



مفردات مناهج كلية الصيدلة للعام الدراسي ٢٠١٩ - ٢٠٢٠



المرحلة الاولى							
الفصل الدراسي الثاني				الفصل الدراسي الاول			
الوحدات		ت	الوحدات		اسم المادة	ت	
عملي	نظري		عملي	نظري			
1	2	Histology	1	1	2	Human Biology	1
1	2	Medical Physics	2	1	3	Analytical chemistry	2
1	3	Organic Chemistry I	3	0	2	Principles of pharmacy practice	3
1	1	Human Anatomy	4	0	3	Mathematics & Biostatistics	4
0	1	Human rights	5	0	1	Medical terminology	5
1	2	Pharmaceutical calculations	6	0	1	English language	6
0	1	English language	7	1	0	Computer sciences	7
1	0	Computer sciences	8				8
المرحلة الثانية							
الفصل الدراسي الثاني				الفصل الدراسي الاول			
الوحدات		ت	الوحدات		اسم المادة	ت	
عملي	نظري		عملي	نظري			
1	3	Pharmacognosy I	1	1	3	Medical Microbiology I	1
1	2	Organic Chemistry III	2	1	3	Organic Chemistry II	2
1	3	Medical microbiology II	3	1	2	Physiology I	3
1	3	Physiology II	4	0	1	Democracy	4
1	3	Physical pharmacy II	5	1	3	Physical pharmacy I	5
0	1	English language	6	0	1	English language	6
0	2	Arabic language	7	1	0	Computer sciences	7
1	0	Computer sciences	8				8
المرحلة الثالثة							
الفصل الدراسي الثاني				الفصل الدراسي الاول			
الوحدات		ت	الوحدات		اسم المادة	ت	
عملي	نظري		عملي	نظري			
1	3	Organic Pharmaceutical Chemistry I	1	1	2	InOrganic Pharmaceutical Chemistry I	1
1	3	Pharmaceutical technology II	2	1	3	Pharmaceutical technology I	2
0	3	Pharmacology I	3	1	2	Pharmacognosy II	3
1	2	Pharmacognosy III	4	1	3	Pathophysiology	4
1	3	Biochemistry II	5	1	3	Biochemistry I	5
0	1	Pharmaceutical Ethics	6	0	1	English language	6
0	1	English language	7				7
المرحلة الرابعة							
الفصل الدراسي الثاني				الفصل الدراسي الاول			
الوحدات		ت	الوحدات		اسم المادة	ت	
عملي	نظري		عملي	نظري			
1	3	Industrial Pharmacy I	1	1	3	Pharmacology II	1
0	2	Pharmacology III	2	0	2	Public Health	2
1	2	Toxicology	3	1	2	Biopharmacy	3
1	2	Clinical Pharmacy II	4	1	2	Clinical Pharmacy I	4
1	3	Organic Pharmaceutical Chemistry III	5	1	3	Organic Pharmaceutical Chemistry II	5
0	2	Communication skills	6	0	1	English language	6
0	1	English language	7				7

المرحلة الخامسة							
الفصل الدراسي الثاني				الفصل الدراسي الاول			
الوحدات		اسم المادة	ت	الوحدات		اسم المادة	ت
عملي	نظري			عملي	نظري		
1	2	TDM	1	0	3	Therapeutics I	1
0	2	Pharmaco-economy	2	1	3	Clinical Chemistry	2
0	2	Therapeutics II	3	0	2	Organic Pharmaceutical Chemistry IV	3
0	2	Dosage Forms design	4	1	3	Industrial Pharmacy II	4
1	3	Advanced Pharmaceutical analysis	5	2	0	Lab Training	5
0	1	Pharmaceutical Bio-technology	6	1	2	Clinical Toxicology	6
2	0	Hospital Training	7	1	0	Graduation project	7

عدد الوحدات الدراسية لكلية الصيدلة جامعة البصرة للعام الدراسي ٢٠١٩-٢٠٢٠			
المجموع	الفصل الثاني	الفصل الاول	المرحلة
٣٣	١٨	١٥	الاولى
٤١	٢٣	١٨	الثانية
٣٩	٢٠	١٩	الثالثة
٣٦	١٩	١٧	الرابعة
٣٥	١٦	١٩	الخامسة
١٨٤	المجموع		

University of Basra
College of Pharmacy
Department of Pharmaceutical Chemistry

Title of the course: *Analytical Chemistry* Course number: 113

Level: 1st Class, 1st Semester

Credit hours/week : Theory 3 Laboratory 1

Reference text: *Fundamentals of Analytical Chemistry by Stook and West.*

Objectives: To provide students with a sound theoretical back ground in chemical principles that is essential to practice chemical analysis. It enables students to understand the importance of judging the accuracy and precision of experimental data and techniques of quantitative analysis, and also to show that theory frequently serves as a useful guide to the solution of analytical

No	Lecture title	hours
1	Review of elementary concept important to analytical chemistry: Strong and weak electrolytes; important weight and concentration units.	4
2	The evaluation of analytical data: Definition of terms.	1
3	An introduction to gravimetric analysis: Statistical analysis of data; rejection of data; precipitation methods; gravimetric factor.	9
4	The scope of applications of gravimetric analysis: Inorganic precipitating agents; organic precipitating agents.	4
5	An introduction to volumetric methods of analysis: Volumetric calculations; acid-base equilibria and pH calculations.	5
6	Buffer solutions: Theory of neutralization titrations of simple system.	3
7	Theory of neutralization titrations of complex system; Precipitation titrations.	5
8	Calculation of pH in complex system; Volumetric methods based on complex system.	4
9	Equilibria in oxidation-reduction system; theory of oxidation-reduction titrations.	6
10	Spectrophotometric analysis: An introduction to optical methods of analysis; Methods based on absorption of radiation.	4

University of Basra
College of Pharmacy
Department of Pharmaceutical Chemistry

Title of the course: *Analytical Chemistry* Course number: 113

Level: 1st Class, 1st Semester

Credit hours/week : Theory 3 Laboratory 1

Reference text: *Fundamentals of Analytical Chemistry by Stook and West.*

Objectives: To provide students with a sound theoretical back ground in chemical principles that is essential to practice chemical analysis. It enables students to understand the importance of judging the accuracy and precision of experimental data and techniques of quantitative analysis, and also to show that theory frequently serves as a useful guide to the solution of analytical

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10	Spectrophotometric analysis: An introduction to optical methods of analysis; Methods based on absorption of radiation.	4

University of Basra

College of Pharmacy

Department of Clinical Laboratory Sciences

Title of the course: *Computer Sciences* Course number: **114**

Level: 1st Class, 1st Semester

Credit hours/week: **Theory 2 Laboratory 1**

Reference text: *Pat Coleman and Peter Dyson, Mastering Internet Windows, 29th ed., Sybex, 1997.* and *Romanoff M (Ed), Microsoft 2000 complete, Sybex, 2000.*

Objectives: Gives students the ability to deal with the concept of computer science, emphasizes the knowledge and skill required to efficiently discharge the duties and responsibilities of the pharmacist. The course deals with the concept of basic computer and application of it in human life and medical field. Upon completion of the course students will be able to understand the computer terminology and abbreviations used to describe the lecture, and the application programming languages.

No	Lecture title	hours
1	General concept: Information technology (IT); Computer systems (hardware, software, user); types of computers; major parts of the computer	3
2	Hardware: Hardware; input and output devices; central processing unit (CPU).	4
3	Memory, storage media and performance: Memory; kind of memory (RAM, ROM, cache memory, flash memory); data representation in memory; storage devices (secondary storage); kind of storage devices; computer performance.	6
4	Computer software: Software (system software, application software); programming languages; generation of programming languages (machine language, assembly language, high level language, application generators, objective oriented language); compiler and interpreters; operating systems (O.S); function and type of O.S; type of software according to source; (commercial, shareware, freeware and public domain); interface, multimedia; system development.	6
5	Data Communication and network: Data communication; work group computing; type of networks; local area network (LAN); wide area network (WAN); WAN Devices (HUB, router, get way, bridge, repeater); networks topologies; data communication hardware; protocols.	5
6	The internet: Internet development; using the internet; internet services; search engines; electronic mail; general concept of internet; viruses and type of virus; protection from virus; security system and information security; data protection act; computer crimes.	6

University of Basra

College of Pharmacy

Department of Clinical Laboratory Sciences

Title of the course: ***Human Biology*** Course number: 111

Level: 1st Class, 1st Semester

Credit hours/week : 2 Laboratory: 1

Objectives: Study the human body composition, types of cell structures, types of tissues, bone, skeleton, joints and muscle as well as the nutrition. Human biology also explains in details the different body systems and human genetics. At the end of the course the student should be able to describe the human body composition, body systems structure and function, and human genetics such as the mendelain inheritance, division of chromosomes, and terms such as allele, locus homo and heterozygous.

Reference text: *Johnks and Enlis (eds.), Text Book of Human Biology, latest edition*

No	Lecture title	hours
1	Biology	2
2	Cell	2
3	Tissues, bone and cartilages	3
4	Nervous system (central & peripheral)	4
5	Nutrition	2
6	Digestive system (Mouth, Esophagus, Stomach)	2
7	Digestive system (intestine)	1
8	Excretory system & respiration	3
9	Human genetics (chromosomes & semi-lethal genes)	3
10	Skin	2
11	Circulatory system	3
12	Immunity (Inflammation, immunity & the blood , immunity to disease)	3

University of Basra

College of Pharmacy

Department of Clinical Laboratory Sciences

Title of the course: *Mathematics and Biostatistics* Course number: 115

Level: 1st Class, 1st Semester

Credit hours/week: **Theory 3**

Reference text: *1. Finny RI, Thomas GB (Eds.); Calculus and Analytical Geometry.*

2. Daniel WW (ED.), Foundation for Analysis in the Health Science, 4th ed.,

Objectives: Gives students the ability to deal with the concept of Mathematics and Statistic, emphasizes the knowledge and skill required to efficiently discharge the duties and responsibilities of the pharmacist. The course deals with the concept of basic Mathematics and application of Biostatistics in the medical field. Upon completion of the course students will be able to understand the applications of statistics in medical field.

No	Lecture title	hours
1	Mathematics: General concepts; coordinate and graph in plane; inequality; absolute value or magnitude; function and their graphs; displacement function; slope and equation for lines.	6
2	Limits and continuity: Limits; theorem of limits; limit involving infinity; continuity; continuity conditions.	4
3	Derivatives: Line tangent and derivatives; differentiation rules; derivative of trigonometric function; practice exercises.	6
4	Integration: Indefinite integrals; rules for indefinite integrals; integration formulas for basic trigonometric function; definite integrals; properties of definite integrals; practice exercises.	6
5	Biostatistics: General concepts of statistics; statistical methods; statistical theory; applied statistics; statistical operations.	2
6	Probability concepts: Properties of probability; Set theory and set notation (basic notation); counting techniques- permutations and combinations; calculating the probability of an events; probability distribution of discrete variable; binomial distribution, Poisson distribution; continues probability distribution and normal distribution, review questions and exercises.	6
7	The concept of central tendency: Mean of sample and mean of population; median; mode; measure of central tendency; review questions and exercises.	6
8	Deviations and variation: Deviation; dispersion and variability; standard deviation and variance; coefficient of variations; standard error; correlation analysis.(regression model and sample regression equation); application of statistic in medical field; review questions and exercises.	9

University of Basra

College of Pharmacy

Department of Pharmacology and Toxicology

Title of the course: *Medical Terminology* Course number: 116

Level: 1st Class, 1st Semester

Credit hours/week: **Theory 1**

Reference text: *Edward CC, (Ed.); A Short Course in Medical Terminology; 1st Ed.; Lippincott Williams and Wilkins; 2008.*

Objective: In this course, students will learn to pronounce, spell, and define medical and pharmaceutical terms used in health care settings. It will use a word-building strategy that helps them discover connections and relationships among word roots, prefixes, and suffixes. They will learn the meaning of each part of a complex medical and pharmaceutical term and be able to put the parts together and define the term.

No	Lecture title	hours
1	Basic word roots and common suffixes	1
2	More word roots, suffixes and prefixes related to pharmaceutical sciences (pharmacognosy, clinical pharmacy, pharmaceuticals,...etc)	1
3	Basic anatomical terms and abnormal conditions	2
4	The genitals and urinary tract	1
5	The gastrointestinal tract	1
6	The heart and cardiovascular system	1
7	Symptoms, diagnoses, treatments, communication qualifiers, and statistics	2
8	Growth and development, and body orientation	1
9	Gynecology, pregnancy, and childbirth	1
10	The eye and the respiratory tract	1
11	The nervous system and behavioral disorders	2
12	Blood and immunity	1

University of Basra

College of Pharmacy

Department of Pharmaceutics

Title of the course: *Principles of Pharmacy Practice* Course number: **112**

Level: 1st Class, 1st Semester

Credit hours/week : **Theory 2**

Reference text: *Pharmaceutical Calculation by Stoklosa*

Objectives: Involves brief information about old pharmacy. It teaches kinds of numbers, abbreviations that are commonly used in prescriptions and their meanings. In this course the students will understand the components of typical prescription, the different unit systems and the relation between these systems. Students will also be familiar with the methods and tools of measuring weights and volumes, and how to calculate doses on different bases and know how to reduce or enlarge formulas; they will be able to describe values in percentage and ratio strength.

No	Lecture title	hours
1	Some fundamentals of measurements and calculations.	4
2	Interpretation of prescription or medication orders.	4
3	The metric system.	4
4	Calculation of doses.	4
5	Reducing and enlarging formulas.	4
6	Density, specific gravity and specific volume.	4
7	Percentage and ratio strength calculation.	6

University of Basra
College of Pharmacy
Department of Clinical Laboratory Sciences

Title of the course: **Histology** Course number: 127

Level: 1st Class, 2nd Semester

Credit hours/week : 2 Laboratory:1

Objectives: To study the histological structure of the human body. It is meant primarily to give the student a foundation for advanced study in health care, physiology, pathology, and other fields related to health and fitness. At the end of the course the student should be familiar with the histological description of the human body.

Reference text:

1- *Basic Histology by Luiz Carlos 11th ed. (2005)*

<i>Lecture No.</i>	<i>Subjective</i>	<i>No. of Hours</i>
1	Circulatory system: Structure of the vascular system (Heart wall, Arteries, Veins & Capillaries)	2
2	Circulatory system: Structure of the lymphatic system (Lymphatic capillary).	1
3	Lymphoid tissue: Structure & function of the (Thymus gland, Spleen & Lymph nodes)	1
4	Lymphoid nodule (MALT) & Tonsils	1
5	Nervous system: Central & Peripheral nervous system	3
6	Respiratory system: -Conducting portion (Nose, Nasopharynx, Trachea Bronchus & Bronchioles). -Respiratory portion (Lung)	3
7	Digestive system: -Digestive steps. -General structure of the digestive tract (GIT) (Oral cavity, Mouth, Esophagus & Stomach) -Small intestine, Large intestine, Rectum & Anus.	3
8	Digestive system: Glands associated with the digestive tract (Salivary glands, Pancreas, Liver & Gall bladder).	1
9	Endocrine system: General structure of the pituitary gland Histophysiology of the pituitary gland.	2
10	Endocrine system: General structure of the Adrenal, Thyroid, Parathyroid, Islet of Langerhans & Pineal glands.	2
11	Male reproductive system: -General structure of the testes. -Stages of spermatogenesis.	2
12	Male reproductive system: Excretory genital ducts-Excretory genital glands (Seminal vesicles, Prostate & Cowper's glands)	1
13	Female reproductive system: -General structure of ovary, Oviduct, Uterus & Vagina. -Stages of follicle development. -Ovulation	3
14	Urinary system: -Structure & Function of the (kidney & nephron) -Histology of the nephron (filtration, absorption & excretion). - Structure of the (Ureter, Bladder & Urethra).	3
15	The skin Thick & Thin skin	2

University of Basra
College of Pharmacy
Department of Clinical Laboratory Sciences

Title of the course: *Human Anatomy* Course number: 127

Level: 1st Class, 2nd Semester

Credit hours/week: Theory 1 lab1

Study the position of different organs in the thoracic and abdominal cavity including: digestive system, circulatory system, lymphatic system, respiratory system, urinary system, reproductive system, endocrine system, nervous system and skin

Reference text:

1- Clinical Anatomy by Regions (Richard S. Snell 8th ed. 2010).

Lecture No.	Subjective	No. of Hours
1	Circulatory system: Location of vascular system (Heart, Arteries, Veins)	1
2	Circulatory system: Location of lymphatic system (Lymphatic capillary).	1
3	Lymphoid tissue: location of the (Thymus gland, Spleen & Lymph nodes)	1
4	Lymphoid nodule (MALT) & Tonsils	1
5	Nervous system: Central & Peripheral nervous system by location	1
6	Respiratory system: -Conducting portion (Nose, Nasopharynx, Trachea Bronchus & Bronchioles). -Respiratory portion (Lung)	1
7	Digestive system: -location of different parts of digestive tract (GIT) (Oral cavity, Mouth, Esophagus & Stomach) -Small intestine, Large intestine, Rectum & Anus.	2
8	Digestive system: Glands associated with the digestive tract by location (Salivary glands, Pancreas, Liver & Gall bladder).	1
9	Endocrine system: -location of the pituitary gland -location of the Adrenal, Thyroid, Parathyroid, Islet of Langerhans & Pineal glands.	1
10	Male reproductive system: -location of the testes. -Excretory genital ducts -Excretory genital glands (Seminal vesicles, Prostate & Cowper's glands)	2
11	Female reproductive system: -location of ovary, Oviduct, Uterus & Vagina.	2
12	Urinary system: -location of the (kidney & nephron) - location of the (Ureter, Bladder & Urethra).	1

University of Basrah

College of Pharmacy

Title of the course: *Human right univ.code*

Level: 1st Class, 2nd Semester

Credit hours/week : 1

University of Basra

College of Pharmacy

Department of Clinical Laboratory Sciences

Title of the course: *Medical Physics* Course number: 129

Level: 1st Class, 2nd Semester

Credit hours/week : **Theory 2 Laboratory 1**

Reference text: *Physics for Biology and Medical Students, 2nd ed.*

Objectives: 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. The course deals with the concept of basic physics and application of physics in the medical field. Upon completion of the course the students will be able to understand the physical terminology and abbreviation used to describe the lecture, and the application in medical field.

No	Lecture title	hours
1	General concepts: Method of physics and standards; thermodynamics system and system properties; conservation of energy principle; application of thermodynamics; the Zeroth law.	3
2	Pressure; temperature and temperature scales (Celsius, Fahrenheit, Kelvin); equation of state; ideal gas and real gas; general law of gases; clauses equation and Vander Waales equation; equilibrium and types of equilibrium; compressibility factor, coefficient of volume expansion, elastic coefficient (bulk modulus).	6
3	Heat and energy; work and mechanical forms of work; power; the 1 st law of thermodynamics; Boyles and Charles law; practice exercises.	3
4	The 2 nd law of thermodynamics; reversible and irreversible process; entropy and enthalpy; internal energy; heat capacity and adiabatic process; the relation between pressure, volume, and temperature in adiabatic process.	6
5	Fundamental of physics: Kinetic theory of a gas; electromagnetic waves; Maxwell equations; physical optics.	6
6	Radiation: Kirshoffs law; planks law; Stefan-Boltzman law; Wiens law; Black body and Albedo; Heat transfer (radiation, convection, conduction).	6
7	Production of X-Ray and X-Ray spectra; absorption of X-Ray; U.V and IR effects; medical and biological effects of radiation; radiotherapy.	3

University of Basra

College of Pharmacy

Department of Pharmaceutical Chemistry

Title of the course: *Organic Chemistry I* Course number: 1210

Level: 1st Class, 2nd Semester

Credit hours/week : **Theory 3 Laboratory 1**

Reference text:

1- Organic Chemistry by Robert T. Morrison and Robert N. Boyd.

2- Organic Chemistry by McCurry; 5th ed. Thomason learning; CA,USA; 2000.

Objectives: To enable students to understand the chemistry of carbon, and the classification, properties and reactions of organic compounds. It includes understanding the basic structure and properties of alkanes, alkenes and alkynes, in addition to the principles of stereochemistry and features of aromatic compounds.

No	Lecture title	hours
1	Introduction.	3
2	Alkanes and methane.	6
3	Alkenes I and II	5
4	Alkynes and dienes.	5
5	Stereochemistry I & II	8
6	Alcohols and ethers.	8
7	Alkyl halides.	6
8	Cycloalkanes.	4

University of Basra

College of Pharmacy

Department of Pharmaceutics

Title of the course: *Pharmaceutical Calculation* Course number: 128

Level: 1st Class, 2nd Semester

Credit hours/week : **Theory 2 Laboratory 1**

Reference text: *Pharmaceutical Calculations by Stoklosa*

Objectives: It involves computation of pharmaceutical ingredients, dosage forms, pharmaceutical formulations of extemporaneous compounding, and biological parameters of drug substances. The course teaches calculations for dilution and concentration of different types of liquids and those involved in preparing isotonic solutions, electrolyte solutions and intravenous admixtures.

No	Lecture title	hours
1	Dilution and concentration of pharmaceutical preparations.	10
2	Isotonic solutions.	6
3	Electrolyte solutions (milliequivalents, millimoles and milliosmoles).	6
4	Constituted solutions, I.V admixtures and flow rate calculations.	8



University of Basra
College of Pharmacy

Department of Pharmaceutical Chemistry

Title of the course: ***Organic Chemistry II*** Course number: **211**

Level: 2nd Class, 1st Semester

Credit hours/week: **Theory 3 Laboratory 1**

Reference text:

1- Organic Chemistry by Robert T. Morrison and Robert N. Boyd.

2- Organic Chemistry by McCurry; 5th ed.; Thomason learning; CA,USA 2000.

Objectives: To enable students to understand the chemistry of carbon, and the classification, properties and reactions of organic compounds. It includes understanding the basic structure and properties of organic halides, carboxylic acids, aldehydes, ketones and amines, in addition to the principles and application of stereochemistry on these compounds.

No	Lecture title	hours
1	Aromatic Hydrocarbons (includes benzene, electrophilic aromatic substitution, arenas and their derivatives).	10
2	Carboxylic acids: properties and reactions.	5
3	Functional derivatives of carboxylic acids.	7
4	Amines I and II.	6
5	Aldehydes and ketones (include also aldol and Claisen condensation); Classification, reactions and properties.	12
6	Phenols.	5

University of Basra**College of Pharmacy****Department of Pharmacology and Toxicology**Title of the course: *Physiology I* Course number: 214Level: 2nd Class, 1st Semester

Credit hours/week : Theory 3 Laboratory 1

Reference text: *Review of Medical Physiology; Ganong W.F (Ed.); 2005.* and *Textbook of Medical Physiology by Guyton AC; latest edition.*

Objectives: To enable students understanding the basic principles of physiological functions of different tissues and organs of the human being, and how to evaluate these functions and correlate them with the normal and abnormal conditions. It also emphasizes on the role of homeostatic and hemodynamic changes in the integration of physiological status.

No	Lecture title	hours
1	The general and cellular basis of medical physiology.	5
2	Physiology of nerves and muscles: Nerve cells; excitation and conduction; Properties of mixed nerves; glia; neurotrophins; Nerve fiber types and functions; Muscles: Skeletal muscle; smooth muscle; cardiac muscle. Synaptic transmission: Reflexes; cutaneous, deep and visceral sensations; alert behavior, sleep and electrical activity of the brain; control of posture and movement; higher function of the nervous system; central regulation of visceral function; the autonomic nervous system.	16
3	Respiration: Respiratory zones; Mechanics of respiration; air volumes; respiratory muscles; compliance of the lungs and chest wall; surfactants; differences in ventilation and blood flow in deferent parts of the lung; Dead space and uneven ventilation; Pulmonary circulation: Pressure, volume and flow. Gas transport between the lungs and tissue; Regulation of respiration: Neural control of breathing; Respiratory centers; Regulation of respiratory activity: Chemical factors; non chemical factors; Respiratory adjustment in health and disease; Effect of exercise; Hypoxia; Emphysema; Asthma.	8
4	Renal Physiology: Introduction; innervations of the renal vessels; renal clearance; renal blood flow; glomerular filtration rate (GFR): Measurements; factor affecting GFR; Filtration fraction; reabsorption of Na ⁺ , Cl ⁻ and glucose. Tubuloglomerular feedback and glomerulotubular balance; water excretion in: proximal tubules; loop of henle; distal tubules; collecting ducts; the counter current mechanism; role of urea; water diuresis and osmotic diuresis; acidification of the urine: H ⁺ secretion; reaction with buffers; ammonia secretion; factors affecting acid secretion; bicarbonate excretion; regulation of Na ⁺ , K ⁺ and Cl ⁻ excretion; uremia; acidosis; micturition.	8
5	Cardiovascular system: origin and spread of cardiac excitation; the electrocardiogram; cardiac arrhythmias; electrographic findings in cardiac diseases; mechanical events of the cardiac cycle; cardiac output; cardiovascular regulatory mechanisms: Local regulatory mechanisms; systemic regulation by the nervous system; systemic regulation by hormones; Coronary circulation; Hypertension; Heart failure; Angina pectoris.	8

University of Basra

College of Pharmacy

Department of Clinical Laboratory Sciences

Title of the course: *Medical Microbiology* Course number: 212

Level: 2nd Class, 1st Semester

Credit hours: **Theory 3 hours Laboratory 1 hour**

Reference text: 1. *Medical Microbiology, seventeenth edition E. Jawetz, J.L.*

Melnick, E.A. Adel 1987 & 2. Principles of microbiology by Roland M.

Objectives: provide a basic understanding of the morphology, anatomy, physiology and genetics of bacteria in addition, the methods of handling, visualizing, characterizing identifying of bacterial disease.

No.	Lecture title	hours
1	Importance of microbiology, History of microbiology	2
2	Anatomy of bacteria: Surface appendage, Capsule, Cell wall of G.+ve & G -ve bacteria, Cytoplasmic membrane.	2
3	Bacterial physiology: Physical and chemical growth determinate, growth and growth curves, bacterial reproduction.	2
4	Genetics: Definition, genetic, element, mutation (spontaneous, gene transfer, transformation, conjugation, and gene transduction).	2
5	Recombinant DNA biotechnology.	2
6	Sporulation and germination.	2
7	Sterilization (chemical + physical Methods).	2
8	Chemotherapy.	2
9	Morphology of Bacteria, Staining and Classification.	1
10	Staphylococci species: <i>Streptococcus pyogenes</i> ; <i>Streptococcus pneumoniae</i>	3
11	Aerobic Spore-forming bacteria Bacillus species (<i>B. anthracis</i> , <i>B. subtilis</i> , <i>B. cereus</i>).	1
12	<i>Clostridium perfringens</i> ; <i>Clostridium tetani</i> ; <i>Clostridium botulinum</i>	3
13	<i>Corynebacterium diphtheriae</i>	1
14	<i>Propionibacterium acnes</i> , <i>Listeria</i>	1
15	<i>Mycobacterium tuberculosis</i> ; <i>M. leprae</i>	1
16	Chlamydiae; Actinomycetes	2
17	Identification & classification of G -ve bacteria	1
18	Enterobacteriaceae: <i>E. coli</i> ; <i>Klebsiella</i> spp.; <i>Citrobacter</i> , <i>Serratia</i> ,	4

University of Basra

College of Pharmacy

Department of Pharmaceutics

Title of the course: ***Physical Pharmacy I*** Course number: **213**

Level: 2nd Class, 1st Semester

Credit hours/week : **Theory 3 Laboratory 1**

Reference text: ***Physical Pharmacy by Alfred Martin et al.***

Objectives: To understand the application of quantitative and theoretical principles of the physical characters of matter in the practice of pharmacy. It aids the pharmacists in their attempt to predict the solubility, compatibility and biological activity of drug products. As a result of this knowledge it will help in the development of new drugs and dosage forms as well as in improvement of various modes of administration.

No	Lecture title	hours
1	States of matter, binding forces between molecules, gases, liquids, solid and crystalline matters; phase equilibria and phase rule; thermal analysis.	10
2	Thermodynamics, first law, thermochemistry, second law, third law, free energy function and applications.	8
3	Solutions of non-electrolytes, properties, ideal and real colligative properties, molecular weight determination.	7
4	Solution of electrolytes, properties, Arrhenius theory of dissociation, theory of strong electrolytes, ionic strength, Debye-Huchle theory, coefficients for expressing colligative properties.	5
5	Ionic equilibria, modern theories of acids, bases and salts, acid-base equilibria, calculation of pH, acidity constants, the effect of ionic strength and free energy.	8
6	Buffered and isotonic solutions: Buffer equation; buffer capacity; methods of adjusting tonicity and pH; buffer and biological system.	7

University of Basra

College of Pharmacy

Title of the course: *Democrcy univ.code*

Level: 2st Class, 1semester

Credit hours/week : 1

University of Basra
 College of Pharmacy
 Department of Clinical Laboratory Sciences
 Title of the course: *Medical MicrobiologyII*

Course number: 227

Level: 2nd Class, 2nd Semester

Credit hours: **Theory 3 hours Laboratory 1 hour**

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Reference text: *Animal Agents and Vectors of Human Disease. 5th.Ed. P.C. Beaver & R.C. Jung.*

Objectives: To provide the student with knowledge of the pathogenesis, morphology, laboratory diagnosis, identification, pathology, and clinical features of medically important parasitic and viral diseases and the basic concepts of immunizing procedure against these diseases.

No	Lecture title	hours
1	Introduction.	1
2	Intestinal protozoa (Amoeba, Balantidium, Giardia, Chilomastix)	4
3	Haemoflagellates: Leshmania spp.; Trypanosome spp.	3
4	Sporozoa: Malarial parasites of human; Toxoplasma.	3
5	Helminthes: Classification, Flukes: Hepatic flukes, Blood flukes (Schistosoma spp). Tap worms: Taenia spp., Echinococcus (Hydatid cyst). Nematods: Ascaris, Entrobis.	4
6	Virology: Introduction, Comparison between viruses and bacteria and other microbes; Classification of viruses; Replication; Chemotherapy; <i>Herpes viridae</i> ; Orthomyxo viruses; Paramyxo viruses; Retro viruses; Hepato viruses; Oncogenic viruses.	15
	-Immunology	
10	General introduction	1
11	innate & adaptive immunity	2
12	-antigen characteristics	1
13	B&T cells	2
14	complements	1
15	Hypersensitivity types	2
16	Oncogenic immunity	3
17	-Auto immune diseases	2
18	Immune deficiency diseases	1

University of Basra

College of Pharmacy

Department of Pharmaceutical Chemistry

Title of the course: ***Organic Chemistry III*** Course number: **226**

Level: 2nd Class, 2nd Semester

Credit hours/week : **Theory 3 Laboratory 1**

Reference text: ***1- Organic Chemistry by Robert T. Morrison and Robert N.***

Boyd, latest edition. 2- Organic Chemistry by J. McMurry, latest ed., Thomson learning, CA, USA. 3_ An introduction to the chemistry of heterocyclic

compound by Acheson, R. M. latest ed.

Objectives: To teach students the principles of heterocyclic chemistry including the fundamental principles and the features, classes and reactions of heterocyclic compounds; it enable students to apply these principles in complicated reactions that involve heteroatoms.

No	Lecture title	hours
1	Heterocyclic system: Classes of heterocyclic systems; general structures; properties; Occurrence in nature and in medicinal products.	5
2	Five-membered ring heterocyclic compounds: pyrrole; furan and thiophen.	3
3	Source of pyrrole, furan and thiophen.	2
4	Electrophilic substitution in pyrrole, furan and thiophen: Reactivity and orientation.	5
5	Six-membered ring heterocyclic compounds: Structure & reactions of pyridine.	4
6	Saturated five-membered heterocyclic compounds.	6
7	Heterocyclic of five & six member rings with two & three heteroatoms.	5

University of Basra

College of Pharmacy

Department of Pharmacognosy

Title of the course: **Pharmacognosy I** Course number: **2210**

Level: 2nd Class, 2nd Semester

Credit hours/week : **Theory 3 Laboratory 1**

Reference text: *Trease and Evans Pharmacognosy; 15th ed., 2000.*

Objectives: This course is intended to study the scope of pharmacognosy, Medicinal plant nomenclature, classification of natural products, phytochemistry which include extraction and isolation of active constituents from natural sources.

No	Lecture title	hours
1	General Introduction: The Scope of Pharmacognosy, definitions and basic principles.	3
2	Drugs from natural sources, crud drugs, official and non-official drugs.	1
3	Classification of natural products.	2
4	Plant nomenclature and taxonomy.	2
5	Production of crude drugs: Cultivation, collection, drying and storage.	3
6	Deterioration of crude natural products.	1
7	Chemistry of natural drug products.	3
8	Quality control: Evaluation of natural products; macroscopical evaluation; physical evaluation; chemical evaluation; biological evaluation; spectroscopical evaluation.	4
9	Phytochemical investigation of herbal products: Extraction of the plant material; Separation and isolation of constituents; characterization of the isolated compounds.	4
10	Separation technique: Introduction; Mechanisms of separation and classification based on the type of technique; paper chromatography; Thin layer chromatography; Ion-exchange chromatography; Gel filtration chromatography; Column chromatography; Gas chromatography; HPLC; Electrophoresis; Affinity chromatography.	15
11	Traditional plant medicines as a source of new drugs. Bioassay-guided fractionation	3
12	Tissue culture of medicinal plant: Introduction and history; laboratory of the plant tissue culture; aseptic techniques Application of the plant tissue culture; environmental and biological control; plant growth regulators.	4

University of Basra
College of Pharmacy
Department of Pharmaceutics

Title of the course: ***Physical Pharmacy II*** Course number: **228**

Level: 2nd Class, 2nd Semester

Credit hours/week : **Theory 3 Laboratory 1**

Reference text: ***Physical Pharmacy by Alfred Martin et al.***

Objectives: To understand the application of quantitative and theoretical principles of the physical characters of matter in the practice of pharmacy. It aids the pharmacists in their attempt to predict the solubility, compatibility and biological activity of drug products. As a result of this knowledge it will help in the development of new drugs and dosage forms as well as in improvement of various modes of administration.

No	Lecture title	hours
1	Solubility and distribution phenomena, solvent-solute interactions, solubility of gases in liquids, solubility of liquids in liquids, solubility of non-ionic solids in liquids, distribution of solutes between immiscible solvents.	10
2	Complexation, classification of complexes, methods of analysis, thermodynamic treatment of stability constants.	5
3	Kinetics, rate and orders of reactions, influence of temperature and other factors on reactions rate, decomposition of medicinal agents and accelerated stability analysis.	9
4	Interfacial phenomena, liquid interfaces, surface free energy, measurement of interfacial tension, spreading coefficient, surface active agents and wetting phenomena.	5
5	Colloids, dispersed system and its pharmaceutical application, types of colloidal systems, kinetic properties, diffusion, zeta potential, solubilization.	5
6	Micrometrics, particle size, methods of determining particle size, particle shape and surface area, porosity, density.	3
7	Rheology, Newtonian systems, thixotropy measurement, negative thixotropy, determination of thixotropy.	5
8	Polymer science, definitions pharmaceutical applications, molecular weight averages.	3

University of Basra

College of Pharmacy

Department of Pharmacology and Toxicology

Title of the course: *Physiology II* Course number: 229

Level: 2nd Class, 2nd Semester

Credit hours/week : Theory 3 Laboratory 1

Reference text: *Review of Medical Physiology; Ganong W.F (Ed.); 2005.* and *Textbook of Medical Physiology by Guyton AC; latest edition.*

Objectives: To enable students understanding the basic principles of physiological functions of different tissues and organs of the human being, and how to evaluate these functions and correlate them with the normal and abnormal conditions. It also emphasizes on the role of homeostatic and hemodynamic changes in the integration of physiological status.

No	Lecture title	hours
1	Gastrointestinal function: Digestion and absorption of carbohydrates; proteins; lipids; absorption of water and electrolytes; vitamins and minerals; regulation of gastrointestinal function: Introduction; gastrointestinal hormones; mouth and esophagus; stomach; exocrine portion of the pancreas; liver and biliary system; small intestine; colon.	10
2	Circulatory body fluid: Introduction; blood; bone marrow; white blood cells; immunity; platelets; red blood cells; anemia; polycythemia; blood group and Rh factor; hemostasis: The clotting mechanism / blood coagulation tests; anti clotting mechanism; the plasma; the lymph; abnormalities of hemostasis.	15
3	Endocrinology: Introduction; energy balance, metabolism and nutrition; the pituitary gland; the thyroid gland; the gonads: development and function of the reproductive system; the adrenal medulla and adrenal cortex; hormonal control of calcium metabolism and the physiology of the bone; endocrine functions of the pancreas and regulation of carbohydrate metabolism.	20

University of Basra
College of Pharmacy
Department of Pharmaceutical Chemistry



Title of the course: *Inorganic Pharmaceutical Chemistry* Course number: 311

Level: 3rd Class, 1st Semester

Credit hours: Theory 2 hours Laboratory 1 hour

Reference text: 1. *Inorganic Medicinal and Pharmaceutical Chemistry by Block, Roche Soine and Wilson, latest edition*

2. *Wilson and Gisvold; Textbook of Organic medicinal and Pharmaceutical chemistry; Delgado JN, Remers WA, (eds); latest edition*

Objectives: To present a review of the principles of inorganic chemistry that applied to medicinal and /or pharmaceutical chemistry. It includes understanding atomic and molecular structures, and explanation of atomic structures and the relationship with binding forces and complexation. It also describes inorganic products used as pharmaceutical preparations or diagnostic tools.

No	Lecture title	hours
1	Atomic and molecular structure/ Complexation.	6
2	Essential and trace ions: Iron, copper, sulfur, iodine.	3
3	Non essential ions: Fluoride, bromide, lithium, gold, silver and mercury.	2
4	Gastrointestinal agents: Acidifying agents.	1
5	Antacids.	2
6	Protective adsorbents.	1
7	Topical agents.	2
8	Dental agents.	1
9	Radiopharmaceutical preparations.	6
10	Radio opaque and contrast media.	6



University of Basra
College of Pharmacy
Department of Clinical Laboratory Sciences

Title of the course: **Biochemistry I** Course number: **314**

Level: 3rd Class, 1st Semester

Credit hours/week : **Theory 3 Laboratory 1**

Reference text: *Harper's Illustrated Biochemistry, Twenty-Sixth Edition*

Objectives: To integrate key concepts describing the traditional core topics of Biochemistry: structure and metabolism. At the end of the semester the students should be able to understand the chemical structure, and function of all biomolecules present in the living organisms.

No.	Lecture title	hours
1	Introduction to the macromolecules biochemistry: Definitions and terms; proteins, enzymes, DNA; Clinical value.	2
2	Amino acids: Structures of A.A (table of standard A.A abbreviation and side chain); Classification, properties, isomerism.	3
3	Amino acids: Chemical reactions, Zwitter ions, titration curve calculating isoelectric point values. Examples and questions. Non standards A.A: Structures, existence and clinical value.	3
4	Peptides: Peptide bond, resonance forms, isomers, physical properties and chemical reactions. Essential poly peptides in human body, structures, roles and clinical values.	3
5	Proteins: Structure and conformations of proteins, Primary structure, Secondary structure (4 helix, 5 sheet), tertiary structure, quaternary structure. Classification, synthesis, cellular functions (Enzymes, cell signaling, and ligand transport, structural proteins), protein in nutrition.	3
6	Denaturation of proteins and protein sequencing: Determining A.A composition, N- terminal A.A analysis, C- terminal A.A analysis, Edman degradation, prediction protein sequence from DNA/ RNA sequences. Methods of protein study: Protein purification, cellular localization, proteomics and bioinformatics, structure predication and simulation.	3
7	Carbohydrates: Chemistry and classification, biomedical importance, classification of CHO, Stereochemistry of monosaccharides, metabolism of CHO; Physiologically important monosaccharides, glycosides, disaccharides, polysaccharides.	3



8	Lipids: Introduction, classification of lipids, fatty acids (F.A), nomenclature of F.A, saturated F.A, unsaturated F.A, physical and physiological properties of F.A, metabolism of lipids. Phospholipids, lipid peroxidation and antioxidants, separation and identification of lipids, amphipathic lipids.	3
9	Enzymes: Structures and mechanism, nomenclature, classification, mechanisms of catalysis, thermodynamics, specificity, lock and key model, induced fit model, transition state stabilization, dynamics and function, allosteric modulation. Biological function, cofactors, coenzymes, involvement in disease.	3
10	Kinetics: General principles, factors effecting enzyme rates (substrate conc., pH, temperature, etc), single-substrate reaction (Michaelis- Menten kinetics), kinetic constants. Examples of kinetic questions and solutions.	2
11	Enzyme inhibition: Reversible inhibitors, competitive and non competitive inhibition, mixed-type inhibition, Irreversible inhibition. Inhibition kinetics and binding affinities (k_i), questions and solutions.	1
12	Control of activity and uses of inactivators; multi-substrate reactions, ternary-complex mechanisms, ping-pong mechanisms, non-Michaelis- Menten kinetics, pre-steady-state kinetics, chemical mechanisms.	1
13	Nucleic Acid: Chemical structure, nucleic acid components, nucleic acid bases, nucleotides and deoxynucleotides (Properties, base pairing, sense and antisense, super-coiling, alternative structures, quadruple structures.	3
14	Biological functions of DNA: Genes and genomes, transcription and translation, replication.	2
15	Biochemistry of extracellular and intracellular communication: Plasma membrane structure and function; Biomedical importance, membrane proteins associated with lipid bilayer, membranes protein composition, dynamic structures of membranes, a symmetric structures of membranes.	3
16	Artificial membranes model, the fluid mosaic model, membrane selectivity, physiological functions of plasma membranes.	1
17	Biochemistry of the endocrine system: Classification of hormones, biomedical importance, the target cell concept and hormone receptors, biochemistry of hormone signal transduction.	3
18	Special topics: Nutrition, digestion, and absorption. Biomedical importance, digestion and absorption of carbohydrates, lipids, proteins, vitamins and minerals; energy balance. Biochemistry of hemostasis and clot formation.	3



University of Basra

College of Pharmacy

Department of Clinical Laboratory Sciences

Title of the course: *Pathophysiology* Course number: 315

Level: 3rd Class, 1st Semester

Credit hours/week : **Theory 3 Laboratory 1**

Reference text: *Essentials in Pathophysiology by: Carol Mattson Porth 2nd Ed.*

Objectives: Describe the basic concepts of pathophysiology at the cellular level related to injury, the self-defense mechanism, mutation, and cellular proliferation. Outline basic pathological factors that influence the disease process. Describe the impact and abnormal functions upon the organ (s) associated with the disease process of targeted body systems. Describe clinical manifestations associated with the diseased organ(s).

No	Lecture title	hours
1	Introduction.	1
2	Cell injury and tissue response; Degeneration; Necrosis; Atrophy; Hypertrophy; Metaplasia and Calcification; Inflammation and Repair.	6
3	Disorders of electrolytes and water and acid–base balances: Hyper and Hyponatremia; Hyper and Hypokalemia; Syndrome of inappropriate secretion of ADH; Diabetes insipidus; Metabolic acidosis and alkalosis; Respiratory acidosis and alkalosis.	4
4	Disorders of cardiovascular system: Hyperemia; Congestion and edema; Thrombosis; embolism and infarction; Shock; Coronary heart disease and MI; Rheumatic heart disease; Heart failure; Acute pulmonary edema; Essential hypertension; Secondary hypertension; Malignant hypertension; Hypotension; Aneurysm versus varicose veins;	5
5	Disorders of respiratory system: Pneumonias; Tuberculosis; Respiratory distress syndrome; Bronchial asthma; Emphysema and bronchiectasis; Cystic fibrosis; Pulmonary embolism; Pulmonary hypertension.	3
6	Disorders of the renal system: Nephrotic syndrome; Glomerulonephritis; Diabetic glomerulosclerosis; Hypertensive glomerular disease; Pyelonephritis; Drug related nephropathies; Acute renal failure; Chronic renal failure.	4
7	Disorders of GI and hepatobiliary systems: Peptic ulcer and Zollinger – Ellison syndrome; Irritable bowel syndrome; Crohn's disease; Diarrhea; Celiac disease; Viral hepatitis; Primary biliary cirrhosis; Liver failure; Cholelithiasis.	4
8	Disorders of thyroid function: Hypothyroidism. Hyperthyroidism. Graves's disease. Thyrotoxicosis.	2
9	Disorders of adrenal function: Cushing syndrome. Adrenal cortical insufficiency (primary and secondary). Congenital adrenal hyperplasia. Pheochromocytoma.	2
10	Diabetes mellitus and metabolic syndrome; Dyslipoproteinemia.	5

University of Basra
College of Pharmacy
Department of Pharmaceutics

Title of the course: *Pharmaceutical Technology I* Course number: 313

Level: 3rd Class, 1st Semester

Credit hours/week : **Theory 3 Laboratory 1**

Reference text: *Pharmaceutical Dosage forms and Drug Delivery Systems By Haward A. Ansel; latest edition.* and *Sprowel's American Pharmacy* .

Objectives: To teach theoretical bases for the technology of preparing different dosage forms with respect to their raw materials, compositions, methods of preparation, stability, storage and uses.

No	Lecture title	hours
1	Dispersed systems: their classification; comparisons between different systems.	2
2	Solutions and types of solutions.	2
3	Solubility: Factors affecting solubility; expression of dissolution; dissolution rate versus solubility; preparation of solutions containing non-volatile materials.	4
4	Official solutions; classification of official solutions; preparation and uses.	4
5	Aqueous solutions containing aromatic principles; aromatic waters; methods of preparations; stability.	4
6	Syrups: sugar based syrups; artificial and sorbitol based syrups; stability of syrups.	4
7	Definition and methods of clarification; filter aids in clarification.	3
8	Preparation of solutions using mixed solvent systems; spirits, and elixirs.	3
9	Extraction; maceration and percolation.	3
10	Tinctures; fluid extracts; extracts of resins and oleoresins.	4
11	Colloidal dispersions; lyophilic; lyophobic.	6
12	Coarse dispersion; suspensions.	6

University of Basra

University of Baghdad

College of Pharmacy

Department of Pharmacognosy

Title of the course: *Pharmacognosy II* Course number: **312**

Level: 3rd Class, 1st Semester

Credit hours/week : **Theory 2 Laboratory 1**

Reference text: *Robbers JE, Speedie MK, Tyler VE (Eds.); Pharmacognosy and Pharmacobiotechnology; the latest edition.*

No	Lecture title	hours
1	Introduction: General biosynthesis pathways of secondary metabolites.	2
2	Carbohydrates.	2
3	Glycosides: Biosynthesis, physical and chemical properties; cardiac glycosides; saponin glycosides; anthraquinone glycosides; flavonoid glycosides; cyanophore lycosides.	5
4	Glycosides: Isothiocyanate glycosides; aldehyde glycosides; alcoholic glycosides; phenolic glycosides; lactone glycosides; coumarins and chromones.	5
5	Resins and resin combination; tannins.	2
6	Lipids: fixed oils and waxes.	3
7	Volatile oils: Introduction; chemistry of volatile oils; biosynthesis of volatile oils; hydrocarbons as volatile oils; alcohols as volatile oils; aldehydes as volatile oils.	4
8	Ketones as volatile oils; Phenols as volatile oils; Oxides as volatile oils; Ester as volatile oils; Phenolic ethers as volatile oils.	3
9	Non- medicinal toxic plants.	2
10	Vitamins and Amino acids.	2

University of Basra

College of Pharmacy

Department of Pharmaceutical Chemistry

Title of the course: *Organic Pharmaceutical Chemistry I* Course number: 326

Level: 3rd Class, 2nd Semester

Credit hours: **Theory 3 hours Laboratory 1 hour**

Reference text: *Wilson and Gisvold Textbook of Organic medicinal and Pharmaceutical chemistry, Delgado JN, Remers WA, (Eds); 10th ed, 2004.*

Objectives To enable understanding mechanisms of drug action at molecular level and the role of medicinal chemistry in the discovery and development of synthetic -therapeutic agents. It also enables students to understand the concept of structure activity relationship and its application in design and synthesis of new compounds or .derivatives

No	Lecture title	hours
1	Drug distribution.	4
2	Acid- base properties.	3
3	Statistical prediction of pharmacological activity.	3
4	QSAR models.	2
5	Molecular modeling (Computer aided drug design).	1
6	Drug receptor interaction: force involved.	1
7	Steric features of drugs.	2
8	Optical isomerism and biological activity.	1
9	Calculated conformation.	1
10	Three- dimensional quantitative structure activity relationships and databases.	1
11	Isosterism.	1
12	Drug-receptor interaction and subsequent events.	1
13	General pathways of drug metabolism: Sites of drug biotransformation; Role of cytochrome P450 mono-oxygenases in oxidative biotransformation; Oxidative reactions; Reductive reactions; Hydrolytic reactions; Phase II reactions.	22
14	Factors affecting drug metabolism.	2

University of Basra

College of Pharmacy

Department of Clinical Laboratory Sciences

Title of the course: **Biochemistry II** Course number: **329**

Level: 3rd Class, 2nd Semester

Credit hours/week : **Theory 3 Laboratory 1**

Reference text: *Harper's Illustrated Biochemistry, Twenty-Sixth Edition*

Objectives: To provide a condensed curriculum of strong basic biochemistry and molecular biology. At the end of the semester the students should be able to understand all metabolic processes occurring in the living cell.

No.	Lecture title	hours
1	Bioenergetics.	2
2	Biologic oxidation.	2
3	The respiratory chain and oxidative phosphorylation.	2
4	Over view of metabolism.	2
5	Citric acid Cycle.	2
6	Glycolysis.	2
7	Metabolism of glycogen.	4
8	Gluconeogenesis.	3
9	Pentose phosphate pathway and other pathways of hexose metabolism.	3
10	Biosynthesis of fatty acids.	3
11	Oxidation of fatty acids.	2
12	Metabolism of acylglycerol and sphingolipids.	2
13	Lipid transport and storage.	2
14	Cholesterol synthesis, transport, and excretion.	2
15	Biosynthesis of the Nutritionally Nonessential Amino Acids.	3
16	Catabolism of Proteins & of Amino Acid Nitrogen	3
17	Catabolism of the Carbon Skeletons of Amino Acids.	2
18	Conversion of Amino Acids to Specialized Products.	2
19	Porphyrins & Bile Pigments	2

University of Basra

College of Pharmacy

Department of Pharmaceutics

Title of the course: ***Pharmaceutical Technology II*** Course number: **328**

Level: 3rd Class, 2nd Semester

Credit hours/week : **Theory 3 Laboratory 1**

Reference text: ***Pharmaceutical Dosage forms and Drug Delivery Systems By Haward A. Ansel; latest edition.*** and ***Sprowel's American Pharmacy*** .

Objectives: To teach theoretical bases for the technology of preparing different dosage forms with respect to their raw materials, compositions, methods of preparation, stability, storage and uses; in addition to define and characterize the possible incompatibilities that may occur in dosage forms.

No	Lecture title	hours
1	Emulsions; purpose of emulsification; methods of emulsification; emulsifying agents; HLB system; stability of emulsions.	10
2	Lotions; liniments and collodions.	5
3	Suppositories.	6
4	Powdered dosage forms.	10
5	Semisolid dosage forms.	10
6	Incompatibilities in pharmaceutical dosage forms.	4

University of Basra

College of Pharmacy

Department of Pharmacognosy

Title of the course: *Pharmacognosy III* Course number: **3210**

Level: 3rd Class, 2nd Semester

Credit hours/week : **Theory 2 Laboratory 1**

Reference text: *Robbers JE, Speedie MK, Tyler VE (Eds.); Pharmacognosy and Pharmacobiotechnology; the latest edition.*

Michael Heinrich, Joanne Barnes; Fundamentals of Pharmacognosy & Phytotherapy.

Objectives: This course is intended to study chemistry of other natural products namely alkaloids and antibiotics. Also this course includes studying phytotherapy & tissue culture techniques utilized for production of natural products.

No	Lecture title	hours
1	Alkaloids: Introduction; Physical and chemical properties; pyridine, piperidine alkaloids; tropane alkaloids.	5
2	Alkaloids: Quinoline tropan alkaloids; iso-quinoline alkaloids; imidazole alkaloids; indole alkaloids.	5
3	Alkaloids: Steroidal alkaloids; lupinane alkaloids; alkaloidal amines; purine alkaloids.	4
4	Antibiotics: Natural sources; biosynthetic pathways, isolation and purification.	6
5	.phytotherapy :Introduction , principles,medicinal plants in selected health care systems.Important natural products & phytomecines used in pharmacy & medicine	10

University of Basra

College of Pharmacy

Department of Pharmacology and Toxicology

Title of the course: **Pharmacology I** Course number: **327**

Level: 3rd Class, 2nd Semester

Credit hours/week : **Theory 3**

Reference text: *Lipincott Pharmacology 3rd Edition, 2006*

Objectives: To introduce the pharmacy students to the basis of general pharmacology. The student will learn about various body systems and drugs used to affect them in health and disease. Moreover the course will cover the drugs used to treat microbial infections.

No	Lecture title	hours
1	General introduction to Pharmacology.	2
2	Pharmacokinetics.	4
3	Drug Receptor interaction and Pharmacodynamics.	4
4	The autonomic nervous system (ANS).	2
5	Cholinergic system.	6
6	Adrenergic system.	6
7	Principal of antimicrobial therapy.	2
8	β - lactam and other cell wall synthesis inhibitor antibiotics	4
9	Protein synthesis inhibitors	4
10	Quinolones, Folate antagonists, and urinary tract antiseptics.	3
11	Antimycobacterium drugs	2
12	Antifungal drugs.	2
13	Antiprotozoal drugs.	1
14	Anthelmintic drugs.	2
15	Antiviral drugs.	1

University of Basra

College of Pharmacy

Department of Clinical Pharmacy

Title of the course: **Medical ethics** Course number: **(3211)**

Level: 3rd Class, 2nd Semester

Credit hour/weeks: **Theory 1**

Reference text:

1- Ruth Rodgers, (ed.); fast track: Law and Ethics in Pharmacy Practice. Pharmaceutical Press 2010.

2-Joy Wingfield and David Badcott . Pharmacy Ethics and Decision Making. Pharmaceutical Press2007

3-Robert J. Cipolle, Linda M. Strand, Peter C. Morley. Pharmaceutical Care Practice: The Clinician's Guide, 2nd Edition.

4- Robert m. Veatch and Amy Haddad. Case Studies in Pharmacy Ethics. second edition. Copyright © 2008 by Oxford University Press, Inc.

Objectives:

The course will provides an overview of ethical issues facing practicing pharmacists in order to enable the student to understand the basic concepts of ethics which formulate the relationship of pharmacist with the patient, colleges, and other health personnel in order to deliver his pharmaceutical services in good way.

The course will begin with an introduction to ethics in pharmaceutical practice and then proceed to examine in depth specific topics (Beneficence, Autonomy, Confidentiality, Consent...).

The course will include lectures, case analysis, and classroom discussion.

No	Lecture title	hours
1	Introduction to Pharmacy Ethics (Theoretical considerations).	2
2	Code of Ethics for Pharmacists.	1
3	Common Ethical Considerations in Pharmaceutical Care Practice (Beneficence, Autonomy, Honesty, Informed Consent, Confidentiality, Fidelity).	3
4	Interprofessional Relations.	2
5	Making ethical decisions.	1
6	Ethical issues related to clinical pharmacy research.	1
7	Ethical problems in the pharmacist's clinical practice.	1
8	Preventing misuse of medicines.	1
9	Case studies in pharmacy ethics.	3

University of Basra
College of Pharmacy
Department of Pharmaceutics

Title of the course: *Biopharmaceutics* Course number: 414

Level: 4th Class, 1st Semester

Credit hours/week : **Theory 2 Laboratory 1**

Reference text: *Shargel L, Yu AB, (Eds.), Applied Biopharmaceutics and Pharmacokinetics.*

Objectives: The course deals with the physical and chemical properties of drug substance, dosage form and the biological effectiveness of the drug or drug product upon administration, including drug availability in the human or animal body from a given dosage form. The pharmacokinetic part of the course deals with the time-course of the drug in the biological system, and quantification of drug concentration pattern in normal subjects and in certain disease states.

No	Lecture title	hours
1	Introduction to biopharmaceutics.	2
2	Biopharmaceutic aspects of products; drug absorption; mechanisms of absorption; physicochemical factors; dissolution rate; effects of excipients; type of dosage forms.	6
3	One compartment open model.	2
4	Multicompartment models.	2
5	Pharmacokinetics of drug absorption.	2
6	Bioavailability and bioequivalence.	2
7	Clearance of drugs from the biological systems.	2
8	Hepatic elimination of drugs.	2
9	Protein binding of drugs.	2
10	Intravenous infusion	2
11	Multiple dosage regimens.	2
12	Non-linear pharmacokinetics.	2
13	Dosage adjustment in renal diseases.	2

University of Basra

College of Pharmacy

Department of Pharmaceutical Chemistry

Title of the course: *Organic Pharmaceutical Chemistry II* Course number: 412

Level: 4th Class, 1st Semester

Credit hours/week : **Theory 3 Laboratory 1**

Reference text: *Wilson and Gisvold Textbook of Organic Medicinal and Pharmaceutical Chemistry; Delgado JN, Remers WA, (Eds.); 10th ed., 2004.*

Objectives : The course is devoted to the discovery and development of new agents for treating diseases, and enables translating the drug structural formula into therapeutic effect. Additionally, it focuses on the methods of .preparation for some pharmaceutical agents

No	Lecture title	hours
1	Cholinergic agents, cholinergic receptors and their subtypes.	3
2	Cholinergic agonists; stereochemistry and structure-activity relationships (SAR); products; cholinesterase inhibitors.	5
3	Cholinergic blocking agent; structure-activity relationships (SAR); Solanaceous alkaloid and analogues; synthetic cholinergic blocking agents and products; ganglionic blocking agents (neuromuscular blocking agents).	5
4	Analgesic agents (SAR of morphine, SAR of meperidine type molecules; SAR of methadone type compounds; N-methylbezomorphans, antagonist type analgesics in benzomorphans).	5
5	Analgesic receptors, endogenous opioids; Products; Antitusive agents; Anti-inflammatory analgesics.	5
6	Adrenergic agents (Adrenergic neurotransmitters); Adrenergic receptors; Drugs affecting Adrenergic neurotransmission; Sympathomimetic agents; Adrenergic receptor antagonists.	8
7	CNS depressant; Benzodiazepines and related compounds; Barbiturates; CNS depressant with skeletal muscle relaxant properties; Antipsycotics; Anticonvulsants.	7
8	CNS Stimulants	3
9	Steroidal & nonsteroidal hormones	4

University of Basra

College of Pharmacy

Department of Clinical Laboratory Sciences

Title of the course: Public Health Course number: **415**

Level: 4th Class, 1st Semester

Credit hours/week : **Theory 2**

Reference text: *Lucas AO, Gilles HM, (Eds), Short Textbook of Public Health Medicine for the Tropic, (4th Ed), 2003.*

Objectives: This course enables the students to understand the principles of public health and the art of preventing disease, promoting health and prolonging life, through organized effort of society.

No	Lecture title	hours
1	General items & ICD10	2
2	Predisposing factors of infectious diseases	1
3	Cardiovascular diseases	1
4	Gastrointestinal diseases	2
5	Skin diseases	1
6	-Sexually transmitted diseases	1
7	Oncogenic diseases	3
8	Respiratory infections	2
9	Family planning include maternal infections, vaccination	2
	-Immunology	
10	General introduction	1
11	innate & adaptive immunity	2
12	-antigen characteristics	1
13	B&T cells	2
14	complements	1
15	Hypersensitivity types	2
16	Oncogenic immunity	3
17	-Auto immune diseases	2
18	Immune deficiency diseases	1

University of Basra
College of Pharmacy
Department of Clinical Pharmacy

Title of the course: *Communication Skills* Course number: 425

Level: 4th Class, 2st Semester (change by head of pharmacy college dean committee) start 2018 -2019

Credit hours: Theory 2 hours Laboratory --

Reference text:

1-Robert S. Beardsley, (ed.); Communication Skills in Pharmacy Practice, 5th edition.

2-Bruce A. Burger (ed.), Communication Skills for Pharmacists; American Pharmacists Association; 2nd ed.

Objectives: Communication skill is one of the missions of pharmacy care practice, aims to develop a conventional relationship between pharmacist and patients, in which information is exchanged, hold in confidence and used to optimize patient care through appropriate drug therapy. This course is intended to pharmacist provide better care to patients, and focus on communication skills necessary to build the kind of relationship that result in improved therapeutic outcomes.

No	Lecture title	hours
1	Patient-Centered Communication in Pharmacy Practice	2
2	Principles and Elements of Interpersonal Communication	2
3	Nonverbal type of communication.	2
4	Barriers to communication.	2
5	Listening and empathic responding during communication.	2
6	Assertiveness.	2
7	Interviewing and assessment.	2
8	Helping patients to manage therapeutic regimens.	2
9	Patient counseling; counseling check list; point-by-point discussion; counseling scenario.	2
10	Medication safety and communication skills.	2
11	Strategies to meet specific needs.	2
12	Communicating with children and elderly about medications.	2
13	Communication skills and inter-professional collaboration.	2
14	Electronic communication in healthcare.	2
15	Ethical behavior when communicating with patients.	2

University of Basra

College of Pharmacy

Department of Clinical Pharmacy

Title of the course: Clinical Pharmacy I

Level: 4th Class, 1st Semester

Credit hours/week : Theory 2 lab:- 1

Reference Text: ALISON BLENKINSOPP, PAUL PAXTON(eds), Symptoms in the Pharmacy. A Guide to the Management of Common Illness, 6th edition.

Lor waterfield, Community Pharmacy Hand Book, 5th edition

No	Lecture title	hours
1	Introduction to community pharmacy.	1
2	Respiratory problems: Cough, Common cold, allergic rhinitis, Otitis media, Laryngitis & Pharyngitis	3
3	G.I.T problemse: Diarrhea, Constipation, Heart burn and indigestion, IBS and Hemorrhoids	4
4	Pediatric care practice : Oral thrush, pinworms and head lice	2
5	Skin conditions: Acne, Scabies, Psoriasis, Hair loss, Fungal infection, Eczema and Dermatitis , Dandruff, Cold sore, Corns and Callus. 5	5
6	Women's health care: Cystitis and vaginal thrush, primary dysmenorrhea and Premenstrual syndrome.	2
7	CNS related problems: Headache, Insomnia, Motion sickness, Nausea and vomiting	3
8	- Eye problems	1
9	ENT problems	1
10	Oral hygiene, mouth ulcer	1
11	Obesity and body weight control.	1
12	- Pain and musculoskeletal disorders	1
13	Nicotine replacement therapy (NRT).	1
14	Dietary supplements	1
15	An update in reclassification of OTC drugs (simvastatin, Tamusotisin & azithromycin).	2
16	Medication adherence and errors.	1

University of Basra
College of Pharmacy
Department of Pharmacology and Toxicology
 Title of the course: *Pharmacology II* Course number: **411**
 Level: 4th Class, 1st Semester
 Credit hours/week: **Theory 3 Laboratory 1**
 Reference text: *Lipincott Pharmacology 3rd Edition, 2006*

Objectives: To introduce the pharmacy students to the general pharmacology of the central nervous system and to the various drug groups used in the treatment of CNS diseases or drugs altering its function. The student will be introduced to the various drugs used in the management of cardiovascular diseases. Moreover the course will cover the drugs affecting the gastrointestinal and respiratory systems.

No	Lecture title	hours
1	Introduction to CNS pharmacology.	2
2	CNS stimulants.	2
3	Anxiolytic and Hypnotic drugs.	3
4	General and Local Anesthetics.	3
5	Antidepressant drugs.	3
6	Antipsychotic (neuroleptic) drugs.	2
7	Opioid analgesics and antagonists.	3
8	Treatment of neurodegenerative diseases.	3
9	Antiepileptic Drugs.	2
10	Diuretics.	2
11	The treatment of heart failure (HF).	2
12	Antiarrhythmic drugs.	2
13	Antianginal Drugs.	2
14	Antihypertensive drugs.	3
15	Drugs affecting the blood.	3
16	Antihyperlipidemic drugs.	2
17	Gastrointestinal and antiemetic drugs.	2
18	Drugs acting on the respiratory system.	3

University of Basra
College of Pharmacy
Department of Clinical Pharmacy
Title of the course: Clinical Pharmacy II

Level: 4th Class, 2nd Semester

Credit

hours/week : Theory 2 hours Lab 1

Reference Text: Roger Walker, Clive Edwards (eds), Clinical Pharmacy & Therapeutics

No	Lecture title	hours
1	Introduction to the concept of clinical pharmacy- its activities and professional responsibilities.(including current state of clinical pharmacy in Iraq) .	1
2	an overview of pharmaceutical care practice (the patient care process).	1
3	Hematologic disorders: Anemia and sickle cell disease.	2
4	Hypertension.	2
5	Ischemic heart diseases	2
6	Heart failure.	2
7	Peripheral vascular diseases.	1
8	- Asthma.	2
9	Chronic obstructive pulmonary disease (COPD).	1
10	Diabetes mellitus & Diabetic ketoacidosis (DKA) .	2
11	Peptic ulcer disease.	2
12	Tuberculosis	1
13	Infective meningitis	1
14	Respiratory tract infections	2
15	GIT infections	1
16	Gout and hyperuricemia	1
17	Rheumatoid arthritis (RA) and osteoarthritis (OA)	2
18	Osteoporosis and other metabolic bone disease.	1
19	Infectious Endocarditis	1
20	Surgical antibiotic prophylaxis	1
21	Urinary tract infection (UTI)	1

University of Basra

College of Pharmacy

Department of Pharmacology and Toxicology

Title of the course: ***General Toxicology*** Course number: **429**

Level: 4th Class, 2nd Semester

Credit hours/week : **Theory 2 Laboratory 1**

Reference text: ***Casarett and Doull, Toxicology, the Basic Science of Poisons; latest edition.***

Objectives: To study the principle of exposure to different chemicals and environmental factors, their sources, mechanisms of toxicity and their risk to human being; it enables students to understand the required measures to protect living organisms against the suspected toxic hazards.

No	Lecture title	hours
1	Introduction: general consideration; host factor, environmental factors of toxic effects.	3
2	Carcinogenesis.	3
3	Mutagenesis:	1
4	Target organs and systemic toxicology; Respiratory system, Liver, Kidney, Skin, Nervous system, cardiovascular system, Blood.	16
5	Toxic substances: Food additive and contaminants, Pesticides, Metals, Radiation and radio active materials, plants, Solvents,	15
6	Environmental toxicology: Air pollution, water and soil pollutants, Gases (Tear gas, Pepper spray), CO, Cyanide(H ₂ S).	7

University of Basra

College of Pharmacy

Department of Pharmaceutics

Title of the course: ***Industrial Pharmacy I*** Course number: **4210**

Level: 4th Class, 2nd Semester

Credit hours/week : **Theory 3 Laboratory 1**

Reference text: ***The Theory and Practice of Industrial Pharmacy by Leon Lachman et al.***

Objectives: The subject aim to teach pharmacy students the steps and lines upon which the preformulation processing of pharmaceutical dosage forms. This fundamental coarse provide the required principles to integrate knowledge of Pharmaceutical Technology in preformulation of perfect dosage form. It includes milling, mixing, drying and filtration, besides sterilization to achieve a proper processing of dosage forms.

No	Lecture title	hours
1	Principles of pharmaceutical processing; mixing; fluid mixing; flow characteristics; mechanisms of mixing; mixing equipments; batch and continuous mixing; mixer selection; solid mixing theory and particulate solid variables; forces and mechanisms.	7
2	Milling; pharmaceutical application; size measurement methods; theory and energy of comminution; types of mills; factors influencing milling; selection of mill techniques; specialized drying methods.	7
3	Drying: definition; purpose; humidity measurement; theory of drying; drying of solids, and classification of dryer; specialized drying methods.	7
4	Clarification and filtration: Theory; filter media; filter aids; selection of drying method; non-sterile and sterile operations; integrity testing; equipments and systems (commercial and laboratory).	7
5	Sterilization; validation of methods; microbial death kinetics; methods of sterilization (thermal and non-thermal); mechanisms; evaluation.	7
6	Pharmaceutical dosage form design; pre-formulation; preliminary evaluation; bulk characterization; solubility and stability analysis.	3
7	Pharmaceutical dosage forms; sterile products; development; formulation; production; processing; quality control.	7

University of Basra
College of Pharmacy

Department of Pharmaceutical Chemistry

Title of the course: *Organic Pharmaceutical Chemistry III* Course number: 427

Level: 4th Class, 2nd Semester

Credit hours/week : **Theory 3 Laboratory 1**

Reference text: *Wilson and Gisvold Textbook of Organic Medicinal and Pharmaceutical Chemistry; Delgado JN, Remers WA, (Eds.); 10th ed., 2004.*

Objectives: To enable understanding mechanisms of drug action, including antibacterial, antifungal and antiviral agents, at molecular level, and the role of medicinal chemistry in the discovery and development of synthetic therapeutic agents. It also enables students to understand the concept of structure-activity relationship and its application in design and synthesis of new chemotherapeutic agents and hormone derivatives with potential biological activity.

No	Lecture title	hours
1	β -Lactam antibiotics (Penicillins); β -Lactamase inhibitors; Cephalosporins and Monobactams.	9
2	Aminoglycosides and Chloramphenicol; Tetracyclines; Macrolides; Lincomycins and Polypeptides; Antiviral agents (properties of viruses, viral classification, products).	9
3	Sulfonamides (chemistry, nomenclature, mechanism of action, resistance, toxicity, side effects, metabolism, protein binding, distribution and SAR); products; Sulfones.	4
4	Anti-neoplastic agents: Alkylating agents; Antimetabolites; Antibiotics; Plant products; Miscellaneous compounds.	17
5	Hormones and related compounds; Future anti-neoplastic agents; Monoclonal antibodies; Gene therapy of cancer.	6

University of Basra

College of Pharmacy

Department of Pharmacology and Toxicology

Title of the course: **Pharmacology III** Course number: **426**

Level: 4rd Class, 2nd Semester

Credit hours/week: **Theory 2 hours**

Reference text: *Lipincott Pharmacology 3rd Edition, 2006*

Objectives: To introduce the pharmacy students to various drug groups affecting endocrine systems and their use in correcting abnormalities in the endocrine functions. Moreover the course will cover the drugs used in the management of neoplastic diseases, bone disorders, obesity and erectile dysfunction. Inflammatory agents and the anti-inflammatory drugs will also be covered during this course.

No	Lecture title	hours
1	Hormones of the pituitary and thyroid glands.	3
2	Insulin and oral hypoglycemic drugs.	4
3	Adreno-corticosteroids.	3
4	The gonadal hormones and inhibitors.	3
5	Autacoids and autacoid antagonists	3
6	Non-steroidal anti-inflammatory drugs (NSAIDs) and other anti-inflammatory agents.	3
7	Drugs used in erectile dysfunction.	2
8	Drugs used in osteoporosis.	2
9	Drugs used in the management of obesity.	2
10	Cancer Chemotherapy: Anticancer drugs and immunosuppressants.	5

University of Basra
College of Pharmacy
Department of Clinical Pharmacy

Title of the course: **Applied Therapeutic I**

Level: 5th Class, 1st Semester

Credit hours: Theory 3 hours

Reference Text: Roger Walker, Clive Edwards (eds), Clinical Pharmacy & Therapeutics.

Barbara G.Wells & Joseph T. Diriro, Pharmacotherapy hand book 7th Edition.

No	Lecture title	hours
1	Interpretation of Lab. data.	2
2	Acute coronary syndrome.	2
3	Arrhythmias	2
4	Thrombosis	2
5	Dyslipidemia	1
6	Stroke	1
7	Shock	2
8	Liver cirrhosis	2
9	Viral hepatitis	1
10	Inflammatory bowel diseases	2
11	Acute renal failure (ARF)	1
12	Chronic renal failure (CRF)	2
13	Hemodialysis and peritoneal dialysis	1
14	Systemic lupus erythematosus (SLE)	1
15	Benign prostatic hyperplasia (BPH)	1
16	Acid – base disorders	2
17	Disorders of fluid and electrolytes	2
18	Urinary incontinence and pediatric enuresis	1
19	Epilepsy and status epilepticus	2
20	Fungal infections	1
21	Parkinson's disease	2
22	Pain management	1
23	Headache disorders	1
24	Tobacco use and dependence	1
25	Parasitic infections	1
26	Viral diseases	1
27	Parenteral nutrition	1
28	Enteral nutrition	1
29	Evidence-based pharmacy practice and medicine.	1
30	Drug distribution systems	2
31	Pharmacovigilance	2

University of Basra

College of Pharmacy

Department of Clinical Laboratory Sciences

Title of the course: *Clinical Chemistry* Course number: 514

Level: 5th Class, 1st Semester

Credit hours/week : **Theory 3 Laboratory 1**

Reference text: *1- Clinical Chemistry & Metabolic Medicine, Crook, 2006. 2- Clinical Chemistry, Kaplan, 2003.*

Objectives: To exhibit knowledge of human body chemistry levels under healthy and abnormal conditions. At the end of the semester the students should be familiar with the basic and advanced information in clinical laboratory chemistry and how it relates to patient health and care

No.	Lecture title	hours
1	Disorders of Carbohydrates metabolism, Hyperglycemia & Diabetes mellitus, Hypoglycemia.	3
2	Disorders of lipid metabolism.	2
3	Liver Function Tests.	4
4	Kidney Function Tests.	4
5	Diagnostic enzymology.	4
6	Hypothalamus & pituitary endocrinology, disorders of anterior pituitary hormones, disorders of adrenal gland, hypopituitarism.	8
7	Reproductive system, disorders of gonadal function in males & females, biochemical assessment during pregnancy.	5
8	Tumor markers.	4
9	Drug interaction with laboratory Tests.	2
10	Disorders of calcium metabolism	3
11	Acid- Base Disorders.	4

University of Basra

College of Pharmacy

Department of Pharmacology and Toxicology

Title of the course: *Clinical Toxicology* Course number: 516

Level: 5th Class, 1st Semester

Credit hours/week : **Theory 2 Laboratory 1**

Reference text: *1- Gossel TA, Bricker TD, (Eds.); Principles of Clinical Toxicology; latest edition. 2-Viccellio P, (Ed.); Handbook of Medicinal Toxicology; latest edition.*

Objectives: The course aims to provide students with the principles and skills required to deal with the toxicity of chemicals and drugs in clinical settings; it enables students to correlate signs and symptoms of toxicity with the analytical data, and to know how to establish preventive and therapeutic measures for poisoning cases.

No	Lecture title	hours
1	Initial Evaluation and Management of the Poisoned Patient. Including pediatric poisoning and special consideration in the geriatric patient	3
2	Drug Toxicity: Over the counter drugs; caffeine; theophylline; antihistamine and decongestant; non-steroidal anti-inflammatory drugs; vitamins.	3
3	Prescription Medications: Cardiovascular drugs; beta blockers; ACE inhibitors; Digoxin; Calcium channel blocker; Antiarrhythmic agents; hypoglycemic drugs; Opioids; CNS depressants; tricyclic antidepressants; anti- cholinergic phenothiazines; CNS stimulant.	13
4	Drug of Abuse: Opioids; Cocaine; phencyclidine; marijuana; Lysergic acid.	4
5	Chemical and Environmental Toxins: Hydrocarbones; Household toxins; Antiseptic; Disinfectants; Camphor; moth repellents.	3
6	Botanicals and plants-derived toxins: Herbal preparation; Toxic plants; Poisonous mushrooms.	4

University of Basra

College of Pharmacy

Department of Pharmaceutics

Title of the course: **Industrial Pharmacy II** Course number: **512**

Level: 5th Class, 1st Semester

Credit hours/week: **Theory 3 Laboratory 1**

Reference text: *The Theory and Practice of Industrial Pharmacy by Leon Lachman et al.*

Objectives: The course enable technical setup for coordination of standards for formulation of typical dosage forms and the principles needed to learn mass production of different pharmaceutical dosage forms. The syllabus includes different dosage forms like tablets, capsules, aerosols, emulsion, etc, besides the advanced techniques like enteric coating and micro-encapsulation.

No	Lecture title	hours
1	Pharmaceutical dosage forms: Tablets; role in therapy; advantages and disadvantages; formulation; properties; evaluation; machines used in tableting; quality control; problems; granulation, and methods of production; excipients, and types of tablets.	10
2	Tablet coating; principles; properties; equipments; processing; types of coating (sugar and film); quality control, and problems.	4
3	Capsules: Hard gelatin capsules; materials; production; filling equipments; formulation; special techniques.	3
4	Soft gelatin capsules: Manufacturing methods; nature of capsule shell and content; processing and control; stability.	2
5	Micro-encapsulation; core and coating materials; stability; equipments and methodology.	2
6	Modified (sustained release) dosage forms; theory and concepts; evaluation and testing; formulation.	3
7	Liquids: Formulation; stability and equipments.	3
8	Suspensions: Theory; formulation and evaluation.	3
9	Emulsions: Theory and application; types; formulation; equipments and quality control.	3
10	Semisolids: Percutaneous absorption; formulation; types of bases (vehicles) preservation; processing and evaluation.	3
11	Suppositories: Rectal absorption; uses of suppositories; types of bases; manufacturing processes; problems and evaluation.	3
12	Pharmaceutical aerosols: Propellants; containers; formulation; types and selection of components; stability; manufacturing; quality control and testing.	6

University of Basra**College of Pharmacy****Department of Pharmaceutical Chemistry**Title of the course: *Organic Pharmaceutical Chemistry IV* Course number: **511**Level: 5th Class, 1st SemesterCredit hours/week : **Theory 2**Reference text: *Wilson and Gisvold Textbook of Organic Medicinal and Pharmaceutical Chemistry; Delgado JN, Remers WA, (Eds.); 10th ed., 2004.*

Objectives: To give the students knowledge and experience in pro-drug and hormones as part of their medicinal and pharmaceutical field. It includes classification, synthesis, biotransformation and/or formulation of certain drugs to improve their action as well as to avoid some side effect.

No	Lecture title	hours
1	Basic concept of prodrugs; Covalent bonds (cleavable); Prodrugs of functional groups; Types of prodrugs.	6
2	Chemical delivery systems; Polymeric prodrugs; Types and structure of polymers; Cross-linking reagents.	6
3	Drug targeting.	4
4	Project.	4
5	Combinatorial chemistry; Peptides and other linear structures; Drug like molecules; Support and linker; Solution-phase combinatorial chemistry.	5
6	Detection, purification and analgesics; Encoding combinatorial libraries; High-throughput screening; Virtual screening; Chemical diversity and library design.	5

University of Basra

College of Pharmacy

Department of Pharmaceutical Chemistry

Title of the course: *Advanced Pharmaceutical Analyses* Course number: 5210

Level: 5th Class, 2nd Semester

Credit hours/week : Theory 3 Laboratory 1

Reference text: 1. *Spectrometric Identification of Organic Compounds by Silverstein, Bassler and Morrill*; 2. *Applications of absorption spectroscopy of organic compounds by Dyer JR*. 3. *Organic Chemistry by McMurry; 5th ed; Thomason learning CA, USA 2000.*

Objectives: To study spectrometric methods used for identification and characterization of organic compounds, including UV, IR, MASS and NMR spectroscopy; it enables students to understand the applications of these techniques for qualitative and quantitative analysis of organic compounds.

No	Lecture title	hours
1	UV / visible spectroscopy; Sample handling and instrumentation; Characteristic absorption of organic compounds; Rules for calculation of lambda max and application; Application of UV/visible; spectroscopy; Problems and solutions.	6
2	Infra Red spectroscopy (theory and H-bonding effect; Sampling techniques and interpretation of spectra; Characteristic group frequencies of organic compounds; Application of IR spectroscopy; Problems and solutions.	14
3	H ¹ –Nucleomagnetic Resonance (NMR) and C ¹³ -NMR spectroscopy; Introduction, the nature of NMR absorption, chemical shifts and factors affecting them, information obtained from NMR spectra, more complex spin-spin splitting patterns, application of H ₁ -NMR spectroscopy; C ¹³ -NMR spectroscopy: introduction and characteristics, DEPT C ¹³ - NMR spectroscopy.	12
4	Mass spectroscopy: Introduction and interpreting Mass spectra; interpreting Mass spectra fragmentation patterns, Mass behavior of some common functional groups.	11
5	elemental microanalysis CHNSO	2

University of Basra
College of Pharmacy
Department of Clinical Pharmacy

Title of the course: **Applied Therapeutic II**

Level: 5th Class, 2nd Semester Credit hours/week : Theory 2

Reference Text: Roger Walker, Clive Edwards (eds), Clinical Pharmacy & Therapeutics.

Barbara G.Wells & Joseph T. Diriro, Pharmacotherapy hand book 7th Edition

No	Lecture title	hours
1	Thyroid and parathyroid disorders	2
2	Contraception	1
3	Endometriosis	1
4	Menstruation related disorders	1
5	Hormonal replacement therapy (HRT)	1
6	Cancer treatment and chemotherapy	2
7	Leukemias	2
8	Lymphomas and Multiple myeloma	2
9	HSCT(Hematop. Stem- cell- Transplantation).	1
10	Breast and prostate cancers	2
11	Adverse effects of chemotherapy	1
12	Human immunodeficiency viruse	1
13	Multiple seclerosis	1
14	Adrenal gland disorders	1
15	Pituitary gland disorders	1
16	Gluacoma	1
17	Alzheimer's disease	1
18	Schizophrenia	2
19	Depressive disorders	2
20	Anxiety disorders	1
21	Sleep disorders	1
22	Bipolar disorders	1
23	Adverse drug reactions	1

University of Basra**College of Pharmacy****Department of Clinical Pharmacy**Title of the course: *Pharmacoeconomy* Course number: 527Level: 5th Class, 2nd SemesterCredit hours/week: **Theory 2**

Reference text: *Bootman JL, Townsend RJ, McGhan WF, (Eds.), Principles of Pharmacoeconomics, 2nd ed., Harvey Whitney Books Company, Cincinnati, Oh, latest edition*

Objectives: The present course will give students the basic understanding of the tools needed to assess the costs and outcomes of medications and pharmaceutical care services. It will enable participants to evaluate the pharmacoeconomic and quality of life literature for the purpose of rational decision-making. Students will be exposed to the drug-focused approaches to pharmacoeconomic research and the fundamentals of quality of life research.

No	Lecture title	hours
1	Course overview, Changes in health care delivery, overview of pharmacoeconomics.	2
2	Cost determination.	2
3	Evaluation of outcomes and effectiveness, types of pharmacoeconomic analyses: Cost effectiveness analyses (CEA), cost minimization analyses (CMA).	2
4	Methods of data collection and analyses, modeling (decision analyses).	2
5	1 st mid-term examination.	2
6	Incremental analyses; case studies.	2
7	Evaluation outcomes: Utility and quality of life; types of pharmacoeconomic analyses, cost utility analyses (CUA).	2
8	Evaluation outcomes: Net benefit, cost utility analyses (CBA), compare and contrast CEA, CUA and CBA.	2
9	Methods of data collection and analyses: Statistical/Econometric modeling.	2
10	2 nd mid-term examination.	2
11	Drug-focused versus disease-focused frame work for conducting pharmacoeconomic analyses.	2
12	Critical review of pharmacoeconomic and quality of life literature.	2
13	Introduction to epidemiology.	2
14	Project presentation.	2
15	Project presentation.	2

University of Basra

College of Pharmacy

Department of Pharmaceutics

Title of the course: *Dosage form Design* Course number:
5212

Level: 5th Class, 2nd Semester

Credit hours/week : **Theory 2**

Reference text: *Pharmaceutical Dosage Forms and Drug Delivery Systems by Haward A. Ansel.*

Objectives: This course enables students to understand the principles and factors that influence design dosage forms; and the applications of these principles in the practice of pharmaceutical industry.

No	Lecture title	hours
1	Pharmaceutical consideration: The need for the dosage form.	1
2	General consideration for the dosage form.	3
3	Pre-formulation; physical description, microscopic examination.	2
4	Melting point; phase rule; particle size; polymorphism; solubility.	2
5	Permeability; pH; partition coefficient; pka; stability; kinetics; shelf life.	2
6	Rate reaction; enhancing stability.	2
7	Formulation consideration: Excipients; definition and types; appearance; palatability; flavoring.	2
8	Sweetening; coloring pharmaceuticals; preservatives; sterilization; preservatives selection.	2
9	Biopharmaceutical considerations: Principle of drug absorption; dissolution of the drugs.	4
10	Bioavailability and bioequivalancy; FDA requirements.	3
11	Assessment of bioavailability; bioequivalence among drug products.	3
12	Pharmacokinetic principles: Half life; clearance; dosage regimen considerations.	4

University of Basra

College of pharmacy

Department of pharmaceutics

Title of the course : pharmaceutical biotechnology

Level 5th. Year , 2nd semester

credit (1

hours) ,Course number 5213

Reference : *pharmaceutical biotechnology*

J . A . Crommelin , Robert D. Syinder

No	Lecture title	hours
1	Biotechnology - introduction	1
2	Formulation of biotechnology product (biopharmaceutical consideration) Microbial consideration- sterility-pyrogen viral decontamination Excipients of parenteral products - solubility enhancer-anti adsorption agents buffer components-preservatives – osmotic agents	4
3	Route of administration Parenteral route Oral route Alternative routes (nasal-pulmonary-rectal-buccal transdermal)	5
4	Pharmacokinetic of peptides and proteins Introduction Elimination of proteins (proteolysis-excretion-metabolism)	5

University of Basra

College of pharmacy

Title of the course : project under graduate

Level 5th. Year , credit (1 hours) , (practical)

Course number 517

University of Basra

College of Pharmacy

Department of Clinical Pharmacy

Title of the course: **Therapeutic Drug Monitoring (TDM)**

Course number: 529

Level: 5th Class: 2nd Semester

Credit hours/week: **Theory 2 , Laboratory 1**

Reference Texts:

Applied Clinical Pharmacokinetics, Second Edition, 2008 by Larry A. Bauer.

Additional references include but not limited to the following:

Clinical Pharmacokinetics Concepts and Applications, Third Edition, 1995 by Malcolm Rowland and Thomas Tozer;

No	Lecture title	hours
1	Course Overview	1
2	Review of basic pharmacokinetic (PK)-	2
3	Review of basic pharmacodynamic (PD)	1
4	Clinical PK equations and calculations	3
5	Clinical PK in special population and cases	3
6	Clinical PK/PD for Antibiotics (e.g., Aminoglycosides, Vancomycin	4
7	Clinical PK/PD for Cardiovascular agents (e.g., Digoxin, Lidocaine, Procainamide/N-Acetyl Procainamide	4
8	Clinical PK/PD for Anticonvulsants (e.g., Phenytoin, Carbamazepine, Valproic Acid, Phenobarbitone/Primidone, Ethosuxsimide	6
9	Clinical PK/PD for Immunosprants (e.g., Cyclosporine, Tacrolimus	2
10	Clinical PK/PD of other drugs (e.g., Lithium, Theophylline, Anticancer agents, Anticoagulats	4