EBLA PRIVATE UNIVERSITY

EPU

SYRIA-IDLEB-SARAQEB

جامعة إيبلا الخاصة
محافظـة ادلب – ناحية سراقب
المحـدثة بالمرسوم 259 لعام 2007

EBLA PRIVATE UNIVERSITY

Faculty of pharmacy

Courses Description
Subject's folder

Subject's number & code PHA 100	Subject's name Cell Biology	
Estimation	**Week**	**Grades**
First test/month	**6**	**10**
Researches & Reports	**-**	**5**
Total quarterly work	**40 grades**	

Reliable subject's units 3 (2T+2P)	Requisite -----	Subject's lecturer
Estimation	**Week**	**Grades**
Second test/month	**11**	**10**
Practical	**Every week**	**15**
Final exam	**16**	**60 grades**

Subject's main contents:

Week №	Theoretical lectures	Practical lectures
1	General meaning of Cell science & its development: • Introduction • Historical overview about Cell Science • Cell shapes & types • Prokaryotes & Eukaryotes	Microscope & its uses • Introduction • Materials & instruments • Combination & right application • Watching animal cell (lining of the cheek cells) • Watching a plant cell (Onion peel)
2	Method of Cell Studying: • Microscopes & its usage • Preparation of Biological samples for microscopic study • Separation methods of living contents • Diagnostic methods of Proteins • Usage of radiating analogue in cellular study	Cell Shapes • Introduction • Materials & instruments • Observing Human's Red & White Blood Cells • Observing Bar particle in White Blood Cells (females) • Observing Red Blood Cells in Frogs
3	Chemical structure of the cell: • Water & minerals • Proteins • Enzymes • Lipids • Carbohydrates • Nucleic acids	Cell movement • Introduction • Materials & instruments • Observing movement in Green Aughlina (flagellum movement) • Observing movement in the Obalina frog {frog's intestine} (flagellum movement) • Observing movement in Paramecium (cilia movement) • Observing movement in Balantidium

		{frog's intestine} (cilia movement) • Observing movement
4	Transparent Cytoplasm: • Chemical structure of Transparent Cytoplasm • Role of Transparent Cytoplasm & its physiological efficacy.	Cells shape in Epithelial Tissues • Introduction • Materials & instruments • Simple Epithelial Tissues (Cubical – Squamous - Cylindrical) • Stratified Epithelial Tissues (Keratinizing – Transitional - Ciliated)
5	Cell membrane • Microscopic structure of cell membrane • Chemical analysis of cell membrane • Geometric structure of cell membrane • Conjunctions between the cell membranes in neighboring cells	Cells shape in 0000 Tissues • Introduction • Materials & instruments • Types of 0000 tissue cells • Types of 0000 tissue fibers • 00000
6	Cell Envelope: • Cell Envelope in Animal cells • Bacterial Cell Envelope • Virus Cell Envelope • Appendages of Cell Envelope	Cells shape in Nervous & Muscular Tissues • Introduction • Materials & instruments • Smooth Tissue • Skeletal Tissue • Cardia Tissue • Nervous Tissue

7	Nucleus • Nuclear envelope • Nucleolus • Chromatin • Chromosomes • Nucleus functions	Cell Division (1) • Introduction • Materials & instruments
8	Mitochondria & Energy: • Introduction • Microscopic & Chemical Study of Mitochondria • Producing Energy in Mitochondria • Other functions of Mitochondria • Duplication & Origin of Mitochondria	Cell Division (2) • Introduction • Materials & instruments
9	Ribosomes: • Shape & structure • Function	Types of genes in human cells • Introduction • Materials & instruments
10	Endoplasmic Reticulum • Shapes & Types • Microscopic structure • Chemical structure • Function	Types of the Cells in Prokaryotes • Introduction • Materials & instruments
11	The Golgi Apparatus: • Microscopic structure • Origin	Eukaryotes (monocytes)

	• Chemical analysis • Function	
12	Lysosomes & Peroxisomes	Anatomy of lungs, larynx & trachea
13	Cytoplasmic Microtubules & Microfilaments	
14	Cell Division • Interior agents affecting Cell Division • Exterior agents affecting Cell Division • Cell cycle stages • Cell cycle apparatus • Mechanism of cleaving division	Anatomy (1) • Introduction • Materials & instruments • Anatomy of Frog
15	Meiosis • Stages of first Meiosis • Stages of second Meiosis • Gametogenesis	Anatomy (2) • Introduction • Materials & instruments • Anatomy of Mouse or Rabbit

Botany's folder

Subject's number & code **PHA 105**	Subject's name **Botany**		Reliable subject's units 3 (2T+2P)	Requisite -----	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60

Subject's main contents:

Week №	Theoretical lectures	Practical lectures
1	Introduction to Botany (plant botany – plant biology) – plant as an alive being	Recognition of some microscopic types used in studying the cell – Simple light Microscope & the usage method – principles of laboratory work.
2	Structure of plant cell (1)	Studying the structure of plant cell – Rotation movement of cytoplasm -
3	Structure of plant cell (2)	Studying living contents – Chloroplast
4	Chemical structure of plant cell	Studying living contents – Colored Chloroplast – Non-Colored Chloroplast
5	Biochemical processes in plant cells Photosynthesis Cellular Respiration (Rating questions about previous researches)	Studying non-living contents (crystallized & non-crystallized) – Calcium oxalate & Calcium Carbonate – Starch.
6	Nutrition, Hormones & Transport in plants	Studying cellular division in the top of Onion root (Meristem tissues)
7	Studying plant tissues	Studying plant tissues – Protective

8	Studying the morphological & anatomical structure in plant organs (Root)	Studying plant tissues – Supportive
9	Studying the morphological & anatomical structure in plant organs (Stem)	Studying plant tissues – Secretive
10	Studying the morphological & anatomical structure in plant organs (Leaves)	Practical Study of morphological & anatomical structure for plat organs: Root
11	Studying the morphological & anatomical structure in plant organs (Flowers) (Rating questions about previous researches)	Practical Study of morphological & anatomical structure for plat organs: Stem
12	Seed & fruits	Practical Study of morphological & anatomical structure for plat organs: Leaves
13	Character & Taxonomy of plants (1)	Practical Study of morphological & anatomical structure for plat organs: Flowers
14	Character & Taxonomy of plants (2)	Practical Study of morphological & anatomical structure for plat organs: Fruits
15	Environment & plants – Plant Adaptation to the Environment	Practical Study of morphological & anatomical structure for plat organs: Seed

Subject's folder 2nd Semester

Subject's number & code **CHM 100**	Subject's name **General & Inorganic Chemistry**		Reliable subject's units 3 (2*T*+2*P*)	Requisite -----	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	40

Subject's main contents:

Week №	Theoretical lectures	Practical lectures
1	Atomic structure (1)	Principles of working in a laboratory
2	Atomic structure (2)	Determination of some physical characteristics
3	The Periodic table	Realization of Law of conservation of energy
4	Chemical bonds	Neutralization temperature & Solubility temperature
5	Molecular orbits & Geometrical structure (1)	Experiments on specific chemical analysis
6	Molecular orbits & Geometrical structure (2)	Experiments on specific chemical analysis
7	Kinetic Chemistry	Experiments in Kinetic Chemistry
8	Chemical Equilibrium & Le Chatelier principle	Experiments on Law of mass action & Le Chatelier principle
9	Solutions & Solubility	Volumetric & quantitative analysis (1)
10	Equilibriums in homogeneous systems	Volumetric & quantitative analysis (2)
11	Equilibriums in heterogeneous systems	Solutions & Buffer solutions (pH)
12	Oxidation & reduction reactions	Salts Solubility Product
13	Hydrogen	Oxidation & reduction reactions (1)
14	Oxygen & Ozone	Oxidation & reduction reactions (2)
15	Hydrogen peroxide & water	Hardness of Water

ITC 100 Computer Skills 1: (3H)

This subject aims to introduce the principal elements of computer including hardware, programming, operation systems of MS DOS and Windows. Also Word, Excel, PowerPoint and Internet. And the role of Information learning within institutions and its uses in Administrations.

ENG 100 English Languages 1: (3H)

This subject aims to training on the conversation and written skills. It adopts methods of communication and conversation in teaching. Through this course, there is a review of principal elements of grammar and vocabulary; in particular, that Arabic-Speaker has difficulties in learning them.

ARB 100 Arabic Languages: (3H)

This subject to ameliorate the student's expression skill and direct him towards the standard Arabic language so that it becomes his essential expression way. This subject has a focus on the skills of writing, grammar, functional competence (Reading & Expression), skills of esthetical appreciation, through the study of some selected literature texts and the analysis of their syntax and language structure, on showing their esthetics of form and substance.

Organic Chemistry 1

Subject's number & code	Subject's name	Reliable subject's units	Requisite	Subject's lecturer
CHM115	**Organic Chemistry 1**	**3(2T+2P)**	**-------**	

Estimation	Week	**Grades**	Estimation	Week	**Grades**
First test/month	6	**10**	Second test/month	11	**10**
Researches & Reports	-	**5**	Practical	Every week	**15**
Total quarterly work	40 grades		Final exam	16	**60 grades**

Subject's main contents:

Week №	**Theoretical lectures**	**Practical lectures**
1	Introduction to General organic chemistry	Chem.lab-safety rules
2	Molecular Properties 1	Extraction
3	Molecular Properties 2	Distillation
4	Stereochemistry 1	Crystallization
5	Stereochemistry 2	Sublimation
6	Organic molecule classification	Physical properties
7	Alkanes and Cyclo-alkanes	Elements qualitative identification tests 1
8	Alkenes and alkynes	Elements qualitative identification tests 2
9	Haloalkanes aliphatic derivatives	Elements qualitative identification tests 3
10	Alcohols and phenols	Alcohols identification tests
11	Ethers and thiols	Phenols identification tests
12	Aldehydes	Aldehydes and ketones identification tests
13	Ketones	Carboxylic acids and derivatives identification tests 1
14	Carboxilic acids and derivatives	Carboxylic acids and derivatives identification tests 2
15	Amines and derivatives	Carboxylic acides and derivatives identification tests 3

Subject's folder

Subject's number & **PHA106**	Subject's name **Anatomy & Histology**		Reliable subject's units **3 (2T+2P)**	Requisite -----	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	11	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60 grades

Subject's main contents:

Week №	Theoretical lectures	Practical lectures
1	General histology	Single-Layered Squamous, Cuboidal Pseudostratified Columnar (Cylindrical) Epithelium
2	Epithelial Tissue	Multilayered Stratified Keratinizing & Nonkeratinizing Squamous Epithelium & Transitional Epithelium
3	Connective Tissue	Soft & Thick connective tissue& Elastic connective tissue
4	Blood	Blood Smear & studying the blood cells
5	Muscular & fatty Tissue	Studying the fatty Tissue & Muscular Tissue (Smooth & Striated Muscle)
6	Cartilage Tissue	Studying the Hyaline, Elastic, Fibrocartilage
7	Bone Tissue	Studying Spongy bone, Cartilage ossification, Compact Bone (Harversian)& embryonal ossification
8	Nerves & Glandular System	Studying parotid & cross sections in the spinal cord & nodes
9	The Motor System, Essential definitions & Essential components of the human body	Introduction to the body parts and the anatomical sections
10	Nervous System	Anatomy of brain & spinal cord
11	The Circulatory System	Anatomy of heart and big blood vessels
12	The Respiratory System	Anatomy of lungs, larynx & trachea
13	Digestive System	Anatomy of lower or higher digestive tract, liver & bile ducts
14	The Urinary -Reproductive System	Anatomy of kidneys, ureters, urinary bladder & urethra
15	Endocrine Glands	Anatomy of thyroid gland & pancreas

Subject's folder

Subject's number & code PHY100	Subject's name **general physics**		Reliable subject's units 3 (2T+2P)	Requisite - - - - - -	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60

Subject's main contents:

Week №	Theoretical lectures	Practical lectures
1	Temperature	
2	Thermal Expansion	Measurement & Errors(1)
3	Ideal gases	Measurement & Errors(2)
4	Real gases	Thin Lenses
5	Temperature and Thermodynamics' law	Surface Tension
6	Matter States	Light Reflection
7	Liquid Mechanics	Speed of Sound
8	Light Reflection	Viscosity of Fluids
9	Light Refraction	Speed of Light
10	Sound & Ultrasound weave	Archimedes Principle
11	Lasers & Characteristics	Newton Rings
12	Laser Applications	stefan- boltzmann's law
13	Nuclear Structure & Properties	Pendulum simple
14	Radionuclides & Nuclear Medicine	Ohm Law
15	Ultraviolet Radiation	

ENG 105 English Language 2: 3H - (Previous record: ENG 100)

This subject completes the previous one, it aims to train students on the conversational skills, including: Conversation about themes related to the ordinary daily life, exchange opinions about different subjects, giving information, short public speaking; giving and taking notes; comprehension and comment on news and reports (written and oral).

ACI 100 Arabic Cultures: (3H)

This subject aims to provide to the student a historical review on the Arab society and on the political and cultural system and their evolution. It also treats the change, and the development of the Arabic Society and it discuss about the economic systems in.

Subject's folder 2nd Semester

Subject's number & code **MTH120**	Subject's name **mathematics**		Reliable subject's units 3 (2*T*+2*P*)	R equisite /	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60

Subject's main contents:

Week №	Theoretical lectures	Practical lectures
1	Derivation and derivation rules	Probability-conditional probability-independent events
2	Inverse trigonometric functions and their derivation	Total events and Baye's theorem(rule)
3	Limits and L'hospital's rule	Random variables and properties
4	Evaluating indeterminate forms and removal methods	Probability distributions-binomial,poisson
5	The indefinit integral and some properties	Probability distributions-uniform,normal
6 (1st test)	Test 1	Expected value and variance of a random variable
7	Expansion integral method and change of variable	Distribution function of a random variable X and a normal random variable
8	Integral by parts method	Approximation normal to binomial
9	Integration of rational fractions	Measures of centeral tendency
10	Integrals of trigonometric and irrational functions	Measures of variability –descriptive distributions of measurements
11	The definite integral and some properties	Test 2
12 (2nd test)	Change of variation in the definite integral	Frequency distributions and graphic presentation
13	Integration by parts method	Estimation and sampling distribution for a small sample
14	Geometric applications of definite integral computing area	Hypothesis testing-Chi-square distribution
14	Geometric applications of definite integral computing arc length-computing volumes of revolution	Simple linear regression and correlation

Subject's folder 2nd Semester

Subject's number & code **CHM 201**	Subject's name **Organic Chemistry 2**		Reliable subject's units 3 (2*T*+3*P*)	Requisite **CHM 115**	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60

Subject's main contents:

Week №	**Theoretical lectures**	**Practical lectures**
1	Nucleophilic Substitution (1)	Nucleophilic Substitution reactions S_N2
2	Nucleophilic Substitution (2)	Nucleophilic Substitution reactions S_N2
3	Elimination Reactions	Nucleophilic Substitution reactions S_N1
4	Aromatic compounds	Aromatic Substitution electrophilic reactions
5	Carbonyl Aromatic compounds	Aromatic Substitution electrophilic reactions
6 (1st test)	Multifunctional Carbonyl Aromatic derivatives	Preparation reactions of Carbonyl compounds (Alcohol oxidation)
7	Carboxylic acids	Addition reactions to Carbonyl compounds (reduction)
8	Aryl-Sulfonic acids	Addition reactions to Carbonyl compounds (Grignard reaction)
9	Phenols	Addition reactions to Carbonyl compounds (Grignard reaction)
10	Aromatic amines	Addition reactions to Carbonyl compounds
11	Di-Azo compounds	Addition reactions to Carbonyl compounds
12 (2nd test)	Non-homogeneous rings	Elimination Reaction (Eliminating water from alcohol)
13	Principles of UV / visible spectroscopy	Addition electrophilic reactions to multiple carbon-carbon bounds
14	Principles of infrared spectroscopy	Spectroscopy application (Principles of infrared spectroscopy)
15	Principles of infrared spectroscopy	Spectroscopy application (Principles of infrared spectroscopy)

Subject's folder 2nd Semester

Subject's number & code **CHM 203**	Subject's name **Analytical Chemistry 1**		Reliable subject's units 3 (2*T*+3*P*)	Requisite **CHM 100**	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60

Subject's main contents:

Week №	**Theoretical lectures**	**Practical lectures**
1	The meaning of solution, solvent and concentration in solutions.	Introducing used laboratorial instruments in analytical chemistry and safety rules and laboratorial safety.
2	Basic principles in chemical balances.	Introducing indicators in different mediums.
3	Principles and calculations of quantitative analysis, pH meaning.	Preparation of standard solutions in definite concentrations.
4	Modulation assays (acid – base): assay curve for strong acids and weak acids.	The assay of strong acids by weak basis.
5	Modulation assays (acid – base): assay curve for strong basis and weak basis.	The assay of weak acids
6 (1st test)	Modulation assays (acid – base): assay curve for acids and basis with multiple functions and salts assay.	The assay of strong and weak basis by acids.
7	The assays in non-aquatic medium	The assays in non-aquatic medium and salts' solution assay.
8		
9	Precipitation assays	
10		
11		
12 (2nd test)	Oxidation and reduction assays (meaning and reactions)	
13	Oxidation and reduction assays curves.	
14	Principles of weighing analysis.	
15	Methods of weighing analysis.	

physical chemistry folder

Subject's number & code **PHA 209**	Subject's name Physical chemistry		Reliable subject's units 3 (2T+3P)	Requisite Phs100	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60

Subject's main contents:

Week №	Theoretical lectures	Practical lectures
1	The different states of matter Effect of attractive intermolecular forces on the properties of material (crystalline solids)	Laboratory work. Determination of density and relative density for the liquids and solids
2	The different states of material Effect of attractive intermolecular forces on the properties of material - (crystalline solids)	Measuring of the liquids viscosity
3	Some physical properties of the material - methods to determine properties of the matter (photometric absorption and emission by chemicals)	Measurement of the surface tension
4	Some physical properties of the material - methods to determine properties of the material (density- viscosity- surface tension- boiling point-melting point)	Determination of the refractive index
5	Some physical properties of the material - methods to determine properties of the material (DTA- DTG)	Determination of the optical rotation and specific rotation of drugs
6	Some physical properties of the material - methods to determine properties of the material (Polarization – refraction)	Absorption of light by chemicals (spectrophotometric analysis)
7	Applications of the thermodynamics : The Zeroth law of the thermodynamics – the first law of the thermodynamics	Determination of the heat capacity for the calorimeter
8	Applications of the thermodynamics : The second law of the thermodynamics – the third law of the thermodynamics	Determination of the neutralization heat by calorimeter
9	Applications of the thermodynamics : Gibbs free energy	Determination of the dissociation constant of electrolytes by the pH-

		meter
10	Chemical kinetics : The effective factors on the rate of reaction – methods to determine reaction orders and rate of reaction	Determination of the dissociation constant of electrolytes by electrical conductivity measurement
11	Chemical kinetics: the relationship between rate of reaction and thermodynamics	Kinetic study of the decomposition of hydrogen peroxide- determination of the reaction order and rate of reaction
12	Chemical kinetics : stability and dissociation of drugs	Kinetic study of the hydrolysis of sucrose by polarimerty
13	Electrochemistry: chemical reactions in electrochemical cells (oxidation-reduction) – Electro motive force (EMF) – Nernst equation	Electrochemistry : Measurement of cell potential
14	Electrochemistry: Electro motive force EMF– thermodynamics function : dG ، dH ، dS	Electrochemistry : determination of the thermodynamic function of electrochemical cells
15	Colloidal Systems	Determination of the critical concentration of Micelle (cmc)

Subject's folder 2nd Semester

Subject's number & code **PHA201**	Subject's name **Pharmacognosy**		Reliable subject's units 3 (2*T*+3*P*)	Requisite **PHA105**	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60

Subject's main contents:

Week №	**Theoretical lectures**	**Practical lectures**
1	Introduction, and definition of Pharmacognosy Production of crude drug (Collection, drying, stabilization, Storage) Quality of medicinal plants and Factors affecting the Quality	Microscope components and microscopic examination of Starch & Yeast of Beer
2	Bioactive agents from medicinal plants (Definition, classification, medicinal effects and uses).	Barks: Definition, Structure, microscopic characters of barks powder and cross section . Microscopic examination of : Chinese Cinnamon and Ceylon Cinnamon barks

3	Plant families of pharmaceutical importance (definition, taxonomy, medicinal importance) Thallophytes (1): -Medicinal fungi	Barks: diagnostic characters of : Cinchona, Salix and Cascara Bark
4	Thallophytes (2): • Medicinal algae • Medicinal lichens • Medicinal pteridophytes	Roots and rhizomes: (1) Definition of underground organ, Differences between root and stem Microscopic examination of: Licorice root, ginger and orris rhizome
5	Spermatophyte or Phanerogames, Gymnospermis 1. Cycadales (Ginkgo) 2. Coniferales (*pinus maritime, Cypres, juniperus communis, Juniperus oxycedrus*) 3. Gnetales(Ephedra)	Roots and rhizomes: (2) Microscopic examination of: Jalp root, rhubarb rhizome, Valerian and Ipecacuanha Root.
6 (1st test)	Plant parts used for medicinal purposes : Medicinal barks (1): Definition, classification, medical importance. Studying various barks: (Taxonomy, active constituents, medicinal uses).	Roots and rhizomes (3) & bulbs: Microscopic examination: Turmeric roots &rhizome and Squill Bulb
7	Medicinal barks (2): Taxonomy, active constituents, medicinal uses	Leaves or leaflets (1): Definition and anatomy. Microscopic examination of: Stramonium leaf Senna and Tea leaves.
8	Subterranean Organs (1): Definition, classification, medical importance. Studying various roots , rhizomes, corms and tubers: (Taxonomy, active constituents, medicinal uses).	Leaves or leaflets (2): Microscopic examination of: Tobacco and Juglans leaves.
9	Subterranean Organs (2): (Taxonomy, active constituents, medicinal uses).	Leaves or leaflets (3): Microscopic examination of: Boldo, peppermint and Thyme leaves.
10	Medicinal leaves (1): Definition, classification, medical importance. Studying various leaves: (Taxonomy, active constituents, medicinal uses).	Leaves or leaflets (4): Microscopic examination of: Rosemary, Eucalyptus and Olive leaves.
11	Medicinal leaves (2): Studying various leaves: (Taxonomy, active constituents, medicinal uses).	Flowers (1): Inflorescence and Flowers: introduction to Flower anatomy, Microscopic examination of: Cloves, Malva and Chamomile flowers

12 (2nd test)	Medicinal flowers (1): Definition, classification, medical importence Studying various flowers: (Taxonomy, active constituents, medicinal uses).	Flowers(2): Microscopic examination of : Rosa damascene and Lavender
13	Medicinal flowers (2): Taxonomy, active constituents and medicinal use.	Fruits(1): Introduction, Types, anatomy Microscopic examination of : Black pepper, aniseed, and capsicum Fruits
14	Medicinal fruits: Introduction, definitions and classifications of fruits. Studying of various medicinal fruits (Taxonomy, active constituents, medicinal uses)	Fruits (2): Microscopic examination of: Visnaga fruits Fennel fruits
15	Medicinal seeds: Introduction, definitions and classifications of seeds. Studying of various medicinal seeds (Taxonomy, active constituents, medicinal uses)	Seeds Introduction, description, anatomy Microscopic examination of : Mustard Seeds Nux Vomica Seeds

Subject's folder

Subject's number & code PHA203	Subject's lecturer	Requisite PHA106	Reliable subject's units (3)	Subject's name physiological and physiological pathology	Subject's lecturer
Estimation	Week	Estimation	Grades	Week	Estimation
First test/month	12	Second test/month	10	6	First test/month
Every week	Practical		5	-	Researches & Reports

Course Topics

the week	**Theoretical lessons**
the first and the second	the blood
Third and fourth	Heart and circulation
Fifth and sixth	Urinary system
Seventh and Eighth	Breathing and a simple idea about the acid-alkaline balance and the

	role of respirator and breathing in it
IX and X	Digestive system
11th, 13th, and 13th centuries	Nervous system
XIV and XV	Endocrine glands

course vocabulary

the week	Theoretical lessons
the first	The blood: A - blood components B - the origin of blood cells C - Functions of blood cells D - plasma structure and functions
The second	the blood: A - the depth and stages B - some cases of disease (hemophilia - anemia - leukemia) C - immunization
the third	Heart and Circulation: A - Structure and Troy of the heart B - characteristics of the heart muscle C-ECG D - heart rate and changes (slow and sinusoidal) E-Nervous Heart - Cardiac Puffing
the fourth	Heart and Circulation: A - arterial blood pressure and factors affecting it (directly and indirectly) B - high arterial pressure (sections - some of the causes)
Fifth	College A- College structure and functions B-Troyate C- the principle of its work and the rate of glomerular filtration
VI	College D - Blowing the urine E. Urine concentration mechanism And - some cases of disease (Diabetes insipidus) G - Device near the glomerular and its importance

Seventh	respiratory system: A - Structure of the respiratory system and its mechanism

	B - pulmonary volumes C - the hollow space D - pulmonary perfusion and transfer of oxygen and carbon dioxide
VIII	respiratory system: A - mechanism of breathing regulation and some cases (hypoxia) B - the idea of acid balance alkali and the role of kidney and lungs in achieving
IX and X And XI	Nervous system: A. Structure of nerve cells and electrical phenomena B - Central nervous system parts and functions C) The device for peripheral nerves 1. The nervous system of the body s.n.somatique 2. The autonomic nervous system s.n.autonom 3 - the effect of diabetes on the nervous system D - Surface sensations and nervous way E) Upper motor neuron and lower motor neuron (surface and deep reflexes) and neural pathway and-senses
twelveth	Digestive: A - Structure of the digestive system and its parts B - saliva and secretion C - movements of the digestive system D - the stomach and its components E-regulation of the secretion and movement of the stomach (stage stage - the infectious stage - the stage)
Thirteenth	Digestive: Liver and biliary system B-bilorubin and the role of liver in its preparations C - Jaundice - the removal of the biliary sac - ulcers - lactose intolerance D - The intestine and its secret E. Colon And - some digestive system reflexes (vomiting - peritoneal reflex - mucous reflexes) G - digestion and absorption

fourteenth	Endocrine glands: A - Definition and distribution - Definition of the hormone and its classification chemically B) The mechanism of hormonal influence (peptide and steroids) C - pituitary gland and its relationship with hypothalamus (hypothalamus) D - growth hormone (GH) and prolactin and frontal pituitary

	hormones
Fifteenth	Endocrine glands: A- thyroid gland B - glands proximal thyroid C-adrenal gland D - testicles and ovaries E. Langerhans islands and their cells

Subject's folder

Subject's number & code	Subject's name	Reliable subject's units	Requisite	Subject's lecturer
PHA207	**Pharmaceutics 1**	**3(2+2)**	**-**	

Estimation	Week	**Grades**	Estimation	Week	**Grades**
First test/month	6	**10**	Second test/month	12	**10**
Researches & Reports	-	**5**	Practical	Every week	**15**
Total quarterly work	40 grades		Final exam	16	**60 grades**

Course Topics:

Week №	Theoretical lectures	Practical lectures
1	**Introduction of Pharmaceutics**	**Pharmacopeias**
2	**Solid Dosage Forms**	**Powders**
3	**Liquid Dosage Forms**	**Effervescent Powders**
4	**Rotes of Drugs Administration**	**Cachets**
5	**Excipients & Others Pharmaceutical Ingredients**	**Capsules**
6	**Classifications Drugs**	**Solutions**
7	**Dispensing**	**Iodine Solutions**
8	**Prescriptions**	**Many Solutions for external use**
9	**Drugs Dose- Dosage**	**Lotions**
10	**labelling**	**Liniments**
11	Pharmaceutical Operations	**Oral mucosal preparations**
12	Pharmaceutical Operations	**Enemas**
13	**Viscocity Dosage Forms**	**Viscocity products Pastes**
14	**Extraction & Doage Forms**	**Collatoires**
`15	Packaging and storing	**Mucilages**

Analytical Chemistry2
Subject's folder 2nd Semester

Subject's number & code **CHM 204**	Subject's name **Analytical Chemistry2**		Reliable subject's units 3 (2T+3P)	Requisite **CHM 203**	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60

Subject's main contents:

Week №	Theoretical lectures	Practical lectures
1	Introduction in Instrumental Analysis and electromagnetic Spectrum	Identify to laboratory tools in Instrumental analysis
2	Ultraviolet-Visible Spectroscopy	Assay colored compounds using visible-Ultraviolet Spectroscopy
3	Infra Red Spectroscopy	Identifying organic compounds using IR Spectroscopy.
4	Scattering Spectroscopy: Nephelometry, Turbidimetry and Fluorescence Spectrometry	assay of Sulfate ions in drinking water using Turbidimetry
5	Atomic Absorption Spectrum and Atomic Emission Spectrum	Assay sodium Chloride using Flame photometry
6 (1st test)	Spectroscopic Titration	Spectrophotometric titration of potassium permanganate
7	Electrochemical Analysis Methods	titration of bases with acids using pH meter or using Electrical Conductivity
8	Oxidation-Reduction titration using Potentiometer and titration using Electrical Conductivity	Oxidation-Reduction titration using Potentiometer
9	titration of strong and weak bases with acids using pH meter , titration of strong and weak bases with acids using Electrical Conductivity	Applications on liquid –liquid Extraction
10	Oxidation-Reduction titration using Potentiometer	Calculations of liquid –liquid Extraction with tow immiscible solvents, recovery and distribution coefficient
11	Chromatography Analysis methods	Separating mixture of metallic ions using Paper Chromatography
12 (2nd test)	Liquid Chromatography on Column and High Performance Liquid	Separating mixture of Potassium permengnate and Potassium Dichromate

	Chromatography	using liquid Chromatography on column
13	Plane Chromatography	Separating mixture of dyes using Thin Layer Chromatography
14	Gas Chromatography	Electrophoresis Applications on Paper
15	Electrophoresis	Separating two dyes using Electrophoresis

Curriculum Expressions

Week №	Theoretical lectures	Practical lectures
1	Introduction in Instrumental Analysis and electromagnetic Spectrum	Identify to laboratory tools in Instrumental analysis
2	Ultraviolet-Visible Spectroscopy	Assay colored compounds using visible-Ultraviolet Spectroscopy
3	Infra Red Spectroscopy	Identifying organic compounds using IR Spectroscopy.
4	Scattering Spectroscopy: Nephelometry, Turbidimetry and Fluorescence Spectrometry	Assay of Sulfate ions in drinking water using Turbidimetry
5	Atomic Absorption Spectrum and Atomic Emission Spectrum	Assay sodium Chloride using Flame photometry
6 (1^{st} test)	Spectroscopic Titration	Spectrophotometric titration of potassium permanganate
7	Electrochemical Analysis Methods	titration of bases with acids using pH meter or using Electrical Conductivity
8	Oxidation-Reduction titration using Potentiometer and titration using Electrical Conductivity	Oxidation-Reduction titration using Potentiometer
9	titration of strong and weak bases with acids using pH meter , titration of strong and weak bases with acids using Electrical Conductivity	Applications on liquid –liquid Extraction
10	Oxidation-Reduction titration using Potentiometer	Calculations of liquid –liquid Extraction with tow immiscible solvents, recovery and distribution coefficient
11	Chromatography Analysis methods	Separating mixture of metallic ions using Paper Chromatography
12 (2^{nd} test)	Liquid Chromatography on Column and High Performance Liquid Chromatography	Separating mixture of Potassium permengnate and Potassium Dichromate using liquid Chromatography on column
13	Plane Chromatography	Separating mixture of dyes using Thin Layer Chromatography
14	Gas Chromatography	Electrophoresis Applications on Paper
15	Electrophoresis	Separating two dyes using Electrophoresis

Subject's folder 2nd Semester

Subject's number & code **PHA202**	Subject's name **Biochemistry 1**	
Estimation	Week	Grades
First test/month	6	10
Researches & Reports	-	5
Total quarterly work	40 grades	

Reliable subject's units 3 (2*T*+2*P*)	Requisite -	Subject's lecturer
Estimation	Week	Grades
Second test/month	12	10
Practical	Every week	15
Final exam	16	60

Subject's main contents:

Week №	**Theoretical lectures**	**Practical lectures**
1	Water distribution in the body.	Safety procedures in biochemical laboratories. Spectrophotometer. Flame photometer.
2	Regulatory mechanisms of water balance in the body.	Albumin assay in serum.
3	Disturbance of water distribution in the body.	Potassium ions assay in serum.
4	Bioenergetics and the role of Adenosine Triphosphate (ATP).	Blood glucose assay.
5	Macro-mineral elements.	Calcium ions assay in plasma.
6 (1st test)	Trace mineral elements	Zinc assay in serum.
7	Amino acids	Qualitative detection of amino acids.
8	Proteins	Qualitative detection and proteins assay
9	Glycolysis	Qualitative detection of carbohydrates (1)
10	The Krebs' cycle or the citric acid cycle.	Qualitative detection of carbohydrates (2)
11	Synthesis and metabolism of glycogen.	Detection of the components of nucleoproteins
12 (2nd test)	Fatty acids and lipids.	Detection of the triglycerides and cholesterol.
13	Fatty acids metabolism.	Cholesterol assay.
14	Enzymes (1)	Extraction of Urease enzyme.
15	Enzymes (2)	Studying the activity of Urease enzyme.

Subject's folder 2nd Semester

Subject's number & code **CHM 204**	Subject's name **Phytochemistry and Natural Products**		Reliable subject's units 3 (2*T*+2*P*)	Requisite **PHA201**	**Subject's lecturer**
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60

Subject's main contents:

Week №	**Theoretical lectures**	**Practical lectures**
1	Conductive Glycosides: Definition, Classification, Structure & biogenesis. Cardenolide group: Digitalis species	Glycosides: General properties, classification, biogenesis, extraction methods
2	Strophanthus, oleander glycosides, Convallaria, and *Adonis vernalis*. The bufadienolides: Squill, Black hellebore	Definition and detection of Cardioactive Glycosides (Kedde, Baljet, Keller-Kiliani, Rosenheim reactions), Assay of cardiac glycosides
3	Isoprenoids: Classification Iridoids: Gentian, Valerian, Harpagophytum (Devil's Claw)	Flavonoids: Definition, detection: shinoda & pew test.
4	Sesquiterpenes : Lactones: Chicory, *Artemisia* , Orris, *Cocculus indicus*, Feverfew, Arnica	Flavonoids: seperation and detection using TLC
5	Diterpenoids: Ginkgo. Triterpenoids. Glucosinolate compound: Black mustard, *Cochlearia armoracia*	Saponins: Definition, detection, foam test, haemolysis test, colour reaction with aromatic aldehydes
6 (1st test)	Cyanogenetic glycosides: Biogenesis, wild cherry bark, cherry-laurel leaves, bitter almonds	Saponins: Reaction with conc. H_2SO_4 and acetic anhydride, detection by TLC, and assay
7	Alkaloids: Definition, history, distribution, properties, structure & classification , tests for alkaloids, extraction & purification	Alkaloids: Extraction methods, properties, detection and identification.
8	Ornithine- derived alkaloids: Tropane	

	alkaloids of Solanaceae (stramonium, Hyoscyamus, Belladonna), Coca and Tobacco alkaloids.	General reagents of alkaloids, detection of tobacco, cinchona and tea alkaloids
9	Lysine-derived alkaloids: Lobelia, Pomegranate barks, Broom, black pepper, Lycopodium.	Assay of Tobacco, cinchona and ergot alkaloids
10	Phenylalanine-, and Tyrosine- derived alkaloids: Ephedra, Khat, opium poppy, boldo, Hydrastis, Calumba root, Curare.	Isoflavonoids: Definition, detection, TLC of isoflavones
11	Ipecacuanha, Colchicum. Tryptophan-derived alkaloids: Ergot alkaloids, Calabar bean, Nux vomica, Rauwolfia, vinca, Jasmin of carolina	Anthranoids: definition, extraction, chemical tests (borntraeger test), assay of Cascara glycosides
12 (2^{nd} test)	Cinchona bark, Imidazole alkaloids, Purine alkaloids, Hemlock fruit, Areca nuts, aconite root, veratrum alkaloids.	Essential oil: Definition, extraction methods, identification, TLc detection, purity tests
13	Volatile oil : Definition, Biogenesis, identification & assay, Classification	Tests of Heavy metals, halogenated compounds, fixed oils, determination of Acid , saponification, and ester value.

14	Volatile oil in gymnosperms & monocotyledonous plants	Assay of Cinnamic aldehyde And esters in Volatile oils
15	Volatile oils in dicotyledonous plants	Coumarins: Definition, separation by TLC, detection of pungent compound (red pepper), Determination of swelling index of mucilage.

Subject's folder 2nd Semester

Subject's number & code **PHA208**	Subject's name **Pharmaceutics 2**		Reliable subject's units 3 (2*T*+2*P*)	Requisite **PHA207**	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60

Subject's main contents:

Week №	**Theoretical lectures**	**Practical lectures**
1	Syrups	Syrups
2	Suspensions (1)	Preparing syrup containing medicament
3	Suspensions (2)	Preparing syrup containing fairly water soluble medicament
4	Emulsions (1)	Dry syrups
5	Emulsions (2)	Prepared syrups, precipitation rate
6 (1st test)	Emulsions (3)	Elixirs
7	Sterile dosage forms	Emulsions
8	Ophthalmic preparations (1)	Hydrophilic Lipophilic Balance (HLB)
9	Ophthalmic preparations (2)	Preparing emulsion that formalize soap during preparation
10	Parenteral preparations (1)	Glance about creams and ointments
11	Parenteral preparations (2)	Eye drops (1)
12 (2nd test)	Nasal and Otic preparations	Eye drops (2)
13	Aerosols (1)	Nasal drops
14	Aerosols (2)	Ear drops
15	Liposomes	Parenteral preparations

Subject's folder 2nd Semester

Subject's number & code **PHA214**	Subject's name **Pathology**		Reliable subject's units 3 (3*T*)	Requisite **PHA203**	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60

Subject's main contents:

Week №	**Theoretical lectures**
1	Introduction – Circulatory disorders (1)
2	Circulatory disturbance (2)
3	Inflammation
4	Introduction in tumors
5	Introduction in clinical pathology
6 (1st test)	Infection diseases (1) - Introduction - Respiratory tracks infections
7	Infection diseases (2) - Diarrhea resulting from Salmonella, Shigella, Vibrio cholera, E.coli - Food poisoning - Brucellosis and Typhoid fever - Protozoa and worms infections
8	Infection diseases (3) - Skin and mucous membranes infections - Infections transported by insects
9	Infection diseases (4) - Urinary and reproductive infections - Nervous system, eye, ear infections
10	Digestive system diseases (digestive duct) (1)
11	Digestive system diseases (liver, gallbladder) (2) Introduction to heart and vessels diseases
12 (2nd test)	Heart and vessels diseases
13	Blood diseases
14	Respiratory system diseases Kidney and urinary system diseases
15	Endocrine diseases and diabetes Glance about some nervous system diseases

Subject's folder

Subject's number & code PHA 301	**Subject's name Biochemistry 2**		**Reliable subject's units** 4 (2*T*+2*P*)	**Requisite PHA202**	**Subject's lecturer**
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60

Subject's main contents:

Week №	**Theoretical lectures**	**Practical lectures**
1	Energetics of Metabolic Pathways	Introducing used laboratorial instruments in Biochemistry and safety rules and laboratorial safety.
2	Metabolism of Galactose and Fructose	Beer–Lambert Law, Principles of Spectrophotometry
3	Glycogen Storage Diseases	Kits, Micropipettes, Cuvette, Reagent Blank, Standard, Linearity …etc.
4	Fatty Acid and Triacylglycerol Synthesis	Venepuncture
5	Triacylglycerol mobilization and fatty acid oxidation	quantitative assay of Triacylglycerol
6 (1st test)	Cholesterol and Steroid Metabolism	quantitative assay of Cholesterol
7	Plasma Lipoproteins	quantitative assay of HDL,LDL
8	Nitrogen Metabolism	quantitative assay of Urea
9	Catabolic Pathways of Amino Acids	quantitative assay of Total Protein and Albumin.
10	Heme synthesis and metabolism	quantitative assay of Bilirubin
11	Integration Of Metabolism, Hormonal Regulation of Metabolism	Detection of Bilirubin, Urobilinogin in urine
12 (2nd test)	Nucleotide Synthesis And Metabolism, Gout	quantitative assay of Uric Acid
13	Minerals and Electrolytes	quantitative assay of Na, K
14	Water soluble vitamins	quantitative assay of Iron, TIBC
15	Fat soluble vitamins	quantitative assay of Calcium, Phosphorus

Subject's folder 2nd Semester

Subject's number & code **PHA303**	Subject's name **Applied Pharmacognosy**		Reliable subject's units 3 (2*T*+2*P*)	Requisite **PHA204**	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60

Subject's main contents:

Week №	Theoretical lectures	Practical lectures
1	Treatment methods of complementary& alternative medicine [CAM] (Definition , types, theoretical and scientific bases, importance, safety and uses of CAM therapies)	Definition of herb teas and identification of their ingredients using macroscopic and microscopic examination, TLC methods, and microchemistry.
2	Homoepathy (Definition, origins, principles, active ingredients, preparation of Homeopathic products, safety, Prescribing and dispensing of homoeopathic remedies)	Teas used as carminative (anti Flatulence*)* (Peppermint, Anise, Fennel, and Cinnamon bark)
3	Aromatherapy (Definition, origins, principles , application, active ingredients, Quality of essential oils and remedies , Storage and Conservation conditions)	Teas used in peptic ulcers (Chamomile flower, Licorice, English lavender, Lemon balm).
4	Various routes to achieve aromatherapy (definition, Prescribing, advantages**,** disadvantages, principles, uses, safety, side effects and interaction with other medicine)	Teas used in Diarrhea ((Sage, Oak, oak gall , and Yeast of beer)
5	Phytotherapy : origins , Clinical applications of herbal medicine, active constituents in medicinal plants	Teas used in Constipation (Senna, Chinese rhubarb, Flax, Clove, Cascara and Mallow)
6 (1st test)	Preparation of herbal medicines (Production and collecting of medicinal plants, methods	Teas used in motion sickness (Ginger and Datura)

	of extraction, and safety) - Quality control methods for herbal drugs.	
7	Herbal medical preparations (drugs) (Types, Preparations, *advantages*, *disadvantages*, clinical Applications). authorizations for herbal medical drugs in Europe, European Quality Assurance for phytotherapy.	Teas used as liver supportive agent (Dandelion, boldo and turmeric) Teas used in anorexia (Cinchona, Gentian and Bitter orange)
8	Medicinal plants used in the prevention and treatment of diseases and disorders of the Nervous System	Teas used as hypoglycemic agent (Fenugreek, walnut and Olive)
9	Medicinal plants used in prevention and treatment of Cardiovascular Diseases	Teas used in Respiratory system disorders (Ipecac, Thyme, Eucalyptus, Linden and rosa).
10	Medicinal plants used in the prevention and treatment of Respiratory Diseases	Nerve Teas (Valerian and Hops). Stimulant teas (Cola and Cacao)
11	Medicinal plants used in Immunodeficiency Diseases	Teas used in depression conditions: St. John's wort
12 (2nd test)	Medicinal plants used in the prevention and treatment of Rheumatic & Dermatological Diseases.	Teas used in Urinary System diseases (inflammation & incontinence): (Barberry, Juniper, Horsetail and Rosemary)

13	Medicinal plants used in the prevention and treatment of the Urogenital Tract Diseases.	Teas used in Benign Prostatic Hypertrophy: (Pumpkin) - Teas used in mild myocardial circulation efficiency (Khella and Hawthorn)
14	Medicinal plants used in the prevention and treatment of digestive system illnesses.	Teas used in Cerebrovascular disease (Ginkgo, Oats and Soybean)
15	Phytomedicine that support Liver	Teas used in peripheral circulatory disturbances (Horse Chestnut and alfalfa)

Week №	Theoretical lectures	Practical lectures
1	**Pharmacokinetics + Pharmacodynamics**	
2	Drug–Receptor Interactions and Pharmacodynamics	
3	Cholinergic Agonist	
4	Cholinergic Antagonists	
5	Adrenergic Agonists	
6 First test	**الجهاز الودي وحاصراته**	
7	Anxiolytic and Hypnotic Drugs.	
8	Antipsychotic Drugs	
9	**Antidepressant**	
10	Antiepileptec dryer..	
11	Opioids.	
12 Second test	NSD,s drug(	
13	**Gastrointestinal drug**	
14	**Gastrointestinal drug**	

Subject's folder 2nd Semester

Subject's lecturer	**Requisite** PHA20**3**	Reliable subject's units (3)	Subject's name General pharmacology	Subject's number & code PHA307

Grades	Week	Estimation	Grades	Week	Estimation
10	12	Second test/month	10	6	First test/month
15	Every week	Practical	5	-	Researches & Reports
Week	Estimation	Grades	Week		Estimation

Subject's main contents:

'Subject's folder

Subject's number & code **PHA309**	Subject's name Parasitology & Mycology		Subject's units 3 (2T+2P)	Requisite **PHA100**	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	10	Practical	-	10
Total quarterly work	40 grades		Final exam	60 grades	

Main Topics in the Subject:

Week	**Theoretical lessons**	**Practical lessons**
1	Introduction to Medical Parasitology	Explanation about used laboratory apparatus & Safety in the Parasitology & Mycology Lab
2	Intestinal & Urological Protozoa	Entamoeba histolytica (Trophozoite, Cysts) in stool Giardia Lamblia (Trophozoite, Cysts) in stool Trichomonas vaginalis (Trophozoite) in Urine
3	Tissue & Blood Protozoa (1)	Plasmodium Falciparum Blood Smear (Ring stage, Trophozoite stage) Toxoplasma gondii Blood Smear (Tachyzoites) Tissue biopsy (Bradyzoites)
4	Tissue & Blood Protozoa (2)	Leishmania Tropical Skin scraping (Blood smear) amastigote form Trypanosoma Gambiense Blood Smear (Trypomastigote)

5	Medically Important Tapeworms (Cestoda)	Taenia solium, Taenia saginata Stool (eggs, graved proglottids) Echinococcus granulosus (worm, eggs, Hydatid cysts)
6 First test	Medically Important Fluke worms (Trematoda)	Schistosoma (mansoni, haematobium) eggs in stool and urine respectively ,Worm (male, female) Faciola hepatica (eggs, worm)
7	Medically Important Round worms (Nematoda)	Ascaris lambricoid eggs, Ankylostoma duodenale (eggs, worm), Trichinella spiralis (larva cysts in muscles biopsy), Enterobius vermicularis (eggs, worm), Trichuris trichura eggs
8	Medically Important Arthropods (1)	Ixodes Ricinus, Pediculus Humanus, Sarcopts Scabiei, Cimex Lectularius
9	Medically Important Arthropods (2)	Phlebotomus Papatasii, Culex, Anopheles, Xenopsylla Cheopis

10	Introduction to Basic Mycology (1)	General principles for diagnosis of fungal diseases in the laboratory: Sample taking, Direct examination Fungi Staining
11	Introduction to Basic Mycology (2)	Fungi Culturing Disk diffusion for antifungal test
12 Second test	Antifungal Agents	Morphological study of some types of fungi: Rhizopus nigricans Penicillium Aspergillus Malassezia furfur
13	Cutaneous & Subcutaneous Mycosis	Check the skin, hair and nails samples for fungal examination
14	Systemic Mycosis	Candida albicans: Urine, mouth, nail, skin, tissue, culture and Germ tube test
15	Opportunistic Mycosis	Rhizopus (culture), Penicillium (culture), Aspergillus (ear wax, lung biopsy)

Subject's folder

Requisite PHA208	subject's units 3 (3T+2P)	**Biochemistry3**		**PHA310**

Subject's lecturer	**Subject's name Biochemistry 3**	Reliable subject's units 3 (3T+2P)	Requisite **PHA208**	Subject's name Biochemistry 2	Subject's number & code PHA310
Grades	Week	Estimation	Grades	Week	Estimation
10	12	Second test/month	10	6	First test/month
Every week	Practical	5	-		Researches & Reports

Subject's main contents:

Week	Theoretical lessons	Practical lessons
1	Pharmaceutical calculations	
2	Pharmaceutical calculations	
3	Preformulation	
4	Nanotechnology 1	
5	Nanotechnology 2	Preformulation
6 First test	Microemulsions	
7	Microencapsulation	
8	Polymers in drug delivery 1	Nanotechnology
9	Polymers in drug delivery 2	Liposomes
10	Novel dosage forms 1	Microencapsulation
11	Novel dosage forms 2	
12 Second test	Products of biotechnology	
13	Radiopharmaceuticals	
14	Stability studies 1	
15	Stability studies 2	

Subject's folder

Requisite	Subject's units 3 (2T+2P)	**Biostatistics**	**STA201**

Subject's lecturer	**Subject's name** Biostatistics	Reliable subject's units 3 (2T+2P)		Subject's name Biochemistry 2	Subject's number & code
Grades	Week	Estimation	Grades	Week	Estimation
10	12	Second test/month	10	6	First test/month
Every week	Practical	5	-		Researches & Reports

Subject's main contents:

Week	**Theoretical lessons**	**Practical lessons**
1	Basic concepts of Biostatistics	Vital events,and vital vates
2	Vital statistics information processing	Measures of central tendency,measures of dispersion
3	Calculations of statistical functions and formulas	Practical applications on the computer program
4	Basic principles of probability, probability distributions	Binary distribution,poisson distribution,binomial distribution
5	Calculations of statistical functions and formulas	Practical applications on the computer program Excel
6 First test	Definition of the statistical program SPSS	Practical applications use a program SPSS
7	Statistical inference in Biostatistics	The evaluation process of applications using program SPSS
8	Statistical hypothesis for the average community	Hypothesis testing of the difference between Mediterranean combined
9	Statistical hypothesis for the community	Hypothesis testing of the difference between the combined rating
10	Variance analysis in one direcation	Practical applications by using program SPSS
11	Simple linear regression and correclтion	Calculating sample regression equation
12 Second test	Coefficient of determination ,correlation coefficient	Practical application on the computer program MS_Excel
13	Squared distribution and analysis of dvplicates	Computerized flow quality testing
14	Independent test,tests of homogeneity	Practical application on the computer using program SPSS
15		General review

Subject's folder

Subject's number & code **PHA312**	Subject's name **Pharmaceutical Chemistry 1**		Reliable subject's units 3 (2*T*+3*P*)	Requisite **CHM201**	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60

Subject's main contents:

Week №	**Theoretical lectures**	**Practical lectures**
1	General introduction to introduce pharmaceutical chemistry.	General introduction about the importance of pharmaceutical chemistry in pharmaceutical control.
2	Metallic pharmaceutical compounds (first and second main groups of the periodic table)	
3	Metallic pharmaceutical compounds (third and fourth main groups of the periodic table)	
4	Metallic pharmaceutical compounds (fifth and main sixth groups of the periodic table)	
5	Metallic pharmaceutical compounds (sixth and seventh main groups of the periodic table)	
6 (1st test)	Metallic pharmaceutical compounds (secondary groups of the periodic table)	
7	Organic, pharmaceutical compounds (hydrogenated carbons – halogen derivatives of hydrogenated carbons)	
8	Organic, pharmaceutical compounds (alcohol – ethers – aldehydes – ketones)	
9	Organic, pharmaceutical compounds (carboxylic acids)	Detection and assay pharmaceutical compounds which contains alcohol group
10	Amines and Amides	Detection and assay pharmaceutical compounds which contains phenol group

11	Amino acids and sulfonic acids and their derivatives.	Detection and assay pharmaceutical compounds which contains carbonyl group
12 (2nd test)	Diuretics	Detection and assay pharmaceutical compounds which contains carboxyl acid group
13	Diuretics	Detection and assay pharmaceutical compounds which contains amine group
14	Diabetes medicaments.	Detection and assay pharmaceutical compounds which contains
15	Digestive system medicaments.	Detection and assay pharmaceutical compounds which contains

Week №	**Theoretical lectures**	**Practical lectures**
1	General characteristics of germs	Safety rules for bacterial laboratory and identification of laboratory equipment
2	Physiological properties of bacteria	Laboratory methods used to diagnose bacterial diseases
3	Antibacterials and antimicrobial chemotherapy	Gram stain
4	Serological and immunological tests	Spores stain
5	Special microbiology	acid-fast Stains
6 (1st test)	Test + positive and negative Gram-positive Staphylococcus	Test + Interview
7	Positive and Gram negative bacilli	Microbiological media
8	Snails	Steps to prepare agricultural media

9	Acid-resistant bacilli	Methods of bacterial transplantation
10	General characteristics of viruses	Formal properties of bacterial colonies
11	Diagnosis of viral diseases	Serological profiling tests
12 (2^{nd} test)	Test + coated and non-coated viruses that contain DNA	test + interview
13	Viruses containing RNA	Bacterial susceptibility test
14	Liver viruses	Implantation of urine
15	Viruses that cause epidemics in the present	Method of identification of the bacterium that causes meningitis

Subject's folder

Subject's number & code	Subject's name Microbiology		Reliable subject's units	Requisite	Subject's lecturer Mohamed Emad Bled
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60

Main Topics in the subject:

Week №	**Theoretical**	**Practical**
1	-Introduction about solid dosage forms :definition, types, advantages and disadvantages Lozenges	Lozenges
2	Pharmaceutical powders	Preparation of tablets by Direct compression, Hardness, thickness, diameter and friability tests of tablets

3	Definition of tablets, advantages and disadvantages of tablets Excipients of tablets	Preparation of tablets by wet aqueous granulation
4	Preparation of tablets by direct compression	Preparation of tablets by wet non-aqueous granulation
5	Wet granulation	Preparation of effervescent tablets
6 (1st test)	Dry and melt granulation	Preparation of chewable tablets
7	Tablets defects Effervescent, vaginal, chewable, soluble and dispersible tablets	Preparation of vaginal tablets
8	Type of tablets 2	Preparation of tablets by dry granulation

9	Tests of tablets	Extended release tablets
10	Introduction of tablet coating Sugar coating	Dispersible tablets
11	Film coating- enteric coating- colon targeting	Preparation of tablets loaded by oily drugs or botanic extracts
12 (2nd test)	Extended release tablets	Dissolution test of immediate and extended release tablets
13	Packaging of tablets Stability studies of tablets	Tablets coating
14	Hard gelatin capsules	Disintegration tests of uncoated and enteric coated tablets
15	Soft gelatin capsules	Effect of type and quantity of disintegrant on the hardness and disintegration time of tablets

Subject's folder

Subject's number & code **PHA401**	Subject's name Hematology & Immunology		subject's units 3 (2T+2P)	Requisite **PHA301**	Subject's lecturer **Dr. Abdulkarim Radwan**
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	10	Practical	-	10
Total quarterly work	40 grades		Final exam	60 grades	

Main Topics in the subject:

Week	Theoretical lessons	Practical lessons
1	Introduction to Hematology	Explanation about used laboratory apparatus & Safety in the Hematology Laboratory
2	Diagnostic assays to hematological disorders	Taking Blood Samples & used apparatus
3	Deficiency Anemia Iron deficiency anemia Megaloblastic anemia	Hemoglobin and Hematocrit Assay
4	Hemolytic Anemia	Erythrocytes Sedimentation Rate (E.S.R)
5	Leukocytes Disorders	Leukocyte Count
6 First test	Acute Leukemia	Erythrocyte Count
7	Chronic Leukemia	Thrombocyte Count
8	Hemostasis Disorders	Peripheral blood smear & recognition normal blood cells
9	Cellular antigens & blood transfusion	Studying blood smears for many blood disorders (1)
10	Introduction to Immunology	Studying blood smears for many blood disorders (2)
11	Humoral & Cellular Immunity	Reticulocyte Count
12 Second test	Antibody & Complement system	Blood typing, Cross matching tests
13	Hypersensitivity	Clotting time test & Bleeding time PT, PTTK

14	Immunophenotyping for hematological malignancies	FCS Express software for Flow cytometry analysis
15	Serological tests	Widal test, write test

Subject's folder

Public Health and Environment Pollution

Grades	Week	Estimation
15	3	Monthly exam first
15	6	Second monthly exam
10	-	Quarterly quest
40		Total quarterly business
60	15	Final exam

Crouse Objectives :

Theoretical lessons	Lecture
Introduction Public Health	1
Epidemiological	2
Environment and Patterns of Environmental pollution	3
Water Pollution	4
Air health, Air pollution	5
Soil Pollution	6 First test
Lifestyle	7
Smoking and Drug addiction	8
Occupation Diseases	9
Professional poisoning	10
Professional Cancers	11
Family Planning	12 Second test
Radioactive Pollution	13
Noise, thermal Pollution	14
Disposal of solid and liquid wastes	15

Subject's folder

Subject's number & code PHA411	**Subject's name Applied & Forensic Toxicology**		**Reliable subject's units 3 (2T+3P)**	**Requisite PHA315**	**Subject's lecturer**
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	14	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60 grades

Subject's main contents:

Week №	**Theoretical lectures**	**Practical lectures**
1	Introduction in Toxicology	Gas Toxicants Carbon Monoxide
2	Taxonomy of Toxicants & Poisoning resources	Volatile Toxicants Hydrogen Cyanide -Chloroform
3	Absorption, Distribution & Effects of the Toxicants in human body	Volatile Toxicants Ethyl Alcohol -Methanol
4	Metabolism & Conjugation Biotransformation of Toxicants	Water vapor drifted toxicants Phenol -Nitrobenzene -Aniline.
5	Excretion of Toxicants & Management of Toxicity	Metal toxicants Arsenic -Antimony -Mercury
6	Gas Toxicants	Metal toxicants Lead -Bismuth -Chromium -Barium
7	Volatile Toxicants	Metal toxicants Cadmium -Copper -Iron -Zinc
8	Volatile Toxicants	Organic constant toxicants Non – Alkaloids & Alkaloids: Extraction Non – Alkaloids: Barbiturates -Salicylate-Paracetamol -Phenothiazine

9	Water vapor drifted toxicants	Non – Alkaloid Organic constant toxicants: Dibenz - azepines -Benzodiazepines - Carbamates -Antipyrine
10	Metal toxicants	Alkaloid Organic constant toxicants: Morphine -Codine-Heroine-Cocaine
11	Metal toxicants	Alkaloid Organic constant toxicants: Strychnine -Colchicine -Atropine-Cinien
12	Non – Alkaloids	Direct detection of some pharmaceutical toxicants in Urine: Salicylate - Phenothiazine -Imipramine – Paracetamol
13	Alkaloids	Met hemoglobin Assay in Blood
14	Alkaloids	Detection of Salicylate in Blood
15	Alkaloids	Serum Paracetamol Assay

Subject's folder

Subject's number & code	**Subject's name**	**Reliable subject's units**	**Requisite**	**Subject's lecturer**
PHA410	Pharmaceutical chemistry 2	**3 (2T+3P)**	**PHA312**	

Estimation	Week	**Grades**	Estimation	Week	**Grades**
First test/month	6	**10**	Second test/month	11	**10**
Researches & Reports	-	**5**	Practical	Every week	**15**
Total quarterly work	40 grades		Final exam	16	**60 grades**

Subject's main contents:

Week №	**Theoretical lectures**	**Practical lectures**
1	Non-Steroidal Anti Inflammatory Drugs Salicylates group	Salicylic acid
2	Non-Steroidal Anti Inflammatory Drugs Aryl Acidic acid group COX-1 inhibitors	Aspirin
3	Non-Steroidal Anti Inflammatory Drugs Aryl Acidic acid group COX-1 & COX-2 inhibitors	Ketoprofen

4	Analgesics & Antipyretic Acetanilide & Ant pyrin group	Paracetamol
5	Amines Anti-Histamines & Anti congestions	Indomethacin or Pseudo Ephedrine derivatives
6	البوليدات المفتوحة Local anesthetics & opened Bolides	Lidocaine
7	Antibiotics – Beta-lactam group – Penicillin	Sodium Ampicillin or Amoxicillin
8	Antibiotics – Beta-lactam group – Cephalosporin	Cephalosporin group – Cefadroxil
9	Other Antibiotics – Chloramphenicol – Tetracycline & Aminoglycoside	Chloramphenicol + Oxitetracycline hydrochloride
10	Disinfectants – Antifungals - Malaria medicaments – Anti parasite	Metronidazole
11	Anti-microbial Sulfamides - Hypoglycemic drugs	Sulfamethoxazole – Trimethoprim
12	Central Analgesics – Morphine & it's derivatives	Caffeine stearate
13	Vitamins	Vitamin B1 Vitamin B6 (Thiamine hydrochloride)
14	Anti-Cancer medicaments	Vitamin B12 – Folic acid – Vitamin C
15	Hormones	Dexamethasone
16	Final exam	Final exam

Subject's folder

Subject's number & code	Subject's name	Reliable subject's units	Requisite	Subject's lecturer
PHA411	**Systematic Pharmacology 2**	**3 (3 T + 3 P)**	**PHA315**	

Estimation	Week	**Grades**	Estimation	Week	**Grades**
First test/month	6	**10**	Second test/month	12	**10**
Researches & Reports	-	**5**	Practical	Every week	**5**
Total quarterly work	40 grades		Final exam	16	**60 grades**

Subject's main contents:

Week №	**Theoretical lectures**	**Practical lectures**
1	Antibiotics 1	Applying some tonic drugs on frog's heart muscle
2	Antibiotics 2	Studying the curve dosage – response to tonic drugs of frog's heart
3	Antifungal drugs	Applying some inhibitory drugs on frog's heart muscle
4	Antiprotozoal drugs	Studying the curve dosage – response to inhibitory drugs of frog's heart
5	Anti-parasitic Drugs	Applying blockers on frog's heart muscle and analyze the results
6	Antiviral drugs	Applying agonists on frog's heart muscle and analyze the results
7	Anti-tubercular drugs	General anesthetics
8	Anti- arthritis drugs	Local anesthetics
9	Anti-gout drugs	Studying the effect of some tonic drugs on isolated rabbit intestine
10	Inflammatory mediums and Anti-Inflammatory	Studying the effect of some inhibitory drugs on isolated rabbit intestine
11	Skin Disorders 1	Isolated rabbit intestine Blockers and agonists
12	Skin Disorders 2	Discussion groups: Therapy of pharmaceutical poisoning
13	Otic and Ophthalmic Preparations	Measurement methods of pharmaceutical effect.
14	Drug usage Side Effects	Analyzing the results of studying Blockers and agonists drugs on isolated rabbit intestine
15	Specific subjects in the field of Pharmacology	General review

Subject's folder

Teachers of the curriculum	**the requirement**	**Accredited units of the curriculum 3 (2T+1P)**	**Name of the Curriculum** Pharmaceutical Technology II		**Number and code of the curriculum** PHA413
Mark	**Week**	**Celender**	**Mark**	**Week**	**Celender**
10	12	**Second monthly test**	10	6	**First monthly test**
15	weekly	**practical**	5	-	**Researches and reports**
60 marks	16	**Final test**	40 marks		**Semester total works**

The main subjects of the curriculum :

week	Teoretical lessons	Practical lessons or exercises
1	Introduction about the pharmaceutical forms in general and about the curriculum vocabulary - What is the medicine? - What is the excipient ? - What is the pharmaceutical form ? - how to choose the pharmaceutical form - Methods of drug insertion .	Making a gel for hair (cosmetic preparation) .
2	Skin structure - Skin function- Transdermal absorption -Disadvantages of transdermal absorption - Advantages of the transdermal absorption	Making a gel for hair contains vit B5 (Medical cosmetic preparation) .
3	Pharmaceutical forms applied on skin - Lipophilic ointments applied on skin . Hydrophilic ointments applied on skin . : Defention - feutures - How to prepare - Tests applied on it .	Making a normal shampoo.
4	Emulsions type O/W & W/O : Defention - features - How to prepare - tests applied on it - Wet granulation .	Making a shampoo for children .
5	Creams type O/W : Defention - features - How to prepare .	Making a hydrophilic cream contains titanium oxide
6 (1^{st} test)	First test	Making a lipophilic ointment contains titanium oxide

7	Creams type W/O : Defention - features - How to prepare ..	Making an emulsion type O/W
8	Liquid solutions and foamed solutions .. powders and pastes applied on skin : Defention - features - how to prepare - Tests applied on it .	Making an emulsion type W/O
9	The modern forms applied on skin .... patches - subdermal planting tablets - transdermal insulin devices.	Making a dermal cream type O/w
10	Release studies and the solubility of dermal preparations - classic ways - Using the artificial tissues	Making a vaginal lotion contains povidone
11	Rectal and vaginal drugs giving: Advantages & disadvantages	Making a gargles contains chlorhexidine
12 (2^{nd} test)	Second test	Making suppositories for adults contains sodium diclofenac. Making suppositories for children contains paracetamol.
13	Suppositiries as pharmaceutical form : Defention – features – Tests -Wet granulation- How to prepare .	Making vaginal eggs contains metronidazole
14	Eggs as pharmaceutical form : Defention – features – Tests -Wet granulation- How to prepare.	Making vaginal eggs contains econazole
15	Stability tests on the semi-solid Pharmaceutical forms.	Making an extended release vaginal eggs.

Subject's folder

Subject's number & code	**Subject's name**	**Reliable subject's units**	**Requisite**	**Subject's lecturer**
PHA209	Industrial Pharmacy and good manufacturing practices	**3(2+1)**	**-**	

Estimation	Week	**Grades**	Estimation	Week	**Grades**
First test/month	6	**10**	Second test/month	12	**10**
Researches & Reports	-	**5**	Practical	Every week	**15**
Total quarterly work	40 grades		Final exam	16	**60 grades**

The main topics:

Week №	**Theoretical lectures**	**Practical lectures**
1	Introduction to industrial Pharmacy: definition of pharmacy-pharmaceutical industrial sections and areas of application in pharmaceutical plants	Communiqué the Syrian Ministry of health registration
2	Good Manufacturing Practice1	International cultivar registration binders CTD
3	Good Manufacturing Practice2	Pre formolation
4	Design of pharmaceutical laboratories and how to distribute production areas and their respective features: movement of material and human elements.	Assessment of manufacturing processes
5	International of Organizition for Standardization1	Validation
6	International of Organizition for Standardization1	Stability studies
7	Drying technology	Nasal Pharmaceutical Products
8	Freeze drying1	The inhalation Pharmaceutical Products
9	Freeze drying 2	Inhilation Pharmaceutical Products
10	Heat transfer and the properties and use of steam	Injectable Pharmaceutical Products
11	Pharmaceutical production lines 1	Biotechnology Pharmaceutical products

12	Pharmaceutical production lines 2	Sugar Coated
13	Aerosol	Film Coated
14	Stability studies	Cosmetics 1
15	Process validation	Cosmetics 2

Subject's folder

Subject's number & code	**Subject's name**	**Reliable subject's units**	**Requisite**	**Subject's lecturer**
PHA209	**Pharmacy practice 1**	**1**	**-**	

Estimation	Week	**Grades**	Estimation	Week	**Grades**
First test/month	6	**10**	Second test/month	12	**10**
Researches & Reports	-	**5**	Practical	Every week	**15**
Total quarterly work	40 grades		Final exam	16	**60 grades**

Subject's main contents:

Week №	Theoretical lectures
1	**General introduction to the pharmacy profession**
2	**The role of the pharmacist in the pharmaceutical industry**
3	**The role of the pharmacist in the pharmacy of the hospital**
4	**The role of the pharmacist in the control and use of the medicine**
5	**Rationalization of controlling medication use**
6	**The role of the pharmacist in the rationalization of controlling medication use**
7	**The role of the pharmacist in the community pharmacy**
8	**Skills that pharmacist have in the community pharmacy**
9	**Community pharmacy skills (1)**
10	**Community pharmacy skills (2)**
11	**Pharmaceutical Care (1)**
12	**Pharmaceutical Care (2)**
13	**Pharmaceutical Care (3)**
14	**Compliance (Adherence)**
15	**Continuing professional development**

Subject's folder

Subject's number & code PHA416	Subject's name **Clinical Biochemistry**		Reliable subject's units 3 (2T+2P)	Requisite PHA301	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	11	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60 grades

Subject's main contents:

Week №	Theoretical lectures	Practical lectures
1	Pathological chemistry of Carbohydrate Metabolism	Serum Glucose Assay
2	Pathological chemistry of Protein Metabolism	Total Protein Assay Serum Albumin Assay
3	Blood	Measuring the concentration of Blood Hemoglobin
4	Tumor markers	Amylase & Lipase Assay
5	Pathological chemistry of Enzymes & its clinical significations	Troponin I & Lactate Dehydrogenase LDH Assay
6	Liver functions	Serum Glutamate Oxaloacetate Transaminase (SGOT) Assay Serum Glutamate Pyruvate Transaminase (SGPT) Assay
7	Pathological chemistry of Nitrogen – Containing Compounds	Alkaline Phosphatase Assay Total Bilirubin (direct & indirect Bilirubin) Assay
8	Pathological chemistry of Lipids Disorders of lipid metabolism	Serum Urea Assay Creatinine Assay Serum Uric Acid Assay
9	Pathological chemistry of Metals Metabolism	Serum Total Cholesterol Assay Triglycerides Assay

10	Metals poisoning	HDL & LDL Assay
11	Pathological chemistry of Water & Minerals Metabolism	Serum Bicarbonate Assay Serum Acid Phosphatase Assay
12	Acid – Base Balance	Serum Calcium & phosphorous Assay
13	Pathological chemistry of Endocrine glands & its Hormones	Serum Iron Assay Total Iron Binding Capacity
14	Vitamins	Sodium, Potassium, Chlorine Assay
15	Urine Biochemistry	Urine Biochemistry

Subject's folder

Subject's number & **PHA418**	Subject's name **History of Pharmacy, Ethics & Legislation**		Reliable subject's units **3T**	Requisite -----	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	15	Second test/month	12	15
Researches & Reports	-	7	Attendance & participation		3
Total quarterly work	40 grades		Final exam		60 grades

Subject's main contents:

Week №	Theoretical lectures
1	The manner of pharmaceutical medical industry appearance & its first occurrence Medicine in Arabs pre-Islamic times.
2	Medicine & Pharmacy in Mesopotamia. Medicine in the heart of Islam & prophetic medicine
3	Medicine & Pharmacy in ancient Egyptians Translation & transportation century
4	Medicine & Pharmacy in ancient Chinese Arabic Medicine principles
5	Medicine & Pharmacy in ancient Indians Arabic Pharmacy principles

6	Medicine & Pharmacy in Al-Fares countries Scientists in the second and third centuries.
7	Medicine & Pharmacy in ancient Greek (1) Scientists in the fourth and fifth centuries.
8	Medicine & Pharmacy in ancient Greek (2) Scientists in the next centuries.
9	Medicine & Pharmacy in Roman times Medicine & Pharmacy in the Byzantine Empire The movement of medical sciences to Europe
10	Medicine & Pharmacy in Maghreb & Andalusia History of translation into Arabic medical education in Arabic countries.
11	Medicine & Pharmacy in Maghreb & Andalusia Controlling human drugs & medical chemicals commerce

12	Golden age for Arabic Medicine (1) (Encyclopedias, Calculation system) Pharmaceutical specific statutes (1)
13	Golden age for Arabic Medicine (2) (Hospitals) Pharmaceutical specific statutes (2)
14	Etiquette & Ethics of Pharmacy Ethics of Pharmacy & Old medicine
15	Pharmacy – types of Pharmacies Modern international Etiquettes for pharmacy career

Subject's folder

Subject's number & code **PHA422**	Subject's name **Applied & Forensic Toxicology**		Reliable subject's units 3 (2*T*+2*P*)	Requisite **PHA407**	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	11	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60 grades

Subject's main contents:

Week №	Theoretical lectures	Practical lectures
1	**General introduction – Pesticides (1)**	**General glance about Applied & Forensic Toxicology فحص اللطاخات الدموية**
2	**Pesticides (2)**	**chlorine كشف ومعايرة المحلات الكلورية**
3	**Pesticides (3)**	**Serum Iron assay**
4	**Pesticides (4)**	**Serum copper assay**
5	**House toxicants (1)**	**Theosianate assay & detection**
6	**House toxicants (2)**	**Urine Phenothiazine detection by TLC (Thin Layer Chromatography)**
7	**Formalin & War toxicants**	**Urine Benzodiazepines detection by TLC (Thin Layer Chromatography)**
8	**War toxicants & phosphor**	**Urine Barbiturate detection by TLC (Thin Layer Chromatography)**
9	**Nitrogenized gases & introduction about Forensic toxicants**	**Serum Zinc assay**
10	**Forensic toxicants**	**Passive ions detention (1) Chlor الهيبوكلوريت- اليودات- اليود واليوديد -**
11	**Analytical samples**	**Passive ions detention (2) Nitrate – nitrite – sulfur – acids – hyperacid**
12	**Samples detection**	**Herbicides detection**
13	**Detection**	**Insecticides & Rodenticides detection**
14	**Anatomy information of some toxicants**	**Measurement choline esterase activity**
15	**Alkaloids**	**Serum Barbiturate assay**

Course Profile

Course Number and code : PHA 100	Course name Drug Synthesis	Course units approved 3(2 T + 1 P)	Course Teacher Dr. Abdullah Kattah

Calendar	Week	Mark	Calendar	Week	Mark
First monthly exam.	**6**	**10**	**Second monthly exam.**	**12**	**10**
Practical reports	**Weekly**	**10**	**Practical quizzes**	**Weekly**	**10**
Total seasonal works	**16**	**40**	**Final exam.**	**16**	**60**

Subject's main contents:

Theoretical Section The number of credit hours (weekly 2-hour) The number of actual hours (weekly 2-hours)	**Practice Section** The number of credit hours (weekly 1-hour) The number of actual hours (weekly 2-hours)
1- The most organic reactions used in the drug synthesis. - Construction of molecule carbon skeleton. - Introducing and eliminating of functional group. - Forming of carbon - oxygen and carbon - nitrogen bond. - Synthesis of sulphar and phosphor compounds. 2- Spectroscopy : (UV/VIS, IR, NMR, MS) 3- Drug based on a substituted benzene ring. - Antimalaria drugs, Halodiphenol derivatives, Benzimidazole derivatives. 4- Drug based on five - membered hetrocycles. - Furan, pyrol, oxazole, isoxzazole, and imidazole derivatives 5- Steroides -Raw materials of steroids. - Istranates, guanates, and endrostanates. 6- Antibiotics - Classification of antibiotics, beta-lactam group (penicillins, and cephalosporins). 7- Oral hypoglycemic drugs	1- The first experiment : Paracetamol preparation 2-The second experiment : Methyl Salycilate preparation 3-The third experiment ;Benzoin preparation 4-The fourth experiment : Benzyl preparation 5-The fifth experiment ; Benzilizc acid preparation 6-The sixth experiment : phenytoin preparation 7- The seventh experiment : Acetanilide preparation 8- The eighth experiment : N-acetylsulphanilyl chloride preparation 9- The ninth experiment : Sulphanyl amide preparation

Drug quality control

Subject's number & **PHA500**	Subject's name **Drug quality control**		Reliable subject's units **3T**	Requisite **PHA410**	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	15	Second test/month	12	15
Researches & Reports	-	10	Practical	-	-
Total quarterly work	40 grades		Final exam	16	60 grades

Subject's main contents:

Week №	**Theoretical lectures**	**Practical lectures.**
1	Trials of newly developed drugs and registration	Application of good laboratory practices
2	Quality assurance in pharmaceutical association	Analytical procedure
3	Good practices (technology-laboratory-distribution)	Pharmaceutical tests of raw materials and pharmaceutical forms
4	Control of essential variables of quality (raw materials-in process control –semi product-final product)	Application of chemical tests of drugs
5	Control of labeling, filling ,packaging materials	Purity test and impurities detection
6 (1^{st} test)	Analytical procedure (sampling-preparation-examination-analyzing results)	Volumelic and massive assays
7	Validation of new analytical procedure	Physical test of drug forms
8	Technological quality control of pharmaceutical forms	Glass and plastic bottles tests
9	Microbiological and bioassays of pharmaceutical forms	Microbial limit tests of drug forms
10	Stability studies for pharmaceutical forms	Stenility test and bioassays
11	Detection of impurities and degradation compounds in drugs	Validation of analytical method

12 (2nd test)	Determination of degradation constant and shelf life	Tests of herbal drugs
13	Drugs forms quality control (tablet-suspension-solution)	Counterfeit drugs detection
14	Herbal drugs quality control	Stability studies of drugs
15	Counterfeit drugs	Dissolution test and drug release test

Subject's folder

Subject's number & **PHA505**	Subject's name **Nutrition & Dietary**		Reliable subject's units **3T**	Requisite **PHA202**	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	15	Second test/month	12	15
Researches & Reports	-	10	Practical	-	-
Total quarterly work	40 grades		Final exam	16	60 grades

Subject's main contents:

Week №	Theoretical lectures
1	Nutrition Bases and principles of nutrition & diseases related to nutrition
2	Pregnant nutrition
3	Infant, Child, Teenager and Aged people nutrition
4	Athletes nutrition
5	Parenteral & tubular nutrition
6	Food secure until the late twentieth century
7	Therapeutic diets Therapeutic diet for obesity in adults
8	Therapeutic diet for heart & blood vessels diseases
9	Diet for Iron deficiency Anemia
10	Diet for diabetes
11	Diet for liver disorders
12	Diet of system disorders

13	Diet for kidney disorders
14	Diet for Cancer (colon & breast)
15	Food Sensitivity

Subject's folder

Subject's number & code	**Subject's name Biopharmaceutics and pharmacokinetics**		**Reliable subject's units 3 (2T+3P)**	**Requisite Ph411**	**Subject's lecturer**
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	14	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40grades		Final exam	16	60 grades

Subject's main contents:

Week №	**Theoretical lectures**	**Practical lectures**
1	**Biopharmaceutics &Pharmacokinetics** General introduction to kinetics - basic definitions	**dissolution of paracetamol tablet**
2	**Kind of Pharmacokinetics model** **Linear model** **Nonlinear model**	**Dissolution assay for piroxicam capsules**
3	**One-compartment model** **Calculating kinetic coefficients** **Kinetic issues**	**Dissolution assay for delayed-release pharmaceutical forms**
4	**Continuous Intravenous Infusion** **Calculating kinetic coefficients** **Kinetic problems**	**Plotting of the dissolution curve of losartan potassium tablets**
5	**Pharmacokinetics of Orally Administered Drugs** **Calculating kinetic coefficients** **Kinetic problems**	**Bioequivalence**
6	**Pharmacokinetics of Orally Administered Drugs** **Calculating kinetic coefficients** **Kinetic problems**	**solved problems in kinetics**

7	**Drug Distribution** The binding of the drug to plasma proteins The effect of binding to plasma proteins and its changes in the applied therapeutic.	
8	**Drug Excretion** - Elimination methods Kinetics of drug removal from the body	**Pharmacokinetic models in the body**
9	**Bioavailability** - types of bioavailability Methods for evaluating the bioavailability of drugs	**Pharmacokinetics for intravenous administration**
10	**Parenteral Delivery** Methods of applying parenteral preparations - Moves the injection route.	**Pharmacokinetics in the case of continuous intravenous infusion**
11	**Rectal Delivery** -Uses of the rectal administration The appropriate pharmaceutical forms for vaginal administration	**Pharmacokinetics in the case of oral administration**
12	**Ophthalmic Drug Delivery** - Effect of lacrimal fluid on the bioavailability of ophthalmic drugs Factors affecting the bioavailability of eye drops	**Pharmacokinetics if the drug is given in multipiled doses**
13	**Pulmonary-nasal drug delivery** Absorption of drugs via the pulmonary route Delivery of medicines through the nose	**solved problems in kinetics**
14	**Reveiw** **solved problems in kinetics**	**solved problems in kinetics**
15	**Pharmacokinetics and pharmacodynamics of biotechnology drugs**	**describe the pharmacokinetics and pharmacodynamics of biotechnology drugs, including proteins and peptides.**

Subject's folder

Subject's number & code	**Subject's name Pharmacy Practices (2)**		**Reliable subject's units 3 (2T+3P)**	**Requisite**	**Subject's lecturer**
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	14	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60 grades

Subject's main contents:

Week №	**Theoretical lectures**	**Practical lectures**
1	Some oral diseases	How to communicate with the patient
2	Pediatric	The role of pharmacist in the treatment of some bone diseases
3	Respiratory diseases	Read recipes
4	The role of pharmacist in the treatment of some eye diseases	Read recipes
5	The role of pharmacist in the treatment of some ears diseases	Feeding Childrean
6	Nausea and Vomiting	The role of pharmacist in the treatment of some eye diseases (1)
7	Headaches	The role of pharmacist in the treatment of some eye diseases (2)
8	Scientific research in pharmaceutical practices	The role of pharmacist in the treatment of some respiratory diseases (1)
9	The role of the pharmacist in the management of diabetes	The role of pharmacist in the treatment of some respiratory diseases (2)
10	The role of the pharmacist in the management of hypertension	The role of pharmacist in the treatment of some Gastrointestinal diseases (1)

11	The role of the pharmacist in the management of high fat and cholesterol	The role of pharmacist in the treatment of some Gastrointestinal diseases (2)
12	Non-steroidal anti-inflammatory drugs	The role of pharmacist in the treatment of some ears diseases
13	Introduction to Antibiotics	Read recipes
14	Penicillin and cephalosporin	The role of pharmacist in the treatment of some Urology (1)
15	Aminoglycosides and quinolones	The role of pharmacist in the treatment of some Urology (2)

Subject's folder

Subject's number & code **BUS513**	Subject's name **Economics & Pharmacy management**		Reliable subject's units **1T**	Requisite -----	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	15	Second test/month	12	15
Researches & Reports	Every week	5	Researches & Reports	Every week	5
Total quarterly work	40 grades		Final exam	16	60 grades

Subject's main contents:

Week №	Theoretical lectures
1	Elementary principles of pharmacy management.
2	Pharmaceutical economic planning
3	Pharmaceutical organization
4	Pharmaceutical multimedia
5	Technical & marketing activities in Pharmacies
6	Rules & Laws that controls discharging medical prescription. (first Test)
7	Pharmaceutical products
8	Medicinal storing
9	Pharmaceutical, finance accounting
10	Equipment used in daily accounting and their methods.
11	Computational operation related to the finance activity of the Pharmacy
12	Computational operation related to the finance activity between the Pharmacy and the Medicaments Storehouse.
13	Review (Inventory)
14	Final Calculations
15	General Budget (annual)

Subject's folder

Subject's main contents:

Week №	Theoretical lectures	Practical lectures.
1	Introduction to structure and properties of nucleic acids.	Isolation of bacterial DNA.

Subject's number & code **00000**	Subject's name **Biotechnology**		Reliable subject's units	Requisite **PHA105**	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60

2	Isolation and analysis of nucleic acids.	Quantitative and qualitative analysis of isolated DNA.
3	Structure and properties of Proteins.	Protein extraction.
4	Isolation and analysis of proteins.	Protein electrophoresis
5	Applications of Bioinformatics (1)	Using the international DNA and protein data banks
6 (1st test)	Applications of bioinformatics (2)	Using of bio softwares available on the internet.
7	PCR technique (types and applications).	PCR procedure (+ PBL).
8	Generation and multiplication of recombinant DNA.	DNA cutting by using the restriction enzymes and agarose gel electrophoresis.
9	Production of therapeutic proteins by means of recombination.	Preparation of transformed cells.

10	Molecular diagnosis	Testing and controlling of transformed cells
11	Gene therapy of diseases	Detection of specific gene within the cell (+ PBL).

12 (2nd test)	Fermentation and production of pharmaceutical compounds by means of microorganisms.	Assembling of small fermenter (+ PBL).
13	Generating of genetically modified organisms.	Genetically modified of beer yeast.
14	Pharmaceutical bionanotechnology	Production of nano wires
15	Stem cells	Isolation and storage of stem cells.

Food Chemistry and its Quality Control

Score	Week	Calendar	Score	Week	Calendar
10	**12**	**Second Test**	**10**	**6**	**First Test**
15	**weekly**	Practical Section	**5**	**-**	Research and reports
60	**16**	**Final Test**	**40**		Semester SUM

Course Topics:

Week	**Theoretical** subject	Practical subject
1st	**Introduction to the importance of food and food chemistry. Water in food**	Calibration of moisture and ash in foodstuffs
2nd	**Mineral elements & Vitamins**	Calibration vitamin C in foods
3rd	**Proteins**	Calibration of proteins and gluten
4th	**Carbohydrates**	Calibration of sugars in food
5th	**Fats**	Calibration of Fats in food
6th	**Enzymes & Antioxidant**	Fat's **quality tests 1(Iodine value)**
7th	**Food additive (Preservatives, colorants, sweeteners, textures, flavorings..)**	Fat's **quality tests 2(saponification value)**
8th	Auxiliary materials used in food technology	Fat's **quality tests 3 (peroxide value)**
9th	**Enzyme efficacy & Non-enzymatic browning**	Detection and calibration of preservatives and antioxidants.
10th	**Food Poisoning**	Calibration of nitrite and nitrates in food
11th	Food - Drug Interactions	Determination of acidity in juices and vinegar
12th	**Food Preservation (Principles & Methods)**	Quality tests of canned food
13th	**Milk and its products**	Quality tests of milk and its derivatives
14th	Plant – origin Food	Calibration of caffeine in tea and coffee
15th	**Animal- origin Food**	Quality tests of Honey

Subject's folder

Subject's number & code 000000	Subject's name Phytochemistry and Natural Products		Reliable subject's units	Requisite PHA201	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	10	Second test/month	12	10
Researches & Reports	-	5	Practical	Every week	15
Total quarterly work	40 grades		Final exam	16	60

Subject's main contents:

Week №	**Theoretical lectures**	**Practical lectures**
1	General introduction, structure and morphology of microorganisms	Training on culturing and calculations of dilutions
2	Growth and reproduction of microorganisms	Total Counting of microorganisms
3	Handling and storage of microorganisms	Spreading and pour plate techniques
4	Counting of microorganisms	Counting of microorganisms by using filtration
5	Microbiological quality control of pharmaceutical preparations	Microbiological quality control of air and environment
6 (1st test)	Ophthalmic and skin preparations and non-injectable sterile fluids	Sedimentation technique
7	Microbial contamination of pharmaceutical preparations	Microbiological quality control of surfaces
8	Types of pyrogens	Contact plate and sterile swapping techniques
9	Detection of pyrogens	Microbiological quality control of water
10	Application of microorganisms in the pharmaceutical sciences	Assessment of the disinfectants activity
11	Production of antibiotics using microbial culturs	Phenol coefficient
12 (2nd test)	Bioassays by using microorganisms	Assessment of the preservation systems
13	Microbial properties of Pharmaceutical preparations according to pharmacopeias	Detection of *E. coli* and *Pseudomonas* in the pharmaceutical preparations
14	Introduction to Sterilization, Heat sterilization	Validation of sterilizing
15	Sterilization techniques using radiation	UV sterilization

Subject's folder

Subject's number & code **BUS515**	Subject's name **First aid**		Reliable subject's units	Requisite -----	Subject's lecturer
Estimation	Week	Grades	Estimation	Week	Grades
First test/month	6	15	Second test/month	12	15
Researches & Reports	Every week	5	Researches & Reports	Every week	5
Total quarterly work	40 grades		Final exam	16	60 grades

Subject's main contents:

Week №	Theoretical lectures
1	Basics of emergencies, airway
2	Diabetes emergencies ,shock, urticarial,syncope,coma
3	Burns,burns cauased by electric current
4	Poisoning
5	Foreign bodies in the digestive system and the other systems
6	Heat shock ,sun shock,fever , convulsions in children
7	Epilepsy and hysteria
8	Rabies , snake bite ,scorpion sting frost bite ,tetanus
9	Myocardial infaction, angina
10	Appendicitis,biliary colic,reval colic and cholecystitis
11	Drowning
12	Collective injuries
13	Holding the injured person away from the accident place,injured persons taking out
14	Pulmonary resuscitation
15	Bleeding, hemoptysis

Dean of Pharmacy College
Dr. DJamila BENHADDA

University Rector
Prof. Dr. Riad Almoustafa