



**Program specification for Master (MSC)
degree of Medical pharmacology (FA200)
2023**

A. Basic Information:

1. **Minia University**
2. **Faculty of Medicine**
3. **Medical pharmacology department**
4. **Program title:** MSC in Medical pharmacology
5. **Program code:** FA 200
6. **Final award:** Master in Medical pharmacology
7. **Program type:** single double multiple
8. **Responsible department:** Medical pharmacology department.
9. **Departments involved in the program:** Medical Pharmacology department, Medical Biochemistry department, Medical Physiology department.
10. **Program duration:** 2 years
11. **Number of program courses:** 2 courses.....
12. **Coordinator:** Ass. Prof. Dr. Seham Abdel-Wakeel Abdel-Gaber
13. **External evaluator:** Prof. Dr. Ashraf Mohamed Abu Elwafaa
14. **Program management team:** Ass. Prof. Dr. Seham Abdel-Wakeel, Ass. Prof. Dr. Walaa Yehia, Ass. Prof. Dr. Heba Mostafa

B- Professional information:

1. Program aims:

2. The aim of this program is to provide the candidate of MSC degree in pharmacology with:

- 1- Basic Pharmacological knowledge and skills essential to gain further training and practice in the field of pharmacology through understanding the mechanisms of drug actions and establishing enough adequate scientific background essential for the practice of pharmacological research.
- 2- Proper knowledge base of information about each prototype drug for a better understanding of current practices and drug research in medicine and therapeutics.
- 3- Marinating of learning abilities necessary for continuous medical education.

- 4- Proper research interest and abilities necessary for becoming an independent researcher, deal with scientific research equipment, capable of supervising postgraduate students, and able to publish international researches competently.
- 5- The learning abilities necessary for continuous medical education and research interests and team working skills

3. Intended Learning Outcomes (ILOs):

2.1. (a) Knowledge and understanding:

By the end of the study of master program in **Medical Pharmacology** the candidate should be able to:

A1. Memorize the basic biochemical and physiological activities, their disturbances and how to be corrected.

A.2 Define general pharmacokinetics as well specific properties of different groups of drugs putting into consideration age, sex and genetic-related variations that affect the response to drugs (pharmacogenetics).

A.3 Identify general pharmacodynamics as well specific properties of different groups of drugs.

A.4 List the basic pharmacotherapeutics which reflects the role of drugs in prevention, diagnosis and treatment of diseases as well as prevention of conception.

A.5 Enumerate systemic pharmacology which includes drugs acting on different body systems such as cardiovascular, autonomic, respiratory, gastrointestinal, endocrine, blood.

A. 6- State chemotherapy which includes anticancer and antimicrobial pharmacology.

A.7 Identify the basic, and ethics of scientific research.

A8 Describe different environmental induced diseases and the pharmacological treatment of such diseases.

A.9. Define the principles of quality in professional practice in the field of therapeutics and applied pharmacology and list their positive effects on the work environment.

A.10 Identify different metabolic diseases and their alteration by drugs.

A.11 Define different hormonal levels, the normal versus abnormal

A.12. Recall the disturbance in normal physiological function and how to be pharmacologically corrected.

A13. Define the medico logical principles and bylaws relevant to his practice in the field of Pharmacology.

2.2. (b)Intellectual skills

By the end of master program in **Medical Pharmacology** the candidate should be able to:

B.1 Integrate the skills in selecting and using drugs safely and efficiently knowing their limits and the potential risks

B.2 Solve medical problems arising from use of drugs and the development of resistance or tolerance encouraging them to search for alternative approaches after revising the diagnosis.

B.3 Demonstrate an investigatory and analytic thinking “problem-solving” approaches to relevant situations related to Medical Pharmacology.

B.4 Plan research projects.

B.5. Design and apply a study and thesis for detection of new drugs, new chemicals, or new applications of the approved drugs.

B.6 Formulate a plane for participation in clinical or laboratory risk management.

B.7. Interpret different methods for data presentation.

B.8 Design management plans and alternative decisions in different situations in the field of Pharmacology.

B.9. Assess risk in research and experimentation using new drugs and/or chemicals.

B.10. Plan for the development of performance in the field of therapeutics and pharmacological researches.

B.11. Assess different clinical problems and formulate pharmacological researches to solve such problems.

B.12. Combine knowledge for Professional problems' solving.

B.13 Interpret the physiological mechanism of action of the pharmacological drugs

2.3. Skills:

(c) Professional and practical skills

By the end of the study of master program in **Medical Pharmacology** the candidate should be able to:

C.1 Practice different skills of research including how to retrieve the literature and use the different laboratory equipment such as centrifuge, homogenizer, spectrophotometer and Ph meter.

C.2 Evaluate the need of his/her career to join the major advances in drug information

C.3 Perform the basic lab skills essential to the course.

C.4 Prepare plans for performing experiments related to pharmacology.

C.5 Educate students, technicians and junior staff, in the lab about conditions related to Medical Pharmacology; including handling of samples, devices, safety, and maintenances of laboratory equipments.

C.6 Band better understanding of the normal structure and function to solve problems.

C.7 Write competently the reports for situations related to the field of pharmacology.

C.8. Apply different isolated organ experiments to detect the normal versus abnormal physiological function and its modification by pharmacological agents.

2.3.2. (d) General and transferable skills

By the end of the study of master program in **Medical Pharmacology** the candidate should be able to:

D1- Collaborate in practice-based improvement activities using a systemic methodology (share in audits and risk management activities and use logbooks).

D2- Use different facilities for learning of students, lab technical staff and other professionals including their evaluation and assessment.

D3- Collect and verify data from different sources.

D4- Analyse and interpret data.

D5- Appraise evidence from scientific studies.

D6- Use information technology to manage information, access on-line medical researches to support his/her own education.

D7- Work effectively with others as a member or leader of a research group and/or a health care team.

D8- Provide information using effective nonverbal, explanatory, questioning, electronic, and writing skills.

D9- Select and use appropriate education methods and materials in the field of Medical Pharmacology.

D10- Demonstrate a commitment to ethical principles of scientific research.

D11- Work effectively in relevant academic and/or health care delivery settings and systems including good administrative and time management.

D12- Become a partner with health care managers and health care providers to assess, coordinate, and improve health care and predict how these activities can affect system performance.

3- Program Academic Reference Standards

- Faculty of Medicine, Minia University adopted the general national academic reference standards provided by the national authority for quality assurance and accreditation of education (NAQAAE) for all postgraduate programs. (Faculty Council Degree No.6854, in its session No.177 Dated: 18/5/2009). {Annex 1}.
- Minia faculty of medicine has developed the academic standards (ARS) for Medical Doctorate (MD) program and was approved in faculty Council degree No.7528, in its session No.191, dated: 15-3-2010), last update: 20-2-2023 {Annex I}.
- Then, Pharmacology department has developed the intended learning outcomes (ILOs) for doctorate (MD) program in Pharmacology and the Date of program specifications first approval was by department council: 13-5-2013, last update: 6-3-2023{Annex 2}.

5- Program structure and contents:

5.A. Program duration: 2 years

5.B. Program structure

Number of hours: 168 hour

-Lectures: 2 hrs/w

- Practical: 2 hrs/w

- Total hours/weeks: 4 hrs/w

1- Basic sciences (compensatory) course: One of two (Physiology or biochemistry)

2- Specific course related to the specialty: One course

5. Program courses

Number of courses: **2** including:

1- Biochemistry **or** Physiology

2- Pharmacology

N.B. {Courses' specifications are present in Annex 3}

	Hour/week		
Subject	Lectures	Practical	Clinical
First part			
<u>Basic sciences</u>			NA
Medical Biochemistry	2 Hours/Week for 25 weeks	1 Hours/Week for 20 weeks	
or			
Medical Physiology	2 hours/week for 25 weeks	2 hours/week for 10 weeks	
Second part			
Medical Pharmacology	2 Hours/Week for 36 weeks	2 Hours/Week for 13 weeks	NA

Course Title	Total No. of Hours				Program ILOs Covered
		Lect.	Practica	tutorial	
FIRST PART					
Medical Biochemistry	70	50	20		A1,A2,A4,A11, A.12, A13
Medical Physiology	70	50	20		A.12, A.13, C8
Training programs and workshops, seminars	Continuous				A1,2,3,4,5,6,7,8,9,10,11,12, A13 B1,2,3,4,5,6,7,8,9,10,11,12,13 C1,2,3,4,5,6,8 D1,2,3,4,5,6,7,8.9,10,11,12
SECOND PART (Pharmacology)					
Medical Pharmacology	98	72	26		A1,2,3,4,5,6,7,8,9 B1,2,3,4,5,6,7,8,9,10,11,12. C1,2,3,4,5,6,7,8 D1,2,3,4,5,6,7,8,9,10,11,12
Training programs and workshops, field visits, seminars& other scientific activities	Continuous				A1,2,3,4,5,6,7,8,9,10,11,12,A13 B1,2,3,4,5,6,7,8,9,10,11,12,13 C1,2,3,4,5,6,7,8 D1,2,3,4,5,6,7,8.9,10,11,12

6. Program admission requirements

1. General requirements:

A. Candidates should have either:

1. MB BCH degree from any Egyptian faculty of medicine or
2. Equivalent degree from medical schools abroad approved by the ministry of higher education

B. Candidate should complete the house office-training year.

C. Follows postgraduate regulatory rules of Faculty of Medicine, Minia University.

2. Specific requirements:

A. Candidates graduated from Egyptian universities should "Good Rank" in their final year/cumulative years examination and grade "Good Rank "in pharmacology course too.

B. Candidate should know how to speak and write English well.

C. Candidate should have computer skills

D. Follows postgraduate regulatory rules of postgraduate studies of Faculty of Medicine, Minia University

7- Regulations for progression and program completion

Duration of program is (2 years) starting from registration till second part exam; divided to:

First Part: (≥ 12 months):

- All courses as specified in the internal by law
- At least 12 months after registration should pass before the student can ask for examination in the 1st part.
- Two sets of exams: 1st in October — 2nd in April.
- For the student to pass the first part exam, a score of at least 60% in each curriculum is needed (with at least 40% in the written exam). Those who fail in one curriculum need to re-exam it only.

Thesis/essay:

- Start from registration and should be completed and accepted at least after passing 6 months from protocol registration till one month before allowing to enter 2nd part final exam.
- Accepting the thesis occurs after publishing one thesis-based paper in local or international journal and this is enough to pass this part.

Second Part: (≥ 12 months):

- Program related specialized Courses.
- At least 12 months after passing the 1st part should pass before the student can ask for examination in the 2nd part.
- Two sets of exams: 1st in October — 2nd in April.
- For the student to pass the first part exam, a score of at least 60% in each curriculum is needed (with at least 40% in the written exam). Those who fail in one curriculum need to re-exam it only.

- For both parts, fulfillment of the of log book (Attendance, effective discussion in seminars, performance in practical lab and other activities).

8- Teaching and learning methods:

- 1- 2 hours of lectures per week throughout the course.
- 2- 2 hours of practical training and demonstration weekly throughout the course.
- 3- Self training activities such as use of internet and multimedia.
- 4- Regular weekly seminars, presentations, and assignments.
- 5- Training courses and workshops.
- 6- Thesis discussion.
- 7- Conference attendance

Teaching and learning methods	The assessed ILOs
Lectures	A1,2,3,4,5,6,7,8,9,10,11,12,13 B 1,2,3, 4,5,6,7,8,9,10,11,12,13
Practical sessions	C.1,2,3,4,5,6,7,8
Presentations/seminars	D1-12
Training courses and work shops	C1,2,3,4,5,6,7,8 D1,2,3,4,5,6,7,8,9,10,11,12

9. Methods of student assessment:

Method of assessment	The assessed ILOs	
1. Written Exams: <ul style="list-style-type: none"> • Short essay • MCQs • Problem solving 	A1,2,3,4,5,6,7,8,9,10 B1,2,3,12,13	
2. Practical Exam (OSPE)	C1,2,3,4,6,7,8	
3. Research (Thesis)	A1,2,3,4,5,6,7,8,9,10,11,12,13 B1,2,3,4,5,6,7,8,9,10,11,12,13 C1,2,3,4,5,6,7,8 D1,2,3,4,5,6,7,8,9,10, 11,12	

4. Oral Exams	A1,2,3,4,5,6,7,8,9,10,11,12,13 B1,2,3,4,5,6,7,8 C1,2,3,4,5,6,7,8 D1,2,3,4,5,6,7,8,9,10,11,12	
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10- Weighing of assessments:

It is mandatory to pass all the papers of written exams separately

- Total Degrees 1000 marks
- 300 marks for 1st part;
 - Written exam (40%) (120 mark)
 - Oral and Practical exams 60%. (180 mark).
- 700 marks for 2nd part;
 - Written exam 40% (280 marks)
 - 1st paper (140)
 - 2nd paper (140)
 - Oral and Practical exams 60% (420 marks).

Examination system:

✓ **First part:**

- One written exam 2 hours in Biochemistry or physiology + Oral exam + practical exam.

✓ **Second part:**

- Two written exams (3 hours for each) in systemic pharmacology + Oral exam + Practical exam.

11. Evaluation of program intended learning outcomes:

Evaluator (By whom)	Method/tool	Sample
1. Senior students (Students of last year)	Questionnaires	Attached to the file
2. Graduates (Alumni)	Questionnaires	Attached to the file
3. Stakeholders	Meeting Questionnaires	Attached to the file

4. External & Internal evaluators and external examiners	Reports	Attached to the file
5. Quality Assurance Unit	Reports Questionnaires Site visits	Attached to the file

Program coordinator:

Ass. Prof. Dr. Seham Abdel-Wakeel Abdel-Gaber

Program management team:

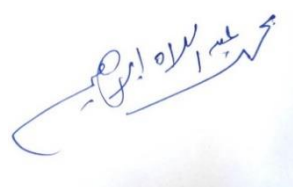
Ass. Prof. Dr. Seham Abdel-Wakeel,

Ass. Prof. Dr. Walaa Yehia

Ass. Prof. Dr. Heba Mostafa

Head of the Pharmacology department:

Prof. Dr. Mohamed Abdellah Ibrahim



Date of 1st approval 13/5/2013.

Date of update 6/3/2023

Annex (1): Comparison between National Academic Quality Assurance & Accreditation (NAQAAE) General Academic Reference Standards (GARS), Faculty Academic Reference Standards (ARS)

NAQAAE برامج الماجستير	Faculty ARS Master (MSC) Program
١. مواصفات الخريج:	1. Graduate Attributes:

خريج برنامج الماجستير في أي تخصص يجب أن يكون قادراً على:	Graduate of master (MSC) program should be able to:
1.1. إجادة تطبيق أساسيات ومنهجيات البحث العلمي واستخدام أدواته المختلفة.	1.1. Understanding and applying of basics of research method and research tools
2.1. تطبيق المنهج التحليلي واستخدامه في مجال التخصص	2.1. Critically analyze, evaluate, and effectively communicate findings, theories, and methods
3.1. تطبيق المعارف المتخصصة ودمجها مع المعارف ذات العلاقة في ممارسته المهنية.	3.1. Apply integrated professional and general knowledge in his scholarly field and at the interface between different fields.
4.1. إظهار وعياً بالمشاكل الجارية والرؤى الحديثة في مجال التخصص.	4.1. Demonstrate awareness of community health needs related to the field of specialization by understanding the beneficial interaction with the society to improve quality of life
5.1. تحديد المشكلات المهنية وإيجاد حلولاً لها.	5.1. Demonstrating proficiency, required to solve current complex problems in his scholarly field.
6.1. إتقان نطاق مناسب من المهارات المهنية المتخصصة واستخدام الوسائل التكنولوجية المناسبة بما يخدم ممارسته المهنية.	6.1. Master a variety of technical skills in his scholarly field and expert relevant equipment, technology, and software.
7.1. لتواصل بفاعلية والقدرة على قيادة فرق العمل.	7.1. Gain leadership skills and be able to communicate efficiently with colleagues and get the best results.
8.1. اتخاذ القرار في سياقات مهنية مختلفة.	8.1. Take professional situational decisions and logically support them.
9.1. توظيف الموارد المتاحة بما يحقق أعلى استفادة والحفاظ عليها	9.1. Optimal use of available resources to achieve research or best patient health care and ensure its maintenance.

10.1. إظهار الوعي بدوره في تنمية المجتمع والحفاظ على البيئة في ضوء المتغيرات.	10.1. Demonstrate awareness of its role in community health development
11.1. التصرف بما يعكس الالتزام بالنزاهة والمصداقية والالتزام بقواعد المهنة.	11.1. Exhibit ethical behavior that reflect commitment to the code of practice
12.1. تنمية ذاته أكاديميا ومهنيا و قادرا علي التعلم المستمر.	12.1. demonstrate the ability to sustain a lifelong personal and professional growth.
٢. المعايير القياسية العامة: NAQAAE General Academic Reference Standards “GARS” for Master Programs	2. Faculty Academic Reference Standards (ARS) for Master Program
١, ٢. المعرفة والفهم: بانتهاء دراسة برنامج الماجستير يجب أن يكون الخريج قادرا علي الفهم والدراسة بكل من:	2.1. Knowledge & Understanding: Upon completion of the Master Program in....., the graduate should have sufficient knowledge and understanding of:
١, ٢, ١. النظريات والأساسيات والحديث من المعارف في مجال التخصص والمجالات ذات العلاقة	2.1.1. Understand the scientific basis and modern knowledge in the field of specialization and related medical sciences
٢, ١, ٢. التأثير المتبادل بين الممارسة المهنية وانعكاسها علي البيئة	2.1.2. The mutual influence of professional practice on work environment, working conditions, and job characteristics.
٣, ١, ٢. التطورات العلمية في مجال التخصص	2.1.3. Scientific developments in the field of specialization
٤, ١, ٢. المبادئ الأخلاقية والقانونية للممارسة المهنية في مجال التخصص	2.1.4. Recognize basics of medico-legal aspects of practice, malpractice and avoid common medical errors

٢,١,٥. مبادئ وأساسيات الجودة في الممارسة المهنية في مجال التخصص	2.1.5. Quality principles in the scholarly field
٢,١,٦. أساسيات وأخلاقيات البحث العلمي	2.1.6. Basis of research methodology and medical ethics.
2.2. المهارات الذهنية: بانتهاج دراسة برنامج الماجستير يجب أن يكون الخريج قادرا على:	2.2. Intellectual Skills: Upon completion of the master program of....., the graduate should be able to:
2.2.1. تحليل وتقييم المعلومات في مجال التخصص والقياس عليها لحل المشاكل	2.2.1. Use judgment skills for analytical and critical problem solving
2.2.2. حل المشاكل المتخصصة مع عدم توافر بعض المعطيات	2.2.2. Capable of integrating knowledge and dealing with complex subjects to solve problems
2.2.3. الربط بين المعارف المختلفة لحل المشاكل المهنية	2.2.3. Be capable of integrating research results and/or results of history, physical and laboratory test findings to solve a research or a clinical problem.
2.2.4. إجراء دراسة بحثية و/أو كتابة دراسة علمية منهجية حول مشكلة بحثية	2.2.4. Effectively apply research methods and carrying out a medical research thesis
2.2.5. تقييم المخاطر في الممارسات المهنية في مجال التخصص	2.2.5. Be aware of risk management principles, and patient safety.
2.2.6. التخطيط لتطوير الأداء في مجال التخصص	2.2.6. Establish goals, commitments, and strategies for improved professional performance in the field of specialty
2.2.7. اتخاذ القرارات المهنية في سياقات مهنية متنوعة.	2.2.7. Take professional situational decisions and logically support them.
3.2. المهارات المهنية: بانتهاج دراسة برنامج الماجستير يجب أن يكون الخريج قادرا على:	3.2. Professional Skills: Upon completion of the master program of....., the graduate must be able to:
3.2.1. إتقان المهارات المهنية الأساسية والحديثة في مجال التخصص	3.2.1. Master the basic and some advanced professional skills in his scholarly field.

٣,٢,٢ كتابة و تقييم التقارير المهني.	3.2.2. Write and evaluate medical or scientific reports
٢,٣,٣ تقييم الطرق والأدوات القائمة في مجال التخصص	3.2.3. Assess and evaluate technical tools during research
4.2. المهارات العامة والمنتقلة : بانتهاؤ دراسة برنامج الماجستير يجب أن يكون الخريج قادرا على:	4.2. General and transferable skills Upon completion of the master program of....., the graduate should be able to:
٤,٢,١. التواصل الفعال بأنواعه المختلفة	4.2.1. Communicate effectively using a written medical record, electronic medical record, or other digital technology.
٤,٢,٢. استخدام تكنولوجيا المعلومات بما يخدم الممارسة المهنية	4.2.2. Use of information technology (computer to create, process, store, secure and exchange electronic data) in the field of medical practice.
4.2.3. لتقييم الذاتي وتحديد احتياجاته التعليمية الشخصية	4.2.3. Assess himself and identify personal learning needs
4.2.4. استخدام المصادر المختلفة للحصول على المعلومات والمعارف	4.2.4. Use various sources for information (physical and digital sources).
4.3.5. وضع قواعد ومؤشرات تقييم أداء الآخرين	4.2.5. Setting indicators for evaluating the performance of others
4.2.6. العمل في فريق، وقيادة فرق في سياقات مهنية مختلفة	4.2.6. Work in a team, and Apply leadership skills to enhance team functioning, the learning environment, and/or the health care delivery system
4.2.7. إدارة الوقت بكفاءة	4.2.7. Manage time efficiently
٤,٢,٨. التعلم الذاتي والمستمر	4.2.8. Demonstrate skills of self-learning and lifelong learning needs of medical profession.

Annex (2): Comparison between National Academic Quality Assurance & Accreditation (NAQAAE) General Academic Reference Standards (GARS), Faculty Academic Reference Standards (ARS), and their adoption by Pharmacology department

NAQAAE برامج الماجستير	Faculty Master (MSC) Program	Pharmacology Master (MSC) Program
١. مواصفات الخريج: خريج برنامج الماجستير في أي تخصص يجب أن يكون قادرا على:	1. Graduate Attributes: Graduate of master (MSC) program should be able to:	1. Graduate Attributes: Graduate of master (MSC) program should be able to:
1.1. إجادة تطبيق أساسيات ومنهجيات البحث العلمي واستخدام أدواته المختلفة.	1.1. Understanding and applying of basics of research method and research tools	1.1. Understanding and applying of basics of pharmacological research method and research tools
2.1. تطبيق المنهج التحليلي واستخدامه في مجال التخصص	2.1. Critically analyze, evaluate, and effectively communicate findings, theories, and methods	2.1. Critically analyze pharmacological data , evaluate, and effectively communicate pharmacological research findings, theories, and methods
3.1. تطبيق المعارف المتخصصة ودمجها مع المعارف ذات العلاقة في ممارسته المهنية.	3.1. Apply integrated professional and general knowledge in his scholarly field and at the interface between different fields.	3.1. Apply integrated professional and general knowledge in pharmacological field and at the interface between different fields as histopathology and biochemistry .
4.1. إظهار وعيا بالمشاكل الجارية والرؤى الحديثة في مجال التخصص.	4.1. Demonstrate awareness of community health needs related to the field of specialization by understanding the	4.1. Demonstrate awareness of community health needs related to the field of specialization by understanding the beneficial interaction with the society to improve quality of life so the candidate can do different researches that may help in solving the health problems

	beneficial interaction with the society to improve quality of life	
5.1. تحديد المشكلات المهنية وإيجاد حلول لها.	5.1. Demonstrating proficiency, required to solve current complex problems in his scholarly field.	5.1. Demonstrating proficiency, required to solve current complex problems in his scholarly field using best results by different pharmacological researches that related to such problems
6.1. إتقان نطاق مناسب من المهارات المهنية المتخصصة واستخدام الوسائل التكنولوجية المناسبة بما يخدم ممارسته المهنية.	6.1. Master a variety of technical skills in his scholarly field and expert relevant equipment, technology, and software.	6.1. Master a variety of technical skills in his pharmacological field and expert relevant equipment, technology, and software.
7.1. لتواصل بفاعلية والقدرة على قيادة فرق العمل.	7.1. Gain leadership skills and be able to communicate efficiently with colleagues and get the best results.	7.1. Gain leadership skills and be able to communicate efficiently with colleagues and get the best results which enhance the pharmacological team work.
8.1. اتخاذ القرار في سياقات مهنية مختلفة.	8.1. Take professional situational decisions and logically support them.	8.1. Take professional situational decisions in pharmacological and non-pharmacological fields and logically support them.
9.1. توظيف الموارد المتاحة بما يحقق أعلى استفادة و الحفاظ عليها	9.1. Optimal use of available resources to achieve research or best patient health care and ensure its maintenance.	9.1. Optimal use of available scientific and non scientific resources to achieve pharmacological researches and ensure its maintenance
10.1. إظهار الوعي بدوره في تنمية المجتمع والحفاظ على البيئة في ضوء المتغيرات.	10.1. Demonstrate awareness of its role in community health development	10.1. Demonstrate awareness of his role in community health development as a pharmacological researcher.
11.1. التصرف بما يعكس الالتزام بالنزاهة والمصداقية والالتزام بقواعد المهنة.	11.1. Exhibit ethical behavior that reflect commitment to the code of practice	11.1. Exhibit ethical behavior that reflect commitment to the code of practice and research roles

<p>12.1. تنمية ذاته أكاديميا ومهنيا و قادرا علي التعلم المستمر.</p>	<p>12.1. Demonstrate the ability to sustain a lifelong personal and professional growth.</p>	<p>12.1. Acquire skills of academic and professional self-development and capability of continuous learning and updating in the related pharmacological and research fields</p>
<p>٢. المعايير القياسية العامة: NAQAAE General Academic Reference Standards “GARS” for Master Programs</p>	<p>2. Faculty Academic Reference Standards (ARS) for Master Program</p>	<p>3- Pharmacological department Standards for Master Program</p>
<p>١, ٢. المعرفة والفهم: بانتهاج دراسة برنامج الماجستير يجب أن يكون الخريج قادرا علي الفهم والدراية بكل من:</p>	<p>2.1. Knowledge & Understanding: Upon completion of the Master Program in....., the graduate should have sufficient knowledge and understanding of:</p>	<p>2.1. Knowledge & Understanding: Upon completion of the Master Program in pharmacology the graduate should have sufficient knowledge and understanding of:</p>
<p>١, ٢, ١, ٢. النظريات والأساسيات والحديث من المعارف في مجال التخصص والمجالات ذات العلاقة</p>	<p>2.1.1. Understand the scientific basis and modern knowledge in the field of specialization and related medical sciences</p>	<p>A1. Memorize the basic biochemical and physiological activities, their disturbances and how to be corrected.</p> <p>A.2 Define general pharmacokinetics as well specific properties of different groups of drugs putting into consideration age, sex and genetic-related variations that affect the response to drugs (pharmacogenetics).</p> <p>A.3 Identify general pharmacodynamics as well specific properties of different groups of drugs.</p> <p>A.4 List the basic pharmacotherapeutics which reflects the role of drugs in prevention, diagnosis and treatment of diseases as well as prevention of conception..</p> <p>A.5 Enumerate systemic pharmacology which includes drugs acting on different body systems such as cardiovascular, autonomic, respiratory, gastrointestinal, endocrine, blood ,.....</p>

		<p>A. 6- State chemotherapy which includes anticancer and antimicrobial pharmacology.</p> <p>A.7 Identify the basic, and ethics of scientific research.</p> <p>A.9. Define the principles of quality in professional practice in the field of therapeutics and applied pharmacology and list their positive effects on the work environment.</p> <p>A.10 Identify different metabolic diseases and their alteration by drugs.</p> <p>A.11 Define different hormonal levels, the normal versus abnormal</p> <p>A.12. Recall the disturbance in normal physiological function and how to be pharmacologically corrected.</p>
٢, ١, ٢. التأثير المتبادل بين الممارسة المهنية وانعكاسها علي البيئة	2.1.2. The mutual influence of professional practice on work environment, working conditions, and job characteristics.	A8 Describe different environmental induced diseases and the pharmacological treatment of such diseases.
٢, ١, ٣. التطورات العلمية في مجال التخصص	2.1.3. Scientific developments in the field of specialization	A.7 Identify the basic, and ethics of scientific research.
٢, ١, ٤. المبادئ الأخلاقية والقانونية للممارسة المهنية في مجال التخصص	2.1.4. Recognize basics of medico-legal aspects of practice, malpractice and avoid common medical errors	A13. Define the medico logical principles and bylaws relevant to his practice in the field of Pharmacology.
٢, ١, ٥. مبادئ وأساسيات الجودة في الممارسة المهنية في مجال التخصص	2.1.5. Quality principles in the scholarly field	A.9. Define the principles of quality in professional practice in the field of therapeutics and applied pharmacology and list their positive effects on the work environment.
٢, ١, ٦. أساسيات وأخلاقيات البحث العلمي	2.1.6. Basis of research methodology and medical ethics.	A.7 Identify the basic, and ethics of scientific research.

<p>2.2.المهارات الذهنية: بانتهاء دراسة برنامج الماجستير يجب أن يكون الخريج قادرا على:</p>	<p>2.2. Intellectual Skills: Upon completion of the master program of....., the graduate should be able to:</p>	<p>2.2. Intellectual Skills: Upon completion of the master program of pharmacology the graduate should be able to:</p>
<p>2.2.1. تحليل وتقييم المعلومات في مجال التخصص والقياس عليها لحل المشاكل</p>	<p>2.2.1. Use judgment skills for analytical and critical problem solving</p>	<p>B.1 Integrate the skills in selecting and using drugs safely and efficiently knowing their limits and the potential risks</p> <p>B.2 Solve medical problems arising from use of drugs and the development of resistance or tolerance encouraging them to search for alternative approaches after revising the diagnosis.</p> <p>B.3 Demonstrate an investigatory and analytic thinking “problem-solving” approaches to relevant situations related to Medical Pharmacology.</p> <p>B.8 Design management plans and alternative decisions in different situations in the field of Pharmacology.</p> <p>B.12. Combine knowledge for Professional problems' solving.</p>
<p>2.2.2. حل المشاكل المتخصصة مع عدم توافر بعض المعطيات</p>	<p>2.2.2. Capable of integrating knowledge and dealing with complex subjects to solve problems</p>	<p>B.3 Demonstrate an investigatory and analytic thinking “problem-solving” approaches to relevant situations related to Medical Pharmacology.</p> <p>B.12. Combine knowledge for Professional problems' solving.</p>
<p>2.2.3 الربط بين المعارف المختلفة لحل المشاكل المهنية</p>	<p>2.2.3. Be capable of integrating research results and/or results of history, physical and laboratory test findings to solve a research or a clinical problem.</p>	<p>B.3 Demonstrate an investigatory and analytic thinking “problem-solving” approaches to relevant situations related to Medical Pharmacology.</p> <p>B.11. Assess different clinical problems and formulate pharmacological researches to solve such problems.</p> <p>B.12. Combine knowledge for Professional problems' solving.</p>
<p>2.2.4. إجراء دراسة بحثية و/أو كتابة دراسة علمية منهجية حول مشكلة بحثية</p>	<p>2.2.4. Effectively apply research methods and carrying out a medical research thesis</p>	<p>B.4 Plan research projects.</p> <p>B5. Design and apply a study and thesis for detection of new drugs, new chemicals, or new applications of the approved drugs.</p>

		B.11. Assess different clinical problems and formulate pharmacological researches to solve such problems.
2.2.5. تقييم المخاطر في الممارسات المهنية في مجال التخصص	2.2.5. Be aware of risk management principles, and patient safety.	B.9. Assess risk in research and experimentation using new drugs and/or chemicals.
2.2.6. التخطيط لتطوير الأداء في مجال التخصص	2.2.6. Establish goals, commitments, and strategies for improved professional performance in the field of specialty	B.10. Plan for the development of performance in the field of therapeutics and pharmacological researches.
2.2.7. اتخاذ القرارات المهنية في سياقات مهنية متنوعة	2.2.7. Take professional situational decisions and logically support them.	B.1 Integrate the skills in selecting and using drugs safely and efficiently knowing their limits and the potential risks B.2 Solve medical problems arising from use of drugs and the development of resistance or tolerance encouraging them to search for alternative approaches after revising the diagnosis. B.12. Combine knowledge for Professional problems' solving.
3.2. المهارات المهنية: بانتهاء دراسة برنامج الماجستير يجب أن يكون الخريج قادرا على:	3.2. Professional Skills: Upon completion of the master program of....., the graduate must be able to:	3.2. Professional Skills: Upon completion of the master program of pharmacology the graduate must be able to:
3.2.1. إتقان المهارات المهنية الأساسية والحديثة في مجال التخصص.	3.2.1. Master the basic and some advanced professional skills in his scholarly field.	C.1 Practice different skills of research including how to retrieve the literature and use the different laboratory equipment such as centrifuge, homogenizer, spectrophotometer and Ph meter. C.2 Evaluate the need of his/her career to join the major advances in drug information C.3 Perform the basic lab skills essential to the course. C.4 Prepare plans for performing experiments related to pharmacology. C.6 Band better understanding of the normal structure and function to solve problems.

		<p>C.7 Write competently the reports for situations related to the field of pharmacology.</p> <p>C.8. Apply different isolated organ experiments to detect the normal versus abnormal physiological function and its modification by pharmacological agents.</p>
٣,٢,٢ كتابة و تقييم التقارير المهني.	3.2.2. Write and evaluate medical or scientific reports	C.7 Write competently and evaluate reports for situations related to the field of pharmacology.
٢,٣,٣ تقييم الطرق والأدوات القائمة في مجال التخصص	3.2.3. Assess and evaluate technical tools during research	C.5 Educate students, technicians and junior staff, in the lab about conditions related to Medical Pharmacology; including handling of samples, devices, safety, and maintenances of laboratory equipment.
<p>4.2. المهارات العامة والمنتقلة :</p> <p>بانتهاؤ دراسة برنامج الماجستير يجب أن يكون الخريج قادرا على:</p>	<p>4.2. General and transferable skills</p> <p>Upon completion of the master program of....., the graduate should be able to:</p>	<p>4.2. General and transferable skills</p> <p>Upon completion of the master program of pharmacology, the graduate must be able to:</p>
٤,٢,١. التواصل الفعال بأنواعه المختلفة	4.2.1. Communicate effectively using a written medical record, electronic medical record, or other digital technology.	D8- Provide information using effective nonverbal, explanatory, questioning, electronic, and writing skills.
٤,٢,٢. استخدام تكنولوجيا المعلومات بما يخدم الممارسة المهنية	4.2.2. Use of information technology (computer to create, process, store, secure and exchange electronic data) in the field of medical practice.	<p>D3- Collect and verify data from different sources.</p> <p>D5-Appraise evidence from scientific studies.</p> <p>D6- Use information technology to manage information, access on-line medical researches to support his/her own education.</p>
4.2.3. لتقييم الذاتي وتحديد احتياجاته التعليمية الشخصية	4.2.3. Assess himself and identify personal learning needs	D6- Use information technology to manage information, access on-line medical researches to support his/her own education.
4.2.4. استخدام المصادر المختلفة للحصول على المعلومات والمعارف	4.2.4. Use various sources for information (physical and digital sources).	<p>D3- Collect and verify data from different sources.</p> <p>D5-Appraise evidence from scientific studies.</p> <p>D6- Use information technology to manage information, access on-line medical researches to support his/her own education.</p> <p>D8- Provide information using effective nonverbal, explanatory,</p>

		questioning, and writing skills.
4.3.5. وضع قواعد ومؤشرات تقييم أداء الآخرين	4.2.5. Setting indicators for evaluating the performance of others	D2- Use different facilities for learning of students, lab technical staff and other professionals including their evaluation and assessment. D12- Become a partner with health care managers and health care providers to assess, coordinate, and improve health care and predict how these activities can affect system performance.
4.2.6. العمل في فريق، وقيادة فرق في سياقات مهنية مختلفة	4.2.6. Work in a team, and Apply leadership skills to enhance team functioning, the learning environment, and/or the health care delivery system	D7- Work effectively with others as a member or leader of a research group and/or a health care team. D11- Work effectively in relevant academic and/or health care delivery settings and systems including good administrative and time management. D12- Become a partner with health care managers and health care providers to assess, coordinate, and improve health care and predict how these activities can affect system performance.
4.2.7. إدارة الوقت بكفاءة	4.2.7. Manage time efficiently	D11- Work effectively in relevant academic and/or health care delivery settings and systems including good administrative and time management.
٤,٢,٨. التعلم الذاتي والمستمر	4.2.8. Demonstrate skills of self-learning and lifelong learning needs of medical profession.	D3- Collect and verify data from different sources. D5-Appraise evidence from scientific studies. D6- Use information technology to manage information, access on-line medical researches to support his/her own education.

Annex 3 Matrices

Matrix of Coverage of MSC Program ILOs By Courses

نموذج رقم (١١ ب)

جامعة/أكاديمية : المنيا.....
 كلية / معهد.....الطب البشري.....
 قسم:.....الفارماكولوجي.....

Master (MSc) of Medical Pharmacology	مسمى البرنامج
FA200	كود البرنامج

I. Matrix of Coverage of MSC program's ILOs by courses

Courses (List of courses in 1 st and 2 nd parts)	Program Intended Learning Outcomes (ILOs)			
	A. Knowledge & Understanding	B. Intellectual Skills	C. Professional & Practical skills	D. General & Transferable Skills
	A	B	C	D
Medical Biochemistry Or Medical Physiology	A1, A11, A12,	B13	C8	

Medical Pharmacology	A2, A3, A4, A5, A6, A8, A9, A10, A11, A13,	B1, B2, B3, B5, B7,,B8,,B9,B1, B10, B11, B12	C1,C2, C3, C4,C5, C6, C7,	D1,D2,D3,D4,D5,D6,D7,D8,D9,D10,D11, D12
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II. Matrix of Coverage of MSC program's ILOs by Methods of Teaching & Learning

Methods of Teaching & Learning	Intended Learning Outcomes (ILOs)			
	A. Knowledge & Understanding	B. Intellectual Skills	C. Professional & Practical skills	D. General & Transferable Skills
	A	B	C	D
Lecture	X1,2,3,4,5,6,7,8,9,10,11,12,13			
Practical	X7,8,13	X3,4,5,9,10,11,12	X1,3,4,5,7	X1,2
Presentation/seminar	X3,4,5,7,12	X1-8	X4,5	X3,5,6,9
Thesis discussion		X4, 5, 7,9,11	X1,2,3,4,6,8	X1,3,4,5,6,7,10
Training courses & workshops	X8	X1-12	X1-8	X1-12

III. Matrix of Coverage of MSC program's ILOs by Methods of Assessment

Methods of Assessment	Intended Learning Outcomes (ILOs)			
	A. Knowledge & Understanding	B. Intellectual Skills	C. Professional & Practical skills	D. General & Transferable Skills
	A	B	C	D
Written Exam	A1,2,3,4,5,6,7,8,9,10,11,12,13	B1,2,3,12,13		
Practical Exam		B1-13	C1,2,3,5,6,7,8	
OSPE				
Oral Exam	A1-13	B1,2,3,6,8,11,12,13	C7,8	C4,5,6,12

Annex 4 Courses specification

I. Medical Biochemistry course specification for master's degree in Medical Pharmacology (First part)

University: Minia

Faculty: Medicine

Department: Medical Biochemistry

1. Basic Information		
<ul style="list-style-type: none"> • Academic Year/level: First Part of Master Degree 	<ul style="list-style-type: none"> • Course Title: First Part of master's degree in Medical pharmacology 	<ul style="list-style-type: none"> • Code:
<ul style="list-style-type: none"> • Number of teaching hours: <p>Lectures: 50 hours; 2 hours/week for 25 weeks</p> <p>Practical: 20 hours; 1 hours/week for 20 weeks</p>		
2. Overall Aims of the course	<p><i>By the end of the course the student must be able to:</i></p> <ol style="list-style-type: none"> 1. Provide the postgraduate student with the medical Knowledge and skills essential for the practice of specialty and necessary to gain. 2. To understand all molecular basics and diseases. 3. To know different molecular techniques and their advanced applications. 4. To better understand and use the research tools including internet and differentlaboratory 	

	<p>equipment.</p> <p>5. To know retrieving the literature and understanding the evidence-based medicine</p> <p>6. Maintain learning abilities necessary for continuous medical education</p> <p>7. Maintain research interest and abilities.</p>
<p>3. Intended learning outcomes of course (ILOs): <i>Upon completion of the course, the student should be able to:</i></p>	
<p>A- Knowledge and understanding</p>	<p>The student finishes the course; he will be able to:</p> <p>A1. Define various metabolic processes of carbohydrate, lipid and protein</p> <p>A2. Identify role of minerals and hormones in metabolism.</p> <p>A3. Discuss various metabolic diseases and their diagnosis</p> <p>A4. Explain integration of metabolism</p> <p>A5-List principles, methodologies, tools and ethics of scientific research.</p>
<p>B- Intellectual Skills</p>	<p>B1- Analyze of different diseases to reach a final diagnosis.</p> <p>B2- Solve problems associated with metabolic diseases.</p> <p>B3- Integrate metabolic pathways with diseases.</p>
<p>C- Professional and Practical Skills</p>	<p>C1. Organize groups, as a leader or as a colleague.</p>

	C2. Practice willingly the presentation skills through the attendance and participation in scientific activities.
D- General and transferable Skills	D1. Demonstrate the advanced biomedical information to remain current with advances in knowledge and practice (self-learning). D2. Prepare for medical progress by having advanced medical research studies

4- Course Contents

Topic	Lecture hours	Practical/Clinical hours	Total No. of hours
1. Carbohydrate metabolism	6	2	8
2. Lipid metabolism	6	2	8
3. Protein metabolism	6	2	8
4. Nucleotide metabolism (Purines and pyrimidine metabolism)	6	2	8
5. Integration of metabolism	6	2	8
6. Minerals	2	-	2
7. Hormone signaling	3	2	5
8. Vitamins	3	1	4
9. Free radicals, Antioxidants & Metabolism of Xenobiotics	4	1	5
10. Body fluids	2	2	4
11. Hemoglobin	2	2	4

metabolism			
12. Gene therapy	4	2	6
Total	50	20	70
5-Teaching and Learning Methods	<p>1-Lectures & discussions.</p> <p>2-Assignments</p> <p>3- Practical sessions.</p> <p>4-Attending and participating in scientific conferences and workshops to acquire the general and transferable skills needed</p>		
6-Teaching and Learning Methods for students with limited Capacity	Additional lectures, adjusting time and place of lectures according to their schedule and capacity		
7- Student Assessment			
A-Student Assessment Methods	<p>1- Written exam:</p> <p>to assess the capability of the student for assimilation and application of the knowledge included in the course.</p> <p>2- Oral exam:</p> <p>to assess the student intellectual and communication skills regarding basic knowledge and understanding of the course topics, and to help the teaching staff to evaluate the % of achievement of the intended learning outcomes of the course.</p> <p>3- Practical exam:</p> <p>to assess the student's ability to identify different methods of identification of different chemical substances by using biochemical methods</p>		

B-Assessment Schedule (Timing of Each Method of Assessment)	<p><i>Assessment 1: one written exam by the end of the course</i></p> <p><i>Assessment 2: Oral exam, after the written exam</i></p> <p><i>Assessment 3: Practical exam</i></p> <p><i>Formative only assessment: log book.</i></p>												
8-Weighting of Each Method of Assessment	<table> <tr> <td>Written examination:</td> <td>120 marks</td> <td>40%</td> </tr> <tr> <td>Oral examination:</td> <td>90 marks</td> <td>30%</td> </tr> <tr> <td>Practical examination:</td> <td>90 marks</td> <td>30%</td> </tr> <tr> <td>Total:</td> <td>300 marks</td> <td>100%</td> </tr> </table>	Written examination:	120 marks	40%	Oral examination:	90 marks	30%	Practical examination:	90 marks	30%	Total:	300 marks	100%
Written examination:	120 marks	40%											
Oral examination:	90 marks	30%											
Practical examination:	90 marks	30%											
Total:	300 marks	100%											
9- List of References													
A-Course Notes/handouts	Lectures notes are prepared in the form of a book authorized by the department.												
B-Essential Books	-Harper's Biochemistry, Robert K. Murray, Daryl K. Granner, Peter A. Mayes, and Victor W. Rodwell (30th edition, 2015)												
C- Recommended Textbooks	<ul style="list-style-type: none"> a. Lubert Stryer, Biochemistry b. Lehninger, Biochemistry c. Lippincott, Biochemistry 												
D-Periodicals, websites	To be determined and updated during the course work.												

	<p>Websites: http://www.Medical Biochemistry.com.</p> <p>Periodicals:</p> <p>1- International journal of biochemistry) 2- Science</p>
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Course Coordinator/s:

Dr. Shereen Samy, Dr. Heba Marey

Head of Department:

Prof. Dr. Salama Rabie Abd El Rahiem



Date of last update & approval by department Council:

5/3 / 2023

مسعى المقرر	جزء اول ماجستير الفارماكولوجى
كود المقرر	

.....جامعة/أكاديمية :.. المنيا

.....الطب: كلية / معهد

.....الكيمياء الحيويه قسم :

A. Matrix of Coverage of Course ILOs By Contents

Contents (List of course topics)	Intended Learning Outcomes (ILOs)			
	A. Knowledge & Understanding	B. Intellectual Skills	C. Professional & Practical skills	D. General & Transferable Skills
	A	B	C	D
1. Carbohydrate Metabolism	+		+	
2. Lipid metabolism	+	+	+	+
3. Protein metabolism	+	+	+	+
4. Nucleotide metabolism (Purines and pyrimidine Metabolism)	+	+	+	+
5. Integration of metabolism	+	+	+	+
6. Minerals	+	+	+	+
7. Hormones Signaling	+	+	+	+
8. Vitamins	+	+	+	+
9. Free radicals, Antioxidants and Metabolism of Xenobiotics	+	+	+	+
10. Body fluids	+	+	+	+
11. Hemoglobin metabolism	+	+	+	+

12. Gene therapy	+	+	+	+
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B. Matrix of Coverage of Course ILOs by Methods of Teaching & Learning

Methods of Teaching & Learning	Intended Learning Outcomes (ILOs)			
	A. Knowledge & Understanding	B. Intellectual Skills	C. Professional & Practical skills	D. General & Transferable Skills
	A	B	C	D
Lecture	X	x	x	x
Practical			x	x
Presentation/seminar		x		
Journal club	X	x		
Training courses & workshops		x	x	x
Oral communication & Observation senior staff experience	X	X	X	x
Observation & supervision Seminars, Lectures, Hand on workshops	X	x	x	

C. Matrix of Coverage of Course ILOs by Methods of Assessment



Methods of Assessment	Intended Learning Outcomes (ILOs)			
	A. Knowledge & Understanding	B. Intellectual Skills	C. Professional & Practical skills	D. General & Transferable Skills
	A	B	C	D
Written exam	X	X		
Oral Exam	X	X		
Practical Exam			X	
Logbook	X	X	X	X

Blueprint of Medical Biochemistry Department

Blueprint of Examination Paper

	Topic	Hours	Knowledge %	Intellectual %	% of topic	No of items per topic	Knowledge		Intellectual		Marks	Actual mark
							No of Items	Mark	No of Items	Mark		
1	Carbohydrate metabolism	6	70	30	12	4	3	10.8	1	3.6	14.4	14.5
2	Lipid metabolism	6	70	30	12	4	3	10.8	1	3.6	14.4	14.5
3	Protein metabolism	6	70	30	12	4	3	10.8	1	3.6	14.4	14.5
4	Nucleotide metabolism	6	75	25	12	3	2	9.6	1	4.8	14.4	14.5
5	Integration of metabolism	6	75	25	12	2	1	7.2	1	7.2	14.4	14.5
6	Minerals	4	80	20	8	2	1	4.8	1	4.8	9.6	9
7	Hormone signaling	3	75	25	6	2	1	3.6	1	3.6	7.2	7
8	Vitamins	3	75	25	6	2	1	3.6	1	3.6	7.2	7
9	Metabolism of Xenobiotics	2	70	30	4	2	1	2.4	1	2.4	4.8	5
10	Enzymes	4	75	25	8	2	1	4.8	1	4.8	9.6	9.5
11	Hemoglobin metabolism	2	70	30	4	2	1	2.4	1	2.4	4.8	5
12	Gene therapy	2	80	20	4	2	1	2.4	1	2.4	4.8	5
	Total	50			100 %						120	120

II.Course Specifications of Medical Physiology

1st Part of Master Program of Medical Pharmacology

University: Minia

Faculty: Medicine

Department: Medical Physiology

1. Course Information		
<ul style="list-style-type: none">• Academic Year/level: 1st part of MSc in Medical Pharmacology	<ul style="list-style-type: none">• Course Title: Basic Science Medical Physiology	<ul style="list-style-type: none">• Code:
<ul style="list-style-type: none">• Number of teaching hours: Lectures: 50 hours; 2 hours/week for 25 weeks Practical: 20 hours; 2 hours/week for 10 weeks		
2. Overall Aims of the course	<i>By the end of the course the student must be able to:</i> <ol style="list-style-type: none">1. Acquire satisfactory knowledge of the cellular basis of Medical Physiology, function of organ systems of the body and the control systems of the human body and various body functions in health and disease.2. Acquire knowledge concerning the physiological mechanism of action of the pharmacological drugs.3. Develop satisfactory skills in techniques used for experimental physiology on isolated organs, tissues and whole animals.	

3. Intended learning outcomes of course (ILOs):

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

A. Knowledge and Understanding	<p>A.1. Mention the principles of:</p> <ol style="list-style-type: none">1- Cellular and Basic Physiology2- Excitable tissues (nerve & muscle) and physiology of ANS3- Neurophysiology (sensory, motor & intellectual divisions of CNS -EEG & Sleep -Aqueous humor, glaucoma, near reflex, miosis & mydriasis)4- Circulatory system (physiology of CVS & blood)5- Gastrointestinal physiology (GI motility & secretions)6- Respiration (Pulmonary functions - Gas transport between lungs and the tissues - Regulation of respiration).7- Renal system (Mechanism of urine formation & concentration - Regulation of electrolyte balance, ECF volume and acid-base balance - Endocrine functions of kidney - Renal function tests – Micturition & diuretics).8- Endocrine system and Reproduction (Mechanism of hormonal action – Pituitary, thyroid & adrenal glands - Calcium & glucose homeostasis - Sex hormones & Female reproductive cycles) <p>A.2 Define general metabolism and regulation of body temperature.</p> <p>A.3. State update and evidence base Knowledge related to the Cellular and Basic Physiology.</p> <p>A.4. State the impact of common problems related to Medical Physiology on the society and how good practice can improve these problems.</p>
B. Intellectual Skills	<p>B.1. Correlate the facts of relevant basic and clinically supportive sciences with conditions and diseases of relevance to Medical Physiology</p> <p>B.2. Demonstrate an investigatory and analytic thinking (problem solving) approaches to conditions relevance to Medical Physiology.</p> <p>B.3. Design and present audits, cases, seminars in common problems related to Medical Physiology.</p> <p>B.4. Formulate management plans and alternative decisions in different situations in the field of Medical Physiology.</p>
C. Professional and Practical Skills	<p>C.1. Perform, interpret & use the instruments essential in evaluation of the following basic lab skills essential to the course:</p>

	<ul style="list-style-type: none"> •Isolated skeletal muscle and perfuse heart (rabbit & frog) experiments. •Recording normal arterial blood pressure, heart rates & ECG in human and experiment animals. •Effect of Autonomic drugs on intact frog heart. •Assessment of kidney functions as GFR, RBF and kidney tubular functions. •Spirometry. •Assessment of hemoglobin contents, bleeding time, prothrombin time, ESR, blood groups, blood hemolysis and blood. •Indirect method for measurement of metabolic rate and measurement of body temperature. <p>C.2. Write and evaluate of the following reports:</p> <ul style="list-style-type: none"> •Applied electrophysiology, passage of ions though cell membranes. <p>C.3. Perform the following basic experiments in relating to basic sciences to be utilized in the research work: Cannulation-ECG recording-Cardiac perfusion.</p>
<p>D. General and transferableSkills</p>	<p>D.1. Perform practice-based improvement activities using a systematic methodology (audit, logbook)</p> <p>D.2. Appraises evidence from scientific studies.</p> <p>D.3. Participate in one audit or survey related to the course.</p> <p>D.4. Perform data management including data entry and analysis.</p> <p>D.5. Facilitate learning of junior students and other health care professionals.</p> <p>D.6. Maintain ethically sound relationship with others.</p> <p>D.7. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.</p> <p>D.8. Provide information using effective nonverbal, explanatory, questioning, and writing skills.</p> <p>D.9. Work effectively with others as a member of a health care team or other professional group.</p> <p>D.10. Present a case.</p> <p>D.11. Write a report.</p> <p>D.12. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society.</p> <p>D.13. Demonstrate a commitment to ethical principles</p>

	<p>including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices.</p> <p>D.14. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities.</p> <p>D.15. Work effectively in relevant health care delivery setting and systems.</p> <p>D.16. Practice cost-effective health care and resource allocation that does not compromise quality of care.</p> <p>D.17. Assist patients in dealing with system complexities.</p>
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4. Course Contents			
Topic	Lecture Hours	Practical/Clinical hours	Total No. of hours
ADVANCED MEDICAL PHYSIOLOGY			
1- General & cellular basis of physiology	2	2	4
2- Nerve and muscle.	3	2	5
3- Autonomic nervous system.	4	-	4
4- Central nervous system.	10	2	12
5- Special senses.	1	-	1
6- Cardiovascular system.	10	4	14
7- Blood.	4	2	6
8- Gastrointestinal system.	3	-	3
9- Respiration.	1	2	3
10- Kidney.	3	2	5
11- Endocrine and reproduction.	8	2	10
12- General metabolism and regulation of body temperature.	1	2	3
Total hours	50	20	70

5. Teaching and Learning methods:	<p>5.1. Lectures, Presentations, Seminars.</p> <p>5.2. Laboratory training.</p>
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	<p>5.3. Oral communication & observation Senior staff experience.</p> <p>5.4. Observation & supervision Seminars, Lectures, Hand on workshops.</p>
6. Teaching and Learning Methods for students with limited Capacity:	<ul style="list-style-type: none"> - Extra didactic (lectures, seminars, tutorial) - Extra laboratory work.
7. Student Assessment	
A. Student Assessment Methods	<ul style="list-style-type: none"> - Log book - Written exam - Practical exam - Oral exam
B. Assessment Schedule (Timing of Each Method of Assessment)	<ul style="list-style-type: none"> - Log book: before the written exam - Written exam: at the end of the course - Practical exam: at the end of the course - Oral exam: after the written exam
C. Weighting of Each Method of Assessment	<ul style="list-style-type: none"> - Log book: required for the entry of written exam - Written exam: 120 (40 %) - Practical exam: 90 (30 %) - Oral exam: 90 (30 %)
8. List of References	
A. Course Notes/handouts	<ul style="list-style-type: none"> - Lecture notes (Medical physiology books) by Staff Members of the Department of Medical physiology, Minia University
B. Essential Books	<ul style="list-style-type: none"> - Guyton AC, Hall JE: Textbook of Medical Physiology, 14th ed. Saunders, 2021. - William F. Ganong: Review of Medical Physiology, 26th Edition, McGraw-Hill Companies, 2019.
C. Recommended Text Books	<ul style="list-style-type: none"> - Gillian Pocock, Christopher D. Richards: Human Physiology the Basis of Medicine. Oxford core texts, 2006. - Robert M. Berne, Matthew N. Levy. Principles of Physiology. 3th edition on, Mosby, 2000. - Duane E. Haines: Fundamental Neuroscience. 2nd edition, Churchill Livingstone, 2002. - Michael Field, Carol Pollock, David Harris: The Renal System (basic science and clinical conditions). Churchill Livingstone, 2001. - Vander, Sherman, Luciano: Human Physiology (the mechanisms of body function), 8th edition, Mcgraw Hill, 2001. - Berne RM et al (editors): Physiology, 5th ed. Mosby, 2004. - Boron WF, Boulpaep EL (editors) Medical Physiology. Saunders, 2003. - McPhee SJ, Lingappa VR, Ganong WF:

	<p>Pathophysiology of Disease. An Introduction to Clinical Medicine, 4th ed. McGraw-Hill, 2003.</p> <ul style="list-style-type: none"> - Alberts B et al: Molecular Biology of the Cell, 4th ed.
D. Periodicals, websites	<ul style="list-style-type: none"> - American journal of physiology. - Journal of applied physiology. - Journal of clinical endocrinology and metabolism. - Physiological Review. - European Journal of Physiology. - Journals of all Egyptian Universities of Medical physiology.

Coordinator:

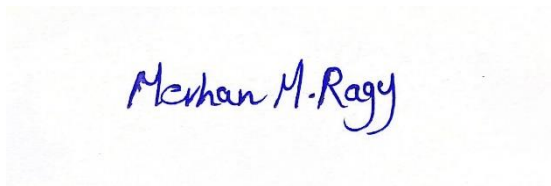
Dr. Wagdy Nashaat Habib

Head of Department:

Prof. Dr. Merhan Mamdouh Ragy

Date of last update & approval by department Council:

06/03/2023



Merhan M. Ragy

نموذج رقم (١١أ)

جزء اول ماجستير الفارماكولوجي	مسمى المقرر
	كود البرنامج

جامعة/أكاديمية: جامعة المنيا

كلية/معهد: كلية الطب

قسم: الفسيولوجيا الطبية

A. Matrix of Coverage of Course ILOs by Course Contents & activities

Contents	Intended Learning Outcomes (ILOs)																											
	A. Knowledge & Understanding				B. Intellectual Skills				C. Professional & Practical skills			D. General & Transferable Skills																
	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17
I. GENERAL PHYSIOLOGY TOPICS																												
1. General & cellular basis of physiology	x	x	x	x	x	x	x	x				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2. Nerve, muscle & ANS	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3. Neurophysiology	x	x			x	x	x	x				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
4. Circulatory system	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5. Gastrointestinal system	x	x		x	x	x	x	x				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6. Respiration.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7. Kidney	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
8. Endocrine and reproduction.	x	x	x	x	x	x	x	x				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
9. General metabolism and regulation of body temperature	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
II. SCIENTIFIC ACTIVITIES																												
(Journal club, Training courses, Case presentation, Conference attendance, Seminars & Workshops)																												
	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

B. Matrix of Coverage of Course ILOs by Methods of Teaching & Learning

[Type here]

Methods of Teaching & Learning	Intended Learning Outcomes (ILOs)			
	A. Knowledge & Understanding	B. Intellectual Skills	C. Professional & Practical skills	D. General & Transferable Skills
Lectures	x	x		
Presentations			x	x
Seminars			x	x
Laboratory training		x	x	x
Oral communication & Observation senior staff experience	x	x	x	x
Observation & supervision Seminars, Lectures, Hand on workshops	x	x	x	

[Type here]

C. Matrix of Coverage of Course ILOs by Methods of Assessment

Methods of Assessment	Intended Learning Outcomes (ILOs)			
	A. Knowledge & Understanding	B. Intellectual Skills	C. Professional & Practical skills	D. General & Transferable Skills
Written exam	x	x		
Oral Exam	x	x		x
Practical Exam			x	
Log book	x	x	x	x

Test blueprint of medical physiology for 1st Part of Master of Medical Pharmacology course

Topic	Hours	% of topic	Written exam (100 %)		Marks	Modified marks
			Knowledge	Intellectual		
➤ General & cellular basis of physiology	2	4%	75%	25%	4.8	5
➤ Nerve and muscle.	3	6%	75%	25%	7.2	7
➤ Autonomic nervous system.	4	8%	75%	25%	9.6	10
➤ Central nervous system.	10	20%	75%	25%	24	24
➤ Special senses.	1	2%	75%	25%	2.4	2
➤ Cardiovascular system.	10	20%	75%	25%	24	24
➤ Blood.	4	8 %	75%	25%	9.6	10
➤ Gastrointestinal system.	3	6%	75%	25%	7.2	7
➤ Respiration.	1	2%	75%	25%	2.4	3
➤ Kidney.	3	6%	75%	25%	7.2	7
➤ Endocrine and reproduction.	8	16%	75%	25%	19.2	19
➤ General metabolism and regulation of body temperature.	1	2%	75%	25%	2.4	2
Total	50	100%				120

III. Course Specifications of MSc in Medical pharmacology (Second part)

University: Minia University

Faculty: Faculty of Medicine

Department offering the course: Medical Pharmacology department

It is a part of Postgraduate (MSC) program for Medical Pharmacology

Program in which the course is given: 2nd part of MSC of Medical Pharmacology

Last date of update: 6/3/2023

4. Course Information		
Academic Year/level: Second part of MSC Pharmacology	Course Title: Advanced and Systemic Pharmacology	Code:
Number of teaching hours: <ul style="list-style-type: none">- Lectures: Total of 72 hours; 2 hours/week- Practical/clinical: Total of 26 hours; 2 hours/week- Total: 98 hours		
5. Overall Aims of the course	<i>By the end of the course the student must be able to:</i> <ol style="list-style-type: none">1- Acquire basic Pharmacological knowledge and skills essential to gain further training and practice in the field of pharmacology through: a- Understanding the mechanisms of drug actions and establishing enough adequate scientific background essential for the practice of pharmacological research.2- Gain the knowledge base of information about each prototype drug for a better understanding of current practices and drug research in medicine and therapeutics.3- Better select and use the research tools including internet to	

	<p>know how to retrieve digital literature, understand the evidence-based medicine, assess research needs and be able to solve scientific problems.</p> <p>4- Acquire sufficient knowledge to deal with scientific research equipments.</p> <p>5. Develop learning abilities necessary for continuous medical education and research interests.</p>
<p>6. Intended learning outcomes of course (ILOs): <i>Upon completion of the course, the student should be able to:</i></p>	
<p>E- Knowledge and Understanding</p>	<p>A1. Memorize the basic biochemical and physiological activities, their disturbances and how to be corrected.</p> <p>A.2 Define general pharmacokinetics as well specific properties of different groups of drugs putting into consideration age, sex and genetic-related variations that affect the response to drugs (pharmacogenetics).</p> <p>A.3 Identify general pharmacodynamics as well specific properties of different groups of drugs.</p> <p>A.4 List the basic pharmacotherapeutics which reflects the role of drugs in prevention, diagnosis and treatment of diseases as well as prevention of conception.</p> <p>A.5 Enumerate systemic pharmacology which includes drugs acting on different body systems such as cardiovascular, autonomic, respiratory, gastrointestinal, endocrine, blood.</p> <p>A. 6- State chemotherapy which includes anticancer and antimicrobial pharmacology.</p> <p>A7 Describe different environmental induced diseases and the pharmacological treatment of such diseases.</p> <p>A.8. Define the principles of quality in professional practice in the field of therapeutics and applied pharmacology and list their positive effects on the work environment.</p> <p>A.9 Identify different metabolic diseases and their alteration by drugs.</p> <p>A.10 Define different hormonal levels, the normal versus abnormal</p> <p>A.11. Recall the disturbance in normal physiological function and how to be pharmacologically corrected.</p>

	<p>A12. Define the medico logical principles and bylaws relevant to his practice in the field of Pharmacology.</p>
<p>F- Intellectual Skills</p>	<p>B.1 Integrate the skills in selecting and using drugs safely and efficiently knowing their limits and the potential risks</p> <p>B.2 Solve medical problems arising from use of drugs and the development of resistance or tolerance encouraging them to search for alternative approaches after revising the diagnosis.</p> <p>B.3 Demonstrate an investigatory and analytic thinking “problem-solving” approaches to relevant situations related to Medical Pharmacology.</p> <p>B.4 Plan research projects.</p> <p>B5. Design and apply a study and thesis for detection of new drugs, new chemicals, or new applications of the approved drugs.</p> <p>B.6 Formulate a plane for participation in clinical or laboratory risk management.</p> <p>B.7. Interpret different methods for data presentation.</p> <p>B.8 Design management plans and alternative decisions in different situations in the field of Pharmacology.</p> <p>B.9. Assess risk in research and experimentation using new drugs and/or chemicals.</p> <p>B.10. Plan for the development of performance in the field of therapeutics and pharmacological researches.</p> <p>B.11. Assess different clinical problems and formulate pharmacological researches to solve such problems.</p> <p>B.12. Combine knowledge for Professional problems' solving.</p>
<p>G- Professional and Practical Skills</p>	<p>C.1 Practice different skills of research including how to retrieve the literature and use the different laboratory equipment such as centrifuge, homogenizer, spectrophotometer and Ph meter.</p> <p>C.2 Evaluate the need of his/her career to join the major advances in drug information</p> <p>C.3 Perform the basic lab skills essential to the course.</p> <p>C.4 Prepare plans for performing experiments related to pharmacology.</p>

	<p>C.5 Educate students, technicians and junior staff, in the lab about conditions related to Medical Pharmacology; including handling of samples, devices, safety, and maintenances of laboratory equipments.</p> <p>C.6 Band better understanding of the normal structure and function to solve problems.</p> <p>C.7 Write competently the reports for situations related to the field of pharmacology.</p> <p>C.8. Apply different isolated organ experiments to detect the normal versus abnormal physiological function and its modification by pharmacological agents.</p>
<p>H- General and transferable Skills</p>	<p>D1- Collaborate in practice-based improvement activities using a systemic methodology (share in audits and risk management activities and use logbooks).</p> <p>D2- Use different facilities for learning of students, lab technical staff and other professionals including their evaluation and assessment.</p> <p>D3- Collect and verify data from different sources.</p> <p>D4- Analyse and interpret data.</p> <p>D5-Appraise evidence from scientific studies.</p> <p>D6- Use information technology to manage information, access on-line medical researches to support his/her own education.</p> <p>D7- Work effectively with others as a member or leader of a research group and/or a health care team.</p> <p>D8- Provide information using effective nonverbal, explanatory, questioning, electronic, and writing skills.</p> <p>D9- Select and use appropriate education methods and materials in the field of Medical Pharmacology.</p> <p>D10- Demonstrate a commitment to ethical principles of scientific research.</p>

	<p>D11- Work effectively in relevant academic and/or health care delivery settings and systems including good administrative and time management.</p> <p>D12- Become a partner with health care managers and health care providers to assess, coordinate, and improve health care and predict how these activities can affect system performance.</p>
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7. Course Contents (2nd t part of master degree)

Topic	Lecture hours/week(s)	Practical/Clinical hours/week(s)	Total No. of hours hours/week(s)
Ion channels and their advances	2	-	2
Recent advances in drug receptors	2	-	2
Pharmacovigilance	2	-	2
Neurotransmitters, neuromodulators and peptides	4	-	4
Transport of drugs across cell membrane	2	-	2
Cytochrome system	2	-	2
Adverse drug reactions	2	-	2
Immunopharmacology	2	-	2
Gene therapy	2	-	2
Stem cells	2	-	2
Drug Screening	2	4	6
Isolated organs (heart, intestine, skeletal muscle)	2	6	8

Measurement of blood pressure in experimental animals	2	4	6
Training on laboratory equipment	-	6	6
Experimental skills and Lab issues	4	6	10
General Pharmacology	4	-	4
Drug induced diseases	4	-	4
Autonomic Pharmacology	4	-	4
Cardiovascular Pharmacology	4	-	4
Central Nervous system	4	-	4
Endocrine Pharmacology	4	-	4
Drugs with Important action on blood, inflammation and gout	4	-	4
Respiratory Pharmacology	2	-	2
Chemotherapeutic drugs	6	-	6
Toxicology	2	-	2
Miscellaneous	2	-	2
Total	72	26	98
8. Teaching and Learning Methods	<ol style="list-style-type: none"> 1. Lectures 2. Department practical class and notes. 3. Practical lessons 4. Seminars 5. Presentations 		
9. Teaching and Learning Methods for students with limited Capacity	Additional lectures, adjusting time and place of lectures according to their schedule and capacity		
10. Student Assessment			

11. List of References	
A. Student Assessment Methods	1. Written Exams: <ul style="list-style-type: none"> • Short essay • MCQs • Problem solving 2. Practical Exams (OSPE) 3. Oral Exams
B. Assessment Schedule (Timing of Each Method of Assessment)	Assessment 1: Written exam by the end of the course. Assessment 2: Practical exams after written exam (OSPE) Assessment 3: Oral exam, after the written exam
C. Weighting of Each Method of Assessment	700 degrees Written examination 280 mark (40 %) Practical examination (OSPE) 210 mark (30 %) Oral examination. 210 mark (30 %) Total 100 %
A. Course Notes/handouts	Course notes prepared by the staff members in the department.
B. Essential Books	Lippincotts pharmacology 6th Edition (2015)
C. Recommended Text Books	- Goodman & Gilman, 14 th edition - Katzung Basic and clinical pharmacology 15 th edition -Rang and Dale's Pharmacology, Seventh Edition- H. P. Rang
D. Periodicals, websites	Pharmacological Reviews

	<ul style="list-style-type: none">- Journal of Pharmacology and Experimental therapeutics- British journal of pharmacology- European journal of pharmacology- Pharmacological research <p>http://www.ncbi.nlm.nih.gov/pubmed/</p>
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Course Coordinator:

Ass. Prof. Dr. Seham Abdel-Wakeel Abdel-Gaber

Course management team:

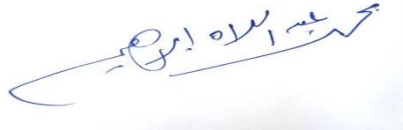
Ass. Prof. Dr. Seham Abdel-Wakeel Abdel-Gaber

Ass. Prof. Dr. Walaa Yehia

Ass. Prof. Dr. Heba Mostafa

Head of Department:

Professor Dr. Mohamed Abdellah Ibrahim



Last date for course update 6/3/2023

نموذج رقم (١١ ب)

Matrices

Master (MSc) of Medical Pharmacology	مسمى البرنامج
FA200	كود البرنامج

جامعة/أكاديمية : المنيا
كلية / معهد الطب البشري.....
قسم:.....الفارماكولوجي.....

I.Matrix of Coverage of MSC Program ILOs By Course

Contents (List of course topics)	Week No.	Intended Learning Outcomes (ILOs)			
		A. Knowledge & Understanding	B. Intellectual Skills	C. Professional & Practical skills	D. General & Transferable Skills
		A	B	C	D
Ion channels and their advances		X1,3,4	X1,2		
Recent advances in drug receptors		X1,3	X2,4		
Pharmacovigilance		X2,3,4,5	X3	X6, [^]	X5,6
Neurotransmitters, neuromodulators and peptides		X1,2,3	X1,2	X8	
Transport of drugs across cell membrane		X1,2,3,4	X8,11,12	X1	
Cytochrome system		X1,2,3,4			

Adverse drug reactions		X4	X1,12		
Immunopharmacology		X1,4,5,6	X10,12	X6	
Gene therapy		X1	X2,8,10,11,12	X4,6	
Stem cells					
Drug Screening			X1,2,3, 4	X ^	
Isolated organs (heart, intestine, skeletal muscle)		X3,6	X9	X4,^	
Measurement of blood pressure in experimental animals		X2,7	X1,3,4	X1,^	X8
Training on laboratory equipment				X1, 2,3,5,5,6	X1,3,4,5
Experimental skills and Lab. Issues			X1	X1,5,^	
General Pharmacology		X2,3,4			
Drug induced diseases		X4,7,8	X1,2,3,8,12	X5,6,^	
Autonomic Pharmacology		X5,12	X1,2,3,8,12	X5,6,^	
Cardiovascular Pharmacology		X5, 12	X1,2,3,8,12	X5,6,^	
Central Nervous system		X5,12	X1,2,3,8,12	X5,6,^	
Endocrine Pharmacology		X5,12	X1,2,3,8,12	X5,6,^	

Drugs with Important action on blood, inflammation and gout		X5,12	X1,2,3,8,12	X5,6,^	
Respiratory Pharmacology		X5,12	X1,2,3,8,12	X5,6,^	
Chemotherapeutic drugs		X6	X1,2,3,8,12	X5,6,^	
Toxicology		X8			
Miscellaneous		X4,7,8	X1,2,3,8,12	X5,6,9	

II. Matrix of Coverage of Course ILOs by Methods of Teaching & Learning

Methods of Teaching & Learning	Intended Learning Outcomes (ILOs)			
	A. Knowledge & Understanding	B. Intellectual Skills	C. Professional & Practical skills	D. General & Transferable Skills
	A	B	C	D
Lecture	X1,2,3,4,5,6,7,8,9,10,11,12			
Practical	X7,8,14	X3,4,5,9,10,11,12	X1,3,4,5,8	X1,2
Presentation/seminar	X3,4,5,7,12	X1-8	X4,5	X3,5,6,9
Thesis discussion		X4, 5, 7,9,11	X1,2,3,4,6,^	X1,3,4,5,6,7,10
Training courses & workshops	X8	X1-1 [†]	X1-^	X1-1 [†]

III. Matrix of Coverage of Course ILOs by Methods of Assessment

Methods of Assessment	Intended Learning Outcomes (ILOs)			
	A. Knowledge & Understanding	B. Intellectual Skills	C. Professional & Practical skills	D. General & Transferable Skills
	A	B	C	D
Written Exam	X1,2,3,4,5,6,7,8,9,10,11,12	X1,2,3,12		
Practical Exam OSPE		X1-1 ²	X1,2,3,5,6,7,8	
Oral Exam	X1-1 ²	X1,2,3,6,8,11,12	X7,8	X4,5,6,1 ²

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Blueprint of Medical Pharmacology MSC 2nd Part
(Pharmacology Examination Papers)

280 Mark

	Topics	H O U R S	Knowledge %	Intellectual %	% of topics	Mark	Actual mark
1st paper							
1	Ion channels and their advances	2	100	0	3.12	8.73	8.5
2	Recent advances in drug receptors	2	100	0	3.12	8.73	8.5
3	Pharmacovigilance	2	100	0	3.12	8.73	9
4	Neurotransmitters, neuromodulators and peptides	4	100	0	6.25	17.5	18
5	Transport of drugs across cell membrane	2	100	0	3.12	8.73	8.5
6	Cytochrome system and Pharmacogenetics	2	100	0	3.12	8.73	9
7	Adverse drug reactions	2	70	30	3.12	8.73	8.5
8	Immunopharmacology	2	80	20	3.12	8.73	8.5
9	Gene therapy	2	70	30	3.12	8.73	8.5
10	Stem cells	2	80	20	3.12	8.73	8.5
11	Drug Screening	2	50	50	3.12	8.73	9
12	General Pharmacology	4	100	0	6.25	17.5	18
2nd paper							

13	Drug induced diseases	4	80	20	6.25	17.5	17.5
14	Autonomic Pharmacology	4	100	0	6.25	17.5	17.5
15	Cardiovascular Pharmacology	4	75	25	6.25	17.5	17.5
16	Central Nervous system	4	80	20	6.25	17.5	17.5
17	Endocrine Pharmacology	4	60	40	6.25	17.5	17.5
18	Drugs with Important action on blood, inflammation and gout	4	60	40	6.25	17.5	17.5
19	Respiratory Pharmacology	2	75	25	3.12	8.73	8.5
20	Chemotherapeutic drugs	6	50	50	9.37	26.25	27
21	Toxicology	2	60	40	3.12	8.73	8.5
22	Miscellaneous	2	100	0	3.12	8.73	8.5
	Total	64			100%		280