

السيد عميد كلية الصيدلة المحترم

السيد معاون العميد للشؤون العلمية المحترم

السيد رئيس فرع العقاقير والنباتات الطبية المحترم

م/ محضر اجتماع اللجنة العلمية في فرع العقاقير والنباتات الطبية

تحية طيبة

اجتمعت اللجنة العلمية يوم الاثنين 2025-9-29 وناقشت تحديث المناهج للدراسات العليا (الماجستير والدكتوراه) في فرع العقاقير والنباتات الطبية وقررت تحديد المواد التالية لدراسة الماجستير والدكتوراه في اختصاص العقاقير والنباتات الطبية في كلية الصيدلة / جامعة بغداد

اعضاء اللجنة العلمية :

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أ.د. ايناس جواد

29-9-2025

Ph.D/ 1st semester

Analytical Pharmacognosy:

1. Phytochemical Screening & Characterization
2. Chromatographic and spectroscopic identification.
3. Spectroscopic & Spectrometric Analysis
4. UV-Vis spectroscopy.
5. IR, NMR, and Mass spectrometry for structural elucidation.
6. Quantitative Analysis of Herbal Drugs
7. Estimation of marker compounds (alkaloids, glycosides, flavonoids, etc.).
8. Gravimetric and titrimetric methods.
9. Pharmacopoeial Standards & Quality Control
10. Identity, purity, and strength testing.
11. Foreign matter, ash values, extractive values, volatile oil content.
12. WHO guidelines for herbal quality assurance.
13. Bioassays & Biological Standardization
14. In vitro assays (antioxidant, antimicrobial, enzyme inhibition).
15. In vivo bioassays for active principles.
16. Adulteration & Authentication
17. Detection of substitution and adulteration.
18. Microscopic and molecular authentication (DNA barcoding).

Advanced Chemistry of natural products I:

1. Chemistry of natural products
2. Diverse aspects of the Chemistry of Natural Products
3. Natural Products as Sources of New Drugs
4. Modern directions in natural products chemistry
5. Natural Anticancer Drug
6. Carotenoids: biosynthesis pathway, β Carotene, Isolation of β -Carotene Lutein, Isolation of Lutein, Zeaxanthin, Isolation of Zeaxanthin Lycopene, Isolation of Lycopene
7. Iridoids: Phytochemistry, Biological Activities, and Pharmacokinetics
8. polyketide natural products: biosynthesis and biological activity.
9. Terpenes in Human Health: The Statin Drugs, Steroids and Cortisone Anti-Infective from Nature
10. Toxins& Venom: Plants, Mycotoxins, Poisonous mushrooms, Marine algae, Animals venom

Advanced separation technique:

1. Separation
2. Selection of relevant chromatographic technique, stationary phase, mobile phase and detector for different sets of analytes.
3. Creation of time-base for LC and GC analysis in chromatographic software.

4. Optimization of chromatographic separation.
5. Validation of chromatographic method
6. Determination of uncertainty of chromatographic method
7. Practical work on flash CC
8. Practical exam in the lab. For unknown

Medicinal plant biotechnology:

1. Medicinal plant biotechnology
2. Medicinal plant biotechnology: principle & application
3. Plant Tissue Culture techniques & its application in relation to Phytopharmaceuticals: Introduction, techniques of initiation and maintenance of various types of cultures. Immobilized cell techniques, Biotransformation studies including recent developments in production of biological active constituents in static, suspension and hairy root cultures, Bioreactors for production of biologically active constituents, & Applications of plant tissue culture techniques.
4. Genetic engineering of bacteria and plants
5. Genomics of bacteria and plants
6. Biopharmaceuticals and gene therapy.
7. Genetics and biotechnology.
8. Recombinant DNA biotechnology, principles and therapy.
9. Genetics in Pharmacognosy: Mendel's laws of hereditary and their application to Pharmacognosy, Chemical races, Selections, Hybridization, Polyploidy, mutation.
10. Commercial aspects of biotechnology

Ph.D/ 2nd semester

Advanced Phytotherapy:

1. Phytotherapy
2. Introduction , principles, medicinal plants in selected health care systems. Important natural products & phytomedicines used in pharmacy & medicine
3. Food supplements
4. Standardization of herbal dosage forms.
5. Standardization & quality control of nutraceuticals derived from plant extract
6. Quality control: Evaluation of natural products.
7. The Changing Landscape of Herbal Medicine, Food and Wellness:
 - Herbal Medicine
 - Dietary Supplement
 - Nutraceutical
 - Functional Food
8. Herbal-drug interaction (adverse herbal-drug interaction)
9. Deterioration of crude natural products
10. Application of Nanotechnology in herbal medicine Transdermal delivery system for natural products (Transfersome). Transdermal delivery system for natural products (Transfersome).

Advanced Chemistry of natural products II:

1. chemistry of natural products
2. Biosynthesis & structure- activity relationship of indole alkaloids.
3. Biosynthesis & structure- activity relationship of anthraquinone:
(anthraquinone derived from micro-organism)
(anthraquinone derived from plants)
4. Biosynthesis & structure- activity relationship of isoquinoline alkaloids (narcotic drugs).
5. Xanthene based natural drugs.
6. Anti-Infective from Nature: Bioassay-guided isolation& characterization of bioactive compounds from actinomycetes.
Bioactive products from fungi.
7. Biodiversity and Ecology; Marine natural products
8. Medicinal Mushrooms
9. Microspong delivery system
10. Transferosomes as transdermal delivery system for medicinal plants.

Selected topics in Pharmacognosy:

1. Nanoparticles as carriers for phytochemicals & herbal extract.
2. Transdermal delivery system for natural products (Transferosome).
3. Recent advances in biotransformation of Saponins.
4. The antiangiogenics and anti-inflammatory activities of Anthraquinone.
5. The antiangiogenics and anti-inflammatory activities of Phytosterols
6. Biodiversity and Ecology; Marine natural products
7. Genetic engineering of bacteria and plants
8. Microsponge delivery system.
9. Bioassay-guided isolation& characterization of bioactive compounds from actinomycetes
10. Bioactive products from fungi.

Research methodology in Pharmacognosy II

Master / 1st semester

Chemotaxonomy:

1. **Secondary Metabolites:** These are compounds not directly involved in the normal growth, development, or reproduction of an organism but are often used in defense or ecological interactions. Chemotaxonomists study the presence, absence, or variation of these compounds to group organisms.
2. **Genetic Influence:** The production of certain chemicals in organisms is often genetically controlled. By studying these chemicals, chemotaxonomy can offer insights into evolutionary relationships.

Chemistry of natural products I:

1. Introduction: primary and secondary metabolites, natural products and their functions, plant chemical Ecology, biosynthesis & metabolic pathways
2. Biosynthesis pathway for phenols, saponins, Terpenoids, antibiotics.
3. Nitrogen-Containing Compounds : Proteins, Peptides, and Amino Acids. Protein–Peptide Building Blocks
4. Phenolic Compounds: Flavonoids, Flavones, Isoflavones, Flavone, Anthocyanins, Tannins, Lignin and Lignans, Various Lignan Structural Units, Lignans as Phytoestrogens

Separation technique:

1. Introduction to separation techniques. Electrophoresis and chromatography. Basic concepts and control of the separation. Isocratic elution. Gradient elution. Solid phase extraction. Soxhlet extraction and accelerated solvent extraction.
2. Chromatographic equipment. Pumps. Injectors. Degassers. Trap columns. Specific requirements of different chromatographic techniques.
3. Liquid chromatography. Normal phase chromatography. Reversed phase chromatography. Liquid chromatography. Planar chromatography. Ion chromatography. Size-exclusion chromatography. HPLC. UPLC
4. Gas chromatography. Temperature effects. GC analysis of nonvolatile compounds. Supercritical fluid chromatography. Multidimensional chromatography. Fundamental principles. Comprehensive mode.
5. Practical exam in the lab. For unknown

Master / 2nd semester

+ Chemistry of natural products II:

1. Approach available for drug development, role of natural products in new drug development .
2. Importance of marine natural products chemistry , Chemistry and biology of marine natural products
3. Nitrogen-Containing Compounds : Alkaloids : biosynthesis , structure- activity relationship for all types of alkaloids.
4. Recent developments in natural product chemistry of microbial sources.
5. Drug discovery in area of toxin and venoms
6. Essential oils : biosynthesis , structure- activity relationship , classification & Pharmacological activity
7. fixed oils : biosynthesis , structure- activity relationship , classification & Pharmacological activity

+ Selected topics in Pharmacognosy:

1. Adulteration of Herbal Medicine and its Detection Methods
2. Standardization of herbal medicine
3. Phytochemical study of some medicinal compounds present in plant cultivated in Iraq
4. A Natural Approach to Breast Cancer Care
5. A Natural Approach to prostate Cancer Care
6. Flavonoids as antioxidant
7. Iridoids: Phytochemistry, Biological Activities, and Pharmacokinetics
8. polyketide natural products: biosynthesis and biological activity.

Research methodology in Pharmacognosy

