



Mansoura University
Faculty of Pharmacy
Clinical Pharmacy Program

| المستوى الثالث | | | | |
|----------------|--|---------------|----|-----|
| no | اسم المقرر | كود المقرر | من | إلى |
| 1 | Pharmacology –I | PO 502 | | |
| 2 | Pharmaceutical Microbiology and Antimicrobials | PM 502 | | |
| 3 | Parasitology & Virology | PM 503 | | |
| 4 | Pharmaceutical Dosage Forms-III | PT 506 | | |
| 5 | Phytochemistry-I | PG 504 | | |
| 6 | Community Pharmacy Practice | PP 501 | | |
| 7 | Pharmacology-II | PO 603 | | |
| 8 | Phytochemistry-II | PG 605 | | |
| 9 | Pharmaceutical Technology | PT 607 | | |
| 10 | Hospital Pharmacy | PP 602 | | |
| 11 | Biopharmaceutics and Pharmacokinetics | PT 608 | | |
| 12 | First Aid and Basic Life Support | MD 605 | | |



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بكالوريوس الصيدلة الإكلينيكية (فارم دي)
Pharm D-Clinical Pharmacy
Course Specification
Academic year: 2023/2024

| | |
|--|--|
| Course name: Pharmacology 1 (PO 502) | اسم المقرر : فارماكولوجي 1 |
| Academic Level: Level 3 | المستوى الأكاديمي : الثالث |
| Scientific department: Pharmacology & Toxicology | القسم العلمي : الادويه والسموم |
| Head of Department: Prof. Dr. Manar A. Nader | رئيس القسم : ا.د/ منار احمد نادر |
| Course Coordinator: Prof. Dr. Ghada M. Suddek | منسق المقرر : ا.د/ غادة محمد صديق |



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| University | Mansoura |
| Faculty | Pharmacy |
| Department offering the course | Pharmacology & Toxicology |
| Department supervising the course | Pharmacology & Toxicology |
| Program on which the course is given | Pharm D-Clinical Pharmacy Program |
| Academic Level | Level 3, First semester, 2023/2024 |
| Date of course specification approval | 18 th September 2023 |

A. Basic Information: Course data:

| | |
|---------------------------------------|---------------------------|
| Course Title | Pharmacology 1 |
| Course Code | PO 502 |
| Prerequisite | Basic Pharmacology |
| Teaching credit Hours: Lecture | 2 |
| : Practical | 1 |
| Total Credit Hours | 3 |

B. Professional Information:

1. Course Aims:

This course enables the students to:

1. Provide fundamental pharmacological knowledge of the principles of drug action and drug interaction.
2. Provide comprehensive coverage of the major drug groups affecting different body systems; autonomic nervous system, cardiovascular system and hem system and autacoids



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3.

2- Course k. elements:

Upon completing the course, the student will be able to dominate the following key elements

Domain 1- Fundamental Knowledge

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|---|
| 1.1.4 | 1.1.4.1 | List drugs' mechanism of action, therapeutic effects and evaluate their suitability, efficacy, and safety in individuals and populations |
| 1.1.10 | 1.1.10.1 | Identify the role of various Pharmacological agents in management of various disorder affecting autonomic, cardiovascular, heam systems and autacoids |

Domain 2: Professional and Ethical Practice

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 2.4.3 | 2.4.3.1 | Formulate pharmaceutical care plans for management of several disorders and drug-related problems with reference to their particulate health problems and special considerations. |
| 2.4.7 | 2.4.7.1 | Evaluate pharmacological and non-pharmacological systemic approaches designed for management of life threatening disorders affecting on various body organs and patients with special consideration to their particular health issues. |



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Domain 3: Pharmaceutical Care

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 3.1.1 | 3.1.1.1 | Adjust a dosage routine for a patient based on the physiological, genetic, and immunological changes brought about by disease or concomitant drug use. |
| 3.1.4 | 3.1.4.1 | Utilize etiology, epidemiology, pathogenesis, laboratory diagnosis, and clinical features to suggest the proper preventive strategies for various infections/diseases and disorders affecting various body disorders and various patients. |
| 3.2.1 | 3.2.1.1 | Monitor principles of pharmacological aspects of drugs, as mode of action, therapeutic uses, proper dosage, unwanted effects and drug interactions. |

Domain 4: Personal Practice:

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|---|
| 4.1.1 | 4.1.1.1 | Demonstrate decision-making activities with other pharmacy team members and non-pharmacy team members and apply effective time management skills. |
| 4.2.1 | 4.2.1.1 | Present clear language, pace, tone and non-verbal communication and writing skills when dealing with patients, other health team and communities. |



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3- Course Contents:

| Week No. | Topics | Lecture credit Hours |
|----------|---|------------------------|
| 1 | Pharmacology of autonomic nervous system (Parasympathomimetic) | 2 |
| 2 | Pharmacology of autonomic nervous system (Parasympatholytic) | 2 |
| 3 | Pharmacology of autonomic nervous system (Sympathomimetic) | 2 |
| 4 | Pharmacology of autonomic nervous system (Sympatholytic) | 2 |
| 5 | Pharmacology of cardiovascular system (diuretics/ Antihypertensive drugs) | 2 |
| 6 | Pharmacology of cardiovascular system (Antihypertensive drugs) | 2 |
| 7 | Pharmacology of cardiovascular system (drugs for heart failure) | 2 |
| 8 | Pharmacology of cardiovascular system (antianginal drugs) | 2 |
| 9 | Pharmacology of cardiovascular system (antiarrhythmic) | 2 |
| 10 | Pharmacology of hematological system (Antiplatelet, anticoagulant & thrombolytic) | 2 |
| 11 | Autacoids | 2 |
| 12 | Anti-hyperlipidemia | 2 |
| 13 | Treatment of anemia | 2 |
| 14 | Revision and quiz | 2 |
| 15 | Final written and oral exam | - |
| Week No. | Practical Topics | Practical credit hours |
| 1. | Autonomic drug affecting the Eye | 1 |
| 2. | Glaucoma | 1 |



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| 3. | Drugs acting on smooth muscles of the intestine | 1 |
| 4. | Action of neuromuscular blockers on isolated frog rectus Abdominus | 1 |
| 5. | Effect of Autacoid drugs on Cardiovascular System (Heart rate and Blood pressure) | 1 |
| 6. | Drugs Acting On Rat Cardiovascular System | 1 |
| 7. | Atrial filtration | 1 |
| 8. | Midterm exam | - |
| 9. | Electrocardiogram (ECG or EKG) | 1 |
| 10. | Hypertension clinical cases | 1 |
| 11. | Heart failure clinical cases | 1 |
| 12 | Angina pectoris clinical cases | 1 |
| 13 | Acute coronary syndrome clinical cases | 1 |
| 14 | Practical exam applying OSPE | 1 |

4- Teaching and Learning Methods:

| | Teaching and Learning Methods | Week number | K. elements to be addressed |
|-----|--|--|---|
| 4.1 | Advanced lectures: <ul style="list-style-type: none"> Lectures using Data show, power Point presentations | 1-14 | 1.1.4.1, 1.1.10.1 |
| 4.2 | Lectures using white board | 6-13 | 1.1.4.1, 1.1.10.1 |
| 4.3 | Hybrid learning <ul style="list-style-type: none"> On line learning through my mans "Mansoura university " Interactive discussion through My Mans | 2,4,7(theoretical) 1, 6 (practical) | 1.1.4.1, 1.1.10.1 |
| 4.4 | Self-learning | 7,11,13 | 4.1.1.1, 4.2.1.1 |
| 4.5 | Practical session through tutorials | 1-14 | 2.4.3.1, 2.4.7.1, 3.1.1.1, 3.2.1.1 |
| 4.6 | Collaborative learning: role play and research project | 2-8 | 2.4.3.1, 2.4.7.1, 3.1.1.1, 3.2.1.1 |
| 4.7 | Case study | 4,7,8,9,11,12 | 2.4.3.1, 2.4.7.1, 3.1.1.1, 3.2.1.1 |
| 4.8 | Formative assignments | 2-11,13 | 2.4.3.1, 2.4.7.1, 3.1.1.1, 3.2.1.1 |
| 4.9 | Class Activity, brain storming, group discussion | 4,6,9,10 | 2.4.3.1, 2.4.7.1, 3.1.1.1, 3.2.1.1 |



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5- Student Assessment:

a- Assessment Methods:

| Assessment Methods | K elements to be assessed |
|---|--|
| 1-Written exam | 1.4.4.1, 1.1.10.1, 2.4.3.1, 2.4.7.1, 3.1.1.1, 3.1.4.1, 3.2.1.1 |
| 2-Practical exam | 1.4.4.1, 1.1.10.1, 2.4.3.1, 2.4.7.1, 3.1.1.1, 3.1.4.1, 3.2.1.1, 4.1.1.1, 4.2.1.1 |
| 3-Oral | 1.4.4.1, 1.1.10.1, 2.4.3.1, 2.4.7.1, 3.1.1.1, 3.1.4.1, 3.2.1.1, 4.1.1.1, 4.2.1.1 |
| 4- Periodical (Mid-term exam) / Course work | 1.4.4.1, 1.1.10.1, 2.4.3.1, 2.4.7.1 |

b. Assessment schedule

| | | |
|--------------|--|--|
| Assessment 1 | Periodical (Mid-term exam) / Course work | 7 th - 9 th week |
| Assessment 2 | Practical examination | 14th week |
| Assessment 3 | Written exam | Start from 15 th week |
| Assessment 4 | Oral exam | Start from 15 th week |

c. Weighing of assessments

| | | |
|-------|--|------|
| 1 | Periodical (Mid-term) exam / Course work | 15% |
| 2 | Practical examination and tutorial | 25% |
| 3 | Final-term examination | 50% |
| 4 | Oral examination | 10% |
| Total | | 100% |

6- Facilities required for teaching and learning

| | |
|------------------------------|---|
| Classroom | Data show- Computers, sound system-Internet, Platform |
| Laboratory facilities | Data show- Computers, Internet, Platform |
| Library | Books |



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7. List of References

| No | Reference | Type |
|----|--|--------------------|
| 1. | Electronic book prepared by staff members | Course notes |
| 2. | Recorded videos prepared by staff members | Videos on platform |
| 3. | Katzung, B. G., Kruidering-Hall, M., & Trevor, A. J. (2021). Katzung & Trevor's pharmacology: Examination & board review (13th edition). | Book |
| 4. | Brunton L., Chabner B. A., Bjorn Knollman B.A. (2021): Goodman and Gilman's the pharmacological basis of therapeutics (14 th edition). | Book |
| 5. | https://www.ncbi.nlm.nih.gov/books/NBK482426/ https://www.ekb.eg | websites |

| | | | | | | | | | | | | |
|---|---|---|--|---|---|--|---|---|---|--|---|---|
| Pharmacology of cardiovascular system (drugs for heart failure) | √ | √ | | √ | √ | | √ | √ | √ | | √ | √ |
| Pharmacology of cardiovascular system (antianginal drugs) | √ | √ | | √ | √ | | √ | √ | √ | | √ | √ |
| Pharmacology of cardiovascular system (antiarrhythmic) | √ | √ | | √ | √ | | √ | √ | √ | | √ | √ |
| Pharmacology of hematological system (Antiplatelet, anticoagulant & thrombolytic) | √ | √ | | √ | √ | | √ | √ | √ | | √ | √ |
| Autacoids | √ | √ | | √ | √ | | √ | | √ | | √ | √ |
| Anti-hyperlipidemia | √ | √ | | √ | √ | | √ | | √ | | √ | √ |
| Treatment of anemia | √ | √ | | √ | √ | | √ | | √ | | √ | √ |
| Practical topics | | | | | | | | | | | | |
| Autonomic drug affecting the Eye | | √ | | √ | √ | | | √ | | | | |
| Glaucoma | | √ | | √ | √ | | √ | √ | | | √ | √ |
| Drugs acting on smooth muscles of the intestine | | √ | | | √ | | | √ | | | | |
| Action of neuromuscular blockers on isolated frog rectus Abdominus | | √ | | √ | √ | | √ | √ | | | √ | √ |

| | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|
| Effect of Autacoid drugs on Cardiovascular System (Heart rate and Blood pressure) | | √ | | √ | √ | | √ | √ | √ | | √ | √ |
| Drugs Acting On Rat Cardiovascular System | | √ | | √ | √ | | | √ | √ | | √ | √ |
| Atrial filtration | | √ | | √ | √ | | | √ | √ | | √ | √ |
| Electrocardiogram (ECG or EKG) | √ | | √ | √ | | √ | √ | √ | | √ | √ | √ |
| Hypertension clinical cases | √ | | √ | √ | | √ | √ | √ | | √ | √ | √ |
| Heart failure clinical cases | √ | | √ | √ | | | √ | | | √ | √ | √ |
| Angina pectoris clinical cases | √ | | √ | √ | | | √ | | | | | √ |
| Acute coronary syndrome clinical cases | √ | | √ | √ | | | √ | | | √ | | √ |



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Matrix 2. Between course contents, learning methods and assessment

| A) Theoretical Part: | | | | | | | | | | | | |
|---|-------------------------------|---------------------------|---------------|--|-----------------------------------|------------|-----------------------|----------------------------|----------------------------|-----------------|---------|------|
| Course Contents | Teaching and Learning Methods | | | | | | | Assessment methods | | | | |
| | Advanced lecture | Lectures using whiteboard | Self-learning | Hybrid learning learning: Research Project | Collaborative learning: Role play | Case study | Formative Assignments | Course Work (presentation) | Course Work mid-term Exam) | Practical/sheet | Written | Oral |
| Pharmacology of autonomic nervous system (Parasympathomimetic) | ✓ | | | | | | | ✓ | ✓ | | ✓ | ✓ |
| Pharmacology of autonomic nervous system (Parasympatholytic) | ✓ | | | ✓ | | | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Pharmacology of autonomic nervous system (Sympathomimetic) | ✓ | | | | | | | ✓ | ✓ | | ✓ | ✓ |
| Pharmacology of autonomic nervous system (Sympatholytic) | ✓ | | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ |
| Pharmacology of cardiovascular system (diuretics/ Antihypertensive drugs) | ✓ | | | | | | ✓ | ✓ | | | ✓ | ✓ |
| Pharmacology of cardiovascular system Antihypertensive drugs) | ✓ | ✓ | | | ✓ | | | ✓ | | | ✓ | ✓ |



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| | | | | | | | | | | | |
|---|---|---|---|---|--|---|---|---|--|---|---|
| Pharmacology of cardiovascular system (drugs for heart failure) | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ |
| Pharmacology of cardiovascular system (antianginal drugs) | ✓ | ✓ | | | | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Pharmacology of cardiovascular system (antiarrhythmic) | ✓ | ✓ | | | | ✓ | | ✓ | | ✓ | ✓ |
| Pharmacology of hematological system (Antiplatelet, anticoagulant & thrombolytic) | ✓ | ✓ | | | | | | ✓ | | ✓ | ✓ |
| Autacoids | ✓ | ✓ | | | | | ✓ | | | ✓ | ✓ |
| Anti-hyperlipidemia | ✓ | | | | | ✓ | | | | ✓ | ✓ |
| Treatment of anemia | ✓ | ✓ | ✓ | | | | ✓ | | | ✓ | ✓ |

B) Practical Part:

| Course Contents | Teaching and Learning Methods | | | | | | | | Assessment methods | | |
|---|---------------------------------|--------------------|---------------|--|-----------------------------------|------------|--|-----------------------|--------------------|-------|----------------|
| | Practical Training / Laboratory | Seminar / Workshop | Self-learning | Tutorial / Interactive Sessions learning: Research Project | Collaborative learning: Role play | Case study | Class Activity Discussion / Brain storming | Formative Assignments | Course Work | Sheet | Practical exam |
| Autonomic drug affecting the Eye | ✓ | ✓ | | ✓ | | | | | ✓ | ✓ | ✓ |
| Glaucoma | ✓ | ✓ | | | ✓ | | | ✓ | ✓ | ✓ | |
| Drugs acting on smooth muscles of the intestine | ✓ | ✓ | | | | | | ✓ | ✓ | ✓ | ✓ |



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|---|---|---|---|---|---|---|---|---|---|---|---|
| Action of neuromuscular blockers on isolated frog rectus Abdominus | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Effect of Autacoid drugs on Cardiovascular System (Heart rate and Blood pressure) | ✓ | ✓ | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| Drugs Acting On Rat Cardiovascular System | ✓ | ✓ | | ✓ | | | ✓ | | ✓ | ✓ | ✓ |
| Atrial filtration | ✓ | ✓ | | ✓ | | | ✓ | | ✓ | ✓ | ✓ |
| Electrocardiogram (ECG or EKG) | ✓ | ✓ | ✓ | | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Hypertension clinical cases | ✓ | ✓ | | | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| Heart failure clinical cases | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | |
| Angina pectoris clinical cases | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | |
| Acute coronary syndrome clinical cases | ✓ | ✓ | ✓ | | | ✓ | | ✓ | ✓ | ✓ | |

Course Coordinator

Prof. Dr. Ghada M Suddek

Head of Department

Prof. Dr. Manar A Nader

Date: 18/9/ 2023



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Pharm D-Clinical Pharmacy
Course Specification
Academic year: 2023/2024

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| Course name: Pharmaceutical Microbiology and Antimicrobials | اسم المقرر: ميكروبيولوجيا صيدلانية ومضادات الميكروبات |
| Academic Level: level 3 | الأكاديمي : الثالث المستوى |
| Scientific department: Microbiology and Immunology | القسم العلمي : الميكروبيولوجي والمناعة |
| Head of Department: Prof. Dr. El-Sayed El-Sherbeny Habib | أ.د/ السيد الشربيني حبيب |
| Course Coordinator: Prof. Dr. El-Sayed El-Sherbeny Habib | منسق المقرر : أ. د السيد الشربيني حبيب |



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Course specification
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| University | Mansoura |
| Faculty | Pharmacy |
| Department offering the course | Microbiology and Immunology |
| Program on which the course is given | B. Pharm. (Clinical Pharmacy) (PharmD) |
| Academic Level | Third level, First semester, 2023/2024 |
| Date of course specification approval | 10/9/2023 |

A- Basic Information: Course data:

| | |
|--------------------------------|--|
| Course Title | Pharmaceutical Microbiology and Antimicrobials |
| Course Code | PM 502 |
| Prerequisite | General Microbiology & Immunology |
| Teaching Credit Hours: Lecture | 2 |
| Practical | 1 |
| Total Credit Hours | 3 |

B-Professional Information:

1- Course Aims:

Upon completion of the course, the student will be able to:

- Demonstrating different methods of sterilization
- Recognize different sources of microbial contamination
- Identifying different methods used for preserving pharmaceutical dosage forms
- Understanding mechanism of action, therapeutic uses, contraindications, adverse drug reactions of antimicrobial agents.
- Understanding the nature of activity of antimicrobials either single or in combination.



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2- Course key elements

Upon completing the course, the student will be able to dominate the following key elements

DOMAIN 1- FUNDAMENTAL KNOWLEDGE

| Program k elements no. | Course k elements no. | Course k. elements |
|------------------------|-----------------------|---|
| (1.1.1) | (1.1.1.1) | Outline the different chemical and physical methods used to control microbial contamination |
| (1.1.2) | (1.1.2.1) | Define different terms related to sterilization technique |
| | (1.1.2.2) | Define different terms related to antimicrobial agents |
| (1.1.3) | (1.1.3.1) | Discuss the principles of source of contamination, control of microbial contamination, sanitation, disinfection, and microbiological QC of pharmaceutical products. |
| (1.1.4) | (1.1.4.1) | Classify the antimicrobials including mechanism of action, therapeutic uses, contraindications, adverse drug reactions and drug interactions. |
| | (1.1.4.2) | Recognize the different methods used for the evaluation of antimicrobial efficacy and factors affecting it |

DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE

| Program K. element no. | Course K. element no. | Course K. elements |
|------------------------|-----------------------|---|
| (2.2.2) | (2.2.2.1) | Decide the most suitable sterilization method to be used for each particular pharmaceutical preparation |
| | (2.2.2.2) | Apply good laboratory practice (GLP), good manufacturing practice (GMP) |
| (2.2.4) | (2.2.4.1) | Implement different quality control and quality assurance measures for the control of microbial contamination |
| (2.3.2) | (2.3.2.1) | Utilize legal and ethical guidelines to ensure the correct and safe supply of medical products to the general public. |



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DOMAIN 3: PHARMACEUTICAL CARE

| Program K. element no. | Course K. element no. | Course K. elements |
|------------------------|-----------------------|---|
| (3.1.4) | (3.1.4.1) | Apply <i>in vitro</i> tests to evaluate the efficacy, the potency and the capacity of different antimicrobial agents |
| (3.2.5) | (3.2.5.1) | Apply the principles of economic treatment to support drug therapy with appropriate and cost effectiveness. |
| (3.2.6) | (3.2.6.1) | Develop a greater awareness for the consequences of ingesting prescription medicines and risk from environmental and biological threats to public safety. |
| (3.2.7) | (3.2.7.1) | Record the common adverse drug event and respond effectively to alleviate harm and prevent reoccurrence. |

DOMAIN 4: PERSONAL PRACTICE

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| (4.1.1) | (4.1.1.1) | Share decision-making activities with other team members and apply effective time management skills. |
| (4.2.1) | (4.2.1.1) | Communicate effectively in a scientific language to support patient, and health care regarding the studied topics. |
| (4.3.2) | (4.3.2.1) | Practice self-learning to improve professional skills |

3- Course Contents

| Week No. | Topics | Credit Hours |
|----------|--|--------------|
| 1 | Physical methods of sterilization | 2 |
| 2 | Chemical methods of sterilization | 2 |
| 3 | Quality control of sterilization+ Sterility test and aseptic technique+ Pyrogen test | 2 |
| 4 | Classifications of Antimicrobial agents & Inhibitors of cell wall synthesis | 2 |
| 5 | Inhibitors of protein synthesis | 2 |
| 6 | Inhibitors of nucleic acid synthesis | 2 |
| 7 | Mechanisms of antibiotic resistance in bacteria + Antibiotic combination | 2 |



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| 8 | Microbial contamination and preservation of pharmaceutical product+ Evaluation of preservative | 2 |
| 9 | Antifungal agents | 2 |
| 10 | Antiviral agents | 2 |
| 11 | Antiviral agents | |
| 12 | evaluation of antibiotics (Antibiotic sensitivity testing +Assay) | 2 |
| 13 | Evaluation of disinfectants and antiseptics +Pyrogen test | 2 |
| 14 | Revision and quiz | 2 |
| 15 | Final written and oral exam | - |
| Week No. | Practical topics | Credit hours |
| 1. | Methods of sterilization | 1 |
| 2. | Efficiency of sterilization methods and sterility test | 1 |
| 3. | Determination of Concentration exponent of disinfectants | 1 |
| 4. | Determination of MIC by microbroth dilution | 1 |
| 5. | Determination of MIC by broth dilution | 1 |
| 6. | Determination of MIC by agar diffusion | 1 |
| 7. | Determination of MIC by agar dilution | 1 |
| 8. | Midterm exam | - |
| 9. | Assay of antibiotics by agar diffusion method | 1 |
| 10. | Determination of antimicrobial susceptibility pattern by disc diffusion method | 1 |
| 11. | Antimicrobial combinations | 1 |
| 12. | Evaluation of antiviral drugs activity | 1 |
| 13. | Revision | 1 |
| 14. | Practical exam | 1 |

4- Teaching and Learning Methods:

| Teaching and Learning Method | | Week No. | K. elements to be addressed |
|------------------------------|---|----------|---|
| 5.1 | Computer aided learning: a. Lectures using Data show, PowerPoint presentations b. Distance learning <ul style="list-style-type: none"> On line learning through My mans "Mansoura university "as recorded – video lectures Inter active discussion through | 1-14 | 1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (1.1.4.1), (1.1.4.2), (2.2.2.1), (2.2.4.1), (2.3.2.1), |



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|-----|---|---------|--|
| 5.2 | Practical sessions using chemicals and laboratory equipment | 1-14 | (2.2.2.1), (2.2.4.1), (2.3.2.1), (3.2.5.1), (3.2.6.1), (3.2.7.1) |
| 5.3 | Self-learning | 9-11+13 | (3.2.5.1), (3.2.6.1), (3.2.7.1), (4.3.2.1) |
| 5.4 | Research assignments | 12 | (3.2.5.1), (3.2.6.1), (3.2.7.1), (4.3.2.1) |
| 5.5 | Class Activity: Group discussion offline and online | 1-13 | (3.2.5.1), (3.2.6.1), (3.2.7.1), (4.3.2.1) |

5- Student Assessment:

b- Assessment Methods:

| | |
|---|---|
| 1- Periodical (Mid-term exam) / Course work | (1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (1.1.4.1), (1.1.4.2), (2.2.2.1), (2.2.4.1), (2.3.2.1), (3.2.5.1), (3.2.6.1), (3.2.7.1), (4.3.2.1) |
| 2-Practical exam applying OSPE | (1.1.1.1), (1.1.4.2), (2.2.2.1), (2.2.2.2), (2.2.4.1), (3.1.4.1) |
| 3-Written exam | (1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (1.1.4.1), (1.1.4.2), (2.2.2.1), (2.2.4.1), (2.3.2.1), (3.2.5.1), (3.2.6.1), (4.1.1.1), (4.2.1.1) (4.3.2.1) |
| 4-Oral | (1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (1.1.4.1), (1.1.4.2), (2.2.2.1), (2.2.4.1), (3.2.7.1) |

c- Assessment schedule

| | | |
|--------------|--|---------------------------------------|
| Assessment 1 | Periodical (Mid-term exam) / Course work | 7 th -9 th week |
| Assessment 2 | Practical | 14 th week |
| Assessment 3 | Written | Starting from 15 th week |
| Assessment 4 | Oral | Starting from 15 th week |



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d- Weighing of assessments

| | | |
|-------|--|------|
| 1 | Periodical (Mid-term exam)/Course work | 15% |
| 2 | Practical examination | 25% |
| 3 | Final-term examination | 50% |
| 4 | Oral examination | 10% |
| Total | | 100% |

6- Facilities required for teaching and learning

| | |
|-----------------------|--|
| Classroom | Data show- Computers, whiteboard, Internet, Platform |
| Laboratory facilities | Laboratory equipment, whiteboard, tools and glasswares |
| Library | Books |



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7- List of References

| No | Reference | Type |
|----|---|--------------------|
| 1. | Electronic book prepared by staff members | Course notes |
| 2. | Recorded videos prepared by staff members | Videos on platform |
| 3. | Cynthia Nau Cornelissen; Bruce D Fisher.; Richard A Harvey. Lippincott's Illustrated Reviews of Microbiology, 3rd Edition, 2013. Philadelphia : Lippincott Williams & Wilkins, 2013 | Book |
| 4. | Denyer, S. P., & Hugo, W. B. (2011). Hugo and Russell's pharmaceutical microbiology (8th ed.). Wiley-Blackwell. | Essential Book |
| 5. | Kar, A. (2008). Pharmaceutical microbiology. New Age International (P) Ltd., Publishers. | Essential Book |
| 6. | http://www.sciencedirect.com / http://www.google scholar.com / http://www.pubmed.com / https://www.ekb.eg | Websites |



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8- Matrix:

Matrix 1. Course contents and course keyelements

A) Theoretical part:

| Course contents | Domain : 1 | | | | | | Domain 2 | | | | Domain 3 | | | | Domain: 4 | | |
|---|------------|---------|---------|---------|---------|---------|----------|---------|---------|---------|----------|---------|---------|---------|-----------|---------|---------|
| | 1.1.1.1 | 1.1.2.1 | 1.1.2.2 | 1.1.3.1 | 1.1.4.1 | 1.1.4.2 | 2.2.2.1 | 2.2.2.2 | 2.2.4.1 | 2.3.2.1 | 3.2.5.1 | 3.2.6.1 | 3.1.4.1 | 3.2.7.1 | 4.1.1.1 | 4.2.1.1 | 4.3.2.1 |
| Physical methods of sterilization | √ | √ | | | | | √ | | | | | | | | | | |
| Chemical methods of sterilization | √ | √ | | | | | √ | | | | | | | | | | |
| Quality control of sterilization+ Sterility test and aseptic technique | √ | √ | | √ | | √ | √ | √ | √ | | | | √ | | √ | | √ |
| Classifications of Antimicrobial agents & Inhibitors of cell wall synthesis | | | √ | | √ | | | | | √ | √ | √ | | √ | | √ | |



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| | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|--|---|--|---|---|
| Inhibitors of protein synthesis | | | √ | | √ | | | | | √ | √ | √ | | √ | | √ | |
| Inhibitors of nucleic acid synthesis | | | √ | | √ | | | | | √ | √ | √ | | √ | | √ | |
| Mechanisms of antibiotic resistance in bacteria + Antibiotic combination | | | | | √ | | | | | √ | √ | √ | | √ | | √ | |
| Microbial contamination and preservation of pharmaceutical product+ Evaluation of preservative | √ | √ | | √ | | √ | √ | √ | √ | | | | | | | | √ |
| Antifungal agents | | | √ | | √ | | | | | √ | √ | √ | | √ | | √ | |
| Antiviral agents | | | √ | | √ | | | | | √ | √ | √ | | √ | | √ | |



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| | | | | | | | | | | | | | | | | | |
|---|--|--|---|---|---|---|--|---|---|---|---|---|---|---|---|---|---|
| Antiviral agents | | | √ | | √ | | | | | √ | √ | √ | | √ | | √ | |
| evaluation of antibiotics (Antibiotic sensitivity testing +Assay) | | | √ | | | √ | | | | | | √ | √ | | √ | √ | |
| Evaluation of disinfectants and antiseptics +Pyrogen test | | | | √ | | √ | | √ | √ | | | | √ | | | | √ |



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B) Practical part:

| Course contents | Domain : 1 | | | | | | Domain 2 | | | | Domain 3 | | | | Domain: 4 | | |
|--|------------|---------|---------|---------|---------|---------|----------|---------|---------|---------|----------|---------|---------|---------|-----------|---------|---------|
| | 1.1.1.1 | 1.1.2.1 | 1.1.2.2 | 1.1.3.1 | 1.1.4.1 | 1.1.4.2 | 2.2.2.1 | 2.2.2.2 | 2.2.4.1 | 2.3.2.1 | 3.2.5.1 | 3.2.6.1 | 3.1.4.1 | 3.2.7.1 | 4.1.1.1 | 4.2.1.1 | 4.3.2.1 |
| Methods of sterilization | √ | √ | | | | | √ | √ | | | | | | | √ | √ | |
| Efficiency of sterilization methods and sterility test | | √ | | √ | | | | √ | √ | √ | | | | | √ | √ | |
| Determination of Concentration exponent of disinfectants | | √ | | √ | | | | √ | √ | | | | | | √ | | √ |
| Determination of MIC by microbroth dilution | | | √ | | | √ | | | | √ | | | √ | √ | √ | √ | |
| Determination of MIC by broth dilution | | | √ | | | √ | | | | √ | | | √ | √ | √ | √ | |
| Determination of MIC by agar diffusion | | | √ | | | √ | | | | √ | | | √ | √ | √ | √ | |
| Determination of MIC by agar dilution | | | √ | | | √ | | | | √ | | | √ | √ | √ | √ | |
| Antibiotic assay by agar diffusion method | | | √ | | | √ | | | | √ | | | √ | √ | √ | √ | |
| Determination of antimicrobial susceptibility pattern by disc diffusion method | | | √ | | | √ | | | | √ | | | √ | √ | √ | √ | |



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| | | | | | | | | | | | | | | | | | |
|----------------------------|---|---|---|---|--|---|---|---|---|---|---|---|---|--|---|---|--|
| Antimicrobial combinations | | | √ | | | √ | | | | √ | √ | √ | √ | | √ | √ | |
| Assay of Antiviral agents | | | √ | | | √ | | | | √ | | | √ | | √ | √ | |
| Revision | √ | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ | |



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Matrix 2. Between course contents, methods of learning, and assessment

A) Theoretical part:

| Course Contents | Teaching and Learning methods | | | | | Assessment methods | | | |
|--|-------------------------------|-----------------|----------------|----------------------|---------------|--------------------|---------------------|---------|------|
| | Lecture | Hybrid learning | Class activity | Research assignments | Self-learning | Course Work | Practical/ Tutorial | Written | Oral |
| Physical methods of sterilization | √ | √ | √ | | | √ | | √ | √ |
| Chemical methods of sterilization | √ | √ | √ | | | √ | | √ | √ |
| Quality control of sterilization+ Sterility test and aseptic technique | √ | √ | √ | | | √ | | √ | √ |
| Classifications of Antimicrobial agents & Inhibitors of cell wall synthesis | √ | √ | √ | | | √ | | √ | √ |
| Inhibitors of protein synthesis | √ | √ | √ | | | | | √ | √ |
| Inhibitors of nucleic acid synthesis | √ | √ | √ | | | | | √ | √ |
| Mechanisms of antibiotic resistance in bacteria + Antibiotic combination | √ | √ | √ | | | | | √ | √ |
| Microbial contamination and preservation of pharmaceutical product+ Evaluation of preservative | √ | √ | √ | | | | | √ | √ |
| Antifungal agents | √ | | √ | | | | | √ | √ |
| Antiviral agents | √ | | √ | | | | | √ | √ |
| Antiviral agents | √ | | √ | | | | | √ | √ |
| evaluation of antibiotics (Antibiotic sensitivity testing +Assay) | √ | | √ | √ | | | | √ | √ |
| Evaluation of disinfectants and antiseptics +Pyrogen test | √ | | √ | | √ | | | √ | √ |



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| | | | | | | | | |
|--|---|---|---|--|--|---|--|---|
| Methods of sterilization | √ | √ | √ | | | √ | | √ |
| Efficiency of sterilization methods and sterility test | √ | √ | √ | | | √ | | √ |
| Determination of Concentration exponent of disinfectants | √ | √ | √ | | | √ | | √ |
| Determination of MIC by microbroth dilution | √ | √ | √ | | | √ | | √ |
| Determination of MIC by broth dilution | √ | √ | √ | | | √ | | √ |
| Determination of MIC by agar diffusion | √ | √ | √ | | | √ | | √ |
| Determination of MIC by agar dilution | √ | √ | √ | | | √ | | √ |
| Antibiotic assay by agar diffusion method | √ | √ | √ | | | √ | | √ |
| Determination of antimicrobial susceptibility pattern by disc diffusion method | √ | √ | √ | | | √ | | √ |
| Antimicrobial combinations | √ | √ | √ | | | √ | | √ |
| Assay of Antiviral agents | √ | √ | √ | | | √ | | √ |



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| | |
|---------------------------|---|
| Course Coordinator | Prof. Dr. El-Sayed E. Habib |
| |  |
| Head of Department | Prof. Dr. El-Sayed E. Habib |
| |  |

Date: 10 /9/2023



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بكالوريوس الصيدلة الإكلينيكية (فارم دي – Pharm D)
Course Specification
Academic year: 2023/2024

| | |
|--|--|
| Course name: Parasitology and Virology | اسم المقرر : الطفيليات و الفيروسات |
| Academic Level: level 3 | الثالث المستوى الأكاديمي : |
| Scientific department: Microbiology and Immunology | القسم العلمي : الميكروبيولوجي و المناعة |
| Head of Department: Prof. Dr. El-Sayed El-Sherbiny Habib | رئيس القسم : أ.د/السيد الشربيني حبيب |
| Course Coordinator: Prof. Dr. El-Sayed El-Sherbiny Habib | منسق المقرر:أ.د. السيد الشربيني حبيب. |



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| | |
|--|---|
| University | Mansoura |
| Faculty | Pharmacy |
| Department offering the course | Microbiology and Immunology |
| Department supervising the course | Microbiology and Immunology |
| Program on which the course is given | B. Pharm. (PharmD) (Clinical Pharmacy) |
| Academic Level | Third Level, First semester, 2023-2024 |
| Date of course specification approval | 10/9/2023 |

A. Basic Information: Course data:

| | |
|---------------------------------------|----------------------------------|
| Course Title | Parasitology and Virology |
| Course Code | PM 503 |
| Prerequisite | ---- |
| Teaching credit Hours: Lecture | 2 |
| : Practical | 1 |
| Total Credit Hours | 3 |

B. Professional Information:

1 . Course Aims:

1. To provide students with knowledge concerning biological, epidemiological and ecological aspects of parasites causing diseases to humans.
2. To enable students to understand the pathogenesis, clinical presentations and complications of parasitic and viral diseases.



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3. To enable students to reach diagnosis and know the general outline of treatment, prevention and control of parasitic and viral infections

2- Course k. elements:

Upon completing the course, the student will be able to dominate the following key elements

Domain 1- Fundamental Knowledge

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 1.1.1 | 1.1.1.1 | Classify parasites and viruses of medical importance in its broad scientific taxonomic positions. |
| 1.1.2 | 1.1.2.1 | Define terms related to medical parasitology and virology. |
| 1.1.5 | 1.1.5.1 | Describe and discuss the common parasitic diseases caused by helminthes and protozoa as regards infective stage, mode infection and life cycle of parasites of medical importance. |
| | 1.1.5.2 | Identify and describe pathogenesis, clinical pictures, complications of viral diseases |
| 1.1.6 | 1.1.6.1 | Outline principle of treatment and prevention and control of common parasitic and viral diseases |
| 1.1.7 | 1.1.7.1 | Recognize the scientific basis of the conventional and up-to-date diagnostic procedures needed to carry out accurate diagnosis of common parasitic and viral diseases with emphasis on their prioritization in management plans. |

Domain 2: Professional and Ethical Practice

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|---|
| 2.4.5 | 2.4.5.1 | Integrate the most important signs and symptoms of important parasitic and viral infections and the laboratory test findings into a meaningful diagnostic significance (using case study) |
| | 2.4.5.2 | Apply systemic thinking and personal judgment for differential diagnosis with prioritization of the common possibilities for each parasitic and viral infection. |



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Domain 3: Pharmaceutical care

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 3.1.4 | 3.1.4.1 | Record the common diseases caused by parasites and viruses of medical interest as regards etiology, pathogenesis, clinical features and methods of combat. |
| | 3.1.4.2 | Retrieve and analyze serological tests used for detection of viral antigens in clinical samples and analyze the results. |
| | 3.1.4.3 | Identify the diagnostic elements of different parasitic infections |

DOMAIN 4: PERSONAL PRACTICE

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|---|
| 4.1.1 | 4.1.1.1 | Share decision-making activities with other team members and apply effective time management skills. |
| 4.2.1 | 4.2.1.1 | Use clear language and communication when dealing with patients and other health team and communities |
| 4.3.2 | 4.3.2.1 | Practice self-learning to improve professional skills |

3- Course Contents

| Week No. | Topics | Lecture credit Hours |
|----------|--|----------------------|
| 1 | - Introduction and classification of parasites. - Intestinal protozoae - Entameba histolytica - Giardia lamblia | 2 |
| 2 | - Intestinal protozoae - Balantidium coli - Trichomonas vaginalis - Blood protozoae - Trypanosoma | 2 |
| 3 | - Blood protozoae - Leishmania - Plasmodium - Toxoplasma | 2 |
| 4 | - Trematoda - Fasciolae - Heterophyes heterophyes. | 2 |



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| | | |
|-----------------|---|-------------------------------|
| | - <i>Human schistosomiasis</i> | |
| 5 | Cestoda - <i>Taenia solium</i> - <i>Taenia saginata</i> - <i>Hymenolepis nana</i> - <i>Echinococcus granulosus</i> - <i>Echinococcus multilocularis</i> | 2 |
| 6 | - Nematoda - <i>Trichuris trichiura</i> - <i>Wuchereria bancrofti</i> - <i>Strongyloides stercoralis</i> - <i>Ascaris lumbricoides</i> | 2 |
| 7 | - Nematoda - <i>Enterobius vermicularis</i> - <i>Trichinella spiralis</i> - <i>Ancylostoma duodenale</i> | 2 |
| 8 | - Arthropoda - Class: Insecta - Class: Arachnida | 2 |
| 9 | Introduction and classification of viruses | 2 |
| 10 | - RNA viruses - Positive single strand RNA viruses | 2 |
| 11 | - RNA viruses - Negative single strand RNA viruses - Double-stranded Non-enveloped RNA Viruses | 2 |
| 12 | - DNA viruses - Non-Enveloped DNA viruses | 2 |
| 13 | - DNA viruses - Enveloped DNA Viruses | 2 |
| 14 | - Revision and quiz | 2 |
| 15 | - Start of Final written and oral exam | - |
| Week No. | Practical topics | Practical credit hours |
| 1 | -Laboratory diagnostic techniques - Slide examination and case study of Fasciolae | 1 |
| 2 | Slide examination and case study of: • <i>Heterophyes heterophyes</i> . • <i>Human schistosomiasis</i> | 1 |
| 3 | Slide examination and case study of: • <i>Ascaris lumbricoides</i> | 1 |



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| | | |
|----|--|---|
| | <ul style="list-style-type: none"> • <i>Enterobius vermicularis</i> | |
| 4 | Slide examination and case study of: <ul style="list-style-type: none"> • <i>Trichinella spiralis</i> • <i>Ancylostoma duodenale</i> | 1 |
| 5 | Slide examination and case study of: <ul style="list-style-type: none"> • <i>Trichuris trichiura</i> • <i>Wuchereria bancrofti</i> • <i>Strongyloides stercoralis</i> | 1 |
| 6 | Slide examination and case study of: <ul style="list-style-type: none"> • <i>Taeniae</i> • <i>Echinococcus granulosus</i> • <i>Hymenolepis nana</i> | 1 |
| 7 | Slide examination and case study of: <ul style="list-style-type: none"> • <i>Entamoeba coli</i> • <i>Giardia intestinalis</i> • <i>Balantidium coli</i> | 1 |
| 8 | Midterm exam | - |
| 9 | Slide examination and case study of: <ul style="list-style-type: none"> • <i>Trypanosomes gambiense</i> • <i>Plasmodium malariae</i> • <i>Toxoplasma gondii</i> | 1 |
| 10 | Lab methods of diagnosis of viral infections | 1 |
| 11 | Viral diseases | 1 |
| 12 | Arachnida: - <i>Sarcoptes scabiei</i> | 1 |
| 13 | Revision | 1 |
| 14 | Practical exam applying OSPE | 1 |

4- Teaching and Learning Methods:

| Teaching and Learning Method | | Week No. | K. elements to be addressed |
|------------------------------|---|----------|---|
| 5.1 | Advanced Lectures using Data show, PowerPoint presentations | 1-14 | (1.1.1.1), (1.1.2.1), (1.1.5.1), (1.1.5.2), (1.1.6.1), (1.1.7.1), (2.4.5.1), (2.4.5.2) |



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| | | | |
|-----|---|-------------------|---|
| 5.2 | Distance learning: a. On line learning through My mans "Mansoura university "as recorded – video lectures b. Inter active discussion through My Mans | 1-13 | (1.1.1.1), (1.1.2.1), (1.1.5.1), (1.1.5.2), (1.1.6.1), (1.1.7.1), (2.4.5.1), (2.4.5.2) |
| 5.3 | Practical sessions | 1-14 | (2.4.5.1), (2.4.5.2), (3.1.4.1), (3.1.4.2), (3.1.4.3) |
| 5.4 | Self-learning | 13 | (3.1.4.1), (3.1.4.2), (3.1.4.3), (4.1.2.1), (4.2.1.1) |
| 5.5 | Research assignments | 2,4,6,8, 10,12 | (3.1.4.1), (3.1.4.2), (3.1.4.3), (4.1.2.1), (4.2.1.1) |
| 5.6 | Collaborative learning: Role play | 2-11 | (4.1.2.1), (4.2.1.1) |
| 5.7 | Collaborative learning: Research project | 6 | (4.1.2.1), (4.2.1.1) |
| 5.8 | Case study | 1-8 | (3.1.4.1), (3.1.4.2), (3.1.4.3), (4.1.2.1), (4.2.1.1) |

5- Student Assessment:

e- Assessment Methods:

| | |
|---|---|
| 1- Periodical (Mid-term exam) / Course work | (1.1.1.1), (1.1.2.1), (1.1.5.1), (1.1.5.2), (1.1.6.1), (1.1.7.1), (2.4.5.1), (2.4.5.2), (3.1.4.1), (3.1.4.2). |
| 2-Practical exam applying OSPE | (1.1.5.1), (1.1.5.2), (1.1.6.1), (1.1.7.1), (2.5.2.1), (2.4.5.1), (2.4.5.2), (3.1.4.1), (3.1.4.2), (3.1.4.3), (4.1.2.1), (4.2.1.1) |
| 3-Written exam | (1.1.1.1), (1.1.2.1), (1.1.5.1), (1.1.5.2), (1.1.6.1), (1.1.7.1), (2.4.5.1), (2.4.5.2), (3.1.4.1), (3.1.4.2) |
| 4-Oral | (1.1.1.1), (1.1.2.1), (1.1.5.1), (1.1.5.2), (1.1.6.1), (1.1.7.1), (2.4.5.1), (2.4.5.2), (3.1.4.1), (3.1.4.2), (4.3.2.1) |

f- Assessment schedule

| | | |
|--------------|--|--|
| Assessment 1 | Periodical (Mid-term exam)/Course work | 7 th - 9 th week |
| Assessment 2 | Practical exam applying OSPE | 14 th week |
| Assessment 3 | Written | Starting from 15 th week |
| Assessment 4 | Oral | Starting from 15 th week |



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g- Weighing of assessments

| | | |
|-------|--|------|
| 1 | Periodical (Mid-term exam)/Course work | 15% |
| 2 | Practical examination & tutorial | 25% |
| 3 | Final-term examination | 50% |
| 4 | Oral examination | 10% |
| Total | | 100% |

6- Facilities required for teaching and learning

| | |
|-----------------------|---|
| Classroom | Data show- Computers, Internet, Platform |
| Laboratory facilities | Data show- Computers, Internet, Platform- tools for role play |
| Library | Books |



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7- List of References

| No | Reference | Type |
|----|---|---|
| 1. | Electronic book prepared by staff members | Book |
| 2. | Nagoba, B. S., & Pichare, A. (2020). Medical Microbiology and Parasitology PMFU 4th Edition-E-book. Elsevier Health Sciences. | eBook |
| 3. | Paniker, CK Jayaram, and Sougata Ghosh. Paniker's Textbook of Medical Parasitology. Seventh edition. New Delhi: Jaypee Brothers Medical Publishers, 2013. | Essential Book |
| 4. | Cornelissen, C. N., Fisher, B. D., Harvey, R. A., & Harvey, R. A. (2013). Lippincott's illustrated reviews: Microbiology. Philadelphia: Lippincott Williams & Wilkins. | Essential Book |
| 5. | Centers for Disease Control and Prevention | The national public health agency of the United States. |
| 6. | http://www.sciencedirect.com / http://www.google.com / http://www.pubmed.com WHO World Health Organization https://www.who.int https://www.ekb.eg | Websites |



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8- Matrix

Matrix 1. Course contents and course key elements

A) Theoretical part:

| Course contents / K. elements | Domain : 1 | | | | | | Domain 2 | | Domain 3 | | | Domain: 4 | | |
|--|------------|---------|---------|---------|---------|---------|----------|---------|----------|---------|---------|-----------|---------|---------|
| | 1.1.1.1 | 1.1.2.1 | 1.1.5.1 | 1.1.5.2 | 1.1.6.1 | 1.1.7.1 | 2.4.5.1 | 2.4.5.2 | 3.1.4.1 | 3.1.4.2 | 3.1.4.3 | 4.1.1.1 | 4.1.2.1 | 4.3.2.1 |
| - Introduction and classification of parasites. - Intestinal protozoae - <i>Entameba histolytica</i> - <i>Giardia lamblia</i> | √ | √ | √ | | √ | √ | √ | √ | √ | | √ | √ | | |
| - Intestinal protozoae - <i>Balantidium coli</i> - <i>Trichomonas vaginalis</i> - Blood protozoae Trypanosoma | | | √ | | √ | √ | √ | √ | √ | | √ | | √ | |
| - Blood protozoae - Leishmania - Plasmodium - Toxoplasma | | | √ | | √ | √ | √ | √ | √ | | √ | | | |
| - Trematoda - Fasciolae | | | √ | | √ | √ | √ | √ | √ | | √ | | | |



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**Course specification
2023- 2024**

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|--|---|---|---|--|---|---|--|---|
| <i>spiralis</i> - <i>Ancylostoma duodenale</i> | | | | | | | | | | | | | | | | | |
| - Arthropoda - Class: Insecta Class: Arachnida | | | √ | | √ | √ | √ | √ | | √ | | √ | | √ | | | |
| - Introduction and classification of viruses | √ | √ | | | | | √ | | | | | | | | | | |
| - RNA viruses Positive single strand RNA viruses | | | | √ | √ | √ | √ | √ | | √ | √ | | | √ | | | √ |
| - RNA viruses Negative single strand RNA viruses Double-stranded Non-enveloped RNA Viruses | | | | √ | √ | √ | √ | √ | | √ | √ | | | √ | | | √ |
| - DNA viruses Non-Enveloped DNA viruses | | | | √ | √ | √ | √ | √ | | √ | √ | | | | √ | | |
| - DNA viruses Enveloped DNA Viruses | | | | √ | √ | √ | √ | √ | | √ | √ | | | | √ | | |

B) Practical part:



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| Course contents / K. elements | Domain : 1 | | | | | | Domain 2 | | Domain 3 | | | Domain: 4 | | |
|--|------------|---------|---------|---------|---------|---------|----------|---------|----------|---------|---------|-----------|---------|---------|
| | 1.1.1.1 | 1.1.2.1 | 1.1.5.1 | 1.1.5.2 | 1.1.6.1 | 1.1.7.1 | 2.4.5.1 | 2.4.5.2 | 3.1.4.1 | 3.1.4.2 | 3.1.4.3 | 4.1.1.1 | 4.1.2.1 | 4.3.2.1 |
| -Laboratory diagnostic techniques - Slide examination and case study of Fasciolae | √ | √ | √ | | √ | √ | √ | √ | √ | | √ | | | |
| Slide examination and case study of: • <i>Heterophyes heterophyes.</i> • <i>Human schistosomiasis</i> | | | √ | | √ | √ | √ | √ | √ | | √ | | √ | |
| Slide examination and case study of: • <i>Ascaris lumbricoides</i> • <i>Enterobius vermicularis</i> | | | √ | | √ | √ | √ | √ | √ | | √ | | | |
| Slide examination and case study of: | | | √ | | √ | √ | √ | √ | √ | | √ | | | |



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| | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|--|---|---|--|---|---|---|---|---|
| Slide examination and case study of: | | | √ | | √ | √ | | √ | √ | | √ | | √ | | |
| • <i>Trypanosomes gambiense</i> | | | | | | | | | | | | | | | |
| • <i>Plasmodium malariae</i> | | | | | | | | | | | | | | | |
| • <i>Toxoplasma gondii</i> | | | | | | | | | | | | | | | |
| - Lab methods of diagnosis of viral infections | √ | √ | | √ | √ | √ | | √ | | | √ | | √ | √ | √ |
| Viral diseases | | | | √ | √ | √ | | √ | √ | | √ | √ | | √ | √ |
| Arachnida: - | √ | √ | √ | √ | √ | √ | | √ | √ | | √ | √ | √ | √ | √ |
| <i>Sarcoptes scabiei</i> | | | | | | | | | | | | | | | |
| Revision | √ | √ | √ | √ | √ | √ | | √ | √ | | √ | √ | √ | √ | √ |



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| Course Contents | Teaching and learning methods | | | | | | Assessment methods | | | | |
|---|-------------------------------|------------------|---------------|----------------------------------|----------|------------|-----------------------------------|-------------|-----------------|---------|------|
| | Lab sessions | On line learning | Self-learning | Collaborative learning: Research | Research | Case study | Collaborative learning: Role play | Course Work | Practical/sheet | Written | Oral |
| -Laboratory diagnostic techniques - Slide examination and case study of Fasciolae | ✓ | ✓ | | | | ✓ | | ✓ | ✓ | | |
| Slide examination and case study of: • <i>Heterophyes heterophyes</i> . - <i>Human schistosomiasis</i> | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Slide examination and case study of: • <i>Ascaris lumbricoides</i> <i>Enterobius vermicularis</i> | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | | |
| Slide examination and case study of: • <i>Trichinella spiralis</i> <i>Ancylostoma duodenale</i> | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Slide examination and case study of: • <i>Trichuris trichiura</i> • <i>Wuchereria bancrofti</i> <i>Strongyloides stercoralis</i> | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | | |



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| | | | | | | | | | | |
|---|---|---|--|--|---|---|---|---|---|--|
| Slide examination and case study of: • <i>Taeniae</i> • <i>Echinococcus granulosus</i> <i>Hymenolepis nana</i> | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | | |
| Slide examination and case study of: • <i>Entamoeba coli</i> • <i>Giardia intestinalis</i> <i>Balantidium coli</i> | ✓ | ✓ | | | | ✓ | ✓ | | ✓ | |
| Slide examination and case study of: • <i>Trypanosomes gambiense</i> • <i>Plasmodium malariae</i> <i>Toxoplasma gondii</i> | ✓ | ✓ | | | ✓ | ✓ | ✓ | | ✓ | |
| Lab methods of diagnosis of viral infections | ✓ | ✓ | | | | | ✓ | | ✓ | |
| Viral diseases | ✓ | ✓ | | | ✓ | | ✓ | | ✓ | |
| Arachnida: - <i>Sarcoptes scabiei</i> | ✓ | ✓ | | | | | ✓ | | ✓ | |
| Revision | ✓ | ✓ | | | | | ✓ | | ✓ | |

| | |
|---------------------------|---|
| Course coordinator | Prof. Dr. El-Sayed E. Habib  |
| Head of Department | Prof. Dr. El-Sayed E. Habib  |

Date: 10 / 9 / 2023



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بكالوريوس الصيدلة (فارم د – Pharm D)

Course Specification

Academic year: 2023/2024

| | |
|---|--|
| Course name: Pharmaceutical dosage forms III | اسم المقرر: مستحضرات صيدلانية 3 |
| Academic Level: Level 3 | المستوى الأكاديمي: الثالث |
| Scientific department: Pharmaceutics | القسم العلمي: الصيدلانيات |
| Head of Department: Prof. Dr. Irhan Ibrahim Abu Hashim | رئيس القسم: أ.د/ ارهان ابراهيم أبو هاشم |
| Course Coordinator: Assoc. Prof. Dr. Amira Motawea | منسق المقرر: أ.م.د/ أميرة محسن مطاوع |



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| | |
|--|---|
| University | Mansoura |
| Faculty | Pharmacy |
| Department offering the course | Pharmaceutics |
| Department supervising the course | |
| Program on which the course is given | Bachelor in Clinical Pharmacy - Pharm D by law |
| Academic Level | Third level, fifth semester, 2023-2024 |
| Date of course specification approval | 20 September 2023 |

A. Basic Information: Course data:

| | |
|--------------------------------|--|
| Course Title | Pharmaceutical dosage forms III |
| Course Code | PT 506 |
| Prerequisite | Physical pharmacy |
| Teaching Hours: Lecture | 2 |
| Practical | 1 |
| Total Credit Hours | 3 (Credit H) |

B. Professional Information:

1- Course Aims:

1. Differentiate a powder from a granule, explain how a drug's powder particle size affects the behavior of pharmaceutical dosage forms also to differentiate between the various types of tablet dosage forms, compare advantages and



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- disadvantages of the various types of tablet dosage forms. The student will be able to compare various suppositories dosage forms.
2. Understand the factors that affect the rate of chemical reactions and determine the rate of reaction at given time and concentration.
 3. Understand the form and meaning of a rate law including the ideas of reaction order and rate constant.
 4. Predict the rate law and rate constant for a reaction from a series of experiments given the measured rates for various concentrations of reactants.
 5. Use the integrated form of a rate law to determine the concentration of a reactant at a given time.
 6. Explain how the activation energy affects a rate and be able to use the Arrhenius Equation.



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2- Course k. elements:

Upon completing the course, the student will be able to dominate the following key elements

DOMAIN 1- FUNDAMENTAL KNOWLEDGE

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 1.1.1 | 1.1.1.1 | Demonstrate understanding of knowledge of solid pharmaceutical dosage forms. |
| 1.1.3 | 1.1.3.1 | Integrate to identify, prepare and assure quality of powder, granules, tablets and suppositories. |
| 1.1.9 | 1.1.9.1 | Perform pharmacokinetic calculations like determination of the rate of reaction at given time and concentration, reaction order and rate constant. |

DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 2.2.5 | 2.2.5.1 | Define the proper the factors that affect the rate of chemical reactions and determine the rate of reaction given time and concentration. |
| 2.2.4 | 2.2.4.1 | Adopt the principles of pharmaceutical calculations and pharmacokinetics using the integrated form of a rate law to determine the concentration of a reactant at a given time Explain how the activation energy affects a rate and be able to use the Arrhenius Equation. |



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DOMAIN 4: PERSONAL PRACTICE

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 4.2.1 | 4.2.1.1 | Use clear language, pace, tone and non-verbal communication and good writing skills. |
| 4.3.2 | 4.3.2.1 | Practice self-learning to improve professional skills. |

1- Course Contents:

A-Theoretical part

| Week No | Topics | No. of hours |
|---------|---|--------------|
| 1. | Introduction about kinetics of drug decomposition | 2 |
| 2. | Rate and orders of reaction | 2 |
| 3. | Determination of Half-life, Expiry date and Shelf-life by different methods | 2 |
| 4. | Stability testing methods | 2 |
| 5. | Stability Protocols and chambers | 2 |
| 6. | In vitro drug/excipients interactions | 2 |
| 7. | Degradation pathways | 2 |
| 8. | Formulation and manufacturing of powders | 2 |



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| 9. | Formulation and manufacturing of granules | 2 |
|--------------------------|--|--------------|
| 10. | Formulation and manufacturing of tablets New strategies in tablet manufacture (self learning) | 2 |
| 11. | Formulation and manufacturing of suppositories | 2 |
| 12. | Capsules (types- formulation) | 2 |
| 13. | Capsules (Quality control tests and applications) | 2 |
| 14. | Revision and quiz | 2 |
| 15. | Final written and oral exam | - |
| B. Practical Part | | |
| Week No. | Topics | Hours |
| 1 | Formulation and manufacturing of powders | 1 |
| 2 | Formulation and manufacturing of granules Effervescent | 1 |
| 3 | Formulation and manufacturing of granules non-effervescent | 1 |
| 4 | Formulation of tablets triturates | 1 |
| 5 | Formulation of prescribed tablets | 1 |
| 6 | Determination of Powder density (bulk & tapped) | 1 |



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| | | |
|-----------|---|---|
| 7 | Orders of reactions and determination the rate constant of a reaction | 1 |
| 8 | Midterm exam | - |
| 9 | Determination of activation energy (Arrhenius plot) | 1 |
| 10 | Determination of angle of repose (powder flowability) | 1 |
| 11 | Formulation of fatty base suppositories | 1 |
| 12 | Formulation of plain glycerogelatine suppositories | 1 |
| 13 | Formulation of medicated glycerogelatine suppositories | 1 |
| 14 | Practical exam | 1 |

4- Teaching and learning Methods:

| Teaching and learning Methods | | Weeks | K. elements to be addressed |
|--------------------------------------|--|---------------|---|
| 4.1 | Computer aided learning: a. Lectures using Data show, power Point presentations b. Distance learning <ul style="list-style-type: none"> • Online learning through my mans "Mansoura university" as recorded video lectures • Interactive discussion through My Mans. | Weeks 1-14 | 1.1.1.1, 1.1.3.1, 1.1.9.1, 2.2.5.1 |
| 4.2 | Practical session using chemicals and laboratory equipment | 1-14 | 2.2.4.1, 2.2.5.1 |
| 4.3 | Self-learning | 10 | 4.3.2.1/4.2.1.1 |
| 4.4 | Class Activity /Problem – based learning and brainstorming | 5-8 | 4.2.1.1 |
| 4.5 | Presentations | 10-12 | 4.3.2.1 |



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5- Student Assessment:

h- Assessment Methods:

| Assessment Methods | K. elements to be assessed |
|---|--|
| 1-Written exam | 1.1.1.1/1.1.3.1/1.1.9.1/ 2.2.5.1/2.2.4.1 |
| 2-Practical exam applying OSPE | 1.1.1.1/1.1.3.1/1.1.9.1/ 2.2.5.1/2.2.4.1/4.2.1.1/4.3.2.1 |
| 3-Oral | 1.1.1.1/1.1.3.1/1.1.9.1/4.2.1.1/4.3.2.1 |
| 4- Periodical (Mid-term exam) / Course work | 1.1.1.1/1.1.3.1/1.1.9.1/2.2.5.1/2.2.4.1/ 4.2.1.1/4.3.2.1 |

b. Assessment schedule

| | | |
|--------------|--|----------------------------------|
| Assessment 1 | Periodical (Mid-term exam) / Course work | 7-9 th week |
| Assessment 2 | Practical examination | 14 th week |
| Assessment 3 | Written exam | Start from 15 th week |
| Assessment 4 | Oral exam | Start from 15 th week |

c. Weighing of assessments

| | | |
|-------|--|------|
| 1 | Periodical (Mid-term) exam / Course work | 15% |
| 2 | Practical examination and tutorial | 25% |
| 3 | Final-term written examination | 50% |
| 4 | Oral examination | 10% |
| Total | | 100% |



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6-Facilities required for teaching and learning

| | |
|--------------------------------|---|
| -Class room | Data show, Computers, and Internet. |
| - Laboratory facilities | Water baths, glassware, chemicals, electronic balance. |

7- List of References

| No | Reference | Type |
|----|--|--------------------|
| 1. | Electronic book prepared by staff members | Course |
| 2. | Recorded videos prepared by staff members | Videos on platform |
| 3. | Drug Stability and Chemical Kinetics. Eds. Kanwal Rehman, Muhammad Sajid Hamid Akash. Second Edition. Publisher: SPRINGER VERLAG, SINGAPOR, [S.I.], 2021. ISBN:9789811564284, 9811564280 | Book |
| 4. | "Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems" 12th Ed., Loyd V. Allen, Timothy B. McPherson, Lippincott Williams and Wilkins, Philadelphia, Aug 16, 2021. | Book |
| 5. | Biopharmaceutics and Pharmacokinetics Considerations, Rakesh Kumar Tekade. Publisher: Elsevier Science, July 7, 2021. ISBN:9780128144268, 0128144262 | Book |
| 6. | Applied Physical Pharmacy, Third Edition. Eds. Michael Weitz and Peter J. Boyle, 2019. | Book |
| 7. | Drug Information: A Guide for Pharmacists, 7th Edition By Patrick M. Malone, Meghan J. Malone, Benjamin A. Witt, David M. Peterson. 2021 | Book |



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| | | |
|----|---|-----------------|
| 8. | <p>www.pharmacy.wsu.edu/courses/ http://www.fda.gov/downloads/RegulatoryInformation/Guidances/cm128204 http://www.sciencedirect.com / http://www.google scholar.com / http://www.pubmed.com https://www.ekb.eg</p> | Websites |
|----|---|-----------------|



8-Matrix of course content versus course k. elements:

Matrix 1. Course contents and course key elements

A) Theoretical part:

| Course contents | Course Key elements | | | | | | | |
|--|---------------------|---------|---------|----------|---------|--|----------|---------|
| | Domain 1 | | | Domain 2 | | | Domain 4 | |
| | 1.1.1.1 | 1.1.3.1 | 1.1.9.1 | 2.2.5.1 | 2.2.4.1 | | 4.2.1.1 | 4.3.2.1 |
| Introduction about kinetics of drug decomposition | | | √ | √ | √ | | | |
| Rate and orders of reaction | | | √ | √ | √ | | | |
| Determination of Half-life, Expiry date and Shelf-life by different methods | | | √ | √ | √ | | | |
| Stability testing methods | | | √ | √ | √ | | | |
| Stability Protocols and chambers | | | | √ | √ | | | |
| In vitro drug/excipients interactions | | | √ | √ | √ | | | |
| Degradation pathways | √ | √ | | | | | | |
| Formulation and manufacturing of powders | √ | √ | √ | √ | √ | | | |
| Formulation and manufacturing of granules | √ | √ | √ | √ | √ | | | |
| Formulation and manufacturing of tablets • New strategies in tablet manufacture (self-learning) | √ | √ | | | | | √ | √ |
| Formulation and manufacturing of suppositories | √ | √ | | | | | √ | √ |
| Capsules (types-formulation) | √ | √ | | | | | | |
| Capsules (Quality control tests and applications) | √ | √ | | | | | | |



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B) Practical part:

| Course contents | Course Key elements | | | | | | |
|---|---------------------|---------|---------|----------|---------|----------|---------|
| | Domain 1 | | | Domain 2 | | Domain 4 | |
| | 1.1.1.1 | 1.1.3.1 | 1.1.9.1 | 2.2.5.1 | 2.2.4.1 | 4.2.1.1 | 4.3.2.1 |
| Formulation and manufacturing of powders | √ | √ | | | | | |
| Formulation and manufacturing of granules Effervescent | √ | √ | | | | | |
| Formulation and manufacturing of granules non-effervescent | √ | √ | | | | | |
| Formulation of tablets triturates | √ | √ | | | | | |
| Formulation of prescribed tablets | √ | √ | | | | | |
| Determination of Powder density (bulk & tapped) | √ | √ | | | | | √ |
| Orders of reactions and determination the rate constant of a reaction | | | √ | √ | √ | | √ |
| Determination of activation energy (Arrhenius plot) | | | √ | √ | √ | | √ |
| Determination of angle of repose (powder flowability) | | | √ | √ | √ | | √ |
| Formulation of fatty base suppositories | √ | √ | | | | | |
| Formulation of plain glycerogelatine suppositories | √ | √ | | | | √ | |
| Formulation of medicated glycerogelatine suppositories | √ | √ | | | | √ | |



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Matrix 2. Between course contents, methods of learning, and assessment

A) Theoretical part:

| Course Contents | Teaching and Learning methods | | | | Assessment methods | | | |
|---|-------------------------------|----------------|----------------------|---------------|--------------------|----------------------|---------|------|
| | Advanced Lecture | Hybrid leaning | Comp. aided learning | Self-learning | Presentations | Course work(midterm) | Written | Oral |
| Introduction about kinetics of drug decomposition | √ | √ | √ | | | √ | √ | √ |
| Rate and orders of reaction | √ | √ | √ | | | √ | √ | √ |
| Determination of Half-life, Expiry date and Shelf-life by different methods | √ | √ | √ | | | √ | √ | √ |
| Stability testing methods | √ | √ | √ | | | √ | √ | √ |
| Stability Protocols and chambers | √ | √ | √ | | | | √ | √ |
| In vitro drug/excipients interactions | √ | √ | √ | | | | √ | √ |
| Degradation pathways | √ | √ | √ | | | | √ | √ |
| Formulation and manufacturing of powders | √ | √ | √ | | | | √ | √ |
| Formulation and manufacturing of granules | √ | √ | √ | | | | √ | √ |



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| | | | | | | | | |
|---|---|---|---|---|---|--|---|---|
| Formulation and manufacturing of tablets | √ | √ | √ | | √ | | √ | √ |
| New strategies in tablet manufacture (self learning) | | | | √ | | | | |
| Formulation and manufacturing of suppositories | √ | √ | √ | | | | √ | √ |
| Capsules (types- formulation) | √ | √ | √ | | | | √ | √ |
| Capsules (Quality control tests and applications) | √ | √ | √ | | | | √ | √ |



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B) Practical part:

| Course Contents | Teaching and Learning methods | | | | Assessment methods | |
|---|-------------------------------|-----------------|-----------------|--------------|--------------------|---------|
| | Lecture | Hybrid learning | Problem solving | Lab sessions | Practical | Written |
| Formulation and manufacturing of powders | | √ | | √ | √ | √ |
| Formulation and manufacturing of granules Effervescent | | √ | | √ | √ | √ |
| Formulation and manufacturing of granules non-effervescent | | √ | | √ | √ | √ |
| Formulation of tablets triturates | | √ | | √ | √ | |
| Formulation of prescribed tablets | | √ | | √ | √ | |
| Determination of Powder density (bulk & tapped) | | √ | √ | √ | √ | |
| Orders of reactions and determination the rate constant of a reaction | | √ | √ | √ | √ | √ |
| Determination of activation energy (Arrhenius plot) | | √ | √ | √ | √ | √ |



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| | | | | | | |
|--|--|---|---|---|---|--|
| Determination of angle of repose (powder flowability) | | √ | √ | √ | √ | |
| Formulation of fatty base suppositories | | √ | | √ | √ | |
| Formulation of plain glycerogelatine suppositories | | √ | | √ | √ | |
| Formulation of medicated glycerogelatine suppositories | | √ | | √ | √ | |

| | |
|---------------------------|---|
| Course Coordinator | Assoc. Prof. Dr. Amira Motawea |
| | |
| Head of Department | Prof. Dr. Irhan Ibrahim Abu Hashim |
| | |

Approval Date: 20/9/2023



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بكالوريوس الصيدلة الإكلينيكية (فارم د – Pharm D)
Course Specification

Academic year: 2023/2024

| | |
|---|---------------------------------------|
| Course name: Phytochemistry-1 | اسم المقرر : كيمياء العقاقير 1 |
| Academic Level: level 3 | المستوى الأكاديمي : الثالث |
| Scientific department: Pharmacognosy | القسم العلمي : العقاقير |
| Head of Department: Prof. Mahmoud Fahmi Elsebai | رئيس القسم : ا.د. محمود فهمي السباعي |
| Course Coordinator: Prof. Mahmoud Fahmi Elsebai | منسق المقرر : ا.د. محمود فهمي السباعي |



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| | |
|---------------------------------------|---|
| University | Mansoura |
| Faculty | pharmacy |
| Department offering the course | Pharmacognosy |
| Department supervising the course | Pharmacognosy |
| Program on which the course is given | B. Pharm. (PharmD) (Clinical Pharmacy) |
| Academic Level | Level 3, first semester, 2023-2024 |
| Date of course specification approval | |

C. Basic Information: Course data:

| | |
|--|------------------|
| Course Title | Phytochemistry-1 |
| Course Code | PG 504 |
| Prerequisite | Registration |
| Teaching Credit Hours: Lecture | 2 |
| Teaching Credit Hours: Practical/ tutorial | 1 |
| Total Credit Hours | 3 |

B. Professional Information:

3- Course Aims:

This course enables the students to:

- Gain an understanding of the chemistry volatile oils, resins and resin combinations, carbohydrates, glycosides, and bitters principles.
- Have the skills to isolate, purify, identify, and/or analyze volatile oils, resins and resin combinations, carbohydrates, glycosides, and bitters principles from their respective sources.
- Know the various pharmacological actions and their medicinal uses of volatile oils, resins and resin combinations, carbohydrates, glycosides, and bitters principles.
- Be aware of their clinical applications that will be correlated with various clinical analyses of the previous plant constituents.



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Course k. elements:

Upon completing the course, the student will be able to dominate the following key elements

Domain 1- Fundamental Knowledge

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 1.1.1 | 1.1.1.1 | List the different classes of volatile oils, resins and resin combinations, carbohydrates, glycosides, and bitters principles with emphasis on those having pharmaceutical applications. |
| 1.1.3 | 1.1.3.1 | Identify the main sources for volatile oils, resins and resin combinations, carbohydrates, glycosides, and bitters principles having pharmaceutical importance and their physical, chemical. |
| 1.1.4 | 1.1.4.1 | Recognize pharmacological effects of volatile oils, resins and resin combinations, carbohydrates, glycosides, and bitters principles as well as their clinical applications correlated with various clinical analyses. |

Domain 2: Professional and Ethical Practice

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 2.2.1 | 2.2.1.1 | Manipulate the suitable methods for volatile oils, resins and resin combinations, carbohydrates, glycosides, and bitters principles extraction, isolation, purification, qualitative and quantitative determination from their respective sources adapting the suitable laboratory rules |
| 2.2.2 | 2.2.2.1 | Analyze volatile oils, carbohydrates, glycosides, and bitters principles in their natural sources or in the pharmaceutical preparation for quality management |
| 2.3.1 | 2.3.1.1 | Recognize the appropriate methods for preparation, analysis and handling of plant active constituents for production of pharmaceuticals |

Domain 4: Personal Practice:

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 4.1.2 | 4.1.2.1 | Retrieve and evaluate information, solve problems, and work effectively in a team. |
| 4.2.1 | 4.2.1.1 | Communicate effectively in a scientific language by verbal and written means in the field of health care and natural pharmaceutical preparations regarding the studied topics. |
| 4.3.2 | 4.3.2.1 | Practice independent learning to promote continuous professional development. |

3-Course Contents:



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A) Theoretical part

| Week No. | Topics | Lecture credit Hours |
|----------|---|----------------------|
| 1 | Introduction and Different classes of carbohydrates including monosaccharides their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and clinical applications correlated with various clinical analyses. | 2 |
| 2 | Disaccharides and polysaccharides their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and clinical applications correlated with various clinical analyses. | 2 |
| 3 | Polysaccharides and polysaccharide containing amino-sugar units: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and clinical applications correlated with various clinical analyses. | 2 |
| 4 | Introduction and Different classes of glycosides: Alcohol, Simple phenolic, coumarin, lignans and neolignans and anthraquinones, glycosides: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses. | 2 |
| 5 | Flavones and related flavonoid, saponins and steroidal glycosides: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and clinical applications correlated with various clinical analyses. | 2 |
| 6 | Steroidal glycosides continue and cyanogenic glycosides: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and clinical applications correlated with various clinical analyses. | 2 |
| 7 | Introduction to volatile oil Different classes of volatile oil: Volatile oils: (Terpene hydrocarbons) : their chemical structure, physical, chemical characters, sources, isolation, identification and determination as well as their pharmacological actions and medicinal uses | 2 |
| 8 | Volatile oils: Oxygenated derivatives: their chemical structure, physical, chemical characters, sources, isolation. | 2 |
| 9 | Volatile oils: Oxygenated derivatives: identification and determination as well as their pharmacological actions and medicinal uses | 2 |
| 10 | Volatile oils: (Sulfur & nitrogen comp) | 2 |



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| | | |
|----|---|---|
| 11 | Resins and resin combinations: Introduction, classification. | 2 |
| 12 | Resins and resin combinations: identification and/or determination and biological activities. | |
| 13 | Bitter principles: classification, identification and/or determination and biological activities | 2 |
| 14 | Revision and quiz | 2 |
| 15 | Start of Final written and oral exam | - |

B) Practical part

| Week No. | Practical topics | Practical credit hours |
|----------|---|------------------------|
| 1. | Qualitative estimation of monosaccharides & reducing disaccharides (Glucose, Fructose, Maltose, lactose, Sucrose) | 1 |
| 2. | Scheme for identification of unknown carbohydrate | 1 |
| 3. | Quantitative estimation of carbohydrates (glucose) <ul style="list-style-type: none"> o Copper reduction method (Practical) Enzymatic method | 1 |
| 4. | Quantitative estimation of glucose and fructose mixture <ul style="list-style-type: none"> o Copper reduction method (Practical) o Iodimetric method (Practical) | 1 |
| 5. | Quantitative estimation of glucose and sucrose mixture (Practical) <ul style="list-style-type: none"> o Quantitative estimation of glucose and maltose mixture | 1 |
| 6. | Qualitative identification of glycosides | 1 |
| 7 | Colorimetric estimation of Digitalis glycosides by Baljet's test | 1 |
| 8. | Midterm exam | - |
| 9. | Extraction of volatile oil by steam distillation. Quantitative estimation of cinnamaldehyde in Cinnamon oil. | 1 |
| 10. | Determination of peroxides in oil of chenopodium. | 1 |
| 11 | Determination of oxides (in cineol). | 1 |
| 12 | Quantitative estimation of nitrogenous and sulfur volatile constituents (e.g. allyl isothiocyanate in mustard oil). Determination of eugenol in clove oil. | 1 |
| 13 | Isolation and Estimation of khellin in Ammi visnaga | 1 |
| 14 | Sheet / and Practical exam | 1 |

4- Teaching and learning Methods:

| | Teaching and Learning Methods | Week No. | K elements to be assessed |
|-----|-------------------------------|----------|----------------------------|
| 4.1 | Computer aided learning: | 1-14 | 1.1.1.1, 1.1.3.1, 1.1.4.1, |



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| | | | |
|-----|--|------|--|
| | a. Lectures using Data show, power Point presentations b. Distance learning <ul style="list-style-type: none"> • Online learning through My Mans "Mansoura university "as recorded – video lectures • Inter active discussion through My Mans | | 4.2.1.1, 4.3.2.1 |
| 4.1 | Self-learning | 13 | 1.1.1.1, 1.1.3.1, 1.1.4.1, 4.1.2.1, 4.3.2.1 |
| 4.2 | Practical session using chemicals and laboratory equipment and/ or tutorials | 1-14 | 2.2.1.1, 2.2.2.1, 2.3.1.1, 4.2.1.1, 4.1.2.1 |
| 4.3 | Class Activity: Group discussion offline and online. | 9-10 | 1.1.1.1, 1.1.3.1, 1.1.3.2, 1.1.4.1, 2.2.1.1., 4.1.2.1, 4.2.1.1 |

5- Student Assessment:

i- Assessment Methods:

| Assessment Methods | K elements to be assessed |
|---|--|
| 1-Written exam | 1.1.1.1, 1.1.3.1, 1.1.4.1, 2.2.1.1, 2.3.1.1, 4.3.2.1 |
| 2-Practical exam Applying OSPE | 1.1.1.1, 1.1.3.1, 1.1.4.1, 2.2.1.1, 2.2.2.1, 2.3.1.1, 4.1.2.1, 4.2.1.1 |
| 3-Oral | 1.1.1.1, 1.1.3.1, 1.1.4.1, 2.2.1.1., 4.1.2.1, 4.2.1.1, 4.3.2.1 |
| 4- Periodical (Mid-term exam) / Course work | 1.1.1.1, 1.1.3.1, 1.1.4.1, 2.2.1.1, 4.1.2.1, 4.2.1.1, 4.3.2.1 |

b. Assessment schedule

| | | |
|--------------|--|---------------------------------------|
| Assessment 1 | Periodical (Mid-term exam) / Course work | 7 th -9 th week |
| Assessment 2 | Practical examination and tutorial | 14 th week |
| Assessment 3 | Written exam | Start from 15 th week |
| Assessment 4 | Oral exam | Start from 15 th week |

c. Weighing of assessments

| | | |
|---|--|-----|
| 1 | Periodical (Mid-term) exam / Course work | 15% |
|---|--|-----|



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|-------|------------------------------------|------|
| 2 | Practical examination and tutorial | 25% |
| 3 | Final-term examination | 50% |
| 4 | Oral examination | 10% |
| Total | | 100% |

6- Facilities required for teaching and learning

| | |
|------------------------------|--|
| Classroom | data show ,computers,internet |
| Laboratory facilities | Microscopes, chemicals ,glass wares,white board. |
| Library | books |

7- List of References

| No | Reference | Type |
|----|--|--------------------|
| 1. | Electronic book prepared by staff members | Course notes |
| 2. | Recorded videos prepared by staff members | Videos on platform |
| 3. | Evans, W.C "Trease and Evans". "Pharmacognosy" 16 th edition, Saunders Ltd, 2009 | Book |
| 4. | Cseke, L. J., Kirakosyan, A., Kaufman, P. B., Warber, S., Duke, J. A., & Briemann, H. L. "Natural products from plants", CRC press., 2016 | Book |
| 5. | Dewick P. M."Medicinal Natural Products, a Biosynthetic Approach", 3 rd edition John Wiley & sons, 2009 | Book |
| 6. | http://www.sciencedirect.com/ http://www.google scholar.com/ http://www.pubmed.com https://www.ekb.eg | websites |



8- Matrix

Matrix 1. Course contents and course key elements

A) Theoretical part:

| Course contents | Course Key elements | | | | | | | | |
|--|---------------------|---------|---------|-----------|---------|---------|-----------|---------|---------|
| | Domain: 1 | | | Domain: 2 | | | Domain: 4 | | |
| | 1.1.1.1 | 1.1.3.1 | 1.1.4.1 | 2.2.1.1 | 2.2.2.1 | 2.3.1.1 | 4.1.2.1 | 4.2.1.1 | 4.3.2.1 |
| Introduction and Different classes of carbohydrates including monosaccharides their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and clinical applications correlated with various clinical analyses. | √ | √ | | | | | | | |
| Disaccharides and polysaccharides their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and clinical applications correlated with various clinical analyses | √ | √ | | | | | | | |
| Polysaccharides and polysaccharide containing amino-sugar units: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and clinical applications correlated with various clinical analyses. | √ | √ | √ | | | | | | |
| Introduction and Different classes of glycosides: Alcohol, Simple phenolic, coumarin, lignans and neolignans and anthraquinones, glycosides: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses | √ | √ | √ | | | | | | |
| Flavones and related flavonoid, saponins and steroidal glycosides: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and clinical applications correlated with various clinical analyses | √ | √ | √ | | | | | | |
| Steroidal glycosides continue and cyanogenic glycosides: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and | √ | √ | √ | | | | | | |



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|--|---|---|---|--|--|--|---|---|---|
| clinical applications correlated with various clinical analyses | | | | | | | | | |
| Introduction to volatile oil | √ | √ | √ | | | | | | |
| Different classes of volatile oil: | | | | | | | | | |
| Volatile oils: (Terpene hydrocarbons) : their chemical structure, physical, chemical characters, sources, isolation, identification and determination as well as their pharmacological actions and medicinal uses | | | | | | | | | |
| Volatile oils: Oxygenated derivatives: their chemical structure, physical, chemical characters, sources. | √ | √ | √ | | | | | | |
| Volatile oils: Oxygenated derivatives: isolation, identification and determination as well as their pharmacological actions and medicinal uses. | √ | √ | √ | | | | | | |
| Volatile oils: (Sulfur & nitrogen comp). | √ | √ | √ | | | | √ | √ | √ |
| Resins and resin combinations: Introduction, classification. | √ | √ | √ | | | | | | |
| Resins and resin combinations: identification and/or determination and biological activities. | √ | √ | √ | | | | | | |
| Bitter principles: classification, identification and/or determination and biological activities | √ | √ | √ | | | | √ | √ | √ |



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|--|---|---|---|---|---|---|---|---|--|
| Extraction of volatile oil by steam distillation. Quantitative estimation of cinnamaldehyde in Cinnamon oil. | √ | √ | √ | √ | √ | √ | √ | √ | |
| Determination of peroxides in oil of chenopodium. | √ | √ | √ | √ | √ | √ | √ | √ | |
| Determination of oxides (in cineol). | √ | √ | √ | √ | √ | √ | √ | √ | |
| Quantitative estimation of nitrogenous and sulfur volatile constituents (e.g. allyl isothiocyanate in mustard oil.). Determination of eugenol in clove oil. | √ | √ | √ | √ | √ | √ | √ | √ | |
| Isolation and Estimation of khellin in Ammi visnaga | | | | √ | √ | √ | √ | √ | |
| Extraction of volatile oil by steam distillation. Quantitative estimation of cinnamaldehyde in Cinnamon oil. | | | | | | √ | | | |



Matrix 2. Between course contents, methods of learning, and assessment

A) Theoretical part:

| Course Contents | Teaching and Learning methods | | | | | Assessment methods | | | |
|--|-------------------------------|----------------|------------------|--------------|---------------|--------------------|---------------------|---------|------|
| | Lecture | Hybrid leaning | Group discussion | Lab sessions | Self-learning | Coruse Work | Practical/ Tutorial | Written | Oral |
| Introduction and Different classes of carbohydrates including monosaccharides their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and clinical applications correlated with various clinical analyses. | √ | √ | | | | √ | | √ | √ |
| Disaccharides and polysaccharides their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and clinical applications correlated with various clinical analyses | √ | √ | | | | √ | | √ | √ |
| Polysaccharides and polysaccharide containing amino-sugar units: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and clinical applications correlated with various clinical analyses. | √ | √ | | | | √ | | √ | √ |
| Introduction and Different classes of glycosides: Alcohol, Simple phenolic, coumarin, lignans and neolignans and anthraquinones, glycosides: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses | √ | √ | | | | √ | | √ | √ |
| Flavones and related flavonoid, saponins and steroidal glycosides: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and clinical applications correlated with various clinical analyses | √ | √ | | | | | | √ | √ |
| Steroidal glycosides continue and cyanogenic glycosides: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and clinical applications correlated with various clinical analyses | √ | √ | | | | | | √ | √ |



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| | | | | | | | | | |
|---|---|---|---|--|---|--|--|---|---|
| Introduction to volatile oil | √ | √ | | | | | | √ | √ |
| Different classes of volatile oil: Volatile oils: (Terpene hydrocarbons) : their chemical structure, physical, chemical characters, sources, isolation, identification and determination as well as their pharmacological actions and medicinal uses | | | | | | | | | |
| Volatile oils: Oxygenated derivatives: their chemical structure, physical, chemical characters, sources. | √ | √ | | | | | | √ | √ |
| Volatile oils: Oxygenated derivatives: isolation, identification and determination as well as their pharmacological actions and medicinal uses. | √ | √ | √ | | | | | √ | √ |
| Volatile oils: (Sulfur & nitrogen comp). | √ | √ | √ | | | | | √ | √ |
| Resins and resin combinations: Introduction, classification. | √ | √ | | | | | | √ | √ |
| Resins and resin combinations: identification and/or determination and biological activities. | √ | √ | | | | | | √ | √ |
| Self-learning Bitter principles: classification, identification and/or determination and biological activities | √ | √ | | | √ | | | √ | √ |

B) Practical part:

| Course Contents | Teaching and Learning methods | | | | | Assessment methods | | | |
|---|-------------------------------|-----------------|------------------|--------------|---------------|--------------------|-----------|---------|------|
| | Lecture | Hybrid learning | Group discussion | Lab sessions | Self-learning | Course Work | Practical | Written | Oral |
| Qualitative estimation of monosaccharides & reducing disaccharides (Glucose, Fructose, Maltose, lactose, Sucrose) | | √ | | √ | | | √ | | |
| Scheme for identification of unknown carbohydrate | | √ | | √ | | | √ | | |
| Quantitative estimation of carbohydrates (glucose) o Copper reduction method (Practical) Enzymatic method | | √ | | √ | | | √ | | |
| Quantitative estimation of glucose and fructose mixture o Copper reduction method (Practical) Iodimetric method (Practical) | | √ | | √ | | | √ | | |
| Quantitative estimation of glucose and sucrose mixture (Practical) Quantitative estimation of glucose and maltose mixture | | √ | √ | √ | | | √ | | |
| Qualitative identification of glycosides | | √ | √ | √ | | | √ | | |



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|--|--|---|---|---|--|--|---|--|--|
| Colorimetric estimation of Digitalis glycosides by Baljet's test | | √ | | √ | | | √ | | |
| Extraction of volatile oil by steam distillation. | | √ | √ | √ | | | √ | | |
| Quantitative estimation of cinnamaldehyde in Cinnamon oil | | | | | | | | | |
| Determination of peroxides in oil of chenopodium. | | √ | | √ | | | √ | | |
| Determination of oxides (in cineol). | | √ | | √ | | | √ | | |
| Quantitative estimation of nitrogenous and sulfur volatile constituents (e.g. allyl isothiocyanate in mustard oil.). | | √ | √ | √ | | | √ | | |
| Determination of eugenol in clove oil. | | | | | | | | | |
| Isolation and Estimation of khellin in Ammi visnaga | | √ | √ | √ | | | √ | | |

| | |
|---------------------------|---|
| Course Coordinator | Prof. Dr. Mahmoud Fahmy El-Sebai |
| | |
| Head of Department | Prof. Dr. Mahmoud Fahmy El-Sebai |

Date: 6/ 9 / 2023



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بكالوريوس الصيدلة الإكلينيكية (فارم د – Pharm D)

Course Specification

Academic year:

2023/2024

| | |
|---|---|
| Course name: Community Pharmacy Practice | اسم المقرر: ممارسه صيدلية مجتمعية |
| Academic Level: Level 3 | المستوى الأكاديمي: الثالث |
| Scientific department: Clinical Pharmacy & Pharmacy Practice | القسم العلمي: الصيدلة الإكلينيكية و الممارسة الصيدلية |
| Head of Department: Prof. Dr/ Mohamed El-Husseiny Shams | رئيس القسم: أ.د/ محمد الحسيني شمس |
| Course Coordinator: | منسق المقرر: |



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|---------------------------------------|---|
| University | Mansoura |
| Faculty | Pharmacy |
| Department offering the course | Clinical Pharmacy and Pharmacy Practice |
| Department supervising the course | Clinical Pharmacy and Pharmacy Practice |
| Program on which the course is given | B. Pharm. (PharmD) (Clinical Pharmacy) |
| Academic Level | Third level, Second Semester 2023/2024 |
| Date of course specification approval | 2023/9/7 |

1- Basic Information: Course data:

| | |
|-----------------------|-----------------------------|
| Course Title | Community Pharmacy Practice |
| Course Code | PP 501 |
| Prerequisite | Pharmacology I |
| Credit Hours: Lecture | 2 |
| Tutorial | 1 |
| Total Credit Hours | 3 (Credit H) |

2- Course Aims:

The course affords students with fundamentals of evidence-based use for OTC medicines in the community pharmacy settings. The course also familiarizes the students with concepts of patient counseling and pharmaceutical care. Other aims include, providing the students with essential competencies to promote the public health role of the pharmacist in the community pharmacy settings.



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3- Course Learning Outcomes

Upon completing the course, the student will be able to dominate the following key elements

DOMAIN 1- FUNDAMENTAL KNOWLEDGE

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|---|
| 1.1.1 | 1.1.1.1 | Differentiate between simple ailments and major diseases. |
| 1.1.4 | 1.1.4.1 | Outline the different pharmacological and non-pharmacological response options for minor ailment in the community pharmacy. |
| 1.1.5 | 1.1.5.1 | Design an individualized optimum therapeutic plan for management of minor illness using over the counter drugs. |
| 1.1.9 | 1.1.9.1 | Understand clinical calculations essential for community pharmacy practice. |

DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|---|
| 2.1.4 | 2.1.4.1 | Identify patient cases that requires referral without dispensing OTC medicines. |

DOMAIN 3: Pharmaceutical care

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 3.2.3 | 3.2.3.1 | Recommend prescription modification after consulting the health care professionals. |
| 3.2.5 | 3.2.5.1 | Practice professional patient counseling to optimize outcomes of pharmaceutical care plan and audit the patient's therapeutic plan in collaboration with healthcare professional |
| 3.2.6 | 3.2.6.1 | Promote public understanding of important vaccinations and self monitoring of chronic diseases. |



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DOMAIN 4: PERSONAL PRACTICE

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|---|
| 4.3.2 | 4.3.2.1 | Practice self-learning to improve professional skills |

4- Course Contents

| Week No. | Topics | Hours |
|----------|--|-------|
| 1 | Introduction to Community pharmacy Community pharmacy and self-care, Community pharmacy performance when dealing with patients' signs and symptoms, Clinical reasoning, Consultation, and communication skills | 2 |
| 2-3 | Women's Health Cystitis, Premenstrual syndrome, Dysmenorrhoea, Menorrhagia Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (Use in children, very common side effects, Drug interactions of note, Patients in whom care is exercised, use in Pregnancy & breastfeeding, practical points, and patient counselling tips. | 4 |
| 4 | Childhood Conditions Chickenpox, Infantile colic, napkin dermatitis, Head lice, Threadworm Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (Use in children, very common side effects, Drug interactions of note, Patients in whom care is exercised, use in Pregnancy & breastfeeding, practical points, and patient counselling tips. | 2 |



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| | | |
|-----|---|---|
| 5,6 | <p style="text-align: center;">Skin Conditions</p> <p>Acne, Psoriasis, Scabies, Dandruff, Athlete's foot Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (Use in children, very common side effects, Drug interactions of note, Patients in whom care is exercised, use in Pregnancy & breastfeeding, practical points, and patient counselling tips.</p> | 2 |
|-----|---|---|



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| | | |
|-------|--|---|
| 7 | <p>OTC medications for respiratory diseases Common Cold& Flu, Sore Throats and Cough</p> <p>Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (Use in children, very common side effects, Drug interactions of note, Patients in whom care is exercised, use in Pregnancy & breastfeeding, practical points, and patient counselling tips.</p> | 2 |
| 8 | <p>Specific product recommendation Smoking cessation-Obesity Management- Motion sickness Practical prescribing and product selection, practical points, and patient counselling tips, Summary of medicines (Use in children, very common side effects, Drug interactions of note, Patients in whom care is exercised, use in Pregnancy & breastfeeding).</p> | 2 |
| 9-10 | <p>OTC medications for gastrointestinal diseases Mouth ulcers, Heartburn, Indigestion Diarrhea, and constipation Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (Use in children, very common side effects, Drug interactions of note, Patients in whom care is exercised, use in Pregnancy & breastfeeding, practical points, and patient counselling tips.</p> | 4 |
| 11-12 | <p>OTC medications for painful conditions Headache, Musculoskeletal problems Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (Use in children, very common side effects, Drug interactions of note, Patients in whom care is exercised, use in</p> | 4 |



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| | | |
|----|---|---|
| | Pregnancy & breastfeeding, practical points, and patient counselling tips | |
| 13 | Eye and Ear Problems (self-learning topic), discussion and revision Eye and ear problems: Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (Use in children, very common side effects, Drug interactions of note, Patients in whom care is exercised, use in Pregnancy & breastfeeding, practical points, and patient counselling tips | 2 |
| 14 | Final theoretical exam | - |

| Week No. | Tutorial topics | Hours |
|----------|--|-------|
| 1 | Training in making a diagnosis: AS METHOD Pharmaceutical calculation for community pharmacist | 1 |
| 2-3 | Case study: Women's Health | 2 |
| 4 | Case study: Childhood Conditions | 1 |
| 5 | Case study: Skin Conditions | 1 |
| 6 | Case presentation: Common cold & Flu | 1 |
| 7 | Case presentation: Cough | 1 |
| 8 | Midterm exam | - |
| 9 | Specific product recommendation Smoking cessation Obesity management | 1 |
| 10 | Case Presentation: GERD Indigestion | 1 |



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| | | |
|-------|--|---|
| 11-12 | Case Presentation: Mouth Ulcers Constipation Diarrhea | 2 |
| 13 | Group project presentation (selected topics) | 1 |
| 14 | Tutorial exam applying OSCE | 1 |



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Teaching and Learning Methods:

| | Teaching and Learning method | Week no. | K.elements to be addressed |
|-----|---|-----------------|--|
| 5.1 | Hybrid learning and Computer aided learning: Lectures using Data show, power Point presentations Distance learning Online learning through My Mans "Mansoura university "as recorded – video lectures Inter active discussion through My Mans | Week 1-14 | 1.1.1.1, 1.1.4.1, 1.1.5.1, 1.1.9.1, , 2.1.4.1, 3.2.3.1, 3.2.5.1, 3.2.6.1 |
| 5.2 | Self-learning | Week 13 | 4.3.2.1 |
| 5.3 | Practical sessions using tutorials | Week 1-14 | 2.1.4.1, 3.2.3.1, 3.2.5.1, 3.2.6.1 |
| 5.4 | Class Activity: Group discussion offline and online | Week 1-14 | 3.2.3.1, 3.2.5.1, 3.2.6.1, 4.3.2.1 |

Student Assessment:

Assessment Methods:

| | |
|--|---|
| 1-Written exam | 1.1.1.1, 1.1.4.1, 1.1.5.1, 1.1.9.1, 2.1.4.1, 3.2.3.1, 3.2.5.1, 3.2.6.1, 4.3.2.1 |
| 2-Tutorial exam (OSCE) | 1.1.1.1, 1.1.4.1, 1.1.5.1, 1.1.9.1, 2.1.4.1, 3.2.3.1, 3.2.5.1, 3.2.6.1, 4.3.2.1 |
| 3-Oral | 1.1.1.1, 1.1.4.1, 1.1.5.1, 1.1.9.1, 2.1.4.1, 3.2.3.1, 3.2.5.1, 3.2.6.1 |
| 4- Periodical (Mid-term exam) / Course work | 1.1.1.1, 1.1.4.1, 1.1.5.1, 2.1.4.1, 3.2.3.1, 3.2.5.1, 3.2.6.1 |

Assessment schedule

| | | |
|---------------------|--|------------|
| Assessment 1 | Periodical (Mid-term exam) / Course Work | Week 6-9 |
| Assessment 2 | Tutorial examination (OSCE) | 14th week |
| Assessment 3 | Written exam | Week 14-15 |
| Assessment 4 | Oral exam | Week 14-15 |

Weighing of assessments

| | | |
|--------------|--|-------------|
| 1 | Periodical (Mid-term exam) / Course work | 15% |
| 2 | Tutorial examination (OSCE) | 25% |
| 3 | Final-term examination | 50% |
| 4 | Oral examination | 10% |
| Total | | 100% |



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7-Facilities required for teaching and learning

| | |
|-----------|--|
| Classroom | Data show- Computers, Internet, Platform |
| Library | Books and mobile applications |

8- List of references:

| No | Reference | Type |
|----|---|--------------------|
| 1. | Electronic book prepared by staff members | Course notes |
| 2. | Recorded videos prepared by staff members | Videos on platform |
| 3. | Symptoms in the pharmacy; a Guide to the Management of Common Illness edited by Alison Blenkinsopp, Paul Paxton, and John Blenkinsopp, 8th edition, 2018 | Essential Book |
| 4. | https://www.ekb.eg/ https://go.wolterskluwer.com/lexicomp-drug-references-int-b.html?utm_source=google&utm_medium=cpc&utm_campaign=ALL_Lexicomp_INT_Brand&utm_content=001-ETA-Brand_Exact&utm_term=lexicomp&gclid=CjwKCAjwhuCKBhADEi wA1He gOa3V40mlNyAwkxXqqD-MhuJqRWNsUDoi7AlREiUFqTghXadDjRSaGBoC2GcQAvD_BwE https://accesspharmacy.mhmedical.com/ http://www.sciencedirect.com / http://www.google scholar.com/ http://www.pubmed.com | Websites |



9.2: Matrix 2. between course contents, methods of learning and assessment

| A) Theoretical Part: | | | | | | | | | | | |
|---|-------------------------------|--------------------|----------------|--------------|--------------------|------------|---------------|--------------------|------------------------|---------|------|
| Introduction to Community pharmacy Women's Health | Teaching and Learning Methods | | | | | | | Assessment methods | | | |
| | Lecture | Hybrid learning | Online lecture | Lab sessions | Problem solving | Case Study | Self-learning | Corse Work | Practical/Tuto rial | Written | Oral |
| Childhood Conditions | √ | √ | √ | | | | | | | | √ |
| Skin Conditions | √ | √ | √ | | | | | | | | √ |
| OTC medications for respiratory diseases (common cold and cough) | √ | √ | √ | | | | | | | √ | √ |
| Smoking cessation- Motion sickness | √ | √ | √ | | | | | √ | | √ | √ |
| Obesity Management | √ | √ | √ | | √ | | | √ | | √ | √ |
| OTC medications for gastrointestinal Diseases | √ | √ | √ | | √ | | | √ | | √ | √ |
| OTC medications for painful conditions | √ | √ | | | √ | | | | | √ | √ |
| Eye and ear problem (self- learning), discussion, revision | √ | √ | | | √ | | √ | | | √ | √ |



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B) Tutorial Part:

| Course Contents | Teaching and Learning Methods | | | | | | | Assessment methods | | | |
|--|-------------------------------|-----------------|----------------|--------------|-----------------|------------|---------------|--------------------|--------------------|---------|------|
| | Lecture | Hybrid learning | Online lecture | Lab sessions | Problem solving | Case Study | Self-learning | Course Work | Practical/Tutorial | Written | Oral |
| Training in making a diagnosis: AS METHOD, Pharmaceutical calculation for community pharmacist | | | | √ | | √ | | | √ | | |
| Case study: Women's Health | | | | √ | | √ | | | √ | | |
| Case study: Childhood Conditions | | | | √ | | √ | | | √ | | |
| Case study: Skin Conditions | | | | √ | | √ | | | √ | | |
| Case presentation: (Common cold & Flu). | | | | √ | | √ | | | √ | | |
| Case presentation: Cough | | | | √ | | √ | | | √ | | |
| Specific product recommendation (Smoking cessation, Obesity management) | | | | √ | | √ | | | √ | | |



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| | | | | | | | | | | | |
|---|--|--|--|---|--|---|--|--|---|--|--|
| Case Presentation: (GERD, Indigestion, Mouth Ulcers) | | | | √ | | √ | | | √ | | |
| Group project presentation | | | | √ | | √ | | | √ | | |

| | |
|--------------------|---|
| Course Coordinator | To be nominated |
| Head of Department | Prof. Dr/ Mohamed El-Husseiny Shams <i>Mohamed Elhusseiny</i> date:7/9/2023 |



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Course specification
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بكالوريوس الصيدلة الإكلينيكية (فارم دي – Pharm D)
Course Specification
Academic year: 2023/2024

| | |
|---|------------------------------------|
| Course name: Pharmacology 2 (PO 603) | 2 اسم المقرر : فارماكولوجي |
| Academic Level: Level 3 | المستوى الأكاديمي : الثالث |
| Scientific department: Pharmacology & Toxicology | القسم العلمي : الادويه والسموم |
| Head of Department: Prof. Manar A. Nader | رئيس القسم: أ.د/ منار احمد نادر |
| Course Coordinator: | منسق المقرر: |



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Course specification
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| | |
|---------------------------------------|--------------------------------------|
| University | Mansoura |
| Faculty | Pharmacy |
| Department offering the course | Pharmacology & Toxicology |
| Department supervising the course | Pharmacology & Toxicology |
| Program on which the course is given | Pharm D-Clinical Pharmacy Program |
| Academic Level | Level 3, second semester , 2023-2024 |
| Date of course specification approval | 18 th September 2023 |

A. Basic Information: Course data:

| | |
|--------------------------------|----------------|
| Course Title | Pharmacology 2 |
| Course Code | PO 603 |
| Prerequisite | Pharmacology 1 |
| Teaching credit Hours: Lecture | 2 |
| : Practical | 1 |
| Total Credit Hours | 3 (Credit H) |

B. Professional Information:

1. Course Aims:

This course enables the students to:

- Describe mechanisms of action, prototypic examples and therapeutic applications of drugs used in CNS, respiratory and GI disorders.
- Know diverse anti-inflammatory, analgesic and gout treatment.



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2- Course k. elements:

Upon completing the course, the student will be able to dominate the following key elements

Domain 1- Fundamental Knowledge

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|---|
| 1.1.4 | 1.1.4.1 | List drugs' mechanism of action, therapeutic effects and evaluate their suitability, efficacy, and safety in individuals and populations. |
| 1.1.10 | 1.1.10.1 | Identify the role of various pharmacological agents in management of various disorder affecting respiratory system and gastrointestinal tract and CNS |

Domain 2: Professional and Ethical Practice

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|---|
| 2.4.3 | 2.4.3.1 | Formulate pharmaceutical care plans for management of several disorders and drug-related problems with reference to their particulate health problems and special considerations. |

Domain 3: Pharmaceutical Care

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 3.1.1 | 3.1.1.1 | Adjust a dosage routine for a patient based on the physiological, genetic, and immunological changes brought about by disease or concomitant drug use. |
| 3.1.4 | 3.1.4.1 | utilize etiology, epidemiology, pathogenesis, laboratory diagnosis, and clinical features to suggest the proper preventive strategies for various infections/diseases. |
| 3.2.1 | 3.2.1.1 | Monitor principles of pharmacological aspects of drugs, as mode of action, therapeutic uses, proper dosage, unwanted effects and drug interactions. |

Domain 4: Personal Practice:



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| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 4.1.4 | 4.1.4.1 | Participate in making strategies to fulfil workplace pharmaceutical needs. |
| 4.3.1 | 4.3.1.1 | Apply effective plans to achieve and improve self-practice of pharmacy. |

3- Course Contents:

| Week No. | Topics | Lecture credit Hours |
|----------|--|------------------------|
| 1 | Drugs for bronchial asthma | 2 |
| 2 | Drugs for cystic fibrosis | 2 |
| 3 | Management of pulmonary embolism | 2 |
| 4 | Introduction to CNS, sedative hypnotic drugs | 2 |
| 5 | Antiepileptics | 2 |
| 6 | Antipsychotics | 2 |
| 7 | Drugs for inflammatory bowel disorders | 2 |
| 8 | Drugs for inflammatory bowel disorders | 2 |
| 9 | Drugs for peptic acid disease | 2 |
| 10 | Antidepressants, mood stabilizers | 2 |
| 11 | Analgesics | 2 |
| 12 | Management of gout | 2 |
| 13 | Antiparkinsonians | 2 |
| 14 | Anesthetics (self-learning) | 2 |
| 15 | Compensatory & alternative lecture | 2 |
| 16 | Revision & quiz | |
| 1 | Final written and oral exam | - |
| Week No. | Practical Topics | Practical credit hours |



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| | | |
|----|-------------------------------|---|
| 1. | Bronchial asthma case study | 1 |
| 2 | Emphysema case study | 1 |
| 3 | ADHD | 1 |
| 4 | Pain management | 1 |
| 5 | Management of headache | 1 |
| 6 | Drugs affecting GIT motility | 1 |
| 7 | Alcohol | 1 |
| 8 | Midterm exam | - |
| 9 | H. pylori case study | 1 |
| 10 | Gout case study | 1 |
| 11 | Alzheimer's disease | 1 |
| 12 | Local Anesthetic | 1 |
| 13 | Local Anesthetic case study-1 | 1 |
| 14 | Local Anesthetic case study-2 | 1 |
| 15 | Revision & activity | 1 |
| 16 | Practical exam | - |

4- Teaching and Learning Methods:

| | Teaching and learning method | Week number | K. elements to be addressed |
|-----|---|-------------|--|
| 4.1 | Advanced lectures: <ul style="list-style-type: none"> Lectures using Data show, power Point presentations Brain storming Group discussion | 1-16 | 1.1.4.1, 1.1.10.1, 2.4.3.1, 3.1.1.1, 3.1.4.1, 3.2.1.1, 4.3.1.1, 4.1.4.1 |
| 4.2 | b. Hybrid learning <ul style="list-style-type: none"> On line learning through my mans "Mansoura university " Inter active discussion through My | 1-16 | 1.1.4.1, 1.1.10.1, 2.4.3.1 |



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| | Mans | | |
|-----|--|------|---------------------------------------|
| 4.3 | Self-learning | 14 | 4.3.1.1, 4.1.4.1 |
| 4.4 | Practical session | 1-16 | 2.4.3.1, 3.1.1.1, 3.1.4.1, 3.2.1.1 |
| 4.5 | Collaborative learning: research project | 9-11 | 4.3.1.1, 4.1.4.1 |

5- Student Assessment:

j- Assessment Methods:

| Assessment Methods | K elements to be assessed |
|---|---|
| 1-Written exam | 1.1.4.1, 1.1.10.1, 2.4.3.1, 3.1.1.1, 3.1.4.1, 3.2.1.1 |
| 2-Practical exam | 1.1.4.1, 1.1.10.1, 2.4.3.1, 3.1.1.1, 3.1.4.1, 3.2.1.1, 4.3.1.1, 4.1.4.1 |
| 3-Oral | 1.1.4.1, 1.1.10.1, 2.4.3.1, 4.3.1.1 |
| 4- Periodical (Mid-term exam) / Course work | 1.1.4.1, 1.1.10.1, 2.4.3.1, 2.4.3.1 |

b. Assessment schedule

| | | |
|--------------|--|--|
| Assessment 1 | Periodical (Mid-term exam) / Course work | 7 th - 9 th week |
| Assessment 2 | Practical examination and tutorial | 16 th week |
| Assessment 3 | Written exam | Start from 17 th week |
| Assessment 4 | Oral exam | Start from 17 th week |

c. Weighing of assessments



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| | | |
|-------|--|------|
| 1 | Periodical (Mid-term) exam / Course work | 15% |
| 2 | Practical examination and tutorial | 25% |
| 3 | Final-term examination | 50% |
| 4 | Oral examination | 10% |
| Total | | 100% |

6- Facilities required for teaching and learning

| | |
|-------------------------|---|
| -Class room | Data show- Computers, Internet. |
| - Laboratory facilities | Data show- Computers, internet, white board, Sterile tools- chemical reagent-experimental animals |

7- List of References

| No | Reference | Type |
|----|---|----------|
| 1. | Course note by staff member | Notes |
| 2. | Katzung and Trevor's Pharmacology Examination and Board Review; Katzung B, Kruidering-Hall M, Tuan RL, Vander TW, Trevor A. McGraw Hill Lange; 13 th edition (2021). | Book |
| 3. | Rang H Rang and Dale's pharmacology; Ritter J; Flower R; Henderson G; Loke YK; MacEwan D. Elsevier; 9 th edition (2020). | Book |
| 4. | Lippincott's Pharmacology; illustrated review; Karen Whalen. Wolters Kluwer; 8th edition (2022). | Book |
| 5. | Basic & Clinical Pharmacology; Katzung B.G., & Vanderah T.W. (Eds.). McGraw Hill Lange; 15th edition (2021). | Book |
| 6. | ACCP guidelines (https://www.accp.com/) Egyptian Knowledge Bank (https://www.ekb.eg/) | websites |



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9- Matrix between course content, method of learning and assessment:

| A) Theoretical part: | | | | | | | | | |
|--|-------------------------------|-----------------|--------------|---------------|-------------------------|--------------------|--------------------|---------|------|
| Course contents | Teaching and learning methods | | | | | Assessment methods | | | |
| | Advanced Lectures | Hybrid learning | Lab sessions | Self-learning | Collaborative learning: | Course work | Practical/tutorial | Written | Oral |
| Drugs for bronchial asthma | ✓ | | | | | ✓ | | ✓ | ✓ |
| Drugs for cystic fibrosis | ✓ | | | | | ✓ | | ✓ | ✓ |
| Management of pulmonary embolism | ✓ | | | | | ✓ | | ✓ | ✓ |
| Introduction to CNS, sedative hypnotic drugs | ✓ | ✓ | | | | ✓ | | ✓ | ✓ |
| Antiepileptics | ✓ | | | | | | | ✓ | ✓ |
| Antipsychotics | ✓ | | | | | | | ✓ | ✓ |
| Drugs for inflammatory bowel disorders | ✓ | ✓ | | | | | | ✓ | ✓ |
| Drugs for inflammatory bowel disorders | ✓ | | | | | | | ✓ | ✓ |
| Drugs for peptic acid disease | ✓ | | | | ✓ | | | ✓ | ✓ |
| Antidepressants, mood stabilizers | ✓ | | | | ✓ | | | ✓ | ✓ |
| Analgesics | ✓ | | | | ✓ | | | ✓ | ✓ |
| Management of gout | ✓ | ✓ | | | | | | ✓ | ✓ |
| Antiparkinsonians | ✓ | | | | | | | ✓ | ✓ |
| Anesthetics (self-learning) | ✓ | | | ✓ | | | | ✓ | ✓ |
| B) Practical part: | | | | | | | | | |
| Course contents | Teaching and learning methods | | | | | Assessment methods | | | |
| | Advanced Lectures | Hybrid learning | Lab sessions | Self-learning | Collaborative learning: | Course work | Practical/tutorial | Written | Oral |
| Bronchial asthma case study | | ✓ | ✓ | | | | ✓ | | |
| Emphysema case study | | ✓ | ✓ | | | ✓ | ✓ | | |
| ADHD | | ✓ | ✓ | | | ✓ | ✓ | | |

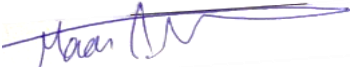


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| | | | | | | | | | |
|------------------------------|--|---|---|--|---|---|---|--|--|
| Pain management | | ✓ | ✓ | | | ✓ | ✓ | | |
| Management of headache | | ✓ | ✓ | | | ✓ | ✓ | | |
| Drugs affecting GIT motility | | ✓ | ✓ | | | ✓ | ✓ | | |
| Alcohol | | ✓ | ✓ | | | ✓ | ✓ | | |
| H. pylori case study | | ✓ | ✓ | | | ✓ | ✓ | | |
| Gout case study | | ✓ | ✓ | | ✓ | ✓ | ✓ | | |
| Alzheimer's disease | | ✓ | ✓ | | ✓ | ✓ | ✓ | | |
| Local Anesthetic | | ✓ | ✓ | | ✓ | ✓ | ✓ | | |
| Local Anesthetic case study | | ✓ | ✓ | | | ✓ | ✓ | | |

| | |
|---------------------------|--|
| Course Coordinator | |
| Head of Department | Prof. Manar A. Nader  |

Date: 18/ 9 / 2023



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بكالوريوس الصيدلة الإكلينيكية (فارم دي – Pharm D)
Course Specification
Academic year: 2023/2024

| | |
|--|---|
| Course name: Phytochemistry-2 | اسم المقرر : كيمياء العقاقير 2 |
| Academic Level: level 3 | الثالث المستوى الأكاديمي : |
| Scientific department: Pharmacognosy | القسم العلمي : العقاقير |
| Head of Department: Prof. Mahmoud Fahmy El-Sebai | رئيس القسم : ا.د/ محمود فهمي السباعي |
| Course Coordinator: To be nominated | منسق المقرر : |



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| | |
|--|--|
| University | Mansoura |
| Faculty | Pharmacy |
| Department offering the course | Pharmacognosy |
| Department supervising the course | Pharmacognosy |
| Program on which the course is given | B. Pharm. a(PharmD) (Clinical Pharmacy) |
| Academic Level | Level 3, Second semester, 2023-2024 |
| Date of course specification approval | 16/9/2023 |

A. Basic Information: Course data:

| | |
|--------------------------------|------------------|
| Course Title | Phytochemistry-2 |
| Course Code | PG 605 |
| Prerequisite | Phytochemistry-I |
| Teaching Hours: Lecture | 2 |
| : Practical | 1 |
| Total Credit Hours | 3 |

B. Professional Information:

1. Course Aims:

This course enables the students to:

- Gain an understanding of the chemistry and bioactivities of alkaloids, tannins and antioxidants.
- Be aware of different chromatographic methods for the isolation and analysis of the for mentioned plant constituents
- Have the skills to isolate, purify, identify, and/or analyze alkaloids, tannins and antioxidants from their respective sources.
- Know the various drugs with valuable use in the Egyptian and worldwide markets, such as anti-cancer agents, drugs affecting CNS, drugs ameliorating liver diseases and anti-inflammatory agents.
- Be aware of the structure activity relationships (SAR) of these natural products derived compounds and their pharmacophoric features.



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2- Course k. elements:

Upon completing the course, the student will be able to dominate the following key elements

Domain 1- Fundamental Knowledge

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 1.1.1 | 1.1.1.1 | List the different classes of alkaloids, tannins and antioxidants with emphasis on those having pharmaceutical applications. |
| 1.1.3 | 1.1.3.1 | Identify the main sources for alkaloids, tannins and antioxidants having pharmaceutical importance and their physical and chemical characters. |
| | 1.1.3.2 | Understand principles of different chromatographic methods used for isolation and / or analysis of the previous plant active constituents. |
| 1.1.4 | 1.1.4.1 | Recognize pharmacological effects, medicinal uses as well as structure activity relationships (SAR) of these natural products derived compounds and their pharmacophoric features. |
| | 1.1.4.2 | Be aware with anti-cancer agents, drugs affecting CNS, drugs ameliorating liver diseases and anti-inflammatory agents having valuable use in Egypt and worldwide markets. |

Domain 2: Professional and Ethical Practice

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|---|
| 2.2.1 | 2.2.1.1 | Manipulate the suitable methods for alkaloids, tannins, antioxidants, anti-cancer agents, drugs affecting CNS, drugs ameliorating liver diseases and anti-inflammatory agents: extraction, isolation, purification, qualitative and /or quantitative determination from their respective sources adapting the suitable laboratory rules |
| 2.2.2 | 2.2.2.1 | Analyze alkaloids and/or any of the for mentioned drugs in their natural sources or in the pharmaceutical preparation for quality management employing the suitable chromatographic methods |
| 2.3.1 | 2.3.1.1 | Discriminate poisonous alkaloids and/or any of the titled drugs and apply the safe procedures for their handling to discard any harm to public |



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Domain 4: Personal Practice:

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 4.1.2 | 4.1.2.1 | Retrieve and evaluate information, solve problems, and work effectively in a team. |
| 4.2.1 | 4.2.1.1 | Communicate effectively in a scientific language by verbal and written means in the field of health care and natural pharmaceutical preparations regarding the studied topics. |
| 4.3.2 | 4.3.2.1 | Practice independent learning to promote continuous professional development. |

3- Course Contents:

A. Theoretical part:

| Week No. | Topics | Hours |
|----------|---|-------|
| 1 | Introduction to alkaloids | 2 |
| 2 | Different classes of alkaloids: each class covers their chemical structure, physical, chemical characters, sources, isolation, identification, and determination as well as their pharmacological actions and medicinal uses | 2 |
| 3 | Non-heterocyclic: Phenylalkylamine, | 2 |
| 4 | Alkaloids: Heterocyclic:(Pyridine and Purine) | 2 |
| 5 | Alkaloids: (Heterocyclic: Tropane, indole and Imidazole) | 2 |
| 6 | Alkaloids: Quinoline, Iso-quinoline | 2 |
| 7 | Alkaloids: Phenanthrene and opium alkaloids | 2 |
| 8 | Antioxidant drugs | 2 |
| 9 | Anti-cancer agents part 1 | 2 |
| 10 | Anti-cancer agents part 2 | 2 |
| 11 | Drugs affecting CNS | 2 |
| 12 | Drugs ameliorating liver diseases and anti-inflammatory agents | 2 |
| 13 | Structure activity relationships (SAR) of these natural products derived compounds and their pharmacophoric features. | 2 |



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| | | |
|----|---|---|
| 14 | Tannins: Introduction, classification, identification and/or determination and biological activities | 2 |
| 15 | Compensatory & alternative lecture | 2 |
| 16 | Revision & activity | 2 |
| 17 | Final written and oral Exam | - |

B. Practical part:

| Week No. | Topics | Hours |
|----------|--|-------|
| 1. | Qualitative identification of alkaloids: Dil Ephedrine, Eserine, Quinine and Quinidine, Atropine, Colchicine | 1 |
| 2. | Qualitative identification of alkaloids (Cont.): Pilocarpine, Strychnine, Papaverine, Emetin | 1 |
| 3. | Qualitative identification of alkaloids (Cont.): Caffeine, Theophylline, Brucine, Methyl ergometrine | 1 |
| 4. | General scheme for alkaloids. | 1 |
| 5. | Quantitative estimation of alkaloids: (colorimetric method). Estimation of Methylergometrine Maleate in Pharmaceutical Preparation | 1 |
| 6. | Qualitative identification of alkaloids: (micro-crystallization or crystallography) o Caffeine, and Theophylline (Aminophylline) | 1 |
| 7. | Qualitative identification of alkaloids: (micro-crystallization or crystallography) Nicotine, Codeine | 1 |
| 8. | Midterm exam | - |
| 9. | Qualitative identification of alkaloids: (micro-crystallization or crystallography) Atropine, Ephedrine, Theobromine | 1 |
| 10. | Qualitative identification of alkaloids: (micro-crystallization or crystallography) Berberine, Quinine, Papaverine, | 1 |
| 11 | General scheme for alkaloids using micro-crystallization | 1 |
| 12 | Qualitative identification of tannins | 1 |
| 13 | Preliminary phytochemical screening of unknown drugs-1 | 1 |
| 14 | Preliminary phytochemical screening of unknown drugs -2 | 1 |
| 15 | Revision & activity | 1 |
| 13 | Practical exam (OSPE) | - |



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4- Teaching and Learning Methods:

| | Teaching and Learning Methods | Week No. | K elements to be assessed |
|-----|---|----------|--|
| 5.1 | Computer aided learning: a. Lectures using Data show, power Point presentations b. Distance learning <ul style="list-style-type: none"> On line learning through my mans "Mansoura university "as recorded – video lectures Inter active discussion through My Mans | 1-16 | 1.1.1.1, 1.1.3.1, 1.1.3.2, 1.1.4.1, 1.1.4.2, 2.2.1.1, 2.2.2.1, 2.3.1.1, 4.2.1.1, 4.3.2.1 |
| 5.2 | Self-learning | 13 | 4.1.2.1, 4.3.2.1 |
| 5.3 | Practical session using chemicals and laboratory equipment and/ or tutorials | 1-16 | 2.2.1.1, 2.2.2.1, 2.3.1.1, 4.1.2.1, 4.2.1.1 |

5- Student Assessment:

k- Assessment Methods:

| Assessment Methods | K elements to be assessed |
|---|--|
| 1-Written exam | 1.1.1.1, 1.1.3.1, 1.1.3.2, 1.1.4.1, 1.1.4.2, 2.2.1.1, 2.2.2.1, 2.3.1.1, 4.2.1.1, 4.3.2.1 |
| 2-Practical exam | 2.2.1.1, 2.2.2.1, 2.3.1.1, 4.1.2.1, 4.2.1.1 |
| 3-Oral | 1.1.1.1, 1.1.3.1, 1.1.3.2, 1.1.4.1, 1.1.4.2, 2.2.1.1., 4.2.1.1 |
| 4- Periodical (Mid-term exam) / Course work | 1.1.1.1, 1.1.3.1, 1.1.3.2, 1.1.4.1, 1.1.4.2, 2.2.1.1, 2.3.1.1, 4.2.1.1 |



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b. Assessment schedule

| | | |
|--------------|--|---------------------------------------|
| Assessment 1 | Periodical (Mid-term exam) / Course work | 7 th -9 th week |
| Assessment 2 | Practical examination and tutorial | 16 th week |
| Assessment 3 | Written exam | 17 th week |
| Assessment 4 | Oral exam | 17 th week |

c. Weighing of assessments

| | | |
|-------|--|------|
| 1 | Periodical (Mid-term) exam / Course work | 15% |
| 2 | Practical examination and tutorial | 25% |
| 3 | Final-term examination | 50% |
| 4 | Oral examination | 10% |
| Total | | 100% |

6-Facilities required for teaching and learning

| | |
|-------------------------|--|
| -Class room | Data show- Computers, Internet. |
| - Laboratory facilities | Microscopes- chemicals- glass wares- white board |

7- List of References

| No | Reference | Type |
|----|--|--------------------|
| 1. | Electronic book prepared by staff members | Course notes |
| 2. | Recorded videos prepared by staff members | Videos on platform |
| 3. | Evans, W.C "Trease and Evans". "Pharmacognosy" 16 th edition, Saunders Ltd, 2009 | Book |
| 4. | Cseke, L. J., Kirakosyan, A., Kaufman, P. B., Warber, S., Duke, J. A., & Brielmann, H. L. "Natural products from plants", CRC press., 2016 | Book |
| 5. | http://www.sciencedirect.com/ http://www.google scholar.com/ http://www.pubmed.com https://www.ekb.eg | websites |



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8- Matrix of course content:

Matrix 1. Course contents and course key elements

| Course contents | Course Key Elements | | | | | | | | | | |
|---|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------|---------|---------|
| | Domain: 1 | | | | | Domain: 2 | | | Domain: 4 | | |
| | 1.1.1. 1 | 1.1.3. 1 | 1.1.3. 2 | 1.1.4. 1 | 1.1.4. 2 | 2.2.1. 1 | 2.2.2. 1 | 2.3.1. 1 | 4.1.2.1 | 4.2.1.1 | 4.3.2.1 |
| A) Theoretical part | | | | | | | | | | | |
| Introduction to alkaloids Different classes of alkaloids: each class covers their chemical structure, physical, chemical characters, sources, isolation, identification, and determination as well as their pharmacological actions and medicinal uses | ✓ | | | | | ✓ | ✓ | ✓ | | | |
| Non-heterocyclic: Phenylalkylamine, Alkaloids: Heterocyclic:(Pyridine and Purine) | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | |



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| | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|
| Alkaloids: (Heterocyclic: Tropane, indole and Imidazole, Quinoline, Iso-quinoline, Phenanthrene and opium | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | |
| Antioxidant drugs | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Anti-cancer agents | | | | ✓ | ✓ | ✓ | | ✓ | | | |
| Drugs affecting CNS | | | | ✓ | ✓ | ✓ | | ✓ | | | |
| Drugs ameliorating liver diseases and anti-inflammatory agents | | | | ✓ | | | | ✓ | | ✓ | |
| Structure activity relationships (SAR) of these natural products derived compounds and their pharmacophoric features. | | | | ✓ | | | | | ✓ | ✓ | ✓ |
| Tannins: Introduction, classification, identification and/or determination and biological activities | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | | ✓ |



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| Course contents | Course Key Elements | | | | | | | | | | |
|--|---------------------|-------------|-------------|---------|-------------|-------------|-------------|---------|-----------|---------|---------|
| | Domain: 1 | | | | | Domain: 2 | | | Domain: 4 | | |
| | 1.1.1. 1 | 1.1.3. 1 | 1.1.3. 2 | 1.1.4.1 | 1.1.4. 2 | 2.2.1. 1 | 2.2.2. 1 | 2.3.1.1 | 4.1.2.1 | 4.2.1.1 | 4.3.2.1 |
| B) Practical part | | | | | | | | | | | |
| Qualitative identification of alkaloids: Dil Ephedrine, Eserine, Quinine and Quinidine, Atropine, Colchicine Pilocarpine, Strychnine, Papaverine, Emetin | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Qualitative identification of alkaloids (Cont.): Caffeine, Theophylline, Brucine, Methyl ergometrine General scheme for alkaloids. | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Quantitative estimation of alkaloids: (colorimetric method). Estimation of Methylergometrine Maleate | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | |



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| | | | | | | | | | | | |
|--|---|---|--|--|--|---|---|---|---|---|---|
| in Pharmaceutical Preparation | | | | | | | | | | | |
| (micro-crystallization or crystallography) Codeine, Atropine, Ephedrine, Theobromine; | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Qualitative identification of alkaloids: (micro-crystallization or crystallography) Berberine, Quinine, Papaverine, | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| General scheme for alkaloids using micro-crystallization | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Qualitative identification of tannins | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Preliminary phytochemical screening of unknown drugs | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |



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Matrix 2. between course contents, methods of learning and assessment

| A) Theoretical Part: | | | | | | | | |
|---|-------------------------------|----------------|--------------|---------------|--------------------|-----------|---------|------|
| Course Contents | Teaching and Learning Methods | | | | Assessment methods | | | |
| | Lecture | Online lecture | Lab sessions | Self-learning | Corse Work | Practical | Written | Oral |
| Introduction to alkaloids | √ | | | | √ | | | √ |
| Different classes of alkaloids: each class covers their chemical structure, physical, chemical characters, sources, isolation, identification, and determination as well as their pharmacological actions and medicinal uses | √ | | | | √ | | | √ |
| Non-heterocyclic: Phenylalkylamine, | √ | | | | √ | | | √ |



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| | | | | | | | | |
|--|---|--|--|---|---|--|---|---|
| Alkaloids: Heterocyclic:(Pyridine and Purine) | √ | | | | √ | | | √ |
| Alkaloids: (Heterocyclic: Tropane, indole and Imidazole) | √ | | | | | | √ | √ |
| Alkaloids: Quinoline, Iso-quinoline | √ | | | | | | √ | √ |
| Alkaloids: Phenanthrene and opium alkaloids | √ | | | | | | √ | √ |
| Antioxidant drugs | √ | | | | | | √ | √ |
| Anti-cancer agents | √ | | | | | | √ | √ |
| Drugs affecting CNS | √ | | | | | | √ | √ |
| Drugs ameliorating liver diseases and anti-inflammatory agents | √ | | | | | | √ | √ |
| Structure activity relationships (SAR) of these natural products derived compounds and their pharmacophoric features. | √ | | | | | | √ | √ |
| Tannins: Introduction, classification, identification and/or determination and biological activities | √ | | | √ | | | √ | √ |



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| B) Practical Part: | | | | | | | | | | |
|--|-------------------------------|----------------|--------------|-----------------|------------|--------------------|-------------|-----------|---------|------|
| Course Contents | Teaching and Learning Methods | | | | | Assessment methods | | | | |
| | Lecture | Online lecture | Lab sessions | Problem solving | Case Study | Self-learning | Course Work | Practical | Written | Oral |
| Qualitative identification of alkaloids: Dil Ephedrine, Eserine, Quinine and Quinidine, Atropine, Colchicine | | | ✓ | | | | | ✓ | | |
| Qualitative identification of alkaloids (Cont.): Pilocarpine, Strychnine, Papaverine, Emetine | | | ✓ | | | | | ✓ | | |
| Qualitative identification of alkaloids (Cont.): Caffeine, Theophylline, Brucine, Methyl ergometrine | | | ✓ | | | | | ✓ | | |
| General scheme for alkaloids. | | | ✓ | | | | | ✓ | | |
| Quantitative estimation of alkaloids: (colorimetric method). Estimation of Methylergometrine Maleate in Pharmaceutical Preparation | | | ✓ | | | | | ✓ | | |



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| | | | | | | | | | | |
|---|--|--|---|--|--|--|--|---|--|--|
| Qualitative identification of alkaloids: (micro-crystallization or crystallography) Caffeine, and Theophylline (Aminophylline), Nicotine, Codeine, Atropine | | | ✓ | | | | | ✓ | | |
| Qualitative identification of alkaloids: (micro-crystallization or crystallography) Ephedrine, Theobromine; Berberine, Quinine, Papaverine, | | | ✓ | | | | | ✓ | | |
| General scheme for alkaloids using micro-crystallization | | | ✓ | | | | | ✓ | | |
| Qualitative identification of tannins | | | ✓ | | | | | ✓ | | |
| Preliminary phytochemical screening of unknown drugs | | | ✓ | | | | | ✓ | | |



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| | |
|---------------------------|---|
| Course Coordinator | To be nominated |
| | |
| Head of Department | Prof. Dr. Mahmoud Fahmy El-Sebai |

Date: 6 / 9 / 2023



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بكالوريوس الصيدلة الإكلينيكية (فارم دي – Pharm D)

**Pharm D-Clinical Pharmacy
Course Specification
Academic year: 2023/2024**

| | |
|---|---|
| Course name: Pharmaceutical technology | اسم المقرر : تكنولوجيا صيدلانية |
| Academic Level: Third level | الثالث المستوى الأكاديمي : |
| Scientific department: Pharmaceutics | القسم العلمي : الصيدلانيات |
| Head of Department: Prof. Dr. Irhan Ibrahim Abu Hashim | رئيس القسم : أ.د/ إرهان ابراهيم ابو هاشم |
| Course Coordinator: Prof. Dr. Hassan Mohammed Elsabbagh | منسق المقرر : أ.د/ حسن محمد الصباغ |



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| | |
|--|--|
| University | Mansoura |
| Faculty | Pharmacy |
| Department offering the course | Pharmaceutics |
| Department supervising the course | Pharmaceutics |
| Program on which the course is given | B. Pharm. (Pharm D) (Clinical Pharmacy) |
| Academic Level | Third level, second semester, 2023-2024 |
| Date of course specification approval | 20/9/2023 |

A. Basic Information: Course data:

| | |
|--------------------------------|---------------------------|
| Course Title | Pharmaceutical technology |
| Course Code | PT 607 |
| Prerequisite | ----- |
| Teaching Hours: Lecture | 2 |
| Practical | 1 |
| Total Credit Hours | 3 |

B. Professional Information:

1. Course Aims:

This course enables the students to:

- Gain understanding of the principles of various unit operations such as heat transfer, evaporation, drying, distillation, filtration, centrifugation, crystallization, extraction, size reduction, size separation, size analysis and size enlargement.
- Have the skills to apply these unit operations in pharmaceutical industry with emphasis on the equipment and machines used during the production of different dosage forms.



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2- Course k. elements:

Upon completing the course, the student will be able to dominate the following key elements.

Domain 1- Fundamental Knowledge

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 1.1.1 | 1.1.1.1 | List the theories of the different unit operations utilized in the pharmaceutical technology. |
| 1.1.6 | 1.1.6.1 | Recognize the quality control of each pharmaceutical operation and how to minimize the error of manufacturing, storage & handling. |
| 1.1.7 | 1.1.7.1 | Identify the construction and operation of these unit operations including heat transfer, evaporation, drying, centrifugation, crystallization, filtration and mixing, size reduction and their equipment. |

Domain 2: Professional and Ethical Practice

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 2.2.2 | 2.2.2.1 | Classify the different equipment commonly used in each unit operation |
| 2.2.3 | 2.2.3.1 | Determine the critical aspects related to the equipment construction that can affect their performance |
| | 2.2.3.2 | Specify the advantages, disadvantages, and best use of each equipment |

Domain 4: Personal Practice:

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 4.1.2 | 4.1.2.1 | Retrieve and evaluate information, solve problems, and work effectively in a team. |
| 4.3.2 | 4.3.2.1 | Practice independent learning to promote continuous professional development. |



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3- Course Contents:

A) Theoretical part:

| Week No. | Topics | Lecture credit Hours |
|----------|--|----------------------|
| 1 | Drying: definition, applications, theory, equipment classification as well as their construction, operation, advantages/disadvantages and uses | 2 |
| 2 | Filtration: definition, applications, theory, equipment classification as well as their construction, operation, advantages/disadvantages and uses | 2 |
| 3 | Evaporation: definition, applications, theory, equipment classification | 2 |
| 4 | Evaporation: equipment construction, operation, advantages/disadvantages and uses. | 2 |
| 5 | Centrifugation: definition, applications, theory, equipment classification as well as their construction, operation, advantages/disadvantages and uses | 2 |
| 6 | Crystallization: definition, applications, theory, equipment classification as well as their construction, operation, advantages/disadvantages and uses | 2 |
| 7 | Heat transfer: definition, applications, theory, equipment classification as well as their construction, operation, advantages/disadvantages and uses | 2 |
| 8 | Extraction: definition, applications, theory, equipment classification as well as their construction, operation, advantages/disadvantages and uses | 2 |
| 9 | Mixing: definition, applications, theory, equipment classification, construction, operation, advantages/disadvantages and uses | 2 |
| 10 | Size enlargement: definition, applications, theory, equipment classification as well as their construction, operation, advantages/ disadvantages and uses. Self-learning topic. | 2 |
| 11 | Size separation: definition, applications, theory, equipment classification as well as their construction, operation, advantages/disadvantages and uses | 2 |
| 12 | Size reduction: definition, applications, theory, equipment classification. | 2 |
| 13 | Size reduction: equipment construction, operation, advantages/disadvantages and uses | 2 |
| 14 | Self-learning topic and discussion (comparison between different equipment) | 2 |
| 15 | Compensatory and alternative lecture | 2 |
| 16 | Revision & quiz | 2 |
| 17 | Final written and oral exam | 2 |



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B) Practical part:

| Week No. | Topics | Practical credit hours |
|----------|--|------------------------|
| 1 | Dryers: critical aspects of construction, operation, and applications | 1 |
| 2 | Filters: critical aspects of construction, operation, and applications | 1 |
| 3 | Natural circulation evaporators: critical aspects of construction, operation, and applications | 1 |
| 4 | Forced circulation and film evaporators: critical aspects of construction, operation, and applications | 1 |
| 5 | Centrifuges: critical aspects of construction, operation, and applications | 1 |
| 6 | Crystallizers: critical aspects of construction, operation, and applications | 1 |
| 7 | Heaters and heat exchangers: critical aspects of construction, operation, and applications | 1 |
| 8 | Midterm exam | |
| 9 | Extractors: critical aspects of construction, operation, and applications | 1 |
| 10 | Mixers: critical aspects of construction, operation, and applications | 1 |
| 11 | Granulation equipment: critical aspects of construction, operation | 1 |
| 12 | Granulation equipment: applications | 1 |
| 13 | Size separation equipment: critical aspects of construction, operation, and applications | 1 |
| 14 | Size separation equipment: critical aspects of construction, operation, and applications –continue. | |
| 15 | Revision & activity | 1 |
| 16 | Practical exam applying OSPE | 1 |



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4- Teaching and Learning Methods:

| Teaching and learning Methods | Weeks No. | K. elements to be addressed |
|---|-----------------|---|
| 4.1 Computer aided learning: a. <u>Advanced Lectures</u> using Data show, power Point presentations b. <u>Hyperid learning</u> <ul style="list-style-type: none"> Online learning through my mans "Mansoura university" as recorded video lectures Interactive discussion through My Mans. | 1-16 | 1.1.1.1, 1.1.6.1, 1.1.7.1, 2.2.2.1, 2.2.3.1, 2.2.3.2, 4.1.2.1 |
| 4.2 Practical session using tutorials | 1-16 | 1.1.1.1, 2.2.2.1, 2.2.3.1, 2.2.3.2, |
| 4.3 Self-learning | 14 | 1.1.6.1, 1.1.7.1, 2.2.3.2, 4.1.2.1 |
| 4.4 Presentation | 3, 6, 7, 10, 14 | 1.1.1.1, 1.1.6.1, 2.2.2.1, 2.2.3.1, 2.2.3.2, 4.1.2.1 |

5- Student Assessment:

1- Assessment Methods:

| Assessment Methods | K elements to be assessed |
|---|--|
| 1-Written exam | 1.1.1.1, 1.1.6.1, 1.1.7.1, 2.2.2.1, 2.2.3.1, 2.2.3.2, 4.1.2.1 |
| 2-Practical exam applying OSPE | 1.1.7.1, 2.2.2.1, 2.2.3.1, 2.2.3.2, 4.1.2.1 |
| 3-Oral exam | 1.1.1.1, 1.1.6.1, 1.1.7.1, 2.2.2.1, 2.2.3.1, 2.2.3.2, 4.1.2.1, 4.3.2.1 |
| 4- Periodical (Mid-term exam) / Course work | 1.1.1.1, 1.1.6.1, 1.1.7.1, 2.2.2.1, 2.2.3.1, 2.2.3.2, 4.1.2.1 |

b. Assessment schedule

| | | |
|--------------|--|------------------------|
| Assessment 1 | Periodical (Mid-term exam) / Course work | 7-9 th week |
| Assessment 2 | Practical examination and tutorial | 16 th week |
| Assessment 3 | Written exam | 17 th week |
| Assessment 4 | Oral exam | 17 th week |



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c. Weighing of assessments

6-

| | | |
|-------|--|------|
| 1 | Periodical (Mid-term) exam / Course work | 15% |
| 2 | Practical examination and tutorial | 25% |
| 3 | Final-term examination | 50% |
| 4 | Oral examination | 10% |
| Total | | 100% |

Facilities required for teaching and learning

| | |
|-------------------------|-----------------------------------|
| -Class room | Data show, computers, internet. |
| - Laboratory facilities | Data show, computers, white board |

8- List of References

| No | Reference | Type |
|----|--|--------------------|
| 1. | Electronic book prepared by staff members | Course notes |
| 2. | Recorded videos prepared by staff members | Videos on platform |
| 3. | "Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems" 10th Ed., Wolters Kluwer, Loyd Allen, Howard C. Ansel, Lippincott Williams and Wilkins, Philadelphia, (2013). | Book |
| 4. | Chemical Engineering Design, 2nd edition (Gavin Towler and Ray Sinnott) (2012). | Book |
| 5 | Handbook of Pharmaceutical Manufacturing Formulations 2nd Ed., Sarfaraz K. Niazi (2009) | Book |
| 6. | http://www.sciencedirect.com/ http://www.google scholar.com/ http://www.pubmed.com https://www.ekb.eg | websites |



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| | | | | | | | | | | |
|--|---|---|---|--|---|---|---|--|---|---|
| Heat transfer: definition, applications, theory, equipment classification as well as their construction, operation, advantages/disadvantages and uses | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Extraction: definition, applications, theory, equipment classification as well as their construction, operation, advantages/disadvantages and uses | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | |
| Mixing: definition, applications, theory, equipment classification, construction, operation, advantages/disadvantages and uses | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | |
| Size enlargement: definition, applications, theory, equipment classification as well as their construction, operation, advantages/ disadvantages and uses. Self-learning topic. | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | |
| Size separation: definition, applications, theory, equipment classification as well as their construction, operation, advantages/disadvantages and uses | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | |
| Size reduction: definition, applications, theory, equipment classification. | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | |
| Size reduction: equipment construction, operation, advantages/disadvantages and uses | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | |
| Self-learning topic, discussion, and revision (comparison between different equipment) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | |



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Matrix 2. Between course contents, methods of learning and assessment:

A) Theoretical Part:

| Course Contents | Teaching and Learning Methods | | | | | | Assessment methods | | | |
|---|-------------------------------|----------------|--------------|-----------------|---------------|---------------|--------------------|------------------------|---------|------|
| | Lecture | Hybrid leaning | Lab sessions | Problem solving | Presentations | Self-learning | Corse Work | Practical/Tutori al | Written | Oral |
| Drying: definition, applications, theory, equipment classification as well as their construction, operation, advantages/disadvantages and uses | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ |
| Filtration: definition, applications, theory, equipment classification as well as their construction, operation, advantages/disadvantages and uses | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ |
| Evaporation: definition, applications, theory, equipment classification | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ |
| Evaporation: equipment construction, operation, advantages/disadvantages and uses. | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ |
| Centrifugation: definition, applications, theory, equipment classification as well as their construction, operation, advantages/disadvantages and uses | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ |



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| | | | | | | | | | | |
|--|---|---|---|--|---|---|--|---|---|---|
| Crystallization: definition, applications, theory, equipment classification as well as their construction, operation, advantages/disadvantages and uses | ✓ | ✓ | ✓ | | ✓ | | | ✓ | ✓ | ✓ |
| Heat transfer: definition, applications, theory, equipment classification as well as their construction, operation, advantages/disadvantages and uses | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✓ |
| Extraction: definition, applications, theory, equipment classification as well as their construction, operation, advantages/disadvantages and uses | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✓ |
| Mixing: definition, applications, theory, equipment classification, construction, operation, advantages/disadvantages and uses | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✓ |
| Size enlargement: definition, applications, theory, equipment classification as well as their construction, operation, advantages/ disadvantages and uses. Self-learning topic. | ✓ | ✓ | ✓ | | | ✓ | | ✓ | ✓ | ✓ |
| Size separation: definition, applications, theory, equipment classification as well as their construction, operation, advantages/disadvantages and uses | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✓ |
| Size reduction: definition, applications, theory, equipment classification. | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✓ |
| Size reduction: equipment construction, operation, advantages/disadvantages and uses. | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✓ |
| Self-learning topic, discussion, and revision (comparison between different equipment) | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ |



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B) Practical Part:

| Course Contents | Teaching and Learning Methods | | | | | | Assessment methods | | | |
|--|-------------------------------|--------------------------------|--------------|-----------------|---------------|---------------|--------------------|--------------------|---------|------|
| | Lecture | Hybrid leaning Recorded videos | Lab sessions | Problem solving | Presentations | Self-learning | Corse Work | Practical/Tutorial | Written | Oral |
| Dryers: critical aspects of construction, operation, and applications | | ✓ | ✓ | | | | ✓ | ✓ | | |
| Filters: critical aspects of construction, operation, and applications | | ✓ | ✓ | | | | ✓ | ✓ | | |
| Natural circulation evaporators: critical aspects of construction, operation, and applications | | ✓ | ✓ | | ✓ | | ✓ | ✓ | | |
| Forced circulation and film evaporators: critical aspects of construction, operation, and applications | | ✓ | ✓ | | | | ✓ | ✓ | | |
| Centrifuges: critical aspects of construction, operation, and applications | | ✓ | ✓ | | | | ✓ | ✓ | | |
| Crystallizers: critical aspects of construction, operation and applications | | ✓ | ✓ | | | | ✓ | ✓ | | |
| Heaters and heat exchangers: critical aspects of construction, operation, and applications | | ✓ | ✓ | | ✓ | | ✓ | ✓ | | |
| Extractors: critical aspects of construction, operation, and applications | | ✓ | ✓ | | | | ✓ | ✓ | | |
| Mixers: critical aspects of construction, operation, and applications | | ✓ | ✓ | | ✓ | | ✓ | ✓ | | |
| Granulation equipment: critical aspects of construction, operation, and applications | | ✓ | ✓ | | | | ✓ | ✓ | | |
| Size separation equipment: critical aspects of construction, operation, and applications | | ✓ | ✓ | | | | ✓ | ✓ | | |
| Size separation equipment: critical aspects of construction, operation, and applications – continue. | | ✓ | ✓ | | | | ✓ | ✓ | | |



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| | |
|---------------------------|--|
| Course Coordinator | Prof. Dr/ Hassan Mohammed Elsabbagh <i>Hassan M. Elsabbagh</i> |
| Head of Department | Prof. Dr. Irhan Ibrahim Abu Hashim <i>Irhan Abuhashim</i> |

Date: 20/ 9 / 2023



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بكالوريوس الصيدلة الإكلينيكية (فارم د Pharm)

Course Specification Academic year: 2022/2023

| | |
|---|--|
| Course name: Hospital Pharmacy | اسم المقرر: صيدلة المستشفيات |
| Academic Level: 3 | المستوى الأكاديمي : الثالث |
| Scientific department: Clinical Pharmacy and Pharmacy Practice | القسم العلمي : الصيدلة الإكلينيكية و الممارسة الصيدلانية |
| Head of Department: Assoc. Prof. Dr. Moetaza Mahmoud Soliman | رئيس القسم :أ.د معتزة محمود سليمان |
| Course Coordinator: Dr. Noha O. Mansour | منسق المقرر : د/ نهى أسامه منصور |



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| | |
|---------------------------------------|---|
| University | Mansoura |
| Faculty | Pharmacy |
| Department offering the course | Clinical Pharmacy and Pharmacy Practice |
| Department supervising the course | Clinical Pharmacy and Pharmacy Practice |
| Program on which the course is given | B. Pharm. (PharmD) (Clinical Pharmacy) |
| Academic Level | Third level, Second Semester, 2022-2023 |
| Date of course specification approval | 7th September 2023 |

Basic Information: Course data:

| | |
|-----------------------|-------------------|
| Course Title | Hospital Pharmacy |
| Course Code | PP 602 |
| Prerequisite | Registration |
| Credit Hours: Lecture | 2 |
| Tutorial | 1 |
| Total Credit Hours | 3 (Credit H) |

Course Aims:

This course familiarizes the students with organization of hospital pharmacy with its different facilities and emphasize the role of hospital pharmacist in different services (inpatient and outpatient services), transfer of care, patient's medication record, and rational medication use, hospital formulary, pharmacy and therapeutic committee, I.V. admixtures and incompatibilities, enteral and parenteral nutrition, handling of cytotoxic drugs, and risk management.



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Course Learning Outcomes

Upon completing the course, the student will be able to dominate the following key elements

DOMAIN 1- FUNDAMENTAL KNOWLEDGE

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|---|
| 1.1.1 | 1.1.1.1 | Recognize the organization of hospital pharmacy and role of hospital pharmacist with different hospital facilities |
| 1.1.2 | 1.1.2.1 | Interpret medication labels and prescription abbreviations. |
| 1.1.9 | 1.1.9.1 | Manage pharmaceutical calculations within the hospital setting: nutrition calculation, infusion rates, and pediatric dose calculations. |

DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|---|
| 2.2.5 | 2.2.5.1 | Compound non-sterile and sterile preparations and manage extemporaneous preparations according to international guidelines and professional practice standards. |
| 2.4.3 | 2.4.3.1 | Demonstrate ability to manage hospital formulary and understand different drug distribution systems within the hospital setting. |

DOMAIN 3: Pharmaceutical care

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 3.2.5 | 3.2.5.1 | Report adverse drug reactions according to the international professional standards of practice. |
| 3.2.6 | 3.2.6.1 | Apply principles of safe handling of hazardous drugs within the hospital setting |



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DOMAIN 4: PERSONAL PRACTICE

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|---|
| 4.1.1 | 4.1.1.1 | Share with healthcare professionals in formulary management activities. |
| 4.3.2 | 4.3.2.1 | Practice self-learning to improve professional skills |

Course Contents

| Week No. | Lecture Topics | Lecture Credit Hours |
|----------|--|----------------------|
| 1 | Introduction to Hospital pharmacy practice Organization of hospital pharmacy with its different facilities, the role of hospital pharmacist in different services (inpatient and outpatient services) | 2 |
| 2 | In-Patient services: Compounding sterile preparations. Types of compounding, standards, and resources, Interpreting USP terminology, USP space requirements for sterile compounding, Types of locations that can house a primary engineering control, “risk” and compounded formulations, garbing for all types of compounding | 2 |
| 3 | In-Patient services: Parenteral therapy Types of parenteral drug administration, IV incompatibilities (different types, prevention strategies) complications of parenteral drug administration (physical and therapeutic complications) and patient monitoring. | 2 |
| 4 | Inpatient services: Handling of hazardous and cytotoxic drugs Hazardous drug exposure & spill management | 2 |



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| | | |
|----|---|---|
| 5 | Inpatient services: Handling of controlled substances A drug or a substance, or immediate precursor, included in schedule I, II, III, IV or V | 2 |
| 6 | Inpatient services: Nutrition therapy management (Parenteral ,Enteral nutrition) Recommend a patient-specific nutrition and monitoring parameters based on nutritional needs, comorbidities, and clinical condition | 2 |
| 7 | Inpatient services: Drug distribution systems Types of drug distribution within the hospital | 2 |
| 8 | Inpatient and outpatient services: Drug Information Center (DIC) Types of information resources, function, systematic approach to answer drug information request | 2 |
| 9 | Inpatient services: Fluid and electrolytes therapy Recommend an appropriate IV fluid regimen and monitoring parameters given a patient clinical scenario, monitoring parameters of safe and effective use of these intravenous fluids, electrolyte abnormalities and recommend an appropriate pharmacologic treatment plan based on individual patient signs and symptoms. | 2 |
| 10 | Inpatient and outpatient services: e-Prescribing (Electronic prescribing service) definition, steps and advantages of e-Prescribing | 2 |
| 11 | Inpatient and outpatient services: Medication errors Types and prevention | 2 |
| 12 | Inpatient and outpatient services: Patient counselling Steps in counseling patients regarding medication use, Important patient considerations for counseling, Concepts to discuss with patients and health care professionals | 2 |



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| | | |
|----------|---|--------------|
| 13 | Pharmacy and therapeutics committee Organization and function of Pharmacy and therapeutics committee | 2 |
| 14 | Hospital Formulary (self learning) and Drug evaluation monograph | 2 |
| 15 | Compensatory and alternative lecture | 2 |
| 16 | Revision & quiz | 2 |
| 17 | Final written and oral exam | - |
| Week No. | Tutorial topics | Credit hours |
| 1 | Clinical case presentations with communication skills applications. Allegation | 1 |
| 2 | Applications on Clean room design & Aseptic Technique: Practical educational videos | 1 |
| 3 | Applications on Clean room design & Aseptic Technique: Basic Calculations for hospital pharmacist | 1 |
| 4 | Hazardous drug handling | 1 |
| 5 | Design of TPN therapy (basic principles) | 1 |
| 6 | Design of TPN therapy (problem-solving) | 1 |
| 7 | Adjustment of dose of insulin | 1 |
| 8 | Midterm exam | - |
| 9 | Generic substitutions | 1 |
| 10 | Pediatric dose calculations | 1 |
| 11 | Calculations of IV infusion Rate | 1 |
| 12 | Reporting and identification of drug therapy problems | 1 |
| 13 | Extraction of medication errors from simulated inpatient prescriptions | 1 |
| 14 | Group project presentation: selected topics | 1 |
| 15 | Revision/ activity | 1 |
| 16 | Sheet / and Tutorial exam (OSCE) | 1 |

5-Teaching and Learning Methods:



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| | Teaching and Learning Methods | Week no. | K. elements to be addressed |
|-----|---|-----------|---|
| 5.1 | Hybrid learning: Lectures using Data show, power Point presentations. Distance learning Online learning through My Mans "Mansoura university "as recorded – video lectures. Inter active discussion through My Mans | Week 1-16 | 1.1.1.1, 1.1.2.1, 1.1.9.1, 2.2.5.1, 2.4.3.1, 3.2.5.1, 3.2.6.1 |
| 5.2 | Self-learning | Week 13 | 4.3.2.1 |
| 5.3 | Practical sessions using tutorials | Week 1-16 | 1.1.1.1, 1.1.2.1, 1.1.9.1, 2.2.5.1, 2.4.3.1, 3.2.5.1, 3.2.6.1, 4.1.1.1, 4.3.2.1 |
| 5.4 | Class Activity: Group discussion offline and online | Week 1-16 | 3.2.6.1, 3.2.5.1, 4.1.1.1, 4.3.2.1 |



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Student Assessment:

Assessment Methods:

| | |
|---|---|
| 1-Written exam | 1.1.1.1, 1.1.2.1, 1.1.9.1, 2.2.5.1, 2.4.3.1, 3.2.5.1, 3.2.6.1, 4.3.2.1 |
| 2-Tutorial exam (OSCE) | 1.1.1.1, 1.1.2.1, 1.1.9.1, 2.2.5.1, 2.4.3.1, 3.2.5.1, 3.2.6.1, 4.1.1.1, 4.3.2.1 |
| 3-Oral | 1.1.1.1, 1.1.2.1, 1.1.9.1, 2.2.5.1, 2.4.3.1, 3.2.6.1, 3.2.5.1, 4.3.2.1 |
| 4- Periodical (Mid-term exam) / Course work | 1.1.1.1, 1.1.2.1, 1.1.9.1, 2.2.5.1, 2.4.3.1, 3.2.6.1, 3.2.5.1 |

Assessment schedule

| | | |
|--------------|--|---------------|
| Assessment 1 | Periodical (Mid-term exam) / Course Work | 7th -9th week |
| Assessment 2 | Tutorial examination (OSCE) | 16th week |
| Assessment 3 | Written exam | 17th week |
| Assessment 4 | Oral exam | 17th week |

Weighing of assessments

| | | |
|-------|--|------|
| 1 | Periodical (Mid-term exam) / Course work | 15% |
| 2 | Tutorial examination (OSCE) | 25% |
| 3 | Final-term examination | 50% |
| 4 | Oral examination | 10% |
| Total | | 100% |



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Facilities required for teaching and learning

| | |
|-----------|--|
| Classroom | Data show- Computers, Internet, Platform |
| Library | Books and mobile applications |

List of References

| No | Reference | Type |
|----|--|--------------------|
| 1. | Electronic book prepared by staff members | Course notes |
| 2. | Recorded videos prepared by staff members | Videos on Platform |
| 3. | Karen Shapiro; Chelsea Bombatch; Stephanie D Garrett; Angie Veverka, 2020 NAPLEX Course Book, RxPrep, 2020. | Essential Book |
| 4. | https://www.ekb.eg/ . https://go.wolterskluwer.com/lexicomp-drug-references-int-b.html?utm_source=google&utm_medium=cpc&utm_campaign=ALL_Lexi_comp_INT_Brand&utm_content=001-ETA-Brand_Exact&utm_term=lexicomp&gclid=CjwKCAjwhuCKBhADEiwA1HegOa3V40mlNyAwkxXqqD-MhuJqRWNSUDOi7AIREiUFqTghXadDjRSaGBoC2GcQAvD_BwE https://accesspharmacy.mhmedical.com/ https://www.usp.org/compounding/general-chapter-797 | Websites |

**Matrix of knowledge and skills of the course**

| Course contents | Outcomes Domains / Key elements | | | | | | | | | |
|--|---------------------------------|---------|---------|----------|---------|----------|---------|----------|---------|--|
| | Domain 1 | | | Domain 2 | | Domain 3 | | Domain 4 | | |
| | 1.1.1.1 | 1.1.2.1 | 1.1.9.1 | 2.2.5.1 | 2.4.3.1 | 3.2.5.1 | 3.2.6.1 | 4.1.1.1 | 4.3.2.1 | |
| Theoretical part | | | | | | | | | | |
| Introduction to Hospital pharmacy practice Organization of hospital pharmacy with its different facilities, the role of hospital pharmacist in different services (inpatient and outpatient services) | √ | | | | | | √ | √ | | |
| In-Patient services: Compounding sterile preparations. Types of compounding, standards, and resources, Interpreting USP terminology, USP space requirements for sterile compounding, Types of locations that can house a primary engineering control, “risk” and compounded formulations, garbing for all types of compounding | √ | √ | √ | √ | | | | | | |

**Matrix of knowledge and skills of the course**

| Course contents | Outcomes Domains / Key elements | | | | | | | | |
|---|---------------------------------|---------|---------|----------|---------|----------|---------|----------|---------|
| | Domain 1 | | | Domain 2 | | Domain 3 | | Domain 4 | |
| | 1.1.1.1 | 1.1.2.1 | 1.1.9.1 | 2.2.5.1 | 2.4.3.1 | 3.2.5.1 | 3.2.6.1 | 4.1.1.1 | 4.3.2.1 |
| In-Patient services: Parenteral therapy Types of parenteral drug administration, IV incompatibilities (different types, prevention strategies) complications of parenteral drug administration (physical and therapeutic complications) and patient monitoring. | √ | √ | √ | √ | | | | | |
| Inpatient services: Handling of hazardous and cytotoxic drugs Hazardous drug exposure & spill management | √ | √ | | | | | √ | | |
| Inpatient services: Handling of controlled substances A drug or a substance, or immediate precursor, included in schedule I, II, III, IV or V | √ | √ | √ | | | | | | |

**Matrix of knowledge and skills of the course**

| Course contents | Outcomes Domains / Key elements | | | | | | | | |
|--|------------------------------------|---------|---------|----------|---------|----------|---------|----------|---------|
| | Domain 1 | | | Domain 2 | | Domain 3 | | Domain 4 | |
| | 1.1.1.1 | 1.1.2.1 | 1.1.9.1 | 2.2.5.1 | 2.4.3.1 | 3.2.5.1 | 3.2.6.1 | 4.1.1.1 | 4.3.2.1 |
| Inpatient services: Nutrition therapy management (Parenteral ,Enteral nutrition) Recommend a patient-specific nutrition and monitoring parameters based on nutritional needs, comorbidities, and clinical condition | √ | √ | | | | | √ | | |
| Inpatient services: Drug distribution systems Types of drug distribution within the hospital | √ | √ | √ | | | | | | |
| Inpatient and outpatient services: Drug Information Center (DIC) Types of information resources, function, systematic approach to answer drug information request | √ | √ | | | | | | | |
| Inpatient services: Fluid and electrolytes therapy Recommend an appropriate IV fluid regimen and monitoring parameters given a patient clinical scenario, monitoring parameters of safe | √ | √ | | | | | | | |

**Matrix of knowledge and skills of the course**

| Course contents | Outcomes Domains / Key elements | | | | | | | | |
|--|------------------------------------|---------|---------|----------|---------|----------|---------|----------|---------|
| | Domain 1 | | | Domain 2 | | Domain 3 | | Domain 4 | |
| | 1.1.1.1 | 1.1.2.1 | 1.1.9.1 | 2.2.5.1 | 2.4.3.1 | 3.2.5.1 | 3.2.6.1 | 4.1.1.1 | 4.3.2.1 |
| and effective use of these intravenous fluids, electrolyte abnormalities and recommend an appropriate pharmacologic treatment plan based on individual patient signs and symptoms. | | | | | | | | | |
| Inpatient and outpatient services: e-Prescribing (Electronic prescribing service) definition, steps and advantages of e-Prescribing | √ | √ | √ | | | | | | |
| Inpatient and outpatient services: Medication errors Types and prevention | √ | √ | √ | | | | | | √ |
| Inpatient and outpatient services: | √ | √ | √ | | | √ | √ | | |

**Matrix of knowledge and skills of the course**

| Course contents | Outcomes Domains / Key elements | | | | | | | | |
|--|------------------------------------|---------|---------|----------|---------|----------|---------|----------|---------|
| | Domain 1 | | | Domain 2 | | Domain 3 | | Domain 4 | |
| | 1.1.1.1 | 1.1.2.1 | 1.1.9.1 | 2.2.5.1 | 2.4.3.1 | 3.2.5.1 | 3.2.6.1 | 4.1.1.1 | 4.3.2.1 |
| Patient counselling Steps in counseling patients regarding medication use, Important patient considerations for counseling, Concepts to discuss with patients and health care professionals | | | | | | | | | |
| Pharmacy and therapeutics committee Organization and function of Pharmacy and therapeutics committee Hospital Formulary: Self learning topic, discussion, revision Management, drug evaluations monograph | √ | √ | | √ | √ | √ | √ | √ | √ |



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| Course contents | Outcomes Domains / Key elements | | | | | | | | | |
|---|---------------------------------|---------|---------|----------|---------|----------|---------|---|----------|---------|
| | Domain 1 | | | Domain 2 | | Domain 3 | | | Domain 4 | |
| | 1.1.1.1 | 1.1.2.1 | 1.1.9.1 | 2.2.5.1 | 2.4.3.1 | 3.2.5.1 | 3.2.6.1 | | 4.1.1.1 | 4.3.2.1 |
| Practical Part | | | | | | | | | | |
| Clinical case presentations with communication skills applications. Allegation | | | | √ | √ | | √ | √ | | |
| Applications on Clean room design & Aseptic Technique: Practical educational videos | | | | √ | √ | | √ | √ | | |
| Applications on Clean room design & Aseptic Technique: | | | | √ | √ | | √ | √ | | |



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|--|--|--|--|---|---|--|---|---|--|---|--|--|
| Basic Calculations for hospital pharmacist | | | | | | | | | | | | |
| Hazardous drug handling | | | | √ | √ | | √ | √ | | | | |
| Design of TPN therapy (basic principles) | | | | √ | √ | | √ | √ | | √ | | |
| Design of TPN therapy (problem-solving) | | | | √ | √ | | √ | √ | | √ | | |
| Adjustment of dose of insulin Generic substitutions | | | | √ | √ | | √ | √ | | √ | | |
| Pediatric dose calculations | | | | √ | √ | | √ | √ | | √ | | |
| Calculations of IV infusion Rate | | | | √ | √ | | √ | √ | | √ | | |
| Reporting and identification of drug therapy | | | | √ | √ | | √ | √ | | √ | | |



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|--|--|--|--|--|---|---|--|---|---|--|---|---|
| problems | | | | | | | | | | | | |
| Extraction of medication errors from simulated inpatient prescriptions | | | | | √ | √ | | √ | √ | | √ | |
| Group project presentation: selected topics | | | | | √ | √ | | √ | √ | | √ | √ |

Matrix 2. between course contents, methods of learning and assessment

A) Theoretical Part:

| Course Contents | Teaching and Learning Methods | | | | | | | Assessment methods | | | |
|-----------------|-------------------------------|-----------------|----------------|--------------|-----------------|------------|---------------|--------------------|--------------------|---------|------|
| | Lecture | Hybrid learning | Online lecture | Lab sessions | Problem solving | Case Study | Self-learning | Corse Work | Practical/Tutorial | Written | Oral |



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| | | | | | | | | | | | |
|---|---|---|---|--|--|--|--|---|--|---|--|
| <p>Introduction to Hospital pharmacy practice Organization of hospital pharmacy with its different facilities, the role of hospital pharmacist in different services (inpatient and outpatient services)</p> | √ | √ | √ | | | | | √ | | √ | |
| <p>In-Patient services: Compounding sterile preparations. Types of compounding, standards, and resources, Interpreting USP terminology, USP space requirements for sterile compounding, Types of locations that can house a primary engineering control, “risk” and compounded formulations, garbing for all types of compounding</p> | √ | √ | √ | | | | | √ | | √ | |



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| | | | | | | | | | | | |
|---|---|---|---|--|--|--|--|---|--|---|---|
| In-Patient services: Parenteral therapy Types of parenteral drug administration, IV incompatibilities (different types, prevention strategies) complications of parenteral drug administration (physical and therapeutic complications) and patient monitoring. | √ | √ | √ | | | | | √ | | √ | √ |
| Inpatient services: Handling of hazardous and cytotoxic drugs Hazardous drug exposure & spill management | √ | √ | √ | | | | | √ | | √ | √ |
| Inpatient services: Handling of controlled substances A drug or a substance, or immediate precursor, included in schedule I, II, III, IV or V | √ | √ | √ | | | | | √ | | √ | √ |



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|---|---|---|---|--|--|--|--|---|--|---|---|
| Inpatient services: Nutrition therapy management (Parenteral ,Enteral nutrition) Recommend a patient-specific nutrition and monitoring parameters based on nutritional needs, comorbidities, and clinical condition | √ | √ | √ | | | | | √ | | √ | √ |
| Inpatient services: Drug distribution systems Types of drug distribution within the hospital | √ | √ | √ | | | | | √ | | √ | √ |
| Inpatient and outpatient services: Drug Information Center (DIC) Types of information resources, function, systematic approach to answer drug information request | √ | √ | √ | | | | | | | √ | √ |



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|---|---|---|---|--|--|--|--|--|--|--|---|---|
| Inpatient services: Fluid and electrolytes therapy Recommend an appropriate IV fluid regimen and monitoring parameters given a patient clinical scenario, monitoring parameters of safe and effective use of these intravenous fluids, electrolyte abnormalities and recommend an appropriate pharmacologic treatment plan based on individual patient signs and symptoms. | √ | √ | √ | | | | | | | | √ | √ |
| Inpatient and outpatient services: e-Prescribing (Electronic prescribing service) definition, steps and advantages of e-Prescribing | √ | √ | √ | | | | | | | | √ | √ |
| Inpatient and outpatient services: Medication errors Types and prevention | √ | √ | √ | | | | | | | | √ | √ |



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| | | | | | | | | | | | |
|--|---|-------------------------------|---|--|--|--|---|--------------------|--|---|---|
| Inpatient and outpatient services: | √ | √ | √ | | | | | | | √ | √ |
| Patient counselling Steps in counseling patients regarding medication use, Important patient considerations for counseling, Concepts to discuss with patients and health care professionals | | | | | | | | | | | |
| Pharmacy and therapeutics committee Organization and function of Pharmacy and therapeutics committee Hospital Formulary: Self learning topic, discussion, revision Management, drug evaluations monograph | √ | √ | √ | | | | √ | | | √ | √ |
| B) Practical Part: | | | | | | | | | | | |
| Course Contents | | Teaching and Learning Methods | | | | | | Assessment methods | | | |



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Course specification
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| | Lecture | Hybrid learning | Online lecture | Lab sessions | Problem solving | Case Study | Self-learning | Corse Work | Practical/Tutorial | Written | Oral |
|---|---------|-----------------|----------------|--------------|-----------------|------------|---------------|------------|--------------------|---------|------|
| Clinical case presentations with communication skills applications. Allegation | | | | ✓ | | ✓ | | | ✓ | | |
| Applications on Clean room design & Aseptic Technique: Practical educational videos | | | | ✓ | | ✓ | | | ✓ | | |
| Applications on Clean room design & Aseptic Technique: Basic Calculations for hospital pharmacist | | | | ✓ | ✓ | ✓ | | | ✓ | | |
| Hazardous drug handling | | | | ✓ | | ✓ | | | ✓ | | |
| Design of TPN therapy (basic principles) | | | | ✓ | | ✓ | | | ✓ | | |
| Design of TPN therapy (problem-solving) | | | | ✓ | ✓ | ✓ | | | ✓ | | |
| Adjustment of dose of insulin Generic substitutions | | | | ✓ | | ✓ | | | ✓ | | |
| Pediatic dose calculations | | | | ✓ | ✓ | ✓ | | | ✓ | | |



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| | | | | | | | | | | | |
|--|--|--|--|---|---|---|---|--|---|--|--|
| Calculations of IV infusion Rate | | | | √ | √ | √ | | | √ | | |
| Reporting and identification of drug therapy problems | | | | √ | √ | √ | | | √ | | |
| Extraction of medication errors from simulated inpatient prescriptions | | | | √ | √ | √ | | | √ | | |
| Group project presentation: selected topics | | | | √ | √ | √ | √ | | √ | | |

| | |
|--------------------|------------------------------------|
| Course Coordinator | Dr. Noha O. Mansour |
| | <i>Noha Osama</i> |
| Head of Department | Prof. Dr. Mohamed Elhusseiny Shams |
| | <i>Mohamed Elhusseiny</i> |
| | Date: 7 /9 /2023 |



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Course specification
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بكالوريوس الصيدلة الإكلينيكية- فارم دي
Pharm D-Clinical Pharmacy
Course Specification
Academic year: 2023/2024

| | |
|--|--|
| Course name: Biopharmaceutics and Pharmacokinetics | اسم المقرر: الصيدلة الحيوية وحركية الدواء |
| Academic Level: Third level | الثالث المستوى الأكاديمي : |
| Scientific department: Pharmaceutics | القسم العلمي : الصيدلانيات |
| Head of Department: Prof. Dr. Irhan Ibrahim Abu Hashim | رئيس القسم :أ.د/ إرهان إبراهيم أبو هاشم |
| Course Coordinator: Prof.Dr / Thanaa EL-said Borg | منسق المقرر : ا.د/ ثناء السعيد برج |



Mansoura University
Faculty of Pharmacy
Clinical Pharmacy Program



Course specification
2023- 2024
Pharm D Program

| | |
|--|--|
| University | Mansoura |
| Faculty | Pharmacy |
| Department offering the course | Pharmaceutics |
| Department supervising the course | Pharmaceutics |
| Program on which the course is given | B. Pharm. (PharmD) (Clinical Pharmacy) |
| Academic Level | Third Level, Second semester, 2023-2024 |
| Date of course specification approval | September 2023 |

A. Basic Information: Course data:

| | |
|---------------------------------------|---------------------------------------|
| Course Title | Biopharmaceutics and Pharmacokinetics |
| Course Code | PT 608 |
| Prerequisite | Pharmaceutical dosage forms III |
| Teaching credit Hours: Lecture | 2 |
| : Practical | 1 |
| Total Credit Hours | 3 |

B. Professional Information:

1. Course Aims:

This course enables the students to:

- Understand the principle of biopharmaceutics and pharmacokinetics.
- Solve problems related to the pharmacokinetic parameters (including AUC, half-life, total clearance, volume of distribution).



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- Know the principles of pharmacokinetic (including absorption, distribution, metabolism, and elimination) and drug-drug interactions.
- Gain some knowledge about the basis of selection, a particular drug preparation, route of administration and evaluation of bioavailability of drugs products.

2- Course K. elements:

Upon completing the course, the student will be able to dominate the following key elements

Domain 1- Fundamental Knowledge

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 1.1.9 | 1.1.9.1 | Define the biopharmaceutical topics such as: drug absorption, distribution, metabolism, excretion. |
| | 1.1.9.2 | Identify the various factors affecting the bioavailability of drugs such as; physiological, physicochemical, and formulation-related factors and describe a route of administration with a dosage regimen that gives appropriate response. |
| | 1.1.9.3 | Recognize pharmacokinetic parameters from data obtained for drugs administered via the intravascular and extravascular routes. |

Domain 2: Professional and Ethical Practice

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|---|
| 2.2.4 | 2.2.4.1 | Implement pharmacokinetics and biopharmaceutics basics in the calculation of pharmacokinetic parameters for new drug delivery systems, as well as dose modification and bioequivalence studies. |
| 2.4.3 | 2.4.3.1 | Conduct the dose adjustment principles for patients with hepatic or renal insufficiency. |
| 2.5.4 | 2.5.4.1 | Determine the different pharmacokinetic parameters from the supplied biological data. |

Domain 3: Pharmaceutical Care



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| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|---|
| 3.1.1 | 3.1.1.1 | Adjust the dosage regimen based on the calculation of the pharmacokinetic parameters. |
| | 3.1.1.2 | Utilize the available pharmacokinetic data to improve the quality of patient's life |

Domain 4: Personal Practice:

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 4.1.2 | 4.1.2.1 | Retrieve and evaluate information, solve problems, and work effectively in a team. |
| 4.2.1 | 4.2.1.1 | Communicate effectively in a scientific language by verbal and written means in the field of health care and natural pharmaceutical preparations regarding the studied topics. |
| 4.3.2 | 4.3.2.1 | Practice independent learning to promote continuous professional development. |

3- Course Contents:

A. Theoretical Part

| Week No. | Topics | Lecture credit Hours |
|----------|---|----------------------|
| 1 | Rates and orders of reactions Intravenous bolus administration: one- compartment model | 2 |
| 2 | Intravenous bolus administration: Monitoring drug in urine The "amount remaining to be excreted" method (ARE) Clearance: definition- types of clearance | 2 |
| 3 | Introduction to biopharmaceutics and pharmacokinetics definitions, Bioavailability. | 2 |



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| | | |
|----|---|---|
| 4 | Mechanisms of drug absorption | 2 |
| 5 | Factors affecting drug absorption (Physiological factors) | 2 |
| 6 | Factors affecting drug absorption (Physicochemical and formulation factors) | 2 |
| 7 | Drug distribution and metabolism | 2 |
| 8 | Drug excretion (renal and non-renal) | 2 |
| 9 | Nonlinear pharmacokinetics (definition, characteristics, Michaelis-Menten equation. | 2 |
| 10 | Pharmacogenetics (definition, examples, application) | 2 |
| 11 | Pharmacokinetics soft wares (importance and Examples)- self learning topics | 2 |
| 12 | Continuous IV infusion (infusion rate, true and practical steady state, loading dose) | 2 |
| 13 | Pharmacokinetics of drug absorption (feathering method- t_{max} - C_{max}) | 2 |
| 14 | Pharmacokinetics of IV bolus multiple dosing + Self – learning discussion | 2 |
| 15 | Compensatory and alternative lecture | 2 |
| 16 | Revision & quiz | 2 |
| 17 | Final written and oral exam | - |

B. practical part:

| Week No. | Practical topics | Practical credit hours |
|----------|---|------------------------|
| 1 | Mathematical Fundamentals in pharmacokinetics and Calculation of AUC (Trapezoid rule) | 1 |
| 2 | Rates and orders of Reactions | 1 |



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| | | |
|----|--|---|
| 3 | One-Compartment Open Model: Intravenous Bolus Administration | 1 |
| 4 | One-Compartment Open Model: Intravenous Bolus Administration, Pharmacokinetic parameters. | 1 |
| 5 | Bioavailability | 1 |
| 6 | Calculation of Elimination rate constant (K): using urine data Urinary excretion rate method | 1 |
| 7 | Calculation of Elimination rate constant (K): using urine data Sigma minus method | 1 |
| 8 | Midterm exam | - |
| 9 | Calculation of Elimination rate constant (K) | 1 |
| 10 | Determination of absorption rate constant ka | 1 |
| 11 | Multiple Dosing of IV bolus injection | 1 |
| 12 | IV infusion | 1 |
| 13 | Noyes-Whitney equation | 1 |
| 14 | Henderson-Hasselbalch equation | 1 |
| 15 | Revision & Activity | 1 |
| 16 | Sheet and Practical exam applying OSPE | 1 |



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4- Teaching and Learning Methods:

| Teaching and learning Methods | | Weeks No. | K. elements to be addressed |
|-------------------------------|---|-----------|---|
| 4.1 | Hybrid learning <ul style="list-style-type: none"> Online learning through my mans "Mansoura university" as recorded video lectures Interactive discussion through My Mans. | 1-16 | 1.1.9.1, 1.1.9.2, 1.1.9.3, 2.2.4.1, 2.4.3.1, 2.5.4.1, 3.1.1.1, 3.1.1.2, 4.1.2.1, 4.2.1.1, 4.3.2.1 |
| 4.2 | Advanced lecture Brain storming | 1-16 | 1.1.9.1, 1.1.9.2, 1.1.9.3, 2.2.4.1, 2.4.3.1, 2.5.4.1, 3.1.1.1, 3.1.1.2, 4.1.2.1, 4.2.1.1, 4.3.2.1 |
| 4.3 | Self-learning | 11, 14 | 4.1.2.1, 4.2.1.1, 4.3.2.1 |
| 4.2 | Practical works and tutorials | 1-12 | 1.1.9.2, 1.1.9.3, 2.2.4.1, 2.4.3.1, 2.5.4.1, 3.1.1.1, 3.1.1.2, 4.1.2.1, 4.2.1.1 |

5- Student Assessment:

m- Assessment Methods:

| Assessment Methods | K elements to be assessed |
|-----------------------------------|---|
| 1-Written exam | 1.1.9.1, 1.1.9.2, 1.1.9.3, 2.2.4.1, 2.4.3.1, 2.5.4.1, 3.1.1.1, 3.1.1.2, |
| 2-Practical exam Applying OSPE | 1.1.9.2, 1.1.9.3, 2.2.4.1, 2.4.3.1, 2.5.4.1, 3.1.1.1, 3.1.1.2, 4.1.2.1, 4.2.1.1 |
| 3-Oral exam | 1.1.9.1, 1.1.9.2, 1.1.9.3, 2.2.4.1, 2.4.3.1, 2.5.4.1, 3.1.1.1, 3.1.1.2, |



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| | |
|---|---|
| | 4.1.2.1, 4.2.1.1, 4.3.2.1 |
| 4- Periodical (Mid-term exam) / Course work | 1.1.9.1, 1.1.9.2, 1.1.9.3, 2.2.4.1, 2.5.4.1, 4.1.2.1, 4.2.1.1 |

b. Assessment schedule

| | | |
|--------------|--|---------------------------------------|
| Assessment 1 | Periodical (Mid-term exam) / Course work | 7 th -9 th week |
| Assessment 2 | Practical examination and tutorial | 16 th week |
| Assessment 3 | Written exam | 17 th week |
| Assessment 4 | Oral exam | 17 th week |

c. Weighing of assessments

| | | |
|-------|--|------|
| 1 | Periodical (Mid-term) exam / course work | 15% |
| 2 | Practical examination and tutorial | 25% |
| 3 | Final-term examination | 50% |
| 4 | Oral examination | 10% |
| Total | | 100% |

6- Facilities required for teaching and learning

| | |
|-------------|--|
| -Class room | Data show- Computers, Internet, platform |
| -library | Books and pharmacopoeia |

7- List of References

| No | Reference | Type |
|----|---|--------------------|
| 1. | Electronic book prepared by staff members | Course notes |
| 2. | Recorded videos prepared by staff members | Videos on platform |



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| | | |
|----|--|----------|
| 3. | Applied Biopharmaceutics and Pharmacokinetics, 8 th Ed., Murray P. Ducharme, Leon Shargel (2022). | Book |
| 5. | Basic pharmacokinetics, 3 rd Ed., Mohsen A Hedaya ed., Pharmaceutical Press (2024) | Book |
| 6. | http://www.sciencedirect.com http://www.google scholar.com http://www.pubmed.com https://www.ekb.eg | Websites |



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Course specification
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8-Matrix

1. Course content and course key elements

A. Theoretical part

| Course contents / K. elements | Domain 1 | | | Domain 2 | | | Domain 3 | | Domain 4 | | |
|---|----------|---------|---------|----------|---------|---------|----------|---------|----------|---------|---------|
| | 1.1.9.1 | 1.1.9.2 | 1.1.9.3 | 2.2.4.1 | 2.4.3.1 | 2.5.4.1 | 3.1.1.1 | 3.1.1.2 | 4.1.2.1 | 4.2.1.1 | 4.3.2.1 |
| Rates and orders of reactions Intravenous bolus administration: one- compartment model | | | ✓ | ✓ | | ✓ | ✓ | | ✓ | | |
| Intravenous bolus administration: Monitoring drug in urine The “amount remaining to be excreted” method (ARE) Clearance: definition- types of clearance | | | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | |



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| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Introduction to biopharmaceutics and pharmacokinetics definitions. Bioavailability | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | |
| Mechanisms of drug absorption | ✓ | ✓ | | | | | | | | | | ✓ | |
| Factors affecting drug absorption (Physiological factors) | ✓ | ✓ | | | | | | | | | | ✓ | |
| Factors affecting drug absorption (Physicochemical and formulation factors) | ✓ | ✓ | | | | | | | | | | ✓ | |
| Drug distribution and metabolism | ✓ | | | | ✓ | | | | | | | ✓ | |
| Drug excretion (renal and non-renal) | ✓ | | | | ✓ | | | | | | | ✓ | |
| Nonlinear pharmacokinetics (definition, characteristics, Michaelis-Menten equation. | | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | |



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| | | | | | | | | | | | | |
|---|--|---|---|---|---|---|--|---|---|---|---|---|
| Pharmacokinetics of IV bolus multiple dosing. | | | | | | | | | | | | |
| Pharmacogenetics (definition, examples, application) | | ✓ | | | | ✓ | | | ✓ | | ✓ | |
| Pharmacokinetics soft wares (importance and Examples)- self learning topics | | | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Continuous IV infusion (infusion rate, true and practical steady state, loading dose) | | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | |
| Pharmacokinetics of drug absorption (feathering method- t max- CP max) | | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | . |
| Pharmacokinetics of IV bolus multiple dosing. and Self-learning discussion. | | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | ✓ |



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Course specification
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B. Practical topics

| Course contents / K. elements | Domain 1 | | | Domain 2 | | | Domain 3 | | Domain 4 | | |
|---|----------|---------|---------|----------|---------|---------|----------|---------|----------|---------|---------|
| | 1.1.9.1 | 1.1.9.2 | 1.1.9.3 | 2.2.4.1 | 2.4.3.1 | 2.5.4.1 | 3.1.1.1 | 3.1.1.2 | 4.1.2.1 | 4.2.1.1 | 4.3.2.1 |
| Mathematical Fundamentals in pharmacokinetics and Calculation of AUC (Trapezoid rule) | | | ✓ | ✓ | | | | | ✓ | ✓ | ✓ |
| Rates and orders of Reactions | | | ✓ | ✓ | | | | | ✓ | ✓ | ✓ |
| One-Compartment Open Model: Intravenous Bolus Administration | | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| One-Compartment Open Model: Intravenous Bolus Administration, Pharmacokinetic parameters. | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Bioavailability | | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| Calculation of Elimination rate constant (K): using urine data Urinary excretion rate method | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Calculation of Elimination rate | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |



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Course specification
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| | | | | | | | | | | | |
|--|--|---|---|---|---|---|---|---|---|---|---|
| constant (K): using urine data Sigma minus method | | | | | | | | | | | |
| Calculation of Elimination rate constant (K): | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Determination of absorption rate constant ka | | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| Multiple Dosing of IV bolus injection | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IV infusion | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Noyes-Whitney equation | | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✓ |
| Henderson-Hasselbalch equation | | ✓ | | | | | | | ✓ | ✓ | ✓ |



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Course specification
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Matrix 2. Between course contents, methods of learning and assessment

A. Theoretical part

| Theoretical course contents | Teaching and Learning Methods | | | | | Assessment methods | | | |
|--|-------------------------------|-----------------|--------------|---------------------|---------------|--------------------|-----------|---------|------|
| | Advanced Lecture | Hybrid learning | Lab sessions | Team-based learning | Self-learning | Course Work | Practical | Written | Oral |
| Rates and orders of reactions Intravenous bolus administration: one- compartment model | √ | √ | | | | √ | | √ | √ |
| Intravenous bolus administration: Monitoring drug in urine The “amount remaining to be excreted” method (ARE) Clearance: definition- types of clearance | √ | √ | | | | √ | | √ | √ |



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| | | | | | | | | | | |
|--|---|---|--|--|--|--|---|--|---|---|
| Introduction to biopharmaceutics and pharmacokinetics definitions. Bioavailability | √ | √ | | | | | √ | | √ | √ |
| Mechanisms of drug absorption | √ | √ | | | | | √ | | √ | √ |
| Factors affecting drug absorption (Physiological factors) | √ | √ | | | | | | | √ | √ |
| Factors affecting drug absorption (Physicochemical and formulation factors) | √ | √ | | | | | | | √ | √ |
| Drug distribution and metabolism | √ | √ | | | | | | | √ | √ |
| Drug excretion (renal and non-renal) | √ | √ | | | | | | | √ | √ |
| Nonlinear pharmacokinetics (definition, characteristics, Michaelis-Menten equation. Pharmacokinetics of IV bolus multiple dosing. | √ | √ | | | | | | | √ | √ |
| Pharmacogenetics (definition, examples, application) | √ | √ | | | | | | | √ | √ |



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| | | | | | | | | | |
|---|---|---|--|--|---|--|--|---|---|
| Pharmacokinetics soft wares (importance and Examples)- self learning topics | √ | √ | | | √ | | | √ | √ |
| Continuous IV infusion (infusion rate, true and practical steady state, loading dose) | √ | √ | | | | | | √ | √ |
| Pharmacokinetics of drug absorption (feathering method- t max- CP max) | √ | √ | | | | | | √ | √ |
| Pharmacokinetics of IV bolus multiple dosing. and Self-learning discussion. | √ | √ | | | √ | | | √ | √ |

B. Practical part



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Course specification
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| Practical course contents | Teaching and Learning Methods | | | | | Assessment methods | | | |
|---|-------------------------------|----------------|--------------|-------------------------------|---------------|--------------------|-----------|---------|------|
| | Lecture | Online lecture | Lab sessions | Practical works and tutorials | Self-learning | Course Work | Practical | Written | Oral |
| Mathematical Fundamentals in pharmacokinetics and Calculation of AUC (Trapezoid rule) | | | ✓ | ✓ | | | ✓ | | |
| Rates and orders of Reactions | | | ✓ | ✓ | | | ✓ | | |
| One-Compartment Open Model: Intravenous Bolus Administration | | | ✓ | ✓ | | | ✓ | | |
| One-Compartment Open Model: Intravenous Bolus Administration, Pharmacokinetic parameters. | | | | | | | | | |
| Bioavailability | | | ✓ | ✓ | | | ✓ | | |



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| | | | | | | | | | |
|---|--|--|---|---|--|--|---|--|--|
| Calculation of Elimination rate constant (K): using urine data Urinary excretion rate method | | | √ | √ | | | √ | | |
| Calculation of Elimination rate constant (K): using urine data Sigma minus method | | | √ | √ | | | √ | | |
| Calculation of Elimination rate constant (K) | | | | | | | | | |
| Determination of absorption rate constant ka | | | √ | √ | | | √ | | |
| Multiple Dosing of IV bolus injection | | | √ | √ | | | √ | | |
| IV infusion | | | √ | √ | | | √ | | |
| Noyes-Whitney equation | | | √ | √ | | | √ | | |
| Henderson-Hasselbalch equation | | | √ | √ | | | √ | | |



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Course specification
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| | |
|---------------------------|---|
| Course Coordinator | Prof .Dr.Thanaa EL-Said Borg  |
| Head of Department | Prof. Dr. Irhan Ibrahim Abu Hashim  |

Date: 20 September 2023



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Course specification
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بكالوريوس الصيدلة الإكلينيكية- فارم دي
Pharm D-Clinical Pharmacy
Course Specification
Academic year: 2023/2024

| | |
|--|---|
| Course name: First Aid and Basic Life Support (MD 605) | اسم المقرر : الاسعاف الأولي ودعم الحياه الأساسى |
| Academic Level: Third level | المستوى الأكاديمي: المستوى الثالث |
| Scientific department: Pharmacology and Toxicology | القسم العلمي : الأدوية والسموم |
| Head of Department: Prof. Dr. Manar A. Nader | رئيس القسم : إ.د/ منار احمد نادر |
| Course Coordinator: | منسق المقرر : |



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Course specification
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| | |
|---------------------------------------|--|
| University | Mansoura |
| Faculty | Pharmacy |
| Department offering the course | Pharmacology and Toxicology |
| Department supervising the course | Pharmacology and Toxicology |
| Program on which the course is given | B. Pharm. (Clinical Pharmacy) (Pharm-D) |
| Academic Level | Level Three, Second semester , 2023-2024 |
| Date of course specification approval | 18 th September 2023 |

A. Basic Information: Course data:

| | |
|--------------------------------|----------------------------------|
| Course Title | First Aid and Basic Life Support |
| Course Code | MD 605 |
| Prerequisite | Registration |
| Teaching credit Hours: Lecture | 2 |
| Practical | - |
| Total Credit Hours | 2 |

B. Professional Information:

1. Course Aims:

This course enables the students to know how to deal with medical emergency based on the different courses. It includes introduction, accidents, first aid of ABCs, medical emergencies,



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Program



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effect of temperature, respiratory emergencies, fractures and dislocations, bleeding and surgical emergencies, burns, animal bites or stings and poisoning.

2- Course k. elements:

Upon completing the course, the student will be able to dominate the following key elements

Domain 1- Fundamental Knowledge

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 1.1.1 | 1.1.1.1 | Recognize first aid skills and management for a range of common disorders and injuries. |
| 1.1.8 | 1.1.8.1 | Describe emergency procedures and techniques of basic life support for casualties in emergency situations. |

Domain 2: Professional and Ethical Practice

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 2.1.1 | 2.1.1.1 | Illustrate professional requirements for individuals and healthcare team to provide first aid care. |
| 2.4.2 | 2.4.2.1 | Recognize the ability to use principles of first aid in the practice of pharmacy |
| 2.4.1 | 2.4.1.1 | Identify and deal with different causes of poisoning and select the first aid measures for various toxic agents. |
| 2.4.5 | 2.4.5.1 | Implement practical solutions to medical emergency cases depending on related signs, symptoms, and risk factors. |



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| | | |
|-------|---------|---|
| 2.4.6 | 2.4.6.1 | Know principles of physical assessment needed to save patients life |
|-------|---------|---|

Domain 3: Pharmaceutical Care

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|--|
| 3.2.2 | 3.2.2.1 | Assess and perform first aid measures and initial therapy for injured and ill casualties. |
| | 3.2.2.2 | Demonstrate how to perform basic first aid technical procedures. |
| 3.2.5 | 3.2.5.1 | Provide education and counseling to patients, healthcare professionals and communities to achieve safe and cost-effective use of medicines |

Domain 4: Personal Practice:

| Program K. element no. | Course K. element no. | Course K. element |
|------------------------|-----------------------|---|
| 4.1.2 | 4.1.2.1 | Apply critical thinking in analyzing information, work individually and in team. |
| 4.3.1 | 4.3.1.1 | Acquire skills to arrange priorities in case of managing medical emergencies in pharmacy. |
| | 4.3.1.2 | Practice independent learning to promote first aid knowledge and skills. |

3- Course Contents:

| Week No. | Topics | Lecture credit Hours |
|----------|---|----------------------|
| 1 | Introduction to first aid | 2 |
| 2 | First aid care for allergic reactions, anaphylaxis, and shock | 2 |
| 3 | First aid care for choking | 2 |



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| | | |
|----|---|---|
| 4 | Cardiovascular Emergencies | 2 |
| 5 | Respiratory Emergencies | 2 |
| 6 | Diabetic Emergencies | 2 |
| 7 | First aid care for bleeding | 2 |
| 8 | First aid care for wounds, and burns | 2 |
| 9 | First aid care for musculoskeletal injuries | 2 |
| 10 | Neurological emergencies | 2 |
| 11 | Environmental emergencies | 2 |
| 12 | First aid care for poisoning (part 1) | 2 |
| 13 | First aid care for poisoning (part 2) | 2 |
| 14 | Human bites (self-learning) | 2 |
| 15 | Compensatory and alternative lecture | 2 |
| 16 | Revision & quiz | 2 |
| 17 | Final written and oral exam | - |

4- Teaching and Learning Methods:

| Teaching and Learning Method | | Week number | K. elements to be addressed |
|------------------------------|---|-------------|---|
| 4.1 | Advanced lectures: <ul style="list-style-type: none"> Lectures using Data show, power Point presentations Brain storming Group discussion | 1-16 | 1.1.1.1, 1.1.8.1, 2.4.1.1, 2.4.2.1,2.4.5.1, 2.4.6.1 |



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|-----|--|--------|--|
| 4.2 | Hybrid learning <ul style="list-style-type: none"> Online learning through my Mans "Mansoura university " Interactive discussion through My Mans | 5,8,12 | 1.1.1.1, 1.1.8.1, 2.4.1.1, 2.4.2.1, 2.4.5.1, 2.4.6.1 |
| 4.3 | Self-learning | 14 | 4.1.2.1.,4.3.1.1, 4.3.1.2 |
| 4.4 | Collaborative learning: research project | 4-8 | 2.4.1.1, 2.4.2.1, 2.4.5.1, 2.4.6.1, 3.2.2.1, 3.2.7.1, 4.1.2.1. |

5- Student Assessment:

n- Assessment Methods:

| Assessment Methods | K elements to be assessed |
|---|--|
| 1-Written exam | 1.1.1.1, 1.1.8.1, 2.1.1.1, 2.4.1.1, 2.4.2.1, 2.4.5.1, 2.4.6.1, 3.2.2.1, 3.2.7.1 |
| 2-Oral | 1.1.1.1, 1.1.8.1, 2.1.1.1, 2.4.1.1, 2.4.2.1, 2.4.5.1, , 2.4.6.1, 3.2.2.2, 3.2.7.1, 4.1.2.1., 4.3.1.2 |
| 3- Periodical (Mid-term exam) / Course work | 1.1.1.1, 1.1.8.1, 2.1.1.1, 2.4.1.1, 2.4.2.1, 2.4.5.1, 2.4.6.1, 3.2.2.1, 3.2.7.1, 4.1.2.1., 4.3.1.1 |

b. Assessment schedule

| | | |
|--------------|--|--|
| Assessment 1 | Periodical (Mid-term exam) / Course work | 7 th - 9 th week |
| Assessment 2 | Written exam | Start from 17 th week |
| Assessment 3 | Oral exam | Start from 17 th week |

c. Weighing of assessments

| | | |
|---|--|-----|
| 1 | Periodical (Mid-term) exam / Course work | 15% |
|---|--|-----|



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|-------|------------------------|------|
| 2 | Final-term examination | 75% |
| 3 | Oral examination | 10% |
| Total | | 100% |

6- Facilities required for teaching and learning

| | |
|-------------|--|
| -Class room | Data show- Computers, Internet, White board. |
|-------------|--|

7- List of References

| No | Reference | Type |
|----|--|---------------------|
| 1. | Electronic book prepared by staff members | Course notes |
| 2. | First Aid Manual, 11th Edition. Written and Authorised by the UK's Leading First Aid Providers (2021). | Book |
| 3. | First Aid Made Easy: A Comprehensive First Aid Manual and Reference Guide; Nigel Barraclough. Quallsafe Limited; 11th edition (2019) | Book |
| 4. | First Aid/ CPR/ AED Participant's Manual, Published by American Red Cross (2021). | Book |
| 5. | PHECC Clinical Practice Guidelines, 2021 edition. | Book |
| 6. | http://www.sciencedirect.com/ http://www.google scholar.com/ http://www.pubmed.com https://www.ekb.eg | websites |



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8- Matrix of course content versus course k. elements:

| Course contents / K. elements | Domain 1 | | Domain 2 | | | | | Domain 3 | | | Domain 4 | | |
|---|----------|---------|----------|---------|---------|---------|---------|----------|---------|---------|----------|---------|---------|
| | 1.1.1.1 | 1.1.8.1 | 2.1.1.1 | 2.4.1.1 | 2.4.2.1 | 2.4.5.1 | 2.4.6.1 | 3.2.2.1 | 3.2.2.2 | 3.2.5.1 | 4.1.2.1 | 4.3.1.1 | 4.3.1.2 |
| Introduction to first aid | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | | | |
| First aid care for allergic reactions, anaphylaxis, and shock | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| First aid care for choking | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Cardiovascular Emergencies | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Respiratory Emergencies | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Diabetic Emergencies | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| First aid care for bleeding | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| First aid care for wounds, and burns | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |



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| | | | | | | | | | | | | | | | |
|---|---|---|--|---|---|---|---|---|--|---|---|---|---|---|---|
| First aid care for musculoskeletal injuries | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Neurological emergencies | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Environmental emergencies | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| First aid care for poisoning (part 1) | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| First aid care for poisoning (part 2) | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Human bites (self-learning) | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

9- Matrix between course content, method of learning and assessment:

| Course contents | Teaching and learning methods | | | | Assessment methods | | | |
|---|-------------------------------|-----------------|---------------|-------------------------|--------------------|--------------------|---------|------|
| | Advanced Lectures | Hybrid learning | Self-learning | Collaborative learning: | Course work | Practical/tutorial | Written | Oral |
| Introduction to first aid | ✓ | | | | ✓ | | ✓ | ✓ |
| First aid care for allergic reactions, anaphylaxis, and shock | ✓ | | | | ✓ | | ✓ | ✓ |
| First aid care for choking | ✓ | | | | ✓ | | ✓ | ✓ |
| Cardiovascular Emergencies | ✓ | | | ✓ | ✓ | | ✓ | ✓ |
| Respiratory Emergencies | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ |

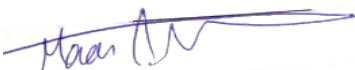


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| | | | | | | | | |
|---|---|---|---|---|---|--|---|---|
| Diabetic Emergencies | ✓ | | | ✓ | ✓ | | ✓ | ✓ |
| First aid care for bleeding | ✓ | | | ✓ | | | ✓ | ✓ |
| First aid care for wounds, and burns | ✓ | ✓ | | ✓ | | | ✓ | ✓ |
| First aid care for musculoskeletal injuries | ✓ | | | | | | ✓ | ✓ |
| Neurological emergencies | ✓ | | | | | | ✓ | ✓ |
| Environmental emergencies | ✓ | | | | | | ✓ | ✓ |
| First aid care for poisoning (part 1) | ✓ | ✓ | | | | | ✓ | ✓ |
| First aid care for poisoning (part 2) | ✓ | | | | | | ✓ | ✓ |
| Human bites (self-learning) | ✓ | | ✓ | | | | ✓ | ✓ |

| | |
|---------------------------|--|
| Course Coordinator | |
| Head of Department | Prof. Dr. Manar A. Nader  |

Date: 18/9/2023