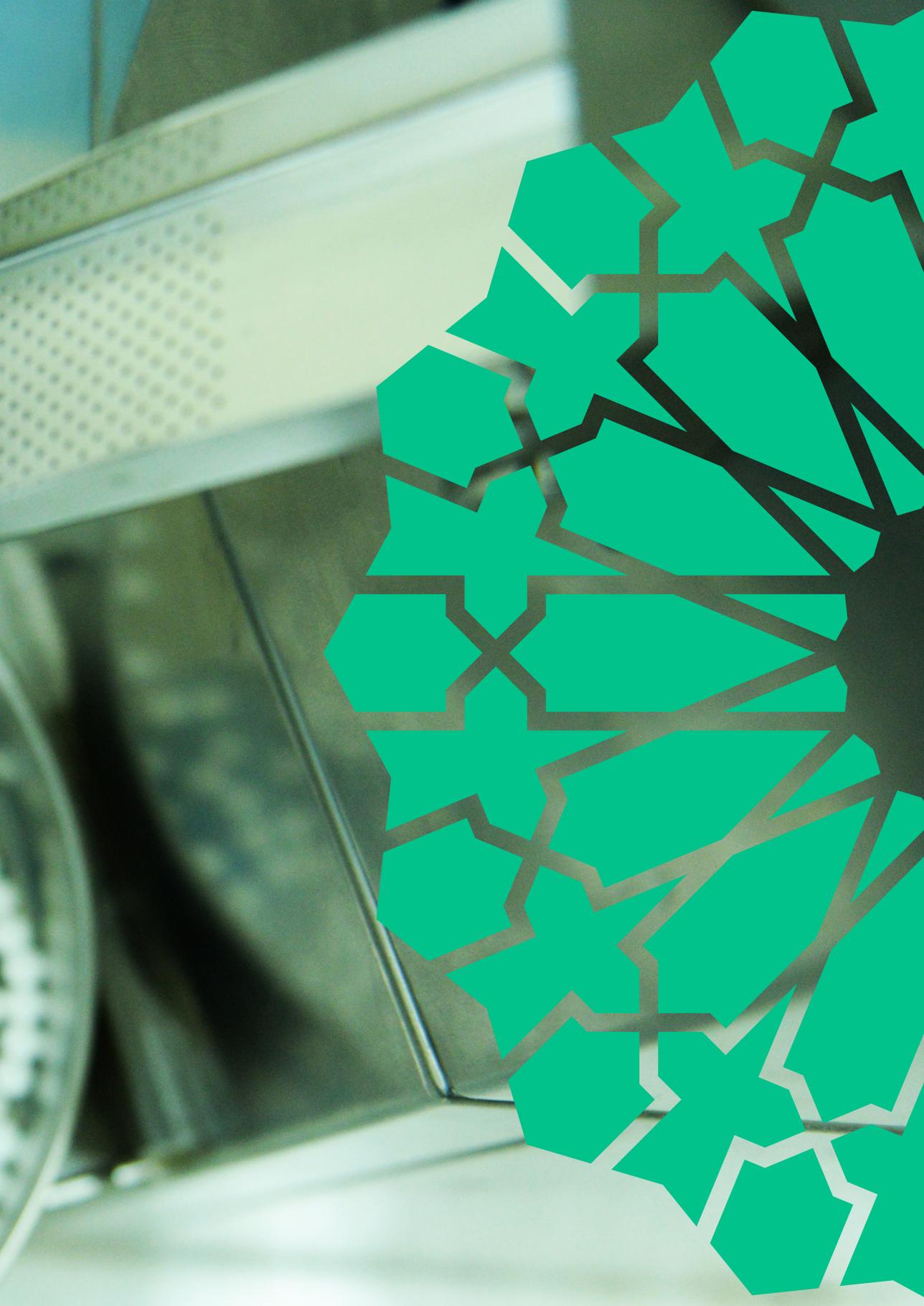




COLLEGE OF

PHARMACY



MEDICINAL CHEMISTRY DEPARTMENT

Medicinal Chemistry Lab Staff

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3	Shatha Khalifa	7415	salyammahi@sharjah.ac.ae

CHEMISTRY FOR PHARMACY LABORATORY



Location	Lab Staff in Charge	Contacts
M12-128	Razan Al-Humaidi Shatha Khalifa	065057415

INTRODUCTION

This course covers experiments on qualitative and quantitative aspects of general chemistry and their applications in the pharmaceutical field, such as separation, identification, determination, purification and extraction procedures.

EQUIPMENT AND INSTRUMENTS

- Analytical Balances
- Hot Plates and Stirrer
- Ice Flaking Machine
- Centrifuge
- Separatory Funnel
- Rota Evaporator
- Top Loading Balances
- Oven
- Water Bath
- Vacuum Pump
- Melting Point Apparatus

EXPERIMENTS

- Laboratory Safety & Measurements
- Qualitative Analysis of Anions
- Qualitative Analysis of Cations
- Physical Properties of Chemicals: Melting Point, Sublimation, and Boiling Point
- Water of Hydration
- Caffeine Extraction
- Analysis of Vinegar by Titration
- Purification Techniques & Recrystallization
- Water hardness & Analysis
- Hybridization, Isomerism & Stereochemistry
- Paper Chromatography; Separation of Plant Pigments
- Analysis of Ascorbic Acid by Oxidation Reduction Titration

MEDICINAL CHEMISTRY IA LABORATORY



Location	Lab Staff in Charge	Contacts
M32-G26	Razan Al Humaidi	065057415

INTRODUCTION

This course introduces the basic concepts of medicinal chemistry, including study of the molecular and chemical structures of organic molecules using molecular models, functional groups reactions and identification of organic compounds, as well as the synthesis of some chiral compounds and the techniques used for enantiomeric separation.

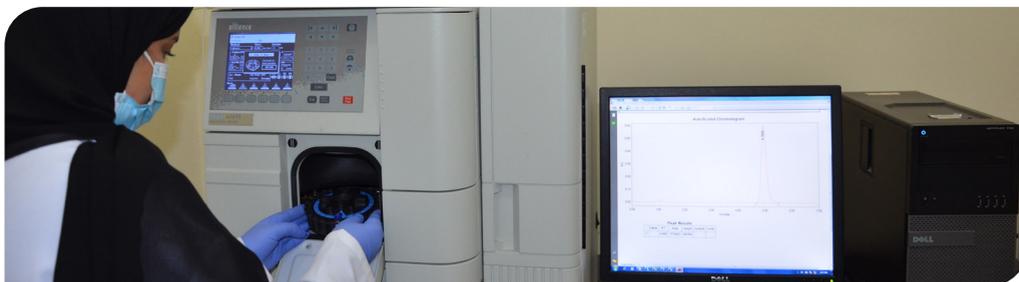
EQUIPMENT AND INSTRUMENTS

- Analytical Balances
- Hot Plates and Stirrers
- Rotary Evaporators and Vacuum Pumps
- Distillation Apparatuses
- Melting Point Apparatuses
- Water Baths
- Ultrasonic Bath
- Ovens

EXPERIMENTS

- Molecular Models and Stereochemistry
- Factors Affecting Nucleophilic Substitution (SN1) Reaction
- Factors Affecting Nucleophilic Substitution (SN2) Reaction
- Oxidation of Benzyl Alcohol to Benzoic Acid
- Resolution of Racemic Mixture of α -Methylbenzylamine (Part-I)
- Resolution of Racemic Mixture of α -Methylbenzylamine (Part-II)
- Synthesis of dibenzyl acetone: (Claisen-Schmidt reaction)

MEDICINAL CHEMISTRY IB LABORATORY



Location	Lab Staff in Charge	Contacts
M12-128	Shatha Khalifa	065057410

INTRODUCTION

This course is concerned with the theory and practice of the preparation of some active ingredients in pharmaceutical preparation as well as the classical and instrumental methods for the separation, identification and quantitative analysis of chemical substances. Satisfactory completion of this course affords students a working knowledge of analytical instrumentation typically employed in pharmaceutical and biochemical research laboratories. It also provides students with an appreciation of the relative strengths and limitations of different instrumental-based analysis methods.

EQUIPMENT AND INSTRUMENTS

- UV-VIS Spectrophotometer
- GC-MSMS
- GC-FID and GC-ECD
- HPLC-UV
- Analytical Balances
- Hot Plates and Stirrers
- Rotatory Evaporators and Vacuum Pumps
- Water Baths
- Ultrasonic Bath
- Ovens

EXPERIMENTS

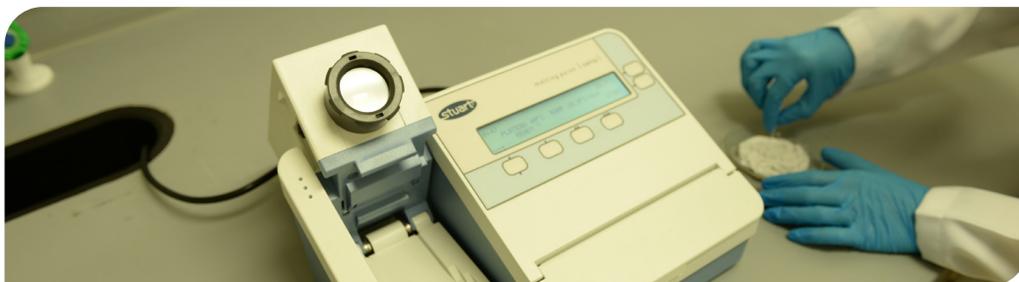
- Qualitative Analysis of Functional Groups (Alcohols, Phenols & Carboxylic Acids)
- Qualitative Analysis of Functional Groups (Aldehydes, Ketones, Ester, Amines & Amides)
- Chromatographic Principles & Drugs Mixture Separation using TLC
- Separation of Caffeine and Paracetamol Mixture using HPLC

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- Separation and Identification of Hydrocarbon Mixture using GC-FID & GC-MSMS
 - Determination of Unknown Concentration using UV-Visible Spectrophotometer

TESTS AND SERVICES

- Development and Validation of Analytical Methods for Analysis of Active Ingredients and Related Substances.
- Routine Quality Control of Pharmaceutical Products.
- Accelerated and Real Time Stability Study of Pharmaceuticals.
- Heavy Metal Content Determination in Pharmaceutical Samples.

MEDICINAL CHEMISTRY IIA LABORATORY



Location	Lab Staff in Charge	Contacts
M32-G26	Shatha Alyammahi	0650577410

INTRODUCTION

The practical part of the course covers experiments on the synthesis of organic and heterocyclic compounds and the different methods for their analysis including purification, assessment and structural elucidation techniques.

EQUIPMENT AND INSTRUMENTS

- Analytical Balances
- Hot Plates and Stirrer
- Water Bath
- Vacuum Pump
- Polarimeter
- Reflux apparatus
- Separator Funnel
- UV Cabinet
- Top Loading Balances
- Oven
- Thermometer
- IR- Spectrophotometer
- Ice Flaking Machine
- Melting Point Apparatus
- Rotary Evaporator
- Thin Layer Chromatography Tanks

EXPERIMENTS

- Friedel-Crafts Alkylation
- Nitrating Methyl Benzoate: Electrophilic Aromatic Substitution
- Synthesis of 3-Methylpyrazole-5-One
- Synthesis of Acetanilide
- Diel's Alder Reaction

TESTS AND SERVICES

- Compound purification and purity check.
- Structural Elucidation and characterization.

MEDICINAL CHEMISTRY IIB LABORATORY



Location	Lab Staff in Charge	Contacts
M32-G26	Shatha Alyammahi	065057410

INTRODUCTION

The practical part of this course deals with experiments on the synthesis of some pharmaceutically active compounds (examples of drug molecules) and their corresponding purification, detection, characterization and stability /biological activity assessment. Experiments cover the study their chemical and pharmaceutical properties as well as the application of molecular modeling to study the three-dimensional structures of drugs and their structure activity relationship (SAR).

EQUIPMENT AND INSTRUMENTS

- Analytical Balances
- Top Loading Balances
- Hot Plates and Stirrer
- Oven
- Water Bath
- Thermometer
- Centrifuge
- Vacuum Pump
- UV-Vis Spectrophotometer
- Polarimeter
- Ice Flaking Machine
- Reflux apparatus
- Melting Point Apparatus
- Separator Funnel
- Rotatory Evaporator
- UV cabinet
- Thin Layer Chromatography Tanks

EXPERIMENTS

- Synthesis of Sulfasalazine
- Synthesis of 5,5-Diphenylhydantoin (Phenytoin)
- Multicomponent Reactions (MCR's) The Biginelli and Passerini Reactions (Part-I).
- Multicomponent Reactions (MCR's) The Biginelli and Passerini Reactions (Part-II)
- Synthesis and Chemical Analysis of Penicillin's
- Structural Data: The Bases for Molecular Modeling (Molecular Docking).

TESTS AND SERVICES

- To have Preliminary Idea about the Active Ingredients and their Concentration in the Drug Dosage Forms
- Toxic Elements Detection and Measurement in Food, Water, Soil and other Specimens (With the Help of ICP)

PHARMACOGNOSY LABORATORY



Location	Lab Staff in Charge	Contacts
M32-DF33	Razan Al-Humaidi Shatha Khalifa	065057415

INTRODUCTION

Plant materials are used throughout all countries from all around the world as home remedies, over the counter which is using drug products and raw materials for the pharmaceutical industry. It is therefore essential to ensure the quality of medicinal plant products by using several techniques and applying suitable standards. One of the most important techniques to authenticate a crude plant drug is the microscopy-based examination of the crude plant or the plant powder. The plant material is prepared for a microscopy examination and the anatomical features of the powdered drugs are recorded in order to compare the structures present with those drawn and described in the relevant monographs. At the end of the lab course, students can interpret the morphological and anatomical descriptions of the crude plant in order to clearly identify it. On the other hand, significant number of drugs present in the market with unique medical applications are of natural origin or inspired from natural origin. Therefore, students are trained on the phytochemical investigations and several discovery approaches that can be employed in the discovery of novel drugs.

EXPERIMENTS

- The Morphological and Microscopical Identification/ Authentication of the Herbal Leaves such as Senna Leaves; Peppermint Leaves; Thyme Leaves
- The Morphological and Microscopical Identification/ Authentication of the Herbal Seeds and Flower Drugs such as Black Mustard Seeds, Fenugreek Seeds, Cardamom Seeds, Clove Flower, Chamomile Flower
- The Morphological and Microscopical Identification/ Authentication of Herbal Fruits such as Anise Fruit, Coriander Fruit, Fennel Fruit, Capsicum Fruit
- The Morphological and Anatomical Identification/ Authentication of Herbal Underground Parts (Barks; Rhizomes) such as Cinnamon Bark, Liquor ice, Ginger Rhizome, Rhubarb

Rhizome, Ginger

- Extraction of Volatile Oil including chamazulene using Steam Distillation Apparatus and Introduction of Techniques for Commercial Production of Volatile Oil from Plant Source
- Extraction of capsaicin from Plant Source using Soxhlet Apparatus
- Phytochemical Investigation of anthraquinone Glycosides
- Phytochemical Investigation of tropane Alkaloids
- Phytochemical Investigation of Carbohydrates
- Extraction of Tannins/ Caffeine from Tea leaves followed by phytochemical investigation of caffeine and industrial application of tannins
- Phytochemical Investigation of Flavonoids

EQUIPMENT AND INSTRUMENTS

- Hot Plates and Stirrer
- Clinical Compound Microscope
- Water Bath
- Vacuum Pump
- Separator Funnel, test tubes and other glass wares
- Rotatory Evaporator
- UV Cabinet
- Distilled Water Machine
- Thin Layer Chromatography Tanks
- Thin layer chromatography plates and sheets
- Steam Distillation Apparatus
- Soxhlet Apparatus
- Gas Chromatography Machine
- HPLC

TESTS AND SERVICES

- This course gives the pharmacists the skills to identify herbal medicines and detect any adulteration in the herbal products in the market through microscopic examinations.
- Students learned to identify the phytochemical constituents in plant sources which are essential for natural drug discovery and industrial applications.