

**Program SPECIFICATION FOR MD Degree in Clinical Physiology Code:
1703800**

University: Alexandria

Faculty: Medical Research Institute

Program Specification

A- Basic information

1- Program title: MD Degree in Clinical Physiology

2- Program type: single double multiple

3- Department: Human Physiology department

4- Coordinator: Prof. Azza Saad Abdo

5- External evaluator: Dr. Alaa El-Dein Hassan Mahmoud., Professor of physiology, faculty of medicine, Alexandria University

6- Last date of program specification approval: 5/6/2014

B- Professional Information

1- Program aims:

This program aims to produce scientifically and professionally capable Clinical Physiologists to meet national and regional needs while developing study skills and attitudes suitable for life-long learning. It also aims to equip students with knowledge, skills, and critical awareness to make a significant contribution to research.

By the end of this program the student should be able to:

1. List the methods applied in physiology research with special emphasis on experimental design and Learn topics with recent implication in special areas of physiology as angiogenesis, apoptosis, physiological proteomics and genomics, integrative physiology of the cardiovascular, respiratory, renal, neural, endocrine systems.
2. Recall of Bioethics, presenting different types of clinical cases including disturbed function assessment and clinical diagnosis. Different topics relating to clinical physiology such as bronchial asthma, COPD, Heart failure obstructive and restrictive airway disease, renal failure & endocrinal disturbance.

3. Examine practical skills as: planning, designing and execution of self-directed and original research investigation.
4. Explore about Aviation, highly altitude and space physiology, effects of low oxygen pressure on the body, physiology of deep-sea diving and other hyperbaric condition and hyperbaric oxygen therapy. Recognize physiology of stress, pollution, and its relation to exercise.
5. Differentiate the pharmacological principles of treatment using drugs, their efficacy in management of diseases and their adverse reactions.
6. Use technology and innovation to increase physiological knowledge and practice team work.
7. Use systematic approaches to design and conduct scientific research.
8. Conduct research studies that add to the existing specialty knowledge.

2- Intended learning outcomes (ILOs)

a- Knowledge and understanding:

- a1- Describe essential concepts, principles, theories of physiological functions and the regulatory mechanisms and express understanding of selected advanced physiological topics.
- a2- Explain physiological principles underlying disease states that aids in interpretation of symptoms (such as in cardiac hypertrophy, bronchial asthma, pulmonary hypertension, gastro-esophageal reflux, metabolic syndrome), with emphasis on altered physiological functions and their ways of assessment (as in renal dysfunction, heart failure, peripheral neuropathy).
- a3 - Describe principles and application of different physiological assessments and the association between altered physiological functions and the pathological lesions.
- a4- Discuss normal, abnormal functions of different systems under environmental conditions such as different temperatures, different oxygen pressures, stress, and pollution, with emphasis on the effect of deep diving and high altitude on cardio-respiratory system.
- a5- Review basic principles of pharmacology.
- a6- Design, conduction & explore publishing of scientific research.

b- Intellectual skills:

- b1- Evaluate functions of respiratory, cardiac, renal, and endocrine systems and analyze effects of hormones on the body.
- b2- Solve problems and analyze some abnormalities in diseases affecting respiratory, cardiac, renal, and endocrine systems.
- b3- Interpret data derived from laboratory and clinical observations in terms of their significance and theory underlying them and solve problems of different body systems.
- b4- Distinguish between physiological and pathological performance of different body systems under conditions of pollution, different temperatures, and different oxygen pressures.
- b5- Prepare scientific articles/papers to be published in indexed journals.

c- Professional and practical skills:

- c1. Perform pulmonary functions and Cardiac functions.
- c2. Develop skills in hormonal assays and PCR.
- c3. Interpret pulmonary functions and Cardiac functions.
- c4. Perform & evaluate data of prevocational challenges for respiratory system and assessment of reflexes.
- c5. Interpret results of physiological diagnostic procedures and contribute appropriately to patient management.
- c6. Interpret and analyze important clinical physiological cases.
- c7. Conduct important physiological techniques for clinical assessment (echocardiogram, exercise echocardiogram, EEG, EPS, and EMG).
- c8. Demonstrate oxidative stress and radioactivity.
- c9. Apply precautions to decrease risk of pollution during exercise.
- c10. Perform work tests to evaluate cardiorespiratory fitness.
- c11. Use spirometry results in diagnosis of occupational lung diseases.
- c12. Assess psychophysiological parameters.
- c13. Perform respiratory muscle training maneuver.
- c14. Observe some basic pharmacological techniques.

d- General and transferable skills:

- d1. Communicate effectively through written and oral presentation.
 - d2. Use modern computing resources for data handling, information retrieval, document preparation, presentation, and communication.
 - d3. Develop process of critical and evaluative thinking and perform self and peer appraisal.
 - d4. Seek continuous learning and help in teaching others and to assess the importance of the ideas of others.
 - d5. Work separately or in a team and understands the responsibilities of a team leader.
 - d6. Manage scientific meetings.
 - d7. Utilize time appropriately.
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3- Academic standards

3a External references for standards (Benchmarks)

Generic Academic Reference Standards of the National Authority for Quality Assurance and Accreditation of Education (NAQAAE) adopted at MRI council 12/2/2014 and re-adopted at 15/1/2023.

last date of Academic Reference standards (ARS) approval by Institute Council: 15/1/2023

3b Comparison of provision to selected external references.

Graduate Attributes of M.D. Program in Clinical Physiology

Generic Graduate Attributes of NAQAAE	Graduate Attributes of Medical Doctor in Clinical Physiology	Program Aims
	By the end of this program, Graduate of Medical Doctor in Clinical Physiology <i>should be able to</i>	
Master the basics and methodologies of scientific research.	<ul style="list-style-type: none"> List basic concepts of scientific research 	<ul style="list-style-type: none"> List the methods applied in physiology research with special emphasis on experimental design and Learn topics with recent implication in special areas of physiology
Work continuously to add to his/her knowledge in the field of specialty.	<ul style="list-style-type: none"> Recall knowledge of clinical physiology. 	<ul style="list-style-type: none"> List the methods applied in physiology research with special emphasis on experimental design and Learn topics with recent implication in special areas of physiology
Apply the analytical and critical approach to knowledge in the field of specialty and related fields.	<ul style="list-style-type: none"> Explore critical and analytical thinking in clinical physiology 	<ul style="list-style-type: none"> Examine practical skills as: planning, designing and execution of self-directed and original research investigations.
Integrate knowledge in the field of specialty with related knowledge, deduce and develop relationships between them.	<ul style="list-style-type: none"> Recall concepts and relate ideas covered in different parts of the program. 	<ul style="list-style-type: none"> Recall of Bioethics, presenting different types of clinical cases including disturbed function assessment and clinical diagnosis.
Demonstrate a deep awareness of current problems and modern	<ul style="list-style-type: none"> Prove deep understanding of current issues and recent 	<ul style="list-style-type: none"> Recall of Bioethics, presenting different types of clinical cases including disturbed function

theories in the field of specialty.	theories in clinical physiology.	assessment and clinical diagnosis.
Identify professional problems and find innovative solutions to solve them.	<ul style="list-style-type: none"> Predict difficult professional problems and create novel approaches for managing them. 	<ul style="list-style-type: none"> Examine practical skills as: planning, designing and execution of self-directed and original research investigation.
Master a wide range of professional skills in the field of specialty.	<ul style="list-style-type: none"> Acquire practical skills to assess the function of human body systems, diagnose abnormalities, and find ways to restore function and/or reduce the disabling consequences to the patient. 	<ul style="list-style-type: none"> Explore about Aviation, highly altitude and space physiology, effects of low oxygen pressure on the body, physiology of deep-sea diving and other hyperbaric condition and hyperbaric oxygen therapy. Recognize physiology of stress, pollution, and its relation to exercise. Differentiate the pharmacological principles of treatment using drugs, their efficacy in management of diseases and their adverse reactions.
Develop new methods, tools, and methods for professional practice.	<ul style="list-style-type: none"> Propose innovative concepts in Clinical Physiology research. 	<ul style="list-style-type: none"> Conduct research studies that add to the existing specialty knowledge.
Use appropriate technological means to serve his professional practice.	<ul style="list-style-type: none"> Use technology and innovation to increase his physiological knowledge and improve his professional practice. 	<ul style="list-style-type: none"> Use technology and innovation to increase physiological knowledge and practice team work.
Communicate efficiently and lead work teams in various professional scenarios.	<ul style="list-style-type: none"> Communicate effectively through written and oral presentation. Establish working relationship with colleagues and work effectively as a leader and part of a team. 	<ul style="list-style-type: none"> Use technology and innovation to increase physiological knowledge and practice team work.
Take Decision in light of available data.	<ul style="list-style-type: none"> Demonstrate decision-making skills in clinical physiology laboratory. 	<ul style="list-style-type: none"> List the methods applied in physiology research with special emphasis on experimental design

		and Learn topics with recent implication in special areas of physiology
Employ and develop available resources efficiently and work to find new resources.	<ul style="list-style-type: none"> Use current research and clinical evidence to improve patient's health outcomes. 	<ul style="list-style-type: none"> Conduct research studies that add to the existing specialty knowledge.
Show awareness of his/her role in community development and environmental preservation	<ul style="list-style-type: none"> Understand the role of Clinical Physiologist in environmental health research and community development. 	<ul style="list-style-type: none"> Use systematic approaches to design and conduct scientific research.
Act in a manner that reflects a commitment to integrity, credibility, and professionalism.	<ul style="list-style-type: none"> Establish collaborative work skills through understanding of roles, responsibilities, and competence in practice. 	<ul style="list-style-type: none"> Use technology and innovation to increase physiological knowledge and practice team work.
Commit to continuous self-development and transfer his/her knowledge and experiences to others.	<ul style="list-style-type: none"> Develop independent learning abilities and teaching skills in the field of Clinical Physiology. 	<ul style="list-style-type: none"> Use systematic approaches to design and conduct scientific research. Conduct research studies that add to the existing specialty knowledge.

ILOs of ARS for M.D. Program in Clinical Physiology

NAQAAE	ILOs of ARS for MD in clinical physiology
A1-Basic facts, theories, of the specialty and related subjects/ fields	A1. Discuss the basic concept of homeostasis in order to have deep fluent knowledge of the normal function of each human body system and recognize how different systems work in harmony to maintain homeostasis under different conditions. A2. Identify traditional and recent methods for functional assessment of the body systems. A4. Discuss the pathophysiological mechanisms underlying important disorders of the human body.
A2-Mutual relation between professional practice and effects on environment	A3. Explain the function of different systems under variable physiological conditions and the effect of environmental stressors on normal physiological

	function.
A3-Recent advances in the field of practice	A6. Review recent scientific research in clinical physiology.
A4-Details of ethical & legal practice	A7. Identify legal and ethical considerations in clinical physiology practice and research.
A5 -Quality standards of the practice	A8. Identify quality standards in the clinical physiology laboratory.
A6- Design, conduction & publishing of scientific research	A5. Design, conduction & explore publishing of scientific research.
A7- Ethical considerations in different types of scientific research	A9. Identify legal and ethical considerations in clinical physiology practice and research
B1- Analyze, deduce, extrapolate & evaluation of information.	<p>B1. Analyze the molecular mechanisms of normal physiological functions and evaluate their role in pathophysiology of different diseases.</p> <p>B2. Interpret abnormalities of physiological functions and plan for improving clinical physiology practice.</p> <p>B4.Distinguish between physiological & pathological responses of human body systems to variable stressors.</p> <p>B5. Distinguish the pharmacokinetics and pharmacodynamics of different pharmacological agents.</p>
B2- Solve the majority of problems in the specialty according to the available data (complete or incomplete)	<p>B3. Solve clinical problems in different fields of clinical physiology according to available data.</p> <p>B7.Evaluate risks of practice in clinical physiology laboratory</p>
B3- Conduct research studies that add to the existing specialty knowledge	B6. Conduct research studies that add to the existing specialty knowledge
B4- Publish scientific articles/papers (in indexed journals)	B10. Prepare scientific articles/papers to be published in indexed journals.
B5- Plan and implement (or supervise implementation of) enhancement & Improvement approaches to practice	B8. Plan for periodic self-enhancement of his/her skills through assignment.
B6- Take decisions in various	B9. Take decisions in various clinical situations

professional situations (including dilemmas & controversial issues)	including dilemmas and controversial issues
B7- Add to the specialty field through creativity & innovation	B11. Add to the specialty field through creativity & innovation through thesis
B8- Manage discussions on basis of evidence and proofs	B12. Manage discussions on basis of evidence and proofs through seminars.
C1- Competent in all basic and all required advanced professional skills (to be determined according to the specialty board/ department)	C1. Perform competently, write a report, and interpret the results of pulmonary function, exercise, and methacholine bronchoprovocation challenge tests. C2. Examine and interpret nerve and muscle, kidney, and GIT function and test results.
C2- Write and appraise reports.	C1. Perform competently, write a report, and interpret the results of pulmonary function, exercise, and methacholine bronchoprovocation challenge tests
C3-Evaluate <i>and improve</i> methods and tools used in specialty.	C3. Use available tools for diagnosis of cardiovascular and respiratory diseases and sleep related disorders and plan for improving methods of diagnosis.
C4-Use technology to advance practice	C4. Use technology to enforce his physiological knowledge, analyze data and improve his practice
C5- Plan professional development courses to improve practice and enhance performance of juniors	C5. Plan for enhancing professional practice and improving performance of other clinical physiologists through assignments.
D1- Communicate effectively using all methods	D1. Communicate effectively using different methods.
D2- Use information technology to improve his/her professional practice	D2. Use information technology to obtain data and improve his/her professional practice.
D3- Teach and evaluate others	D3. Perform self and peer appraisal.
D4- Perform self-appraisal and seek continuous learning	D3. Perform self and peer appraisal. D4. To be motivated and able to seek continuous learning and help in teaching others.
D5- Use different sources of information to obtain data	D7. Use different sources of information to obtain data
D6- Work in teams as well as a member in larger teams	D5. Work in a team and understands the responsibilities of a team leader
D7- Manage scientific meetings	D6. Manage scientific meetings and appropriately

and appropriately utilize time	utilize time
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4- Curriculum structure and contents

4.a program duration: 3-5 years (academic years including thesis)

4.b program structure:

4.b.i- No. of hours per week in each year/semester:

Semester	Core Courses	Elective Courses
	No. of hours	No. of hours
First semester	4	3
Second semester	3	
Third semester	4	3
Fourth semester	4	
Fifth semester	3	

4.b.ii- No. of credit hours	Lectures	<input type="text" value="17"/>	Practical	<input type="text" value="7"/>	Thesis	<input type="text" value="24"/>	Total	<input type="text" value="48"/>
	Compulsory	<input type="text" value="18"/>	Elective	<input type="text" value="6"/>	Optional	<input type="text" value="0"/>		

4.b.iii- No. of credit hours of specialized courses No. %

4.b.iv- No. of credit hours of other courses No. %

4.b.v- Program levels (in credit-hours system)

Student is required to pass at least 12 credit hours with CGPA not less than C+ before submitting a thesis proposal.

5- Program Courses

5.1- Compulsory (18 CH)

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
1703801	Advanced Physiology	4	3	2
1703802	Advanced Clinical Physiology	4	3	2
1703803	Environmental Physiology	3	2	2
1703804	Diagnostic physiology	4	3	2
1704820	Pharmacology	3	2	2
	Total	18	13	10

5.2- Elective I (2 CH)

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
1700850	Nutrition	3	2	2
1701821	Molecular Biology	3	2	2
1705820	Hematology	3	2	2
1708820	Immunology	3	2	2
1713820	Genetics	3	2	2

5.3- Elective II (2 CH)

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
1715851	Chest Diseases	3	2	2
1715852	Renal Diseases	3	2	2
1715853	Endocrinal Diseases	3	2	2
1715854	Cardiac Diseases	3	2	2

5.4- Optional – (none)

6- Program admission requirements: Postgraduate students with a M.Sc. or an equivalent degree in Clinical Physiology

7- teaching and learning methods

- Lecture
- Practical/Clinical
- Brainstorming
- Problem Solving
- Case Study
- Self-Directed Learning

8- Regulations for progression and program completion

For the progression and completion of the program to obtain the degree of MD in clinical physiology, the student must:

- 1- Complete 24 credit hours with CGPA of at least C+ through courses.
- 2- Complete 24 credit hours with through thesis.
- 3- Submit a thesis validity report by an examination committee approved by the department council and their members include at least two external examiners.

9- Evaluation of Students enrolled in the program.

Tool evaluation	Intended learning outcomes being assessed
Written	ILOs a &b
Practical	ILOs c
Oral	ILOs a, b &d
Semester Work	ILOs b & d

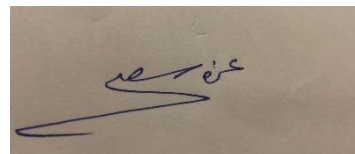
Evaluation of the Program

Evaluator	Tool	Sample
1- Senior students	questionnaire	At least 50 %
2- Alumni	questionnaire	Representative sample
3- Stakeholders (Employers)	meeting	Representative sample
4- External Evaluator(S) or External Examiner (s)	Report	Prof.Dr. Alaa El-Dein Hassan Mahmoud
5- Other		

Program coordinator:

Name: Prof. Azza Saad Abdou Ibrahim

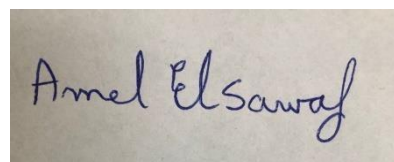
Signature:



Department Head:

Name: Prof. Amel El-sawaf

Signature:



Date of Department Council Approval: 29 /8/2023

Attached Matrices:

****Program Aims vs ILOs matrix***

**** Courses vs Program ILOs matrix***

****ARS vs ILOs matrix***

****Teaching methods vs Course matrix***

Program Aims vs ILOs matrix.

ILOS Aims	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	D1	D2	D3	D4	D5	D6	D7
1	X																							X		X	X	X	X		X	X
2		X	X				X		X			X	X		X	X								X		X	X	X	X	X	X	X
3			X					X						X	X		X				X					X	X	X	X	X	X	X
4				X						X								X	X		X	X				X	X	X	X		X	X
5					X																				X	X	X	X	X			
6						X		X	X																	X	X					
7						X					X																			X	X	X
8						X					X																			X	X	X

Courses vs Program ILOs matrix

ILOS Courses	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	D1	D2	D3	D4	D5	D6	D7	
Advanced Physiology	x						x					x	x	x									x	x						x	x		
Advanced Clinical Physiology		x						x								x											x	x	x	x		x	x
Environmental Physiology				x						x									x	x		x	x				x	x					
Diagnostic Physiology			x						x						x		x				x						x	x	x		x		
Pharmacology					x																				x	x	x			x			
Thesis						x					x																x	x	x	x	x	x	x

Teaching and Learning Methods Vs Courses Matrix (Degree: Master) Code: 1701700

Courses	1703801	1703802	1703803	1703804	1703820	1703821
Teaching Methods						
Lecture	√	√	√	√	√	√
Practical/Clinical	√	√	√	√	√	
Brainstorming	√	√	√	√	√	√
Discussion Groups						
Problem Solving	√	√	√	√		
Case Study	√	√		√		
Field Training						
Role playing						
Training Workshops						
Self-Directed Learning	√	√	√	√	√	√
e-learning						
Project						

Department of Human Physiology