



ثانيا : درجة الماجستير M. Sc. Degree

مقررات درجة الماجستير العامة (GCM-200)

MS .D. Courses (General Courses) (GCM-200)

First Semester

الفصل الدراسي الأول

Code No	Course Title	Credit Hours	Exam. Hours	Exam. Marks	
			Written	Written	Oral
GCM-201	Instrumental Analysis التحليل الآلي	2 + 0	3	80	20
GCM-202	Statistics and biostatistics الإحصاء والإحصاء الحيوي	2 + 0	3	80	20
GCM-203	Physical chemistry كيمياء طبيعية	1 + 0	2	80	20
GCM-204	Bioinformatics المعلوماتية الحيوية	1 + 0	2	80	20
GCM-205	Research Methodology & Ethics أخلاقيات وطرق البحث	1 + 0	2	80	20
GCM-206	Scientific writing and Seminar الكتابة العلمية والإلقاء العلمي	1 + 0	2	80	20
Total		8	14	480	120



محتوي مقررات درجة الماجستير العامة (GCM-200)
MS .D. Courses (General Courses) (GCM-200)

First Semester **الفصل الدراسي الأول**

GCM-201 Instrumental Analysis **التحليل الآلي** **Credit Hours (2 + 0)**

The course concerns with the study of the principles and techniques of spectroscopic and chromatographic methods of analysis. The spectroscopic methods include ultraviolet-visible spectroscopy, luminescence spectroscopy (fluorescence, phosphorescence and chemiluminescence), IR spectroscopy, FT-IR, NMR, mass spectrometry (MS) and atomic spectroscopy. The chromatographic methods include liquid chromatography with a special focus on HPLC and GC. In addition, the course includes the pharmaceutical applications of the studied methods.

GCM-202 Statistics and biostatistics **الإحصاء والإحصاء الحيوي** **Credit Hours (2 + 0)**

Upon completion of this course, the student should be able to Calculate and measure central tendency, variability (Dispersion) Normal Distribution, Skewness, Kurtosis , Z distribution , t distribution), Hypothesis testing and Significance testing for one and two samples (parametric), Hypothesis testing and Significance testing for Non-parametric data, The quality of analytical measurements, Calibration methods in instrumental analysis: regression and correlation, Experimental design and optimization

GCM-203 Physical chemistry **كيمياء طبيعية** **Credit Hours (2 + 0)**

Kinetics: Introduction, rate of reactions, molecular and order of reactions, parallel reactions, consecutive reactions. Methods of determination the order of reactions, theories of reaction rates & chain reactions. Catalysis: criteria of catalysis, homogeneous catalysis, enzyme catalysis and heterogeneous catalysis. Acid – base catalysis, PH- rate profile of drugs. Types of photochemical reactions. Polymers Types , properties , molecular weight, solution of polymers, pharmaceutical applications .

Photo chemistry: Types of chemical reactions, properties of electromagnetic radiations, laws of photochemical processes, quantum yield, photo processes and chain reactions.

GCM-204 Bioinformatics **المعلوماتية الحيوية** **Credit Hours (2 + 0)**

The course covers an in-depth knowledge of the bioinformatics with particular emphasis on database, Information Retrieval from Biological Databases, Protein Family Databases, Protein Structure Basics, Determination of Protein Three-Dimensional Structure Genome Mapping, Assembly, and Comparison, Microarray-Based Approach

GCM-205 Research Methodology & Ethics **أخلاقيات وطرق البحث** **Credit Hours (2 + 0)**

Research ethics provides guidelines for the responsible conduct of biomedical research. In addition, research ethics educates and monitors scientists conducting research to ensure a high ethical standard. Authorship, Plagiarism, Peer review, Conflicts of interest, Data management, Research misconduct, Research with animals, Research with human subjects

GCM-206 Scientific writing and Seminar **الكتابة العلمية والإلقاء العلمي** **Credit Hours (2 + 0)**

The course concerns Show independence and self discipline in writing competent resume, Develop the skills required to collect, evaluate and analyze research data and results necessary for writing research report, scientific paper and thesis, Understand and express most medical and biological terms commonly used in the field of the study, How to prepare a manuscript, conference report, book review, thesis, poster.



مقررات درجة الماجستير (الصيدلانيات) (PTM- 200)
MS .D. Courses (Pharmaceutics) (PTM- 200)

Second Semester

الفصل الدراسي الثاني

Code No	Course Title	Credit Hours	Exam. Hours	Exam. Marks	
			Written	Written	Oral
PTM-201	Kinetics, Stability and Storage of Dosage Forms. دراسة حركية ، ثبات ، وتخزين المستحضرات الصيدلانية	2 + 0	3	90	10
PTM-202	Pharmacokinetics حركية الدواء	2 + 0	3	90	10
PTM-203	Advanced Drug Delivery Systems أنظمة متقدمة لتوصيل الدواء	2 + 0	3	90	10
PTM-2EC	Elective Course مقرر اختياري	2 + 0	3	90	10
Total		8	12	360	40

Elective Course (PT-2EC)

المقررات الاختيارية

Code No	Course Title	Credit Hours	Exam. Hours	Exam. Marks	
			Written	Written	Oral
PTM-204	Controlled drug delivery أنظمة دوائية للتحكم في توصيل الدواء	2 + 0	3	90	10
PTM-205	Nanotechnology تكنولوجيا النانو	2 + 0	3	90	10
Total		2	3	90	10



محتوي مقررات درجة الماجستير (الصيدلانيات) (PTM- 200)
MS .D. Courses (Pharmaceutics) (PTM- 200)

Second Semester		الفصل الدراسي الثاني
PTM-201	Kinetics, Stability and Storage of dosage forms.	دراسة حركية ، ثبات ، وتخزين المستحضرات الصيدلانية Credit Hours (2 + 0)
Stability prediction by the pharmacist, stability calculations, interpretation of kinetic data, strategy of stability testing.		
PTM-202	Pharmacokinetics	حركية الدواء Credit Hours (2 + 0)
Physicochemical principles involved in the kinetics of drug absorption, distribution, biotransformation, elimination, and therapeutic response.		
Application of these physicochemical principles in studying and interpreting current research articles dealing with these parameters and in performing bioequivalence studies.		
Intravenous infusion (one compartment model & two compartment model drugs).		
PTM-203	Advanced Drug Delivery Systems	أنظمة متقدمة لتوصيل الدواء Credit Hours (2 + 0)
Study at the advanced level of the physical and biological principles which apply to the design, development and evaluation of novel drug delivery systems with emphasis on carrier systems for biotechnology proteins and DNA, as well as site- specific delivery systems and the contribution of nano technology research in this area.		
Selected examples of modern systems such as vesicular carriers and others will be discussed.		
PTM--204	Controlled drug delivery	أنظمة دوائية للتحكم في توصيل الدواء Credit Hours (2 + 0)
Fundamental of controlled drug delivery systems (Influence of drug properties, Design of sustained and controlled release), Design and formulation of oral controlled release drug delivery systems and Parental products including; Implantable therapeutic systems and Transdermal therapeutic systems		
Pharmacokinetic and pharmacodynamic basis of controlled drug delivery, Requirements for modified release dosage forms Clinical considerations in the use of modified-release dosage forms.		
PTM-205	Nanotechnology	تكنولوجيا النانو Credit Hours (2 + 0)
Introduction to nanotechnology. Nano-disperse system including (nano-emulsion and nano-suspension) preparation and their application. Nano-particles (nano-crystals and polymeric nano-particles) preparation and their application. Nano-metals (silver, gold, carbon and nano-tube)		



مقررات درجة الماجستير (العقاقير) (PGM- 200)
MS .D. Courses (Pharmacognosy) (PGM- 200)

Second Semester

الفصل الدراسي الثاني

Code No	Course Title	Credit Hours	Exam. Hours	Exam. Marks	
			Written	Written	Oral
PGM-201	Modern applications of chromatographic analyses for natural products. التطبيقات الحديثة لطرق التحليل الكروماتوجرافي للنواتج الطبيعية .	2 + 0	3	90	10
PGM-202	Application of advanced spectroscopic techniques تطبيقات لطرق التحليل الطيفي المتقدمة	2 + 0	3	90	10
PGM-204	Herbal remedies الأدوية العشبية	2 + 0	3	90	10
PGM-2EC	Elective Course مقرر اختياري	2 + 0	3	90	10
Total		8	12	360	40

Elective Course (PG-2EC)

المقررات الاختيارية

Code No	Course Title	Credit Hours	Exam. Hours	Exam. Marks	
			Written	Written	Oral
PGM-203	Bench-top Biological Assay. الاختبارات البيولوجية	2 + 0	3	90	10
PGM-205	Aromatherapy. العلاج بالمواد العطرية.	2 + 0	3	90	10
Total		2	3	90	10



محتوي مقررات درجة الماجستير (العقاقير)(PGM- 200)
MS .D. Courses (Pharmacognosy) (PGM- 200)

Second Semester

الفصل الدراسي الثاني

PGM-201	Modern applications of chromatographic analyses natural products.	التطبيقات الحديثة لطرق التحليل الكروماتوجرافي للنواتج الطبيعية .	Credit Hours (2 + 0)
Separation techniques using TLC, column (vacuum, pressure, normal & reversed phases), GC, HPLC, ion exchanger, size exclusion, affinity, chiral....etc. Quantitative analysis:HPTLC, GC, HPLC; Hyphenated chromatographic techniques			
PGM-202	Application of advanced spectroscopic techniques	تطبيقات طرق التحليل الطيفي المتقدمة	Credit Hours (2 + 0)
Spectral methods: ultraviolet and visible, infra-red, mass (EI, CI, FAB, MALDI, ESI..... etc.) and nuclear magnetic resonance (1H-NMR, 13C-NMR, DEPT, APT, COSY, HSQC, HMBC, NOESY ... etc.). Hyphenated techniques of mass and NMR spectroscopy.			
PGM-203	Bench-top Biological Assay..	الاختبارات البيولوجية	Credit Hours (2 + 0)
Bench-top Primary Bioassay Screening includes the following assays: toxicity, antimicrobial, antiviral, anticancer, antimitotic, genotoxicity, control of tropical diseases, agrochemicals, hepatotoxicity, hypoglycemic/antidiabetic activity, diuretic activity, anthelmintic, anti-fertility/anti-implantation, platlet aggregation, anti-inflammatory immunomodulatory, antiepileptic, analgesic, gastroprotective/ antiulcer, radio-labeling and antiemetic High-Throughput Screening includes enzyme assays, cell-based receptor functional assays and radiolig and binding assays			
PGM-204	Herbal remedies	الأدوية العشبية	Credit Hours (2 + 0)
Herbal remedy is considered as a new approach in complementary medicine so it's deemed of interest to study: Introduction, Definition, history, the complexity of herbal medicines, safety of herbal drug, parts of plant to be used, active principles, therapeutic overview of galenical preparations, uses of herbal medicine in specific situations e.g. pregnancy, nursing, pediatric age group and geriatric age group, plants and (nervous system, cardiovascular system, renal system, respiratory system, digestive system, liver and biliary system), plants and the metabolic diseases, anti-inflammatory plants, nutraceutical and herbal supplements, herbal medicine and cancer prevention.			
PGM-205	Aromatherapy.	العلاج بالمواد العطرية.	Credit Hours (2 + 0)
The course discusses an introduction to aromatherapy, definition, history, the rationale of essential oil treatments, scientific considerations, essential oils (uses and practical considerations), the uses of essential oils in (body, beauty and supportive treatments), phys-essential therapy & (skeletal/muscular, neurological, vascular, skin/face, stress and nervous tension) case histories.			



مقررات درجة الماجستير (الأدوية و السموم)(PHM- 200)
MS .D. Courses (Pharmacology) (PHM- 200)

Second Semester

الفصل الدراسي الثاني

Code No	Course Title	Credit Hours	Exam. Hours	Exam. Marks	
			Written	Written	Oral
PHM-201	Pathophysiology فسيولوجيا الأمراض	2 + 0	3	90	10
PHM-202	Pharmacotherapeutiocs I العلاج الدوائي	2 + 0	3	90	10
PHM-203	Drug Discovery and Evaluation إكتشاف الدواء وتقييمه	2 + 0	3	90	10
PH-2EC	Elective course مقرر اختياري	2 + 0	3	90	10
Total		8	12	360	40

Elective Course (PHM-2EC)

المقررات الاختيارية

Code No	Course Title	Credit Hours	Exam. Hours	Exam. Marks	
			Written	Written	Oral
PHM-204	Molecular Pharmacology الفارماكولوجيا الجزيئية	2 + 0	3	90	10
PHM-205	Pharmacogeomics الفارماكولوجيا الجينية	2 + 0	3	90	10
Total		2	3	90	10



محتوي مقررات درجة الماجستير (الأدوية و السموم) (PHM- 200)
MS .D. Courses (Pharmacology) (PHM- 200)

Second Semester

الفصل الدراسي الثاني

PHM-201	Pathophysiology	فسيولوجيا الأمراض	Credit Hours (2 + 0)
This course provides information about physiologic bases of etiology, physical signs and symptoms, progression, prognosis and complications of commonly occurring diseases.			
PHM-202	Pharmacotherapeutics I	العلاج الدوائي	Credit Hours (2 + 0)
This course provides information about therapeutic recommendations for drug selection, dosing and monitoring of patients having cardiovascular, hematologic, respiratory, gastrointestinal or endocrinologic diseases.			
PHM-203	Drug Discovery and Evaluation	إكتشاف الدواء وتقييمه	Credit Hours (2 + 0)
This course includes a study of pharmacological assays that can be used in different therapeutics areas that includes in vitro methods, tests on isolated organs, in vivo methods and molecular methods and their applications to discover or evaluate new drugs.			
PHM-204	Molecular Pharmacology	الفارماكولوجيا الجزيئية	Credit Hours (2 + 0)
The course is concerned with a detailed study of the mechanisms of drug action at the molecular level by examining the receptors and other drug targets with their signal transduction mechanisms and application of this knowledge in developing new drugs and understanding mechanisms of old drugs.			
PHM-205	Pharmacogeomics	الفارماكولوجيا الجينية	Credit Hours (2 + 0)
This course introduces the genetic basis of pharmacology. It includes the study of genetic variations that gives rise to differing responses to drugs, and the application of genomic technologies to new drug discovery. Pharmacologic approaches to genetic manipulation such as gene transfer and genetic engineering are involved.			



مقررات درجة الماجستير (الميكروبيولوجيا والمناعة) (PMM- 200)
MS .D. Courses (Microbiology and Immunology) (PMM- 200)

Second Semester

الفصل الدراسي الثاني

Code No	Course Title	Credit Hours	Exam. Hours	Exam. Marks	
			Written	Written	Oral
PMM-201	Advanced Microbiology الميكروبيولوجيا المتقدمة	2 + 0	3	90	10
PMM-202	Medical Immunology المناعة الطبية	2 + 0	3	90	10
PMM-203	Antimicrobial Chemotherapy المضادات الحيوية	2 + 0	3	90	10
PMM-2EC	Elective course مقرر اختياري	2 + 0	3	90	10
Total		8	12	360	40

Elective course (PMM-2EC)

المقررات الاختيارية

Code No	Course Title	Credit Hours	Exam. Hours	Exam. Marks	
			Written	Written	Oral
PMM-204	Infectious Diseases الأمراض المعدية	2 + 0	3	90	10
PMM-205	Industrial Microbiology and Biotechnology الميكروبيولوجيا الصناعية و التقنية الحيوية	2 + 0	3	90	10
Total		2	3	90	10



محتوي مقررات درجة الماجستير (الميكروبيولوجيا والمناعة)(PMM- 200)
MS .D. Courses (Microbiology and Immunology) (PMM- 200)

Second Semester

الفصل الدراسي الثاني

PMM-201	Advanced Microbiology	الميكروبيولوجيا المتقدمة	Credit Hours (2 + 0)
Classification- Three-domain system. An Overview of procaryotic cell structure. An Overview of eucaryotic cell structure. Microscopy including: optical light microscope, fluorescent microscope, Phase contrast microscope, electron microscope and atomic force microscopy. Nutritional types of microorganisms. Culture media and isolation of pure culture. Physiology and metabolism of bacteria Microbial growth curve. Measurement of microbial growth. Continuous culture of microorganisms. Influence of environmental factors on growth. Microbial growth in natural environments. Structure and cultivation of viruses and fungi, Nucleic acid structure, DNA replication. Genetic code and gene structure. Mutations and their chemical basis. Detection and isolation of mutants. DNA repair. Construction of cDNA, and genomic libraries and CDNA library screening., Conventional and pulsed-field gel electrophoresis, Polymerase Chain Reaction (PCR), Micrarray technology, DNA sequencing and Next generation DNA sequencing			
PMM-202	Medical Immunology	المناعة الطبية	Credit Hours (2 + 0)
Prevention and control of disease: Vaccination and immunizations. Major histocompatibility complexes Immune disorders:Hypersensitivities. Autoimmune diseases. Transplantation (Tissue) rejection. Immunodeficiencies., Immunomodulation: Immunosuppressants , immunostimulants , tolerogens, Cancer Immunology			
PMM-203	Antimicrobial Chemotherapy	المضادات الحيوية	Credit Hours (2 + 0)
General characteristics of antimicrobial chemotherapeutic agents. Classification: Antibiotics, antiseptics, disinfectants and preservative. Preservation of pharmaceutical product and evaluation of preservative. Chemical disinfectants, antiseptic and their evaluation Antibacterial drugs. Antifungal drugs Antiviral drugs Resistance to antimicrobial agents. Selective toxicity of antimicrobial agents. Evaluation of antimicrobial agents. Evaluation of antimicrobial agents., Kirby-Bauer test, Broth dilution Method, Agar dilution Method Micro broth Dilution Method E test, Bioluminescence Antibiotic policy in medical care, Aim of antibiotic policy, Objectives of antibiotic policy, Advantages of antibiotic policy			
PMM-204	Infectious Diseases	الأمراض المعدية	Credit Hours (2 + 0)
Specimens collection and identification of microorganisms from specimens. Pathogenesis of bacterial disease. Pathogenesis of fungal disease. Pathogenesis of viral diseases. Microbial mechanisms for escaping host defenses. Spread of infectious disease Airborne diseases. Arthropod-borne diseases. Direct contact diseases. Food-borne and waterborne diseases. Hospital infection			
PMM-205	Industrial Microbiology and Biotechnology	الميكروبيولوجيا الصناعية و التقنية الحيوية	Credit Hours (2 + 0)
Introduction to biotechnology, Biology of industrial micro-organism Fermentation Technology. Production of Major Pharmaceutical products, Antibiotics; Penicillin, Cephalosporins, Streptomycin production and Semi- Synthetic Antibiotics to Combat Resistant Microbes. Production of acids such as lactic acid, citric acid and gluconic acid. Enzyme Technology: Techniques of immobilization of enzymes, Factors affecting enzyme kinetics, Manipulation of living organisms to produce new products such as Hormones, vaccines and monoclonal antibodies. - Production of Vaccines introduction, conventional vaccines, types of vaccines, preparation and standardization., Production of Monoclonal antibodies, Production of Hormones , Biofuels, Nanobiotechnology.Gene therapy , Processes carried out in natural environments (Biodegradation, bioremediation and environmental maintenance processes....). Biotechnological applications (Biosensors, Microarrays, Biopesticides...).			



مقررات درجة الماجستير (الكيمياء العضوية الصيدلانية)(POM- 200)
MS .D. Courses (Pharmaceutical Organic Chemistry) (POM- 200)

Second Semester

الفصل الدراسي الثاني

Code No	Course Title	Credit Hours	Exam. Hours	Exam. Marks	
			Written	Written	Oral
POM-201	Advanced Organic Chemistry كيمياء عضوية متقدمة	2 + 0	3	90	10
POM-202	Heterocyclic Chemistry الكيمياء الحلقية الغير متجانسة	2 + 0	3	90	10
POM-203	Structural Elucidation of Drugs إثبات التركيب البنائي للأدوية	2 + 0	3	90	10
POM-2EC	Elective course مقرر اختياري	2 + 0	3	90	10
Total		8	12	360	40

Elective course (POM-2EC)

المقررات الاختيارية

Code No	Course Title	Credit Hours	Exam. Hours	Exam. Marks	
			Written	Written	Oral
POM-204	Molecular Modeling and Drug Development النمذجة الجزيئية وتطوير الأدوية	2 + 0	3	90	10
POM-205	Stereochemistry of Drugs الكيمياء الفراغية للأدوية	2 + 0	3	90	10
Total		2	3	90	10



محتوي مقررات درجة الماجستير (الكيمياء العضوية الصيدلانية) (POM- 200)
MS .D. Courses (Pharmaceutical Organic Chemistry) (POM- 200)

Second Semester

الفصل الدراسي الثاني

POM-201	Advanced Organic Chemistry	كيمياء عضوية متقدمة	Credit Hours (2 + 0)
The course is designed to discuss some new reactions and mechanisms in organic chemistry with special emphasis on reactions related to synthesis of pharmaceutical compounds. As pericyclic reactions, Radical and carbene reactions, The Role of Protective Groups in Organic Synthesis:			
POM-202	Heterocyclic Chemistry	الكيمياء الحلقية الغير متجانسة	Credit Hours (2 + 0)
The course covers an in-depth knowledge of the chemistry of heterocyclic compounds with particular emphasis on the synthesis, reactions, and stereochemistry of different three, four, five and six member heterocycles.			
POM-203	Structural Elucidation of Drugs	إثبات التركيب البنائي للأدوية	Credit Hours (2 + 0)
Application of combined spectroscopic techniques e.g. UV, IR, ¹ H-NMR, ¹³ C-NMR, TOCSY, MS, DEPT, APT, HMQC , HMBC, NOESY...etc in the identification of different classes of compounds. This course covers the theory and background to chirality and provides an overview of the effects of enantiomers at biological receptors. It also includes the use of chiral compounds as drugs, and the application of chirality as a tool in Pharm. Organic Chemistry to obtain better potency, selectivity, and duration of action of drugs through the study of the topics:			
POM-204	Molecular Modeling and Drug Development	النمذجة الجزيئية وتطوير الأدوية	Credit Hours (2 + 0)
The course covers the concepts of molecular modeling and simulation; and provides an overview of computational chemistry techniques, ranging from the fundamental theoretical basis of modeling techniques to their application. This course covers the drug discovery process from the beginning through the final stages of clinical trials. The various stages of identifying and selecting a target, selecting and optimizing a lead compound, carrying out of in-vitro and in-vivo testing to determine biological activity and/or toxicity and evaluating acceptable "drug-like" properties are discussed.			
POM-205	Stereochemistry of Drugs	الكيمياء الفراغية للأدوية	Credit Hours (2 + 0)
This course covers the theory and background to chirality and provides an overview of the effects of enantiomers at biological receptors. It also includes the use of chiral compounds as drugs, and the application of chirality as a tool in Pharm. Organic Chemistry to obtain better potency, selectivity, and duration of action of drugs through the study of the topics: Introduction, Chirality and chiral drug development, Elements of symmetry, Stereochemistry and chemical R , Conformation, isosterism, anomeric affect importance of chirality on bioactivity of pharmacologically active drugs, Stereochemistry and drug design, Resolution, Some synthetic routes for chiral drugs			



مقررات درجة الماجستير (كيمياء تحليلية صيدلية)(PAM- 200)
MS .D. Courses (Pharmaceutical Analytical Chemistry) (PAM- 200)

Second Semester

الفصل الدراسي الثاني

Code No	Course Title	Credit Hours	Exam. Hours	Exam. Marks	
			Written	Written	Oral
PAM-201	Quality Control of Drugs الرقابة النوعية للأدوية	2 + 0	3	80	20
PAM-202	Electrochemical Analysis التحليل الكهروكيميائي	2 + 0	3	80	20
PAM-203	Separation Techniques تقنيات الفصل	2 + 0	3	80	20
PAM-2EC	Elective course مقرر اختياري	2 + 0	3	80	20
Total		8	12	320	80

Elective course (PAM-2EC)

المقررات الاختيارية

Code No	Course Title	Credit Hours	Exam. Hours	Exam. Marks	
			Written	Written	Oral
PAM-204	Therapeutic Drug Monitoring رصد الأدوية العلاجية	2 + 0	3	80	20
PAM-205	Chemometrics الإحصاء الكيميائية	2 + 0	3	80	20
PAM-206	Environmental Analysis. التحليل البيئي	2 + 0	3	80	20
Total					



محتوي مقررات درجة الماجستير (كيمياء تحليلية صيدلانية)(PAM- 200)
MS .D. Courses (Pharmaceutical Analytical Chemistry) (PAM- 200)

Second Semester

الفصل الدراسي الثاني

PAM-201	Quality Control of Drugs	الرقابة النوعية للأدوية	Credit Hours (2 + 0)
This course is concerned with definitions and terminology in quality control, impurities, sampling, documentation, writing and reading quality control report, official methods of analysis, stability- indicating methods of analysis, stability of drugs. In addition, a special focus is given to the validation of analytical methods adopting pharmacopeial guidelines.			
PAM-202	Electrochemical Analysis	التحليل الكهروكيميائي	Credit Hours (2 + 0)
The course covers the fundamentals of potentiometry (electrode potential, types of electrodes and ion-selective electrodes), voltammetry (polarography, stripping voltammetry and amperometry) and their applications in pharmaceutical and biological analyses.			
PAM-203	Separation Techniques	تقنيات الفصل	Credit Hours (2 + 0)
The course concern with the study of principles and techniques of high performance liquid chromatography HPLC, gas chromatography, capillary electrophoresis and their application in pharmaceutical analysis and forensic medicine.			
PAM-204	Therapeutic Drug Monitoring	رصد الأدوية العلاجية	Credit Hours (2 + 0)
The main purpose of therapeutic drug monitoring is to able to individualize drug dosage to allow for individual differences in rates of drug metabolism or excretion. By individualizing dosage to achieve a therapeutic concentration of drug in plasma, the intensity of effect of the drug is much more likely to be the desired one than the intensity of effect achieved by giving everyone an average dose of the drug.			
PAM-205	Chemometrics	الإحصاء الكيميائية	Credit Hours (2 + 0)
Coverage of statistical methods in Analytical Chemistry. Course includes basic statistics, experimental design, modeling, exploratory data analysis and other multivariate techniques.			



مقررات درجة الماجستير (كيمياء دوائية) (PDM- 200)
MS .D. Courses (Medicinal Chemistry) (PDM- 200)

Second Semester

الفصل الدراسي الثاني

Code No	Course Title	Credit Hours	Exam. Hours	Exam. Marks	
			Written	Written	Oral
PDM-201	Drug Development تطوير الأدوية	2 + 0	3	90	10
PDM-202	Drug Pharmacokinetics حركية الدواء	2 + 0	3	90	10
PDM-203	Structural Elucidation of Drugs إثبات التركيب البنائي للأدوية	2 + 0	3	90	10
PDM-2EC	Elective course مقرر اختياري	2 + 0	3	90	10
Total		8	12	360	40

Elective course (PDM-2EC)

المقررات الاختيارية

Code No	Course Title	Credit Hours	Exam. Hours	Exam. Marks	
			Written	Written	Oral
PDM-204	Synthetic Chemistry of Drugs التشبيد الكيميائي للأدوية	2 + 0	3	90	10
PDM-205	Drug Stability ثبات الأدوية	2 + 0	3	90	10
Total		2	3	90	10



محتوي مقررات درجة الماجستير (كيمياء دوائية) (PDM- 200)
MS .D. Courses (Medicinal Chemistry) (PDM- 200)

Second Semester

الفصل الدراسي الثاني

PDM-201 Drug Development	تطوير الأدوية	Credit Hours (2 + 0)
This course embraces the drug discovery process from the beginning through the final stages of clinical trials. The various stages of identifying and selecting a target, selecting and optimizing a lead compound, carrying out of in-vitro and in-vivo testing to determine biological activity and/or toxicity and evaluating acceptable "drug-like" properties are discussed. The course covers the theory and background to chirality and provides an overview of the effects of enantiomers at biological receptors. It also includes the use of chiral compounds as drugs, and the application of chirality as a tool to obtain potent, selective, and long acting drugs through the study of the topics		
PDM-202 Drug Pharmacokinetics	حركية الدواء	Credit Hours (2 + 0)
The course focuses on the in-depth studies of the chemical aspects of drug metabolism, in addition to components and structure of microsomal drug metabolizing systems. The student will be exposed to the mechanistic studies and stereoselectivity in drugs metabolism.		
PDM-203 Structural Elucidation of Compounds	إثبات التركيب البنائي للمركبات	Credit Hours (2 + 0)
The course is dealing with teaching the concepts of spectroscopic identification of pharmaceutical active compounds including(IR,UV,NMR,H1,C13) and the two dimensional application COSY , DEPT , APT , INEPT , HMQC , HSQS etc ... and mass spectrometry for full structural identification and elucidation .		
PDM-204 Synthetic Chemistry of Drugs	التشبيد الكيميائي للأدوية	Credit Hours (2 + 0)
The Course Deals with Concepts of Drug Absorption, Distribution, Metabolism and Excretion.The main objective is to assist in developing the ability of the students to correlate the Pharmacokinetics properties of the drug and its pharmacological action, and drug design concept		
PDM-205 Drug Stability	ثبات الأدوية	Credit Hours (2 + 0)
The course is dealing with the pathways of chemical degradation, testing of drugs including oxidative and photostability stress testing, the stability of drugs in different conditions, the stability of drug excipients and drug-drug interactions.		



مقررات درجة الماجستير (كيمياء حيوية إكلينيكية) (PBM- 200)
MS .D. Courses (Clinical Biochemistry) (PBM- 200)

Second Semester

الفصل الدراسي الثاني

Code No	Course Title	Credit Hours	Exam. Hours	Exam. Marks	
			Written	Written	Oral
PBM-201	Advanced Biochemistry كيمياء حيوية متقدمة	2 + 0	3	90	10
PBM-202	Clinical Biochemistry كيمياء حيوية إكلينيكية	2 + 0	3	90	10
PBM-203	Advanced Molecular Biology بيولوجيا جزيئية متقدمة	2 + 0	3	90	10
PB-2EC	Elective course مقرر اختياري	2 + 0	3	90	10
Total		8	12	360	40

Elective course (PBM-2EC)

المقررات الاختيارية

Code No	Course Title	Credit Hours	Exam. Hours	Exam. Marks	
			Written	Written	Oral
PBM-204	Oncology and Tumor Markers الأورام ودلالاتها	2 + 0	3	90	10
PBM-205	Biochemistry Laboratory Techniques التقنيات المعملية للكيمياء الحيوية	2 + 0	3	90	10
Total		2	3	90	10



محتوي مقررات درجة الماجستير (كيمياء حيوية إكلينيكية) (PBM- 200)
MS .D. Courses (Clinical Biochemistry) (PBM- 200)

Second Semester

الفصل الدراسي الثاني

PBM-201	Advanced Biochemistry	كيمياء حيوية متقدمة	Credit Hours (2 + 0)
Enzymes. Vitamins. Biological oxidation. Oxidative stress and antioxidants. Metabolism of Carbohydrate and Lipids. Amino acids and proteins metabolism. Inflammation mediators. Body fluids: blood, breast milk, cerebrospinal fluid, semen, urine.			
PBM-202	Clinical Biochemistry	كيمياء حيوية إكلينيكية	Credit Hours (2 + 0)
Water, electrolytes and hydrogen ion disorders, Respiratory disorders, Disorders of kidney and urinary tract. Cardiovascular disorders. Porphyrins, bile pigments and jaundice. Hepatobiliary disorders. Gastrointestinal and pancreatic disorders. Disorders of carbohydrate metabolism. Disorders of amino acids and protein metabolism. Disorders of lipid metabolism. Disorders of nucleic acids. Disorders of minerals and trace elements.			
PBM-203	Advanced Molecular Biology	بيولوجيا جزيئية متقدمة	Credit Hours (2 + 0)
Nucleic acid-protein interaction, Gene expression: methodology, microarrays. Regulation of gene expression. Gene silencing. Genomic biology. Positional cloning. Gene mutation. Molecular biology techniques: Recombinant DNA, Cloning of DNA molecules and Application of DNA cloning. Phenotyping.			
PBM-204	Oncology and Tumor Markers	الأورام ودلالاتها	Credit Hours (2 + 0)
Tumor. Cancer biology. Cell cycle. The ideal tumor marker and its purpose, Classification of tumor markers: Oncofetal proteins, Hormones, Enzymes, Tumor-associated antigens, Special proteins. Tissue-bound receptors. Cytokines and chemokines. Genes and Miscellaneous markers. Biological factors that affect serum concentrations of tumor markers. Tumor markers use and relation with tumors.			
PBM-205	Biochemistry Laboratory Techniques	التقنيات المعملية للكيمياء الحيوية	Credit Hours (2 + 0)
Introduction to the Biochemistry/Molecular Biology Laboratory. Using the Computer and Internet for Research in Biochemistry. General Laboratory Procedures: accurate measurements, pH metery and sample storage. Centrifugation Techniques in Biochemistry/Molecular Biology. HPLC. Purification and Analysis of Biomolecules by Chromatography. Characterization of Proteins and Nucleic Acids by Electrophoresis. Flow cytometry. Spectroscopic Analysis of Biomolecules, Immuno-techniques: ELISA, Immunohistochemistry, Tissue culture technique. Spectroscopic Analysis of Biomolecules. Immuno-techniques: ELISA, Immunohistochemistry. Molecular Biology I: Structures and Analysis of Nucleic Acids, Molecular Biology II: Recombinant DNA, Molecular Cloning and Enzymology, Protein Production, Purification, and Characterization.			