr method for chloride determination. 3. Explain how EDTA is used to measure metal ions. 4. Identify the indicators used in both titration types.	Volumetric Analysis II: Precipitation and Complexometric titration (Mohr, EDTA)		
18,19	3	By the end of this topic,	Redox Titrations:		

		students should be able to: 1. Define redox titration and explain the basic principle. 2. Describe iodometry and its use of iodine and thiosulfate. 3. Explain how $KMnO_4$ acts as a titrant and indicator. 4. Recognize color changes and endpoints in redox titrations.	Principles, iodometry, permanganometry		
20-24	7	By the end of this topic, students should be able to: 1. Calculate the mean and standard deviation of a data set. 2. Explain what confidence limits mean. 3. Use the Q-test to check for outliers. 4. Understand the purpose of the Grubbs test.	Statistical Evaluation of Data: Mean, SD, confidence limits, Q-tes Grubbs test		
25,26	3	By the end of this topic, students should be able to: 1. Explain the principle of UV-Visible spectrophotometry. 2. State Beer's Law and its variables. 3. Describe how absorbance relates to	UV-Visible Spectrophotometry: Principles, Beer's Law, applications.		

		concentration. 4. List common applications in pharmacy and science.			
27,28	3	By the end of this topic, students should be able to: 1. Define potentiometry and conductometry. 2. Explain how each method works. 3. List common uses of potentiometry and conductometry in analysis. 4. Understand the role of electrodes and ions in these methods.	Electrochemical Methods Potentiometry, Conductometry		
29,30	3	By the end of this topic, students should be able to: 1. Define chromatography and its purpose. 2. Describe how paper chromatography and TLC work. 3. Compare the two methods. 4. Calculate and interpret Rf values.	Introduction to Chromatography: TLC, paper chromatography		

11. Course Evaluation

Written exam 60 marks

Midterm 15 marks

Practical exam 10 marks

Collective Theo practical exam 5 marks

Course work 10 marks

Total =100 marks	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Quantitative Chemical Analysis – Daniel C. Harris
Main references (sources)	1)Fundamentals of Analytical Chemistry – Skoog, West, Holler & Crouch 2)Pharmaceutical Analysis – A.H. Beckett & J.B. Stenlake
Recommended books and references (scientific journals, reports…)	British Pharmacopoeia (BP), United Sta Pharmacopeia (USP), ICH
Electronic References, Websites	Analytical sciences Digital library (ASDL) and Royal Society of Chemistry Databases

Course Description Form

1. Course Name:
Biostatistics
2. Course Code:
PH1105
3. Semester / Year:
First semester/first level
4. Description Preparation Date:
2025-22026
5. Available Attendance Forms:
Full-time and official attendance hours
6. Number of Credit Hours (Total) / Number of Units (Total)
3x15=45 hrs/ 3units
7. Course administrator's name (mention all, if more than one name)
Name: Mustafa Jumaah Maaroof Email: Mustafa.Jumaah@alayen.edu.iq
8. Course Objectives

Course Objectives	Understand the terms, concepts and laws in biostatistics and their application in the field of pharmacy

9. Teaching and Learning Strategies	
Strategy	1. Discussion of teamwork 2.Self-report writing 3.Use the strategy of cooperation and assistance during the education process 4.Holding seminars, courses and workshops for students that encourage spiritual values

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	3	This topic aims to teach students the basic	Fundamentals of biostatistics and descriptive statistics	Power Points.	Quizzes , homework and

		concepts of descriptive statistics. Students learn how to collect data in an accurate and organized way and understand the meaning of variables and their types, such as qualitative and quantitative variables. The topic also introduces how to organize data using frequency tables, including absolute, relative, and cumulative frequencies, which help in presenting data clearly and simply		Whit board	Oral examination
2.	3	In addition, students learn the measures of central tendency, which are used to describe the center of the data. These include the mean, median, and mode. By the end of this topic, students will be able to summarize, describe, and perform basic analysis of data, providing a foundation for	Fundamentals of biostatistics and descriptive statistics		

		more advanced statistical studies.			
3.	3	This topic aims to introduce students to the basic concepts of differentiation and integration in calculus. Students learn the meaning of derivatives and integrals and understand their mathematical definitions and notation.	Integration and differentiation		
4.	3	he topic explains how to differentiate functions and interpret the derivative as a rate of change and slope of a curve. It also introduces integration as the inverse process of differentiation, with an emphasis on basic integration rules and techniques. By the end of this topic, students will be able to differentiate and integrate basic functions, understand their applications, and use these concepts as a foundation for more advanced	Integration and differentiation		

		topics in calculus and applied mathematics.			
5.	3	This topic aims to introduce students to the applications of the area under the curve. Students learn how definite integrals are used to calculate the area between a curve and the coordinate axes or between two curves. The topic explains the use of integrals in practical and real-life applications, such as calculating distance, displacement, accumulated quantities, and physical or engineering problems.	Applications of the a under the curve		
6	3	students will be a to apply defi integrals to find ar and interpret th meaning, providin solid foundation more advan applications mathematics applied sciences.	Applications of the a under the curve		
7	3	This topic aims to introduce students to the concepts of samples and confidence	Samples and confidence intervals		

		intervals in statistics. Students learn the difference between a population and a sample, and how to select samples to represent the population accurately. The topic also explains confidence intervals as a method for estimating population parameters based on sample data, and how the level of confidence reflects the reliability of the estimate. By the end of this topic, students will be able to construct and interpret confidence intervals, understand sampling variability, and use these concepts as a foundation for more advanced statistical inference.			
8	3	This topic aims to introduce students to the basic concepts of sampling and confidence intervals.	Samples and confidence intervals		

		Students learn the difference between a population and a sample, as well as common sampling methods used to obtain representative data. The topic explains the concept of confidence intervals as a statistical tool for estimating population parameters using sample data, and shows how confidence levels indicate the degree of certainty in the estimation. By the end of this topic, students will be able to understand sampling variability, construct confidence intervals, and correctly interpret their results, forming a basis for more advanced studies in statistical inference.			
9	3	This topic aims to introduce students to the concepts of dependent and	Dependent and independent variables		

		independent variables. Students learn how to identify the independent variable as the factor that is controlled or changed, and the dependent variable as the outcome or response that is measured. The topic explains the relationship between these variables and their role in experiments, observational studies, and data analysis. By the end of this topic, students will be able to distinguish between dependent and independent variables, understand their interactions, and apply these concepts correctly in scientific and statistical studies.			
10.	3	This topic aims to introduce students to the concepts of correlation and regression. Students learn how to measure	Correlation and regression		

		the strength and direction of the relationship between two variables using correlation, and how to predict or model one variable based on another using regression analysis. The topic explains different types of correlation, the interpretation of correlation coefficients, and the basic principles of simple linear regression. By the end of this topic, students will be able to analyze relationships between variables, interpret correlation coefficients, and apply simple regression for prediction, providing a foundation for more advanced statistical modeling.			
11	3	This topic introduces correlation and regression. Students learn to measure the relationship between two	Correlation and regression		

		variables and use regression to predict one variable from another. By the end, students can interpret correlation and apply simple regression for basic predictions.			
12	3	This topic covers one-sample and two-sample tests. Students learn to compare sample data to a population (one-sample) or compare two groups (two-sample) to make statistical conclusions. By the end, students can perform basic hypothesis tests for one or two samples.	One-sample tests and Two-sample tests		
13	3	This topic introduces analysis of variance (ANOVA), which is used to compare means of three or more groups. By the end, students can determine if group differences are statistically significant.	Analysis of variance tests		

14	3	This topic covers methods for non-normal distributions, teaching students how to analyze data that do not follow a normal distribution. By the end, students can apply appropriate non-parametric tests.	Choices in the domain of non-normal distribution		
15	3	This topic covers correlation tests for categorical variables, teaching students how to assess associations between categorical data. By the end, students can determine if categories are related statistically.	Correlation test for categorical variables		

11. Course Evaluation

Written exam 70 marks

Midterm 20 marks

Class work 10 marks

Total = 100 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1-Calculas(Thomas)(Eleventh edition) 2-Introductory Biostatistics for the helath sciences(Robert C. Duncan,…)(Second edition)

Main references (sources)	1-Calculas(Thomas)(Eleventh edition).2011 2-Introductory Biostatistics for the helath sciences(Robert C. Duncan,...)(Second edition)1989
Recommended books and references (scientific journals, reports...)	Any book or reference in mathematics well as in biostatistics
Electronic References, Websites	Depending on the type of topic discuss during the week

Course Description Form

1. Course Name:
Computer Sciences I
2. Course Code:
PH2106
3. Semester / Year:
Second semester / First level
4. Description Preparation Date:
2026-2025
5. Available Attendance Forms:
Full-time and official attendance hours
6. Number of Credit Hours (Total) / Number of Units (Total)
3/2
7. Course administrator's name (mention all, if more than one name)
Name: Redhaa Fadhil Sabri Namaa Email: Redhaa.Fadhil@alayen.edu.iq

8. Course Objectives

Course Objectives	1- Utilize the computer for fundamental tasks. 2- Identify and discuss the hardware components of the computer system. 3- Creating documents using a word processor and creating presentations. 4- Conducting research on the internet.

9. Teaching and Learning Strategies

Strategy	1-lectures included multimedia lectures 2- PowerPoint presentation 3- practical work 4- open discussion 5- class activity

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Understanding the computer, its hardware and software components, and input and output devices.	Introduction to Computer	1-lectures included multimedia lectures 2- PowerPoint presentation	1-written exam 2- Quiz 3-midterm exam 4- final exam
2	3	Learn about computer components, Hardware parts, I/O units, and memory types.	Computer Components		

3	3	Basic CPU Components, Computer ports, Personal Computers (types and features	Computer Components	3- open discussion 5- class activity 6-Self learning	5- Laboratory reports
4	3	Operating system, Basics of common OS, the user interfac and using the Mouse techniqu	Operating System and Graphical User Interface.		
5	3	Use of a common icon, Statue Bar, Concept of folders.	Operating System and Graphical User Interface.		
6	3	Word processing basics: Crea delete, open, and close documents, text and formattin	Word Processing.		
7	3	Create and manage tables, styles, and themes, as well as headers and footers.	Word Processing.		
8	3	Introduction, Creating and formatting a spreadsheet, sort and filtering data, using formulas and functions.	Spreadsheet.		
9	3	Introduction, create a presentation, insert an image, and use a template.	Presentation Software.		
10	3	Types of networks, types of browsers, World Wide Web, a URLs.	Introduction to the internet and web browser.		
11	3	Basics of E-mails, getting an email account, and using ema	Communications and emai		
12	3	What is a Cloud, Google Doc Google Sheets, Drive, etc.	Introduction to Cloud.		

11. Course Evaluation

Written exam 70 marks
Midterm 20 marks
Coursework 10 marks
Total =100 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Graham Brown, David Watson, "Cambridge IGCSE Information and Communication Technology", 3rd Edition (2020).
Main references (sources)	Alan Evans, Kendall Martin, Mary Anne Poatsy, "Technology in Action Complete ", 16th Edition (2020).
Recommended books and references (scientific journals, reports…)	Ahmed Banafa, "Introduction to Artificial Intelligence (AI)", 1st Edition (2024).
Electronic References, Websites	Microsoft Office 2019 step by step 1st Edition by Curtis Frye & Joan Lambert.

Course Description Form

1.Course Name:
Human Anatomy & Histology
2.Course Code:
PH1201
3.Semester / Year:
first semester /first year
4.Description Preparation Date:
1/1/2026
5.Available Attendance Forms:
Full-time and official attendance hours
6.Number of Credit Hours (Total) / Number of Units (Total)
2x15= 30 hrs (theoretical) 1x15=15 hrs (practical) \Total Credits 4
7.Course administrator's name (mention all, if more than one name)
Name: Karema mohamed Abuelfotouh soliman Email: Karema.mohammed@alayen.edu.eg
8.Course Objectives

Course Objectives	**1)** Learning the names and functions of anatomical structures. **2)** Provide comprehensive understanding of how abnormal anatomy can lead to disease. **3)** To acquire a basic background in histology and to understand the properties of cells and their interactions with one another as components of tissues and organs **4)** To be able to describe the normal structure and function of various cell types, tissues, and organs, and to differentiate their histological structures from each

	other through microscopic examination.

9.Teaching and Learning Strategies	
Strategy	PowerPoint and Multimedia presentation Class discussion. Visual aids: Utilize visual aids such as pictures, charts, graphs, diagrams **Teaching Strategies** • **Interactive Lectures**: Core concepts are delivered using visual aids, diagrams, and clinical correlations to enhance understanding. • **Small Group Discussions**: Students engage in guided discussions to promote critical thinking and peer learning. • **Demonstrations and Practical Sessions**: Use of anatomical models, histology slides, and virtual microscopy to reinforce theoretical knowledge. • **Problem-Based Learning (PBL)**: Real-life clinical scenarios are used to develop problem-solving and analytical skills. • **Case-Based Learning**: Integration of clinical cases to link basic science concepts with clinical relevance. • **E-learning and Multimedia Resources**: Recorded lectures, animations, and online resources support self-directed learning. • **Student-Centered Learning**: Encouraging active participation through questioning, presentations, and group activities. **Learning Strategies** • **Self-Directed Learning**: Students are encouraged to prepare before class and review learning materials independently. • **Collaborative Learning**: Group assignments and peer teaching enhance communication and teamwork skills. • **Active Learning**: Use of quizzes, concept maps, and in-class activities to reinforce key concepts. • **Practical Skill Development**: Hands-on practice with models,

	slides, and lab exercises to improve observational skills. • **Reflective Learning**: Students reflect on feedback and learning outcomes to improve performance. • **Formative Assessment**: Continuous assessments help students identify strengths and areas for improvement.

11.Course Structure

Course Structure (Theory)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Identify the stand anatomical posi and anatom terminology. T will describe m body regions body cavities their contents. define histology explain the b concepts of tissue, organ, system organizat They will re microscopic struc to overall b function.	**General anatomy** :Anatomical Positions ,Body regions ,Body cavities. **Introduction to Histology**: Definition , basic concepts of cell, tissue , organ , system .	smartboard/ Presentation slides/ discussion	oral questions and written exams
2	3	Classify the f primary tiss types based structure a function. Th will recogn the gene histological features epithelial, connective,	**Overview of the Four Primary tissue types** -Epithelial Tissues , Connective Tissues, Muscular Tissues, Nervous Tissue	smartboard/ Presentation slides/ discussion	oral questions and written exams

		muscular, a nervous tissu			
3	3	Describe the anato and classification bones and jo They will re structural features movement support functions.	**Musculoskeletal System (- Bones & Joints):**	smartboard/ Presentation slides/ discussion	oral questions and written exams
4	3	Describe the anato of the heart and bl vessels. They identify histological layers arteries, veins, capillaries.	**Circulatory System (Cardiovascular System):Anatomy & Histology**	smartboard/ Presentation slides/ discussion	oral questions and written exams
5	3	Explain the anato and functions of lymphatic syst They will describe components functions of blood	**Circulatory System (Lymphatic System) & Blood.**	smartboard/ Presentation slides/ discussion	oral questions and written exams
6	3	Describe the anato and histology of th oral cavity, pharyn esophagus, and stomach. They wil relate structural features to digesti functions.	**Digestive System (Part 1 - Upper GIT):** Oral cavity, pharynx, esophagus, stomach	smartboard/ Presentation slides/ discussion	oral questions and written exams
7	3	Describe the anato and histology of intestines accessory diges organs. They explain how th structures contril to digestion absorption.	**Digestive System (Part 2 - Lower GIT & Accessory Organs):** Small intestine, large intestine, rectum, anus. Salivary glands, pancreas, liver, gallbladder.	smartboard/ Presentation slides/ discussion	oral questions and written exams
8	3	Describe the organization of the central and periph nervous systems. They will identify basic histological	**Nervous System: Anatomy & Histology:** Central Nervous System (brain, spinal cord)	smartboard/ Presentation slides/ discussion	oral questions and written exams

		features of neural tissues.	and Peripheral Nervous System (nerves, ganglia), basic organization		
9	3	Describe the anato of the respiratory t and lungs. They identify histolog features involved gas exchange.	**Respiratory System: Anatomy & Histology**	smartboard/ Presentation slides/ discussion	oral questions and written exams
10	3	Describe the anato of the kidneys urinary tract. T will explain histological struc of the nephron an functional role.	**Urinary System: Anatomy & Histology**	smartboard/ Presentation slides/ discussion	oral questions and written exams
11	3	Describe the anatomical layers the skin and its accessory structur They will differentiate betwe thick and thin skin histologically.	**Integumentary System (The Skin):** - Anatomy: Layers of the skin (epidermis, dermis, hypodermis). Histology: Detailed histology of thick and thin skin, epidermal layers, , accessory structures (hair follicles, sebaceous glands, sweat glands).	smartboard/ Presentation Slides /discussion	oral questions and written exams
12	3	Identify the m endocrine glands their anatom locations. They relate gland struc to hormonal functi	**Endocrine System: Anatomy** pituitary, thyroid, parathyroid, adrenal, pancreas-islets of Langerhans, pineal, gonads	smartboard/ Presentation slides/ discussion	oral questions and written exams

	3	Identify histological feat of major endoc glands. They correlate microsc structure hormone secretion	**Endocrine System: Histology** pituitary, thyroid, parathyroid, adrenal glands, islets of Langerhans, and pineal gland		
	3	Describe the anat and histology of male reproduc organs. They relate struct features to sp production hormone secretion	**Male Reproductive System:**		
	3	Describe the anat and histology of female reproduc organs. They relate struct features reproductive func and horm regulation.	**Female Reproductive System:**		

12.Course Evaluation

Midterm Exam 15 marks

Quizzes and activities 5 marks

Practical 20 marks

Final Exam 60 marks

13.Learning and Teaching Resources

Required textbooks (curricular books any)	1. "Atlas of Human Anatomy" by Frank H. Netter: A detailed atlas of human anatomy. 2. "Clinically Oriented Anatomy" by Keith L. Moore et al.: focuses on clinical applications of anatomy. 3. “Gray's Anatomy for Students” by Richard Drake et al.: A comprehensive explanation of anatomy with a focus on students' needs. 4. "Essential Clinical Anatomy" by Keith L. Moore et al.: A brief anatomical reference covering the key points.

	5. "Sobotta Atlas of Human Anatomy": an accurate depiction of anatomy with a focus on applied aspects.
Main references (sources)	1) Anatomy and Physiology for Healthcare by Paul Marshall; Beverly Gallacher; Jim Jolly; Shupikai Rinomhota 2) Atlas of Human Anatomy by Frank H. Netter 3) Basic Histology: text and Atlas, 11th ed. BY Luiz Carlos, Uchoa Junqueria 4) Wheaters functional histology: a text and colour atlas 6th ed. BY Yung , Barbara
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1.Course Name:
Medical Physics
2.Course Code:
3.Semester / Year:
First semester /first year
4.Description Preparation Date:
2026-2025
5.Available Attendance Forms:
Full-time and official attendance hours
6.Number of Credit Hours (Total) / Number of Units (Total)
1x15= 15 hrs (theoretical) 2x15=30 hrs (practical) /number of units = 2
7.Course administrator's name (mention all, if more than one name)
Name: Sara Salah Email: sara.salah@alayen.edu.iq
8.Course Objectives

Course Objectives	1) Gives students the ability to deal with the concepts of physics, emphasizes the knowledge and skills required to efficiently discharge the duties and responsibilities of the pharmacist. 2) students will be able to understand the physical terminology and abbreviation used to describe the lecture, and the application in medical field.

9.Teaching and Learning Strategies	
Strategy	-PowerPoint and Multimedia presentation -Class discussion. -Visual aids: Utilize visual aids such as pictures, charts, graphs, diagrams

10.Course Structure

Course Structure (Theory)

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	1	These concepts help students understand the scientific method in physics and the importance of accurate measurement and	General concepts: Method of physics and standards;	smartboard/ Presentation slides/ discussion	Oral questions and written exams

		standards. They also introduce thermodynamic systems and their properties, as well as the principle of energy conservation and energy transfer in physical and medical systems.	thermodynamics system and system properties; conservation of energy principle		

2	1	Students learn the basic concepts of pressure and temperature, including different temperature scales, and how to describe the state of matter using equations of state. They also understand the difference between ideal and real gases and the general gas laws and their applications.	Pressure; temperature and temperature scales (Celsius, Fahrenheit, Kelvin); equation of state; ideal gas and real gas; general law of gases.		
3	1	Students learn the concepts of heat and energy, mechanical work, and power, and how energy is transferred and transformed. They also understand the First Law of Thermodynamics and the fundamental gas laws such as Boyle's and Charles's laws and their practical applications.	Heat and energy; work and mechanical forms of work; power; the 1st law of thermodyna mics; Boyles and Charles law.	smartboard/ Presentation slides/ discussion	Oral questions and written exams
4&5	2	Students learn the physical principles behind medical devices used for blood glucose monitoring, parenteral infusion, and cardiac output measurement. They also understand how these devices	Medical Devices for: Blood Glucose Monitoring ,Parenteral Infusion Devices , Cardiac Output Measurement	smartboard/ Presentation slides/ discussion	Oral questions and written exams

		operate, their clinical applications, and the importance of accuracy and safety in medical measurements.			
6	1	Students learn the basic principles, components, and operation of implantable cardiac pacemakers. They also understand their medical applications, physiological effects on the heart, and the importance of safety and reliability in their use.	Implantable Cardiac Pacemakers I	smartboard/ Presentation slides/ discussion	Oral questions and written exams
7	1	Students learn the principles and function of the electrocardiogram (ECG), including how it records the heart's electrical activity. They also understand how to interpret ECG signals, recognize normal and abnormal heart rhythms, and apply this knowledge in clinical settings.	Electrocardiogram ECG	smartboard/ Presentation slides/ discussion	Oral questions and written exams
8	1	Students learn the principles and operation of electroencephalography (EEG), which records the brain's	Electroencephalography EEG	smartboard/ Presentation slides/ discussion	Oral questions and written exams

		electrical activity. They also understand how to interpret EEG patterns, identify normal and abnormal brain activity, and apply this knowledge in clinical diagnostics and research.			
9	1	Students learn the fundamental laws of radiation, including Kirchhoff's, Planck's, Stefan–Boltzmann, and Wien's laws, as well as concepts like black body and albedo. They also understand the mechanisms of heat transfer—radiation, convection, and conduction—and their applications in physics and medical contexts.	Radiation: Kirshoffs law; planks law; Stefan- Boltzman law; Wiens law; Black body and Albedo; Heat transfer (radiation, convection, conduction).	smartboard/ Presentation slides/ discussion	Oral questions and written exams
10&11	2	Students learn the principles of X-rays and their spectra, how X-rays are absorbed, and the effects of ultraviolet (UV) and infrared (IR) radiation. They also understand the medical and biological effects of radiation and its applications in diagnosis and therapy.	X-Ray and X-Ray spectra; absorption of X-Ray; U.V and IR effects; medical and biological effects of radiation;	smartboard/ Presentation slides/ discussion	Oral questions and written exams
12	1	Students learn the principles and applications of radiotherapy and radioactive iodine in medical treatment. They also understand how radiation targets diseased tissues, its therapeutic effects, safety precautions, and biological interactions.	Radiotherapy, radioactive iodine.	smartboard/ Presentation slides/ discussion	Oral questions and written exams

13	1	Students learn the principles and operation of Magnetic Resonance Imaging (MRI), including how it uses magnetic fields and radio waves to produce detailed images of the body. They also understand MRI applications in diagnosis, safety considerations, and the interpretation of images for medical purposes.	Magnetic Resonance Imaging MRI		
14	1	Students learn the principles and operation of Computed Tomography (CT) scanning, including how X-rays are used to create cross-sectional images of the body. They also understand CT applications in medical diagnosis, image reconstruction, and safety considerations regarding radiation exposure.	Computed Tomography CT scan		
15	1	Students learn the principles of diffusion, describing how particles move from regions of high concentration to low concentration, and rheology, which studies the flow and deformation of materials. They also understand the applications of these concepts in biological systems, medical fluids, and material science.	Diffusion and rheology		

	11.Course Evaluation
	Midterm Exam 20 marks Practical part 20 marks Final Exam 60 marks
	12.Learning and Teaching Resources
Required textbooks (curricular books, if any).	1) Physics for Biology and Medical Students, 2nd ed.

	2) Medical Instruments and Devices: principles and practices: Schreiner, Steven CRC Press, 2015.
Main references (sources).	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites.	

Course Description Form

1. Course Name:	
organic Chemistry I	
2. Course Code:	
PH1204	
3. Semester / Year:	
Second semester / First level	
4. Description Preparation Date:	
2025-2026	
5. Available Attendance Forms:	
Full-time and official attendance hours	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3x15= 45 hrs (theoretical) 2x15=30 hrs (practical) /number of units = 4	
7. Course administrator's name (mention all, if more than one name)	
Name: Ranza Ahmed Abdo Hassan Email: Ranza.ahmed@alayen.edu.iq	
8. Course Objectives	
Course Objectives	1-This course provides a foundational understanding of organic chemistry, focusing on the relationship between the structure of carbon-based molecules and their physical and chemical properties. 2- The curriculum progresses logically from fundamental principles of bonding to the chemistry of major hydrocarbon families, three-dimensional structure, and key functional groups, culminating with the unique chemistry of aromatic compounds. 3- Each topic is crucial for building a solid foundation in organic chemistry, which is essential for understanding the design and synthesis of pharmaceutical compounds.
4- Teaching and Learning Strategies	
Strategy	1-lectures included multimedia lectures 2- power point presentation

	3- practical work 4- open discussion 5- class activity 6-Self learning

5- Course Structure

Week	hrs	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction: An overview of organic chemistry principles and their relevance to pharmaceuticals.	Introduction (Structure and properties: Atomic and molecular orbitals, Hybrid orbitals, Intermolecular forces, Polarity, Structure and physical properties)	1-lectures included multimedia lectures 2- power point presentation 3- open discussion 5- class activity 6-Self learning	1-written exam 2- Quiz 3- midterm exam 4- final exam
2	4	Study of the simplest hydrocarbons, their properties, and reactions	Alkanes and methane.		
3	4	Detailed exploration of alkenes, including their structure, properties, and reactions.	Alkenes		
4	3	Examination of alkynes and dienes, focusing on their unique chemical behaviors.	Alkynes and dienes.		

5	3	Study of cyclic hydrocarbons, their stability, and reactions.	Cycloalkanes.		
6-8	8	Understanding the three-dimensional arrangement of atoms in molecules and its impact on chemical reactions.	Stereochemistry I & II		
9	3	Exploration of alkyl halides, their properties, and reactions.	Alkyl halides.		
10-11	6	Study of these functional groups, their synthesis, and reactions.	Alcohols and ethers.		
12	4	Describe the structure, properties, and acidity of phenols. Understand the reactions of phenols, including electrophilic substitution and oxidation.	Phenols.		

13-15	7	-Understand the structure and stability of benzene and other aromatic compounds -Explain the mechanism of electrophilic aromatic substitution reactions. -Identify and describe the properties and reactions of arenes and their derivatives.	Aromatic Hydrocarbons (includes benzene, electroph aromatic substitution, arenes and their derivatives).		

6- Course Evaluation

Written exam 60 marks
Midterm 10 marks
Practical exam 10 marks
Collective Theo practical exam 10 marks
Course work 10 marks
Total =100 marks

7- Learning and Teaching Resources

Required textbooks (curricular books, if any)	Organic Chemistry: Structure and Function (8th Edition) by Vollhardt and Schore. Organic Chemistry by Robert T. Morrison and Robert N. Boyd.
Main references (sources)	ORGANIC CHEMISTRY BY SMITH - Organic Chemistry: by John McMurry 10th Ed, 2023

Recommended books and references (scientific journals, reports…)	Scientific journals in basic specializations
Electronic References, Websites	Websites of Arab and foreign universities and pharmaceutical companies

Course Description Form

1. Course Name:
Pharmaceutical calculation
2. Course Code:
PH1202
3. Semester / Year:
Second semester/1st year
4. Description Preparation Date:
2025-2026
5. Available Attendance Forms:
Full-time and official attendance hours
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours/week (theoretical), 2 hours/week (practical), total units = 3
7. Course administrator's name (mention all, if more than one name)
Name: Assist. Lecturer Mays Mazin AL-Hamadanl Email: Mais.yahya@alayen.edu.iq
8. Course Objectives

Course Objectives	1.The use of calculations in pharmacy is varied and broad-based. As pharmaceutical 2.calculations are concerned in several areas, including commercial and research, especially in industry, academics, and government institutions. 3.Applications of pharmaceutical calculations include: the physical and chemical properties of the drug, the biological effectiveness and the speed of absorption of the drug, the spread of the drug in the body, the metabolic changes of the drug and its excretion, statistical information for research and clinical studies of drugs, the development and formulation of drug products, the calculation of drug doses, Pharmacoeconomics and other fields

9. Teaching and Learning Strategies	
Strategy	1- Lectures 2- Class discussion 3- practical work 3- Quizzes 4-Reports

10. Course Structure (Theory)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Analyzing medical orders, identifying their essential components, decoding abbreviations, and ensuring accurate medication processing.	Interpretation of prescription or medication orders.	smartboard/ Presentation slides/discussion	oral questions and written exams
2	2	Mastering the Metric, Apothecaries', and Household systems, with a focus on unit conversions for precise dosage and compounding.	Systems of measurement	smartboard/ Presentation slides/discussion	oral questions and written exams
3	2	Calculating the relationship between mass and volume to ensure accuracy in pharmaceutical formulations and liquid measurements	Density, specific gravity and specific volume	smartboard/ Presentation slides/discussion	oral questions and written exams
4	2	Understanding various methods to express pharmaceutical	Percent strength, ratio strength, and other	Smartboard/ Presentation slides/discussion	oral questions and written exams

		strength, including percent and ratio strengths, for accurate preparation	expressions of concentration		
5	2	Computing precise medication doses based on specific patient parameters to ensure safe and effective therapy.	Calculation of doses, calculation of doses patient parameters	smartboard/ Presentation slides/discussion	oral questions and written exams
6	2	earning to scale pharmaceutical formulas up or down while maintaining the correct proportion of ingredients.	Reducing and enlarging formulas	smartboard/ Presentation slides/discussion	oral questions and written exams
7 8	4	Techniques for modifying product concentrations and utilizing stock solutions in pharmaceutical compounding	Altering product strength, use of stoc solutions, and problem solvin by alligation	smartboard/ Presentation slides/discussion	oral questions and written exams
9 10	4	Designing and preparing solutions that maintain physiological pH and osmotic balance for safe administration.	Isotonic and buffer solutions	smartboard/ Presentation slides/discussion	oral questions and written exams
11 12	4	Calculating ionic concentrations in milliequivalents, millimoles, and milliosmoles for fluid and electrolyte therapy.	Electrolyte solutions (milliequivalents, millimoles and milliosmoles)	smartboard/ Presentation slides/discussion	oral questions and written exams
13 14	6	Advanced calculations for	. Intravenous infusions,	smartboard/ Presentation	oral questions

15		sterile parenteral admixtures and determining accurate infusion delivery speeds.	parenteral, admixtures, rate-of-flow calculations use of stock solutions.	slides/discussion	and written exams

11. Course Evaluation	
Mid term Exam 15 marks Quizzes and activities 5 marks Practical 20 marks Final Exam 60 marks	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Pharmaceutical Calculation, Howard C. Edition 2010 Wolters Kluwer Lippincott Williams &Wilkins.
Main references (sources)	1-Pharmaceutical Calculation, Howard C. Edition 2010 Wolters Kluwer Lippincott Williams &Wilkins. 2-Aulton's Pharmaceutics: The Design and Manufacture of Medicines, 3ed Michael E. Aulton (Author) Churchill,
Recommended books and references (scientific journals, reports...)	none
Electronic References, Websites	

Course Description Form

1. Course Name:
Physiology 1
2. Course Code:
PH1104
3. Semester / Year:
First year/ Second- semester /2025-2026
4. Description Preparation Date:
2026
5. Available Attendance Forms:
In class only
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours/ week (theoretical) / 4
7. Course administrator's name (mention all, if more than one name)
Name: Lec. Mohammad Jabbar Makki Email: Mohammed.jabbarmakki@alayen.edu.iq
8. Course Objectives

Course Objectives	• To learn the principle of human physiology and the body organized. • To learn the cell structure, functions, and signaling • To learn how the nervous system works
9. Teaching and Learning Strategies	
Strategy	To achieve the desired educational goal, a set of educational activities take place during the course, including: • Examination • Seminars • Workshops • Homework • Class activity • Open discussion

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1-2	6	Introduction to physiology: How is the body organized		-In class Study -using textbooks - using electronic sources -using library of college	• Examinations • Seminars • Oral examination
3-4	6	Homeostasis: Framework for Human Physiology			
5-6	6	Cellular structure, protein, and metabolic pathways			
7-8	6	Movement of Molecules across Cell Membranes			
9	3	Cell signaling in physiology			
10-11	6	Neuronal signaling and the structure of the nervous system			
12-13	6	Sensory physiology			

11.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.....etc

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Vander's Human physiology: the mechanisms of body function. Eric P. Widmaier, Hershel Raff, Kevin T. Strang, last edition
Main references (sources)	Vander's Human physiology: the mechanisms of body function. Eric P. Widmaier, Hershel Raff, Kevin T. Strang, last edition
Recommended books and references (scientific journals, reports...)	research gate google scholar Scopus PubMed
Electronic References, Websites	google