PROGRAMME SPECIFICATION

Faculty of Medicine– Mansoura University

(A) Administrative information

(1) Programme Title & Code	Master degree of Medical Physiology/ **PHYS 503**
(2) Final award/degree	Master degree
(3) Department (s)	Medical Physiology
(4) Coordinator	**Dr. Abdelaziz M. Hussein** (Professor of Medical Physiology department, Faculty of Medicine, Mansoura University)
(5) External evaluator (s)	**Dr. Shereef Wagih** (Prof. of Medical Physiology–Faculty of Medicine, Zagazeg University)
(6) Date of approval by the Department`s council	10/7/2016
(7) Credit hours	45 credit hours
(8) Date of last approval of programme specification by Faculty council	9/8/2016

(B) Professional information:

(1) Programme Aims:

The broad aims of the Programme are as follows:

Master degree in Medical Physiology program is a professional degree that enables the candidates to

1. Develop basic concepts and principles of human physiology logically and clearly to correlate and analyze physiological phenomena
2. Recognize cellular basis of medical physiology, the control systems of human body, and various body functions in health and disease
3. Develop knowledge concerning molecular biology and the basis of genetics
4. Continuously be updated with published scientific papers and to produce publishable research work
5. Develop different practical skills by experimenting on isolated organs, tissues, and whole animals

(2) Intended Learning Outcomes (ILOs):

On successful completion of the programme, the candidate will be able to;

A- Knowledge and Understanding

A1 Describe the organization of human body and body compartments and intercellular comunications
A2 Describe the types of membrane potentials and different ion channels involved in membrane potentials
A3 Describe the principles of functions of cell organelles and basics of DNA replication
A4 Point out the physiology of exctible tissues including nerves and muslces
A5 Describe functional organization of different organs of different body systems
A6 Point out the mechanisms involved in regulations of different body systems including respiratory system, CVS, digestive, urinary and nervous systems under different conditions of health and disease such as ms exercise, pregnancy, aging and hypoxia
A7 Describe the mechanisms involved in the endocrine regulation of metabolism, growth and reproduction
A8 Describe the mechanisms aiming at maintenance of homeostatic functions as: pH, body water, electrolytes, osmolarity and body temperature
A9 Describe some pathophysiological aspects underlying the development of common diseases as hypertension , heart failure, respiratory failure, endocrinal disorders.
A10 Describe the changes in partial pressures of gases on high altutide and effects of hypoxia on different body systems
A11 Point out the mechanisms involved in adaption to high altitude
A12 Describe the changes in partial pressures of gases on deep sea and effects of high partial pressure of gases on different body systems
A13 Point out the physiological bases of decompression under sea and decompression sickness
A14 Explain the underlying mechanisms of of different medical diseases namely GIT, cardio, respiratory, blood, endocrine, renal, neurology and rheumatology
A15 Describe the metabloism of CHO, fats and proteins
A16 Explain the role of quality control in experimental labs.
A17 List mechanisms by which different drugs perform its actions

B- Intellectual skills

The Postgraduate Degree provides opportunities for candidates to achieve and demonstrate the following intellectual qualities;

B1 Appraise the function of different components of cells
B2 Categorize the function of different organs subserving the homeostasis
B3 Solve medical problems related to diagnosis & treatment of physiological problems as: pH, osmolarity, anemia
B4 Analyze & interpret some physiological records (ECG & spirogram) and some laboratory tests (blood count, hemoglobin, pregnancy tests)
B5 Anayze the mechanisms adaptation of body systems to high altitude
B6Analyze the physiological problem of submarine
B7 interpret the pathophysiological mechanisms of different diseases
B8 Compare the function of different chemical compounds inside the body
B9 categorize the different types of receptors and their agonists and antagonists
B10 Perform scientific research/ thesis about a scientific problem
B11 Evaluate risks in the professional practices of Medical Physiology
B12 Plan for development of performance in the field of medical Physiology
B13 Take professional decisions in different situations

C- Professional/practical skills

C1 Work effectively in a group in biological science laboratories.
C2 Deal with experimental animal as: Rats, Frogs, and Rabbits
C3 Work efficiently conventional RT-PCR for a gene
C4 Record signals from animals such as muscle twitch from frog muscle, ECG from rats, aortic strip from rabbit, small intestinal motility etc……
C5 Use basic medical devices such as sphygmomanometer, stethoscope, and thermometer, medical hammer, tuning fork, compass,
C6 demonstrate competency in history taking and clinical examination skills in internal medicine specialties
C7 demonstrate competency in performing diagnostic procedures
C8 Work biochemical analysis for some parameters in blood and tissues samples and gel electrophoresis

D- Communication & Transferable skills

D1 Relate course information effectively in the field of general medicine practice.
D2 Retrieve, manage, and manipulate course information by all means, including electronic means.
D3 Discuss freely about any medical problem.
D4 Present course information clearly in written, electronic and oral forms.
D5 Communicate ideas and arguments effectively.
D6 Analyze and use numerical data including the use of simple statistical methods

(3) Academic standards:

3a-Academic Reference Standards (ARS) Mansoura Master degree in Medical Physiology:

Academic Reference Standards (Annex 2) for this program were compiled according to the general Academic Reference Standards provided by the national authority for quality assurance and accreditation of education (naqaae) for postgraduate programs (published on February 2009). This program ARS were approved by the department council on 17/5/2016 and faculty of medicine council on

(4) Curriculum structure and contents:

4.a- Duration of the programme (in years or months): 3 Years

4.b- programme structure and teaching hours :

Candidates should fulfill a total of **45** credit hours

●4.b.1: Number of credit hours:

A) Theoretical courses

1. **First part (30 weeks)** : 8 credit hours (elective 5 credit hours + compulsory 3 credit hours) represents 17.78% of total hours
2. **Second part (30 weeks)**: 15 credit hours (12 credit compulsory course + 3 elective) represents 33.33 % of total hours.

B) Thesis: 10 credit hours represent 25% of total hours

C) Practical skills and training: 8 credit hours

D) Activities (seminars, paper reviewing, conferences etc….): 2 credit hours

●4.b.2: Number of credit hours for practical skills and activities to be performed = 10 credit hours represents 22.22% of total hours.

a) Compulsory Courses:

Code	Course Title	No of Semester	No. of Credit Hours	Total teaching hours	No. of hours/week			Program ILOs Covered
					Lect.	Lab.	Seminars /Tutorial	
PHYS503CEP	Cell and electrophysiology	One Sem (1) (15 weeks)	3	45 hrs	2	–	1	A1,2,3 B1,12,13
PHYS503MP	Medical Physiology	2 Sem (3,4) (30 weeks)	13	180 hrs	5	–	1	A4-A9 B2,3,4,7,8,10,11, 12 C1,2,4,5,8 D1-D6
PHYS503P	Practical & Experimental Physiology	1,2,3,4 (60 weeks)	8 Practical + 2 activities	240 hrs Practical + 120 Activities	–	6	–	C1-C7
Thesis	Thesis	2,3,4,5	10	–	–	–	–	B1-B8 C1-C7 D1-D5

b) Elective Course: (One of these 2 courses is required)

Code	Course Title	Sem	No. of Credit Hours	Total teaching hours	No. of hours/week			Program ILOs covered
					Lect.	Lab.	Seminar/tutorial	
BIC504	Biochemistry	Sem 1,2	5 (15 weeks)	75 hrs	4	–	1	A3,8,15 B3,7,8,11,12 C1,3,8 D1,2,3,4
PHYS510	Internal medicine	Sem 1,2	5 (15 weeks)	75 hrs	4	–	1	A9,14 B4,7,11,12,13 C5,6,7 D1-D5

PHYS506	Pharmacology	Sem 1,2	5 (15 weeks)	75 hrs	4	-	1	A9,16,17 B9,11,12,13 C1,2,4 D1-D4
PHYS503AP	Aviation Physiology	Sem 3	2 (15 weeks)	30 hrs	1	-	1	A6,10,11 B5,7,12,13
PHYS503DSP	Deep sea Physiology	Sem 3	2 (15 weeks)	30 hrs	1	-	1	A6,12,13 B6,7,12,13

(5) Teaching Methods

Method	ILOS assessed by the exam.
5.1: Lectures	A1-A17, B1-B13
5.2: practical sections	C1-C8
5.3: Seminars	A1-A17, B1-B13,D1-D6

(6) Methods of Assessment

Cell and electrophysiology

Tools	Marks	Percentage of the total mark	ILOS assessed by the exam.	Schedule
6.1a:MCQ exam	24	12 %	A1-A3, B1, B12,B13	2nd week of Jan / July
6.1b:Written exam	96	48 %	A1-A3,B1, B12,B13	October / April
6.1c:Oral exam	80	40 %	A1-A3,B1, B12,B13	October / April
Total marks	200			

Internal medicine

Tools	Mark	Percentage of the total mark	ILOS assessed by the exam.	Schedule
6.2a:MCQ exam	36	12 %	A9, A14, B4, B7,B11,B12,B13	2nd week of Jan / July
6.2b:Written exam	144	48 %	A9, A14, B4, B7,B11,B12,13	October / April
6.2c:Oral exam	60	20 %	A9, A14, B4, B7,B11,B12,13	October / April
6.2d:Practical exam	60	20%	C5, C6, C7	October / April
Total marks	300			

Pharmacology

Tools	Mark	Percentage of the total mark	ILOS assessed by the exam.	Schedule
6.3a:mcq	36	12 %	A9, A16, A17, B9, B11,B12,B13	2nd week of Jan / July
6.3b:Written exam	144	48%	A9, A16, A17, B9, B11,B12,B13	October / April
6.3c:Oral exam	60	20 %	A9, A16, A17, B9, B11,B12,B13	October / April
6.3dPractical exam	60	20%	C1, C2,C4	October / April
Total marks	300			

Biochemistry

Tools	Mark	Percentage of the total mark	ILOS assessed by the exam.	Schedule
6.4a mcq	36	12%	A3, A8, A15, B3, B7,B8,B11,B12	2nd week of Jan / July
6.4b:Written exam	144	48%	A3, A8, A15, B3, B7,B8,B11,B12	October / April
6.4c:Oral exam	60	20 %	A3, A8, A15, B3, B7,B8,B11,B12	October / April
6.4d :Practical exam	60	20%	C1, C3,C8	October / April
Total marks	300			

Medical physiology

Exam	Mark	Percentage of the total mark	ILOS assessed by the exam.	Schedule
6.5a:MCQ exam	60	10%	A4-A9, B2-B4,B7,B8,B10-B12	Feb/Sept
6.5bWritten exam	240	40%	A4-A9, B2-B4,B7,B8,B10-B12	May/Nov
6.5c :Oral exam	150	25 %	A4-A9, B2-B4,B7,B8,B10-B12,	May/Nov
6.5d:Practical exam	150	25%	C1,c2,c4,c5, c8	May/Nov
Total marks	600			

Aviation physiology

Tools	Marks	Percentage of the total mark	ILOS assessed by the exam.	Schedule
6.6a:MCQ exam	15	20%	A6,-A10, A11, B5, B7,B12,B13	April/Oct
6.6b:written exam	60	80%	A6,-A10, A11, B5, B7,B12,B13	April/Oct
Total marks	75			

Deep sea physiology

Tools	Marks	Percentage of the total mark	ILOS assessed by the exam.	Schedule
6.7a:MCQ exam	15	20%	A6,A12, A13, B6, B7,B12,B13	April/Oct
6.8a:written exam	60	80%	A6,A12, A13, B6, B7,B12,B13	April/Oct
Total marks	75			

7) Programme admission requirements:

- **General requirements:**

According to the faculty postgraduate bylaws

- **Specific requirements (if applicable)**

No specific requirements

8) Regulations for progression and programme completion:

Regulations for progression:

- **First part:**
  - Study begins in October following the registration and for 6 months (one semester) after which, the student is allowed to attend the first part exam in September following the registration after attending courses of the first part.
  - The student must attend workshop in biostatics, research methodology and medical uses of IT before thesis registration
- **Second part:**

  The student to attend the exam second part when fulfilling the following:

- Spending an actual training period not less than 36 months from the date of starting the work as demonstrator in the department.
- Attending courses and completing at least 70% of practical and laboratory training programs as shown in the Logbook.

Regulations for programme completion:

1. Success in the exam of the first part by obtaining at least 60% of total scores.
2. Success in the thesis.
3. Success in the exam of the second part by obtaining the sum of at least 60% of the total scores of written exams "collectively" as well as 60% at least of the total oral and practical examinations.

9) Evaluation of Programme's intended learning outcomes (ILOs):

Evaluator	Tools*	Samples
Internal evaluator Dr. **Abdelaziz M. Hussein**	**Evaluation report**	
External Evaluator Dr. **Shereef Wagih**	**Evaluation report**	
Senior student **(s)**		All the students
Alumni		10 students
Stakeholder **(s)** *Teaching staff. *Technicians. *Regional medical institutes *International medical institutes. *Other Governmental faculties *Non-governmental faculties		
Others (if present)		

* TOOLS= QUESTIONNAIRE, INTERVIEW, WORKSHOP, COMMUNICATION, E_MAIL

We certify that all information required to deliver this programme is contained in the above specification and will be implemented. All course specification for this programme are in place.	
Programme coordinator: Name: Dr. Abdelaziz M. Hussein	Signature & date

Dean: Name: Dr. Said AbdelHady	Signature & date
Executive director of the quality assurance unit: Name: Dr. Seham Gad El-Hak	Signature & date

P.S. The programme specification should have attached to it all courses specifications for all courses listed in the matrix.

Annex 1 Programme Courses ILOs

Programme-Courses ILOs Matrix

Programme ILOs are enlisted in the first row of the table (by their code number: a1, a2……etc), then the course titles or codes are enlisted in first column, and an "x" mark is inserted where the respective course contributes to the achievement of the programme ILOs in question.

P.S. All courses` specifications are attached in Appendix III.

			First Part				Second Part			
Course		Title	Cell Physiology	Elective			Elective		Medical Physiology	Thesis
		code	PHYS503CEP	Internal medicine	Biochemistry	pharmacology	Aviation physiology	Deep sea physiology	PHYS503MP	
Programme ILOs	Knowledge and Understanding	A1	x							
		A2	x							
		A3	x		x					
		A4							x	
		A5							x	
		A6					x	x	x	
		A7							x	
		A8			x				x	
		A9		x		x			x	
		A10					x			
		A11					x			
		A12						x		
		A13						x		
		A14		x						
		A15			x					
		A16				x				
		A17				x				
	Intellectual skills	B1	x							
		B2							x	x
		B3			x				x	x
		B4		x					x	x
		B5					x			x
		B6						x		
		B7		x	x		x	x	x	x
		B8			x				x	x
		B9				x				
		B10							x	x
		B11		x	x	x			x	x
		B12	x	x	x	x	x	x	x	x
		B13	x	x		x	x	x		
	Professional/practical skills	C1			x	x			x	x
		C2				x			x	x
		C3			x					x
		C4				x			x	x
		C5		x					x	x
		C6		x						x
		C7		x						x
		C8			x				x	x
	Transferable skills	D1		x	x	x			x	x
		D2		x	x	x			x	x
		D3		x	x	x			x	x
		D4		x	x	x			x	x
		D5		x					x	x
		D6							x	x

Programme aims ILOS matrix:

	Aims		1. Develop basic concepts and principles of human physiology logically and clearly to correlate and analyze physiological phenomena	2. Recognize cellular basis of medical physiology, the control systems of human body, and various body functions in health and disease	3. Develop knowledge concerning molecular biology and the basis of genetics	4. Continuously be updated with published scientific papers and to produce publishable research work	5. Develop different practical skills by experimenting on isolated organs, tissues, and whole animals
Programme ILOs	Knowledge and Understanding	A1	X	X	X		
		A2	X	X			
		A3	X	X	X		
		A4	X	X			
		A5	X				
		A6		X			
		A7		X			
		A8		X			
		A9		X			
		A10		X			
		A11		X			
		A12		X			
		A13		X			
		A14		X			
		A15			X		
		A16					
		A17					
	Intellectual skills	B1	X	X	X		
		B2	X	X			
		B3		X			
		B4					
		B5		X			
		B6		X			
		B7		X			
		B8					
		B9					
		B10				X	
		B11					
		B12					
		B13					
	Professional/practical skills	C1					X
		C2					X
		C3			X		
		C4					X
		C5					
		C6					
		C7					
		C8					X
	Transferable skills	D1					
		D2				X	
		D3					
		D4				X	
		D5					
		D6				X	

المعايير الاكاديمية المرجعية لقسم الفسيولوجي لدرجة الماجستير

Annex 2: Program academic reference standards (ARS)

Medical Physiology is science of studying the functions of living organs and systems in human body. Physiology is of fundamental importance in understanding the functioning or our own bodies in both sickness and health, and in developing new medical treatments. Our ARS of Medical Physiology are designed to provide a broad grounding in physiology, together with a range of advanced knowledge of medical relevance. Students having MD in Medical Physiology are equipped with a wide range of skills, both subjects specific and generic.

Attributes of the graduate

1- Able to develop basic concepts and principles of Human physiology logically -and clearly in order to correlate and analyze Physiological phenomena

2- Understand the cellular basis of medical physiology, control of genetics.

3- Continuously be updated with published scientific papers, and to produce publishable research work.

4- Develop different practical skills by experimenting on isolated organs, tissues, and whole animals

5- Provide a broad understanding of physiology together with more detailed and critical knowledge in areas of the subject relevant to medicine.

6- Provide an extended laboratory-based research project in a university or environment.

7- Provide additional training in research skills

Intended learning outcomes

A) Knowledge and Understanding:

Student is expected to know:

A1-Established basics, principles of medical Physiology and related sciences

A2 -Recent advances and areas under research in the field of Medical Physiology

A3- Quality assurance basic measures in the field of medical Physiology

B) Intellectual skills

Student is expected to have:

a) Analyze, and evaluate medical information to elicit new conclusions

b) Evidence based discussion

c) Problem solving based on available data.

d) Planning to develop progress in his career practice.

e) Formulation of medical research paper

f) Analyze, and evaluate medical information to elicit new conclusions.

C) Professional and practical skills

Student is expected to have:

i. Master practical skills relevant Physiology
ii. Evaluate and improve tools in his/her specialty
iii. Write and evaluate relevant reports
iv. Use recent technological tools to serve his career

D) General transferable skills:

Student is expected to have:

1. Develop & make database search in the library & internet and use different resources to gain knowledge and information
2. Use information and communication technology effectively
3. Evaluate him/herself and assess the personal educational needs
4. Practice the different types of effective communication
5. Manage seminars in addition to the effective time management
6. Work in a team and lead teams in different professional situation and solve problems related to work management and among colleagues
7. Learn by self and in a continuous manner

Annex 3 Comparisons between NARS, ARS, and ILOs of MSc in Medical Physiology Programme

(NARS) المعايير القومية الأكاديمية القياسية العامة لبرامج قطاع الدراسات العليا	Academic Reference Standards (ARS) for MSc in Medical Physiology	ILOs مخرجات التعلم المستهدفة	المقررات التى تحقق المعايير الأكاديمية للبرامج
A-Understanding and Knowledge			
الفهم و المعرفة **a)** النظريات و الأساسيات المتعلقة بمجال التعلم و كذا في المجالات ذات العلاقة	A1-Established basics, principles of Physiology and related sciences.	A1 Describe the organization of human body and body compartments and intercellular comunications A2 Describe the types of membrane potentials and different ion channels involved in membrane potentials A3 Describe the principles of functions of cell organelles and basics of DNA replication A4 Point out the physiology of exctible tissues including nerves and muslces A5 Describe functional organization of different organs of different body systems A6 Point out the mechanisms involved in regulations of different body systems including respiratory system, CVS, digestive, urinary and nervous systems under different conditions of health and disease such as ms exercise, pregnancy, aging and	**1.** Medical Physiology (PHYS503MP) **2.** Cell Physiology (PHYS503CEP) **3.** Internal medicine (PHYS510) or Biochemistry (PHYS504) or Pharmacology (PHYS506) **4.** Aviation physiology (PHYS503AP) or Deep Sea Physiology (PHYS503DSP)

		hypoxia A7 Describe the mechanisms involved in the endocrine regulation of metabolism, growth and reproduction A8 Describe the mechanisms aiming at maintenance of homeostatic functions as: pH, body water, electrolytes, osmolarity and body temperature A9 Describe some pathophysiological aspects underlying the development of common diseases as hypertension , heart failure, respiratory failure, endocrinal disorders. A10 Describe the changes in partial pressures of gases on high altutide and effects of hypoxia on different body systems A11 Point out the mechanisms involved in adaption to high altitude A12 Describe the changes in partial pressures of gases on deep sea and effects of high partial pressure of gases on different body systems A13 Point out the physiological bases of decompression under sea and decompression sickness A14 Explain the	

		underlying mechanisms of of different medical diseases namely GIT, cardio, respiratory, blood, endocrine, renal, neurology and rheumatology A15 Describe the metabloism of CHO, fats and proteins A17 List mechanisms by which different drugs perform its actions	
b) ا-لتطورات العلمية في مجال التخصص	A2 -Recent advances and areas under research in the field of Medical Physiology	A10 Describe the changes in partial pressures of gases on high altutide and effects of hypoxia on different body systems A11 Point out the mechanisms involved in adaption to high altitude A12 Describe the changes in partial pressures of gases on deep sea and effects of high partial pressure of gases on different body systems A13 Point out the physiological bases of decompression under sea and decompression sickness A14 Explain the underlying mechanisms of of different medical diseases namely GIT, cardio, respiratory, blood, endocrine, renal, neurology and rheumatology	• Aviation physiology (PHYS503AP) or Deep Sea Physiology (PHYS503DSP)

c) مبادئ و أساسيات الجودة في الممارسات المهنية في مجال التخصص.	A3- Quality assurance basic measures in the field of Physiology.	A16 Explain the role of quality control in experimental labs.	**1.** Medical Physiology (PHYS503MP) **2.** Cell Physiology (PHYS503CEP) **3.** Internal medicine (PHYS510) or Biochemistry (PHYS504) or Pharmacology (PHYS506) • Aviation physiology (PHYS503AP) or Deep Sea Physiology (PHYS503DSP)
B-Intellectual skills			
المهارات الذهنية a) تحليل و تقييم المعلومات في مجال التخصص والقياس عليها لحل المشاكل.	1) Analyze, and evaluate medical information to elicit new conclusions	**B1** Appraise the function of different components of cells **B2** Categorize the function of different organs subserving the homeostasis **B4** Analyze & interpret some physiological records (ECG & spirogram) and some laboratory tests (blood count, hemoglobin, pregnancy tests) **B5** Anayze the mechanisms adaptation of body systems to high altitude **B6**Analyze the physiological problem of submarine **B7** interpret the pathophysiological mechanisms of	• Medical Physiology (PHYS503MP)

		different diseases **B8** Compare the functions of chemical compounds inside the body **B 9** Categorize different types of receptors.	
b) منهجية لحل مشكلة بحثية.	2) Evidence based discussion	**B10** Perform scientific research/ thesis about a scientific problem **B11** Evaluate risks in the professional practices of Medical Physiology	• Medical Physiology (PHYS503MP
c) الربط بين المعارف المختلفة لحل المشاكل المهنية	3) Problem solving based on available data.	**B3** .Solve medical problemsrelated to diagnosis and treatment of physiological problems	• Medical Physiology (PHYS503MP)
d) التخطيط لتطوير الأداء في مجال التخصص.	4) Planning to develop progress in his career practice.	**B12** Plan for development of performance in the field of medical Physiology **B11** Evaluate risks in the professional practices of Medical Physiology	• Medical Physiology (PHYS503MP)
e) اجراء دراسة بحثية \أو كتابة دراسة علمية	5) Formulation of medical research paper	**B10** perform scientific research about a scientific problem	• Medical Physiology (PHYS503MP)
f) أتخاذ القرارات المهنية في سياقات مهنية متنوعة	g) Analyze, and evaluate medical information to elicit new conclusions.	**B13** Take professional decisions in different situations	• Medical Physiology (PHYS503MP)

C- Professional/practical skills			
المهارات المهنية a) اتقان المهارات المهنية الأساسية و الحديثة في مجال التخصص	i. Master practical skills relevant Physiology	**C1** work effectively in agroup **C2** deal with experimental animals **C3** work conventional PCR for agene **C4** record signals from animals	• Medical Physiology (PHYS503MP
b) تقييم و تتطوير الطرق و الأدوات القائمة في مجال التخصص	ii. Evaluate and improve tools in his/her specialty	**C5** use basic medical devices **C6** demonstrate competency in history taking and examination **C7** demonstrate competency in performingdiagnostic procedures	– • Medical Physiology (PHYS503MP Internal medicine (PHYS510)
c) كتابة و تقييم التقارير المهنية	iii. Write and evaluate relevant reports	**C4** Record signals from animals such as muscle twitch from frog muscle, ECG from rats, aortic strip from rabbit, small intestinal motility **C8** Work biochemical analysis for some parameters in blood and tissues samples and gel	• medical Physiology (PHYS503MP •

		electrophoresis	
d) إستخدام الوسائل التكنولوجية الحديثة بما يخدم الممارسة المهنية.	i. Use recent technological tools to serve his career	**C3** Work efficiently conventional RT-PCR for a gene **C4** Record signals from animals such as muscle twitch from frog muscle, ECG from rats, aortic strip from rabbit, small intestinal motility	• Medical Physiology (PHYS503MP •
D-General transferrable Skills			
المهارات العامة و المتنقلة ١. استخدام المصادر المختلفة للحصول علي احتياجاته التعليمية الشخصية	1. Develop & make database search in the library & internet and use different resources to gain knowledge and information	**D1** Relate course information effectively in the field of general medicine practice.	• Medical Physiology (PHYS503MP
٢. استخدام تكنولوجيا المعلومات بما يخدم الممارسة المهنية	2. Use information and communication technology effectively	**D2** Retrieve, manage, and manipulate course information by all means, including electronic means **D4** Present course information clearly in written, electronic and oral forms	• Medical Physiology (PHYS503MP
٣. التقييم الذاتي و تحديد احتياجاته التعليمية الشخصية	3. Evaluate him/herself and assess the personal educational needs	**D3** Discuss freely about any medical problem. **D5** Communicate	• Medical Physiology (PHYS503MP

		ideas and arguments effectively.	
٤. التواصل الفعال بأنواعه المختلفة	4. Practice the different types of effective communication	D5 Communicate ideas and arguments effectively.	• Medical Physiology (PHYS503MP
٥. إدارة الوقت بكفاءة	5.Manage seminars in addition to the effective time management and solve problems	D2 Retrieve, manage, and manipulate course information by all means, including electronic means D6 Analyze and use numerical data including the use of simple statistical methods	• Medical Physiology (PHYS503MP • Medical Physiology (PHYS503MP •
6.العمل في فريق و قيادة فرق في سياقات مهنية مختلفة	6. Work in a team and lead teams in different professional situation and solve problems related to work management and among colleagues	D5 Communicate ideas and arguments effectively.	• Medical Physiology (PHYS503MP
٧. التعلم الذاتي و المستمر	7. Learn by self and in a continuous manner	D2 Retrieve, manage, and manipulate course information by all means, including electronic means	• Medical Physiology (PHYS503MP