2025 -2026

University of Mosul
College of Pharmacy

Syllabuses For Under Graduate Students

2025 -2026

Dept. of Pharmaceutics= Phind

Dept. of Pharmacognosy= Phcog

Dept. of Clinical Pharmacy= Phclp

Dept. of Pharmaceutical Chemistry= Phpch

Dept. of Clinical Laboratory Sciences= Phcls

Dept. of Pharmacology and Toxicology=Phpht

2025 -2026

First-year/Total units 31

First Semester

Course number	Course title	Credit hours/week		Units	Code	
		Theory	Practical			
111	Analytical Chemistry	3	2	4	Phpch25_111-	الكيمياء التحليلية
112	Human Anatomy & Histology	3	2	4	Phcls25_112-	علم التشريح البشري والانسجة
113	Biostatistics	2	----	2	Phcls25_113-	الإحصاء الحيوي
114	Medical Terminology	1	----	1	Phcls25_114-	المصطلحات الطبية
115	Medical Physics	1	2	2	Phcls25_115-	فيزياء طبية
116	Democracy & Human Rights	2	----	2	Phcls25_116-	الديموقراطية وحقوق الانسان
Total				15		

Second Semester

Course number	Course title	Credit hours/week		Units	Code	
		Theory	Practical			
128	Physiology I	3	2	4	Phpht25_128-	علم وظائف الأعضاء I
129	Organic Chemistry I	3	2	4	Phpch25_129-	الكيمياء العضويةI
1210	Pharmaceutical Calculation	3	2	4	Phind25_1210-	الحسابات الصيدلانية
1211	Computer Sciences I	1	2	2	Phcls25_1211-	حاسوب
1212	Arabic Language	2	---	2	Phcls25_1212-	اللغة العربية
Total				16		

منهج المرحلة الأولى تم تغييره بالكامل استنادا الى توصية اللجنة الوزارية التخصصية لتحديث المناهج والتي اقرتها لجنة العمداء.

ملاحظة: يتم تحديث المنهج للسنة القادمة للمرحلة الثانية أيضا بحيث تكون دفعة ٢٠٢٥-٢٠٢٦ متخرجة حسب المنهج المحدث لكل المراحل.

2025 -2026

Second year/Total units 43

First Semester

Course number	Course title	Credit hours/week		Units	Code	
		Theory	Practical			
211	Crimes of the Baath Regime in Iraq	2	----	2	Phcls25_211-	جرائم نظام البعث في العراق
212	Medical Microbiology I	3	2	4	Phcls25_212-	علم الاحياء المجهرية I
213	Organic Chemistry II	3	2	4	Phpch25_213-	كيمياء عضوية II
214	Physical Pharmacy I	3	2	4	Phind25_214-	صيدلة فيزياوية I
215	Physiology I	3	2	4	Phpht25_215-	علم وظائف الاعضاءI
216	Computer Sciences II	1	2	2	Phcls25_216-	حاسوب
	Arabic Language	2	----		أضيفت كمقاصة تعويضية لأنها لم تؤخذ في المرحلة الأولى لهذه الدفعة وتلغى في السنة القادمة من هذا الكورس لتبقى اللغة العربية في المرحلة الأولى والثانية في الكورس الثاني فقط وترجع عدد الوحدات الى ٢٠	
Total				22		

Second Semester

Course number	Course title	Credit hours/week		Units	Code	
		Theory	Practical			
227	Medical Microbiology II	3	2	4	Phcls25_227-	IIعلم الاحياء المجهرية
228	Organic Chemistry III	2	2	3	Phpch25_228-	IIIكيمياء عضوية
229	Pharmacognosy I	3	2	4	Phcog25_229-	Iالعقاقير والنباتات الطبية
2210	Physical Pharmacy II	3	2	4	Phind25_2210-	IIالصيدلة الفيزياوية
2211	Physiology II	3	2	4	Phpht25_2211-	IIعلم وظائف الأعضاء
2213	Arabic Language	2	---	2	Phcls25_2213-	اللغة العربية
Total				21		

الدروس المؤشرة باللون الأصفر يتم اتباع السيليبس الجديد المقر استنادا الى توصية اللجنة الوزارية التخصصية لتحديث المناهج والتي اقرتها لجنة العمداء

2025 -2026

Third year/Total units 37

First Semester

Course number	Course title	Credit hours /week		Units	Code	
		Theory	Practical			
311	Biochemistry I	3	2	4	Phcls25_311-	Iكيمياء حياتية
312	Inorganic Pharmaceutical Chemistry	2	2	3	Phpch25_312-	كيمياء صيدلانية لا عضوية
313	Pathophysiology	3	2	4	Phcls25_313-	علم فسلجة الامراض
314	Pharmaceutical Technology	3	2	4	Phind25_314-	Iتقانة صيدلانية
315	Pharmacognosy II	2	2	3	Phcog25_315-	العقاقير والنباتات IIالطبية
Total				18		

Second Semester

Course number	Course title	Credit hours /week		Units	Code	
		Theory	Practical			
326	Biochemistry II	3	2	4	Phcls25_326--	IIكيمياء حياتية
327	Pharmacy Ethics	1	----	1	Phclp25_327--	اخلاقيات الصيدلة
328	Organic Pharm. Chemistry I	3	2	4	Phpch25_328-	الكيمياء الصيدلانية Iالعضوية
329	Pharmaceutical and Cosmetic Preparations	3	2	4	Phind25_329--	المستحضرات الصيدلانية والتجميلية
3210	Pharmacognosy III	2	2	3	Phcog25_3210--	العقاقير والنباتات الطبية III
3211	Pharmacology I	3	----	3	Phpht25_3211--	Iعلم الادوية
Total				19		

الدروس المؤشرة باللون الأصفر يتم اتباع السيليبس الجديد المقر استنادا الى توصية اللجنة الوزارية التخصصية لتحديث المناهج والتي اقرتها لجنة العمداء مع الانتباه الى ان مادة الصيدلة التكنلوجية للفصل الثاني تم تغيير تسميتها الى المستحضرات الصيدلانية والتجميلية

2025 -2026

Fourth year/Total units 34

First Semester

Course number	Course title	Credit hours /week		Units	Code	
		Theory	Practical			
411	Biopharmaceutics	2	2	3	Phind25_411-	الصيدلة الحيوية
412	Clinical Pharmacy I	2	2	3	Phclp25_412-	الصيدلة السريرية I
413	Organic Pharm. Chemistry II	3	2	4	Phpch25_413-	الكيمياء الصيدلانية العضويةII
414	Pharmacology II	3	2	4	Phpht25_414-	علم الدواءII
415	Public Health	2	----	2	Phcls25_415-	الصحة العامة
Total				16		

Second Semester

Course number	Course title	Credit hours /week		Units	Code	
		Theory	Practical			
426	Communication Skills	2	----	2	Phclp25_426-	مهارات التواصل
427	Clinical Pharmacy II	2	2	3	Phclp25_427-	الصيدلة السريريةII
428	General Toxicology	2	2	3	Phpht25_428-	علم السموم العام
429	Industrial Pharmacy I	3	2	4	Phind25_429-	الصيدلة الصناعيةI
4210	Organic Phar. Chemistry III	3	2	4	Phpch25_4210-	الكيمياء الصيدلانية العضويةIII
4211	Pharmacology III	2	----	2	Phpht25_4211-	علم الادويةIII
Total				18		

الدروس المؤشرة باللون الأصفر يتم اتباع السيليبس الجديد المقر استنادا الى توصية اللجنة الوزارية التخصصية لتحديث المناهج والتي اقرتها لجنة العمداء

2025 -2026

Fifth year/Total units 35

First Semester

Course number	Course title	Credit hours /week		Units	Code	
		Theory	Practical			
511	Applied Therapeutics- I	3	----	3	Phclp25_511-	علاجات تطبيقية I
512	Clinical Chemistry	3	2	4	Phcls25_512-	الكيمياء السريرية
513	Clinical Laboratory Training	----	4	2	Phcls25_513-	التدريب المختبري السريري
514	Clinical Toxicology	2	2	3	Phpht25_514-	علم السموم السريري
515	Industrial Pharmacy- II	3	2	4	Phind25_515-	الصيدلة الصناعيةII
516	Organic Phar. Chemistry- IV	2	----	2	Phpch25_516-	الكيمياء الصيدلانية العضويةIV
517	Graduation project	1	----	1	----------	
Total				19		

Second Semester

Course number	Course title	Credit hours /week		Units	Code	
		Theory	Practical			
528	Advanced Pharmaceutical Analysis	3	2	4	Phpch25_528-	التحليلات الصيدلانية المتقدمة
529	Applied Therapeutics- II	2	----	2	Phclp25_529-	علاجات تطبيقيةII
5210	Drug Delivery Systems Design (Dosage Form Design)	2	----	2	Phind25_5210-	تصميم أنظمة توصيل الدواء
5211	Hospital Training	----	4	2	Phclp25_5211-	تدريب مستشفى
5212	Pharmacoeconomic	2	----	2	Phclp25_5212-	اقتصاديات الدواء
5213	Therapeutic Drug Monitoring (TDM)	2	2	3	Phclp25_5213-	المناطرة الدوائية
5214	Pharmaceutical Biotechnology	1	----	1	Phind25_5214-	التقانة الحيوية الصيدلانية
Total				16		

الدروس المؤشرة باللون الأصفر يتم اتباع السيليبس الجديد المقر استنادا الى توصية اللجنة الوزارية التخصصية لتحديث المناهج والتي اقرتها لجنة العمداء

2025 -2026

First Year

2025 -2026

Department of Pharmaceutical Chemistry
Title of the course: *Analytical Chemistry*
Level: 1st Class, 1st Semester
Course number:111
Code: Phpch25_111--
Credit (hours/week): Theory (3) Laboratory (2) Units: 4

No.	Lesson Subject	Hours
1	Introduction to Analytical Chemistry: Types and roles in drug development and QC	3
2	Review of Basic Concepts: Concentration units, standards, solution preparation	4
3	Introduction to Pharmacopoeias: USP, BP, monographs, specifications	4
4	Case Study: Interpreting pharmacopoeial monographs and ICH Q2(R1) overview	2
5-6	Gravimetric Analysis: Precipitation, weighing, error sources	5
7-8	Volumetric Analysis I: Acid-base titrations, indicators, pH, calculations	5
9	Volumetric Analysis II: Precipitation and Complexometric titrations (Mohr, EDTA)	3
10	Redox Titrations: Principles, iodometry, permanganometry	3
11-12	Statistical Evaluation of Data: Mean, SD, confidence limits, Q-test, Grubbs test	7
13	UV-Visible Spectrophotometry: Principles, Beer's Law, applications	3
14	Electrochemical Methods: Potentiometry, Conductometry	3
15	Introduction to Chromatography: TLC, paper chromatography	3
	Total Hours	45

Reference(s):

1) Fundamentals of Analytical Chemistry – Skoog, West, Holler & Crouch
2) Pharmaceutical Analysis – A.H. Beckett & J.B. Stenlake
3) Quantitative Chemical Analysis – Daniel C. Harris
4) Supplementary: British Pharmacopoeia (BP), United States Pharmacopeia (USP), ICH Q2(R1)

Objectives (Learning Outcome):

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

2025 -2026

Department of Pharmaceutical Chemistry
Title of the course: *Practical Analytical Chemistry*
Level: 1st Class, 1st Semester
Course number:111
Code: Phpch25_111--

No.	Lesson Subject	Hours
1	Demonstration of some laboratory equipment.	2
2	Volumetric method of analysis	2
3	Preparation and standardization of HCl solution (known)	2
4	Preparation and standardization of HCl solution (unknown)	2
5	Preparation and standardization of NaOH solution	2
6	Determination of the percentage of acetic acid.	2
7	Analysis of sodium carbonate and sodium hydroxide mixture.	2
8	Determination of chloride by the Mohr method.	2
9	Determination of chloride by the Volhard method.	2
10	Determination of ferrous form of iron in Mohr's salt.	2
11	Determination of total hardness in tab water.	2
12	Gravimetric determination of Nickel.	4

Reference(s):

1) Handbook for Analytical Chemistry lab adopted by department

Objectives (Learning Outcome):

1) Correctly use and handle basic laboratory equipment while following safety protocols.
2) Prepare and standardize solutions of acids, bases, and salts with accuracy and precision.
3) Apply volumetric and gravimetric methods for quantitative chemical analysis.
4) Analyze pharmaceutical-related samples such as acetic acid, sodium carbonate–sodium hydroxide mixtures, water hardness, and ferrous iron content.

2025 -2026

Department of Clinical Laboratory Sciences

Title of the course: *Human Anatomy & Histology*

Level: 1st Class, 1st Semester

Course number:112

Code: Phcls25_112-

Credit (hours/week): Theory (3) Laboratory (2) Units: 4

No.	Lesson Subject	Hours
1	**General anatomy** :Anatomical Positions ,Body regions ,Body cavities. **Introduction to Histology**: Definition , basic concepts of cell, tissue , organ , system .	3
2	**Overview of the Four Primary tissue types** -Epithelial Tissues , Connective Tissues, Muscular Tissues, Nervous Tissue	3
3	**Musculoskeletal System (- Bones & Joints):**	3
4	**Circulatory System (Cardiovascular System):Anatomy & Histology**	3
5	**Circulatory System (Lymphatic System) & Blood.**	3
6	**Digestive System (Part 1 - Upper GIT):** Oral cavity, pharynx, esophagus, stomach	3
7	**Digestive System (Part 2 - Lower GIT & Accessory Organs):** Small intestine, large intestine, rectum, anus. Salivary glands, pancreas, liver, gallbladder.	3
8	**Nervous System: Anatomy & Histology:** Central Nervous System (brain, spinal cord) and Peripheral Nervous System (nerves, ganglia), basic organization	3
9	**Respiratory System: Anatomy & Histology**	3
10	**Urinary System: Anatomy & Histology**	3
11	**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).	3
12	**Endocrine System: Anatomy** pituitary, thyroid, parathyroid, adrenal, pancreas-islets of Langerhans, pineal, gonads	3
13	**Endocrine System: Histology**	3

	pituitary, thyroid, parathyroid, adrenal glands, islets of Langerhans, and pineal gland	
14	**Male Reproductive System:**	3
15	**Female Reproductive System:**	3
	Total Hours	45

Reference(s):

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

Objectives (Learning Outcome):

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.

2025 -2026

Department of Clinical Laboratory Sciences

Title of the course: *Practical of Human Anatomy & Histology*

Level: 1st Class, 1st Semester

Course number:112

Code: Phcls25_112-

No.	Lesson Subject	Hours
1	Anatomical models & terms . Microscopic usage & cell identification	2
2	- Identification of various epithelial tissue slides. - Identification of various connective tissue slides (including cartilage and bone). - Identification of muscular tissue slides (skeletal, cardiac, smooth)	2
3	Identification of major bones on skeletal models. -Microscopic identification of compact and spongy bone, and different types of cartilage	2
4	Identification of heart chambers, major vessels on models/pro-sections Microscopic identification of heart wall, arteries, veins, and capillaries	2
5	-Identification of lymphoid organs on models/ prosections - Microscopic identification of blood cells (various types of WBCs), and general structure of lymph nodes	2
6	Identification of upper digestive tract parts on models/pro-sections Microscopic identification of oral cavity, esophagus, and stomach	2
7	Identification of lower digestive tract and accessory organs on models/pro-sections. - Microscopic identification of small intestine, large intestine, liver, and pancreas	2
8	Identification of major brain regions and spinal cord on models. Microscopic identification of nerve tissue (neurons, nerve fibers) and ganglia	2
9	Identification of respiratory system components on models/prosections Microscopic identification of trachea, bronchus, bronchioles, and lung tissue (alveoli).	2
10	Identification of urinary system organs on models/pro-sections. - Microscopic identification of kidney (nephron components), ureter, and bladder	2
11	Microscopic identification of thick and thin skin, and accessory structures	2
12	Identification of endocrine glands on anatomical models	2
13	Microscopic identification of selected endocrine glands.	2

14	-Identification of male reproductive organs on models/pro-sections. - Microscopic identification of testes and accessory glands	2
15	-Identification of female reproductive organs on models/pro-sections. - Microscopic identification of ovary (including different follicle stages) and uterus.	2
	Total Hours	30

Reference(s):

1) Atlas of Human Anatomy by Frank H. Netter
2) Basic Histology: text and Atlas, 11th ed. BY Luiz Carlos, Uchoa Junqueria
3) Wheaters functional histology: a text and colour atlas 6th ed. BY Yung , Barbara

Objectives (Learning Outcome):

1) Learning the names and functions of anatomical structures.
2) 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
3) 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.

2025 -2026

Department of Clinical Laboratory Sciences
Title of the course: *Biostatistics*
Level: 1st Class, 1st Semester
Course number:113
Code: Phcls25_113-
Credit (hours/week): Theory (2) Laboratory (0) Units: 2

No.	Lesson Subject	Hours
1-2	Fundamentals of biostatistics and descriptive statistics	4
3-4	Integration and differentiation	4
5-6	Applications of the area under the curve	4
7-8	Samples and confidence intervals	3
9	Dependent and independent variables	3
10-11	Correlation and regression	3
12	One-sample tests and Two-sample tests	3
13	Analysis of variance tests	2
14	Choices in the domain of non-normal distribution	2
15	Correlation test for categorical variables	2
	Total Hours	30

Reference(s):

1. Introductory Biostatistics for the Health Sciences, by Michael R. Chernick

2. introduction statistics using SPSS, Second Edition, by Hersschel Knapp.

Objectives (Learning Outcome):

1. Enable students to apply mathematical statistics in pharmaceutical science.

2. Use biostatistics in specific pharmaceutical courses, calculate the odds ratio and relative risk of an event

3. Estimate statistical population indicators, and develop alternative hypotheses.

2025 -2026

Department of Pharmacology and Toxicology

Title of the course: *Medical Terminology*

Level: 1st Class, 1st Semester

Course number:114

Code: Phpht25_114-

Credit (hours/week): Theory (1) Laboratory (0) Units: 1

2025 -2026

Department of Pharmaceutics
Title of the course: *Medical Physics*
Level: 1st Class, 1st Semester
Course number:115
Code: Phind25_115--
Credit (hours/week): Theory (1) Laboratory (2) Units: 2

No.	Lesson Subject	Hours
1	General concepts: Method of physics and standards; thermodynamics system and system properties; conservation of energy principle	1
2	Pressure; temperature and temperature scales (Celsius, Fahrenheit, Kelvin); equation of state; ideal gas and real gas; general law of gases.	1
3	Heat and energy; work and mechanical forms of work; power; the 1st law of thermodynamics; Boyles and Charles law	1
4	Medical Devices for: Blood Glucose Monitoring ,Parenteral Infusion Devices , Cardiac Output Measurement	2
5	Implantable Cardiac Pacemakers	1
6	Electrocardiogram ECG	1
7	Electroencephalography EEG	1
8	Radiation: Kirshoffs law; planks law; Stefan- Boltzman law; Wiens law; Black body and Albedo; Heat transfer (radiation, convection, conduction).	1
9	X-Ray and X-Ray spectra; absorption of X-Ray; U.V and IR effects; medical and biological effects of radiation;	2
10	Radiotherapy, radioactive iodine	1
11	Magnetic Resonance Imaging MRI	1
12	Computed Tomography CT scan	1
13	Diffusion and rheology	1
	Total Hours	15

Reference(s):

1) **Physics for Biology and Medical Students, 2nd ed.**

2) **Medical Instruments and Devices: principles and practices**: Schreiner, Steven CRC Press, 2015.

Objectives (Learning Outcome):

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.

2025 -2026

Department of Clinical Laboratory Sciences

Title of the course: *Practical of Medical Physics*

Level: 1st Class, 1st Semester

Course number:115

Code: Phind25_115--

No.	Lesson Subject	Hours
1	Calculate ground acceleration	2
2	Calculate the density of liquids	2
3	Calculating the focal length of a convex lens in several ways	2
4	Calculate the viscosity of a liquid	2
5	Calculating atmospheric pressure	2
6	Calculate the speed of sound	2
7	Comparing the viscosity of two liquids	2
8	Comparing the densities of two liquids	4
9	Study the Decay curve and find the half-life of water	4
10	Calculating the surface tension coefficient of water and any other liquid	4
11	Optical Fiber Loss (bend) Measurement	2
12	Spectrophotometer	2
	Total Hours	30

Reference(s):

1) **Physics for Biology and Medical Students, 2nd ed.**

2) **Medical Instruments and Devices: principles and practices**: Schreiner, Steven CRC Press, 2015.

Objectives (Learning Outcome):

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.

2025 -2026

Department of Clinical Laboratory Sciences
Title of the course: *Democracy & Human Rights*
Level: 1st Class, 1st Semester
Course number:116
Code: Phcls25_116-
Credit (hours/week): Theory (2) Laboratory (0) Units: 2

No.	Lesson Subject	Hours
1	تعريف الديمقراطية	2
2	نشوء الديمقراطية المفاهيم المختلفة للديمقراطية	2
3	خصائص النظام الديمقراطي	2
4	شروط ومقومات وأركان الديمقراطية	2
5	أنواع الديمقراطية: الديمقراطية في الاسلام	2
6	نظم حكم الأكثرية	2
7	إيجابيات الديمقراطية و سلبيات الديمقراطية	2
8	مبادئ الديمقراطية المشتركة : نظم الديمقراطية	2
9	الحقوق المدنية والسياسية	2
10	أنواع حقوق الانسان في القانون الدولي	2
11	أنواع حقوق الانسان في القانون الدولي	2
12	الإعلان العالمي لحقوق الانسان	2
13	اختلاف الحقوق في الديانات	2
14	حقوق المرأة والطفل	2
15	حقوق المرأة بين الشريعة والقانون	2
	Total Hours	30

المصادر

١. الأنظمة السياسية تأليف حميد حنون, الديمقراطية من الاغريق الى عالم ما بعد الحداثة تأليف هاشم الميلاني

٢. حقوق الانسان والطفل الديمقراطية للدكتور ماهر صالح

Objectives (Learning Outcome):

1) تعريف الطلبة بحقوق الانسان وابرز خصائصها ومصادرها والمراحل التاريخية التي مرت بها حقوق الانسان .

2) التعرف على كيفية ممارسة الحقوق السياسية .

3)التعرف على الإعلان العالمي لحقوق الانسان والمواثيق الدولية والمعاهدات التي نصت على حقوق الانسان .

2025 -2026

Department of Pharmacology & Toxicology

Title of the course: *Physiology I*

Level: 1st Class, 2nd Semester

Course number:128

Code: Phcls25_128-

Credit (hours/week): Theory (3) Laboratory (2) Units: 4

No.	Lesson Subject	Hours
1	Introduction to physiology: How is the body organized?	5
2	Homeostasis: Framework for Human Physiology	5
3	Cellular structure, protein, and metabolic pathways	7
4	Movement of Molecules across Cell Membranes	7
5	Cell signaling in physiology	6
6	Neuronal signaling and the structure of the nervous system	9
7	Sensory physiology	6
	Total Hours	**45**

Reference(s):

Vander's Human physiology: the mechanisms of body function. Eric P. Widmaier, Hershel Raff, Kevin T. Strang, last edition

Objectives (Learning Outcome):

1) To learn the principle of human physiology and the body organized.
2) To learn the cell structure, functions, and signaling
3) To learn how the nervous system works

2025 -2026

Department of Pharmacology & Toxicology
Title of the course: *Practical of Physiology I*
Level: 1st Class, 2nd Semester
Course number:128
Code: Phcls25_128-

2025 -2026

Department of Pharmaceutical Chemistry
Title of the course: *Organic Chemistry- I*
Level: 1st Class, 2nd Semester
Course number:129
Code: Phpch25_129-
Credit (hours/week): Theory (3) Laboratory (2) Units: 4

No.	Lesson Subject	Hours
1	Introduction (Structure and properties: Atomic and molecular orbitals, Hybrid orbitals, Intermolecular forces, Polarity, Structure and physical properties))	3
2	Alkanes and methane.	4
3	Alkenes and dienes.	4
4	Alkynes	3
5	Cycloalkanes.	3
6	Stereochemistry I & II	8
7	Alkyl halides.	3
8	Alcohols and ethers.	6
9	Phenols.	4
10	Aromatic Hydrocarbons (includes benzene, electrophilic aromatic substitution, arenas and their derivatives).	7
	Total Hours	45

Reference(s):

1. Organic Chemistry: by John McMurry 10th Ed, 2023
2. Organic Chemistry: Structure and Function (8th Edition) by Vollhardt and Schore.
3. Organic Chemistry by Robert T. Morrison and Robert N. Boyd.

Objectives (Learning Outcome):

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.

2025 -2026

Department of Pharmaceutical Chemistry
Title of the course: *Practical of Organic chemistry- I*
Level: 1st Class, 2nd Semester
Course number:129
Code: Phpch25_129-

No.	Lesson Subject	Hours
1	Determination of melting point (Known sample).	2
2	Determination of melting point (quiz and unknown).	2
3	Determination of boiling point (known sample).	2
4	Determination of boiling point (quiz and unknown).	2
5	Re-crystallization (known sample).	2
6	Re-crystallization (quiz and unknown sample).	2
7	Distillation techniques (known samples).	2
8	Distillation techniques (quiz and unknown).	2
9	Determination of solubility class (known sample).	2
10	Determination of solubility class (quiz and unknown).	2

Reference(s):

1) Handbook for Practical organic chemistry Adopted by the Department

Objectives (Learning Outcome):

1) **Understand and apply thermal analysis methods** by determining the melting and boiling points of known and unknown compounds.
2) **Evaluate purity and identity of substances** through interpretation of melting/boiling point data.
3) **Perform recrystallization techniques** to purify solid compounds and assess the efficiency of purification.
4) **Conduct distillation methods** (simple and fractional) for separation and purification of liquid mixtures.
5) **Determine solubility classes** of pharmaceutical compounds in different solvents, and apply solubility data in drug formulation and analysis.

2025 -2026

Department of Pharmaceutics
Title of the course: *Pharmaceutical Calculation*
Level: 1st Class, 2nd Semester
Course number:1210
Code: Phind25_1210-
Credit (hours/week): Theory (3) Laboratory (2) Units: 4

No.	Lesson Subject	Hours
1	Interpretation of prescription or medication orders.	3
2	Systems of measurement	3
3-4	Density, specific gravity and specific volume	3
5-6	Percent strength, ratio strength, and other expressions of concentration	6
6-7	Calculation of doses, calculation of doses patient parameters	6
8	Reducing and enlarging formulas	3
9	Altering product strength, use of stock solutions, and problem solving by alligation	3
10-11	Isotonic and buffer solutions	6
12-13	Electrolyte solutions (milliequivalents, millimoles and milliosmoles)	6
14-15	Intravenous infusions, parenteral, admixtures, rate-of-flow calculations	6
	Total Hours	45

Reference(s):

1. Pharmaceutical Calculations; 15th edition (2017) by Howard C. Ansel

Objectives (Learning Outcome):

1. Develop skills in **interpreting prescriptions and medication orders** accurately and safely.
2. Apply all types of measurement systems in pharmaceutical calculations, including **dose determinations** for different patient needs.
3. Perform calculations for **adjusting formulas**, including **reduction and enlargement** methods.
4. Calculate **percentage strength, ratio strength, density, and specific gravity/volume** for various pharmaceutical preparations.
5. Prepare and evaluate isotonic solutions for compatibility with physiological systems.
6. Calculate values related to electrolyte solutions, including milliequivalents, millimoles, and milliosmoles.
7. Apply principles of IV admixture preparation, and flow rate calculations for intravenous therapy.

2025 -2026

Department of Pharmaceutics

Title of the course: *Practical of Pharmaceutical Calculation*

Level: 1st Class, 2nd Semester

Course number:1210

Code: Phind25_1210-

No.	Lesson Subject	Hours
1.	Demonstration of different glass ware and equipment used in the field of pharmacy.	2
2.	Pharmaceutical measurements.	4
3.	Volume measurements.	4
4.	Calculations involving liquid pharmaceutical preparations.	4
5.	Calculations involving buffer and isotonic liquid preparations	4
6.	Reducing and enlarging prescription contents.	4
7.	Percentages in calculating prescription contents.	4
8.	Stock solutions and dilution technique during dispensing technique.	4
	Total Hours	30

Reference text

Labarotary Manual for Practical Pharmacology adopted by the department.

2025 -2026

Department of Clinical Laboratory Sciences

Title of the course: *Theoretical & Practical of Computer Sciences*

Level: 1st Class, 2nd Semester

Course number:1211

Code: Phcls25_1211-

Credit (hours/week): Theory (1) Laboratory (2) Units: 2

No.	Lecture title	Theoretical Hours	Practical Hours
1.	**Introduction to computer:** concepts of hardware and software with their components; Concept of computing, Data and Information; Connecting input/output devices, and peripherals to CPU.	1	2
2.	**Computer Components:** Computer Portions, Hardware parts, I/O units, Memory types.	1	2
3.	**Computer Components (Cont.):** Basic CPU components, Computer ports, Personal computer, Personal computer (Features and types)	1	2
4.	**Operating system and graphical user interface GUI:** Operating system, Basics of common operating system, The user interface, Using mouse techniques.	1	2
5.	**Operating system and graphical user interface GUI (Cont.):** Use of the common icons, Status bar, Using menu and menu-selection, Concept of folders and directions, Opening and closing of different windows, Creating short cuts.	1	2
6.	**Word processing**: Word processing basics, Basic features of word processors, Opening and closing of documents, Text creation and manipulation, Formatting of text and paragraphs, Using templates for document creation.	1	2
7.	**Word processing (Cont.)**: Creating and managing tables, Utilizing styles and themes, Spell check and grammar tools, Using headers and footers.	1	2
8.	**Spreadsheet:** Introduction to spreadsheet software, Creating and formatting worksheets. Sorting and filtering data, Using formulas and functions.	1	2
9.	**Spreadsheet (Cont.):** Using formulas and functions, Using pivot tables for data analysis, Data validation and error checking, Data visualization: Creating charts and graphs.	1	2
10.	**Presentation software:** Introduction to presentation software, Overview of popular presentation tools, Creating a new presentation, Using templates and themes, Inserting and formatting text and images, Transition and animation effects.	1	2
11.	**Presentation software (Cont.):** Using Speaker notes and timers, Advanced features: Hyperlinks and action buttons, troubleshooting common presentation issues, future trends in presentation technology.	1	2
12.	**Introduction to Internet and web browsers:** Computer networks basic; LAN, WAN; Concept of Internet and its applications; Connecting to Internet.	1	2

13.	**Introduction to Internet and web browsers (Cont.):** World wide web; Web browsing software's, Search engines; Understanding URL; Domain name; IP addresses.	1	2
14.	**Communications and emails:** Basics of electronic mail; Getting an email account; Sending and receiving emails; Accessing sent emails; Using emails; Document collaboration.	1	2
15.	**Introduction to Cloud Computing and Services:** Definition of cloud computing and its concept, Cloud-based office suites (Office 365 and Google workspace), Google Docs, Google sheets, Google drive, Google meet.	1	2

Suggested Books:

1. Graham Brown, David Watson, "Cambridge IGCSE information and communication technology", 3rd Edition (2020).
2. Alan Evans, Kendall Martin, Mary Anne Poatsy, "Technology in Action Complete 16th Edition (2020).
3. Ahmed Banafa, "Introduction to Artificial Intelligence (AI)", 1st Edition (2024).
4. Microsoft Office 2019 Step by Step 1st Edition by Curtis Frye & Joan Lambert.
5. 2016 "اساسيات الحاسوب"، الخضر علي الخضر بحاث
6. 2005 "مدخل الى عالم الذكاء الاصطناعي"، الدكتور عادل عبد النور

2025 -2026

Department of Clinical Laboratory Sciences
Title of the course: *Arabic Language*
Level: 1st Class, 2nd Semester
Course number:1212
Code: Phcls25_1212-
Credit (hours/week): Theory (2) Units: 2

المنهاج الموحد المقترح لمادة اللغة العربية لغير الاختصاص في الجامعات العراقية والاهلية

القرآن والحديث النبوى الشريف

الصف الأول - الفصل الأول

- من سورة البقرة الآيات من (٢٦٠-٢٦٣)
- من الحديث النبوي الشريف: قال رسول الله صلى الله عليه وآله وسلم: « إنما بعثت لأتمم مكارم الأخلاق »

الادب العربي

- الاختيارات الشعرية في العصر الجاهلي المعلقات اختيارا
- قصيدة عنترة بن شداد

يا عَبلُ أَينَ مِنَ الْمَنِيَةِ مَهْرَبِي

إن كَانَ رَبّي فِي السَّمَاءِ قَضاها

الصرف

- الميزان الصرفي .
- الجموع في العربية .
- أسناد الفعل للضمائر.
- تصريف الأفعال من حيث:
  - الصحة والاعتلال
  - والتجرد والزيادة
  - المشتقات

مهارات لغوية

- الحروف الهجائية (الشمسية والقمرية).
- أحكام كتابة علامات الترقيم.
- أحكام كتابة الهمزة (الأولى والمتوسطة والمتطرفة، وهمزتا الوصل والقطع).

المعاجم العربية

- المدارس المعجمية .
- معاني الالفاظ الغريبة في القران الكريم كالفظة "تفهم" ، "فرشاً" ، " نقيراً" ، والاعتماد في ذلك على كتاب المفردات للراغب الاصفهاني
- منهج مدرستي (العين) و(الأساس)، والتمرين على استخراج الألفاظ.
- من الأخطاء اللغوية الشائعة .

المنهاج الموحد المقترح لمادة اللغة العربية لغير الاختصاص في الجامعات العراقية والاهلية

الصف الأول - الفصل الثاني

القرآن الكريم والحديث النبوي الشريف

- من سورة الحج من اية (١-٥)
- من الحديث النبوي الشريف: قال رسول الله صلى الله عليه وآله وسلم: «خيركم من تعلم القرآن وعلمه».

الادب العربي

- سبعة أبيات من بائية ابن الرومي

عدوك من صديقك مستفاد

فلا تستكثرن من الصحاب

- القيم الإنسانية في الشعر الجاهلي
- الإسلام والشعر .

النحو العربي

- اقسام الكلام وعلامات اعرابها
- المعرب والمبني / المعرفة والنكرة
- المبتدأ والخبر
- النواسخ
- الفاعل والنائب عنه .

2025 -2026

البلاغة العربية

- مقدمة عامة في البلاغة العربية
- تعريفها لغة واصطلاحاً
- مدخل في تعريف علوم البلاغة
- بيان علاقتها باللغة العربية
- علم البيان : (تعريفه وأنواعه)
- التشبيه : (تعريفه وأنواعه وتطبيقاته)
- الحقيقة والمجاز .
- المجاز اللغوي (تعريفه وعلاقاته وتطبيقاته.
- الاستعارة (تعريفها وأنواعها وتطبيقاتها)
- المجاز العقلي (تعريفه وعلاقاته وتطبيقاته) .
- الكناية (تعريفها وأنواعها وتطبيقاتها)
- من الأخطاء اللغوية الشائعة .