



**Quality Assurance Unit**



**Tanta University  
Faculty of Medicine**

**Department of Medical Physiology**

**Course Specifications**

**Medical Physiology First Year**

**2017-2018**

Medical Physiology First Year Course specifications

University: Tanta

Faculty: Medicine

Department: Medical Physiology

### **1- Administrative Information**

- **Course title :Medical Physiology**
- **Code: TMED.01:03**
- **Department offering the course: Department of Medical Physiology**
- **Program (s) on which this course is given: Bachelor of Medicine and Surgery (M.B.B.Ch).**
- **Academic year/ Level : First year of M.B.B.Ch**
- **Semester in which the course is given: one academic year**
- **Date of specifications /revision: /8/2017**
- **Date of approval by department council: /9/2017**
- **Date of approval by faculty council : / /**
- **Taught hours: in 30 weeks**
  - Lectures           **150 hours (5 hr/week)**
  - Practical           **60 hours (2hr/week)   Extra added hours Tutorial           2 hours / 2w**
  - **Total               210 hours (7hr/week)**

### **2 – Overall Course Aims is to:**

- Present the important feature of human Physiology in a clear and concise manner and is to provide essential facts and concept of Medical Physiology which will aid in understanding of Clinical Medicine.
- Develop basic understanding of the key functions of human body in preparation for subsequent second year course.
- Integrate physiological data & mechanisms with the ongoing basic sciences : anatomy, histology & biochemistry and clinical applications.
- Explore in detail the functions of the autonomic, the neuromuscular, the respiratory and the cardiovascular systems as well as their integration to achieve homeostasis.
- Develop the basic scientific effective communication and team work attitudes.

### **3- Intended learning outcomes (ILOs):**

#### **a. knowledge and understanding:**

At the end of the course the student will be able to:

- a1. Define some biophysical laws and their relation to physiology.
- a2. Recognize some pathophysiological aspects underlying the development of common diseases.
- a3. Describe the normal function of the human body and record the adaptations that occur to maintain life and explaining them on physiological bases

- a4. List Mechanisms aiming at maintenance of homeostatic functions as: pH, osmolarity, body temperature, etc.....
- a5. List the morphological and functional characteristics of skeletal, cardiac and smooth muscle.
- a6. List the divisions of the Autonomic System and understand its role in the regulation of physiological systems.
- a7. State the properties of the cardiac muscle and factors affecting them
- a8. Relate the main functions of the heart and blood vessels, as well as the regulation And integrative actions of the cardiovascular system.
- a9. Discuss the organization of the respiratory system as well as its function and components.
- a10. Describe the functional structure of the respiratory system,, respiratory cycle, its mechanism, regulation of normal respiration , respiratory functions of the blood and some conditions related to disorders
- a11. Identify the physiological adaptations and responses to exercise.
- a12. State the physiological responses caused by acid or base disturbances.
- a13. Name and outline the basic immunity and body defense .
- a14. Recognize the general components of blood and its functions, mechanism of blood coagulation and regulation of blood volume and understand some of clinical conditions occurring due to deficiency of one or more of the blood components.
- a15. State the properties of excitability of living tissues, membrane potentials, and their relation to different phases of excitability, physiological anatomy of the skeletal muscle and mechanism of contraction and changes occurring during it.

#### **b. Intellectual skills:**

At the end of the course the student will be able to:

- b1. Interpret the most important physiological laboratory results (blood, respiratory, neuromuscular), to distinguish a physiological from a pathological condition.
- b2. Demonstrate & interpret some clinical parameters such as ABP, ECG, nerve conduction velocity & pulmonary functions for a normal individual.
- b3. Evaluate the skills in the correct use of basic clinical equipment, such as: use of sphyngomanometer, ECG and spiromanometer in the monitoring of the function of the cardiovascular and respiratory systems.
- b4. Organize practice sessions with the clinical instruments and interpret their findings in various altered states of the cardiovascular and respiratory system.
- b5. Express systemic thinking in problem solving of cases with altered ECG or Respiratory function tests.

#### **c. Professional & practical skills:**

At the end of the course the student will be able to:

- c1. Classify symptoms and physical signs in terms of anatomic, pathologic and functional diagnostic significance.

c2.Perform hematological tests; with estimation of blood Hb, bleeding & clotting times, determination of the hematocrit value and blood groups.

c3.Perform respiratory function tests. Lung volumes and capacities, timed vital capacity .

c4.Manipulate a stethoscope for hearing heart and respiratory sounds and measure the arterial blood pressure

c5.Record and read an electrocardiogram.

c6.Draw & construct physiological scientific data in a graphical form.

**d. General transferable skills, Professional Attitude and Communication Skills**

At the end of the course the student will be able to:

d1. Work effectively within a team and prepare a scientific topic.

d2.Think independently and encourage to integrate knowledge .

d3.Be prepared for the lifelong learning needs of the medical profession.

d4.Use information and communication technology effectively in the field of the medical practice.

d5.Present information clearly in written, electronic, and oral forms.

d6.Communicate ideas and arguments effectively with colleagues and other individuals regardless of their different background..

**4- Topics (Contents of the course)**

Theoretical topic	No. of hrs.		
	Lectures	Practical/ Small groups	Total
<b>1. Respiration</b>			
-Introduction& mechanism of respiration	2hours	2hours	32 hours (30 h. Lectures + 2 h. Practical)
-I.p.p. & Lung compliance	2hours		
-Lung surfactant & Resp. work of breathing	2hours		
-Dead space	2hours		
-Lung Volumes & Capacities	2hours		
-Mechanism of gas exchange	2hours		
-Pulmonary function tests	2hours		
-Respiratory functions of the blood	4hours		
-Respiratory centre & mechanism of respiration	2hours		
-Regulation of respiration	4hours		
-Acid – Base balance	2hours		
-Hypoxia and cyanosis	2hours		
-Acclimatization to low O <sub>2</sub> tension & Miscellaneous	2hours		
<b>2. Blood</b>			

Theoretical topic	No. of hrs.		
	Lectures	Practical/ Small groups	Total
- Introduction & properties of blood	1hours	4hours	47 hours (17 h. Lectures + 30 h. Practical)
- Function of the blood	1hours		
- Plasma protein	2hours	4hours	
- Hemostasis	4hours	8hours	
- BL. Volume & its regulation	2hours		
- Erythrocytes	3hours	8hours	
- Blood group & Leucocytes	2hours	4hours	
- Immunity	2hours	Revision (2 h.)	
<b>3. Cardiovascular System</b>			
- Introduction & Properties	10hours	6hours	89 hours (66 h. Lectures + 23 h. Practical)
- Cardiac cycle (Radial – jugular- Sounds)	5hours		
- Innervations & Heart rate	6hours		
- Cardiac output & cardiac work	6hours		
- Arterial blood pressure	6hours	6hours	
- Diameter of arterioles	6hours	Revision (3 h.)	
- Capillary & lymphatic circulation	5hours		
- Coronary & pulmonary circulation	5hours		
- Cerebral & hepatic circulation	5hours		
- Muscular exercises on C.V.S	5hours		
- Hemorrhage & Shock	6hours		
<b>4. Autonomic Nervous System</b>			
- Introduction	2hours		14 hours
- Autonomic ganglia	2hours		
- Sympathetic	2hours		
Parasympathetic	2hours		
- Chemical transmission	6hours		
<b>5. general physiology</b>			
- transport across cell membrane	2hours		
- Body fluids	2hours		
- Homeostasis	2hours		
<b>6. Excitable tissue</b>			
- Introduction & Nerve	6hours		22 hours (17 h. Lectures + 5 h. Practical)
- Neuromuscular junction	2hours		
- Skeletal Muscle	7hours	4hours	
- Smooth Muscle	2hours	Revision (1 h.)	
<b>Total</b>	<b>150 hours</b>	<b>60 hours</b>	<b>210 hours</b>

## 5-Teaching and learning methods

### a. Teaching methods:

5-1. Lectures: (5 hours / week)

- All the students attend in one big lecture hall.

5.2-E-learning is activated

5.4-Tutorial: (2hours / every 2weeks)

- Half of the students attend in a small lecture hall.
- Tutorial class is scheduled and previously announced, the subjects that conventionally directed are lagging by few weeks to the related branches and systems given at that time in the lecture. Special topics from the curriculum are discussed in the tutorial.

5.5-Practical: Laboratory demonstration and practical training, the students are divided into small subgroups, 2 hours / every 2 weeks alternating with the tutorial.

5.6- Practical book activities:

- Each teaching method is designed to serve different educational goal, and together they provide an appropriately stimulating atmosphere for learning.

5-2.Methods for disabled students:

- No special arrangements are available

**b. Teaching plan:**

Item	Time schedule	Teaching hours
Lectures	5 hours/w	150 hours
Practical and tutorial classes	Alternating groups 2hours/w	60 hours
Total		210 hours

No.	Date	General	Blood	N&M	Resp.	A.N.S	C.V.S
1.	16/9/2017	5	XX	XX	XX	XX	XX
2.	23/9/2017	1	1	1	XX	2	XX
3.	30/9/2017	XX	2	1	XX	2	XX
4.	7/10/2017	XX	2	1	XX	2	XX
5.	14/10/2017	XX	2	1	XX	1	1
6.	21/10/2017	XX	2	1	XX	1	1
7.	28/10/2017	XX	2	1	XX	1	1
8.	4/11/2017	XX	2	1	XX	1	1
9.	11/11/2017	XX	2	1	XX	1	1
10.	18/11/2017	XX	2	1	XX	1	1
11.	25/11/2017	XX	XX	1	2	1	1
12.	2/12/2017	XX	XX	1	2	1	1
13.	9/12/2017	XX	XX	1	2	XX	2
14.	16/12/2017	XX	XX	1	2	XX	2
15.	23/12/2017	XX	XX	1	2	XX	2
16.	30/12/2017	XX	XX	1	2	XX	2
	6/1/2018	Midyear exam					

**Course Specifications: Medical Physiology First Year 2017-2018**

No.	Date	General	Blood	N&M	Resp.	A.N.S	C.V.S
	13/1/2018	<b>Midyear holiday</b>					
	20/1/2018						
	27/1/2018						
17.	3/2/2018	XX	XX	1	2	XX	2
18.	10/2/2018	XX	XX	1	2	XX	2
19.	17/2/2018	XX	XX	XX	2	XX	3
20.	24/2/2018	XX	XX	XX	2	XX	3
21.	3/3/2018	XX	XX	XX	2	XX	3
22.	10/3/2018	XX	XX	XX	2	XX	3
23.	17/3/2018	XX	XX	XX	2	XX	3
24.	24/3/2018	XX	XX	XX	2	XX	3
25.	31/3/2018	XX	XX	XX	2	XX	3
26.	7/4/2018	XX	XX	XX	XX	XX	5
27.	14/4/2018	XX	XX	XX	XX	XX	5
28.	21/4/2018	XX	XX	XX	XX	XX	5
29.	28/4/2018	XX	XX	XX	XX	XX	5
30.	5/5/2018	XX	XX	XX	XX	XX	5

**\*\* Details of teaching hours of Practical classes:**

No.	Experiment	hours	Date (No. of the week)
A) Hematology experiments			
1.	Haematocrit value	4 h.	3rd week
2.	E.S.R	4 h.	4th week
3.	Bleeding time & hiss test	4 h.	5th week
4.	Coagulation time	4 h.	6th week
5.	Estimation of Hemoglobin content	4 h.	7th week
6.	Osmotic fragility	4 h.	8th week
7.	Blood groups	4 h.	9th & 10th weeks
B) Demonstration of frog & mammalian experiments			
8.	Effects of temperature & fatigue on SMT	4 h.	12th week
9.	Pacemaker	3 h.	13th week
10.	Extrasystole and compensatory pause	3 h.	14th week
C) Demonstration of human experiments			
11.	ABP	6 h.	16th & 17th weeks
12.	ECG	8 h.	18th, 19th, 20th weeks
13.	Measurement of lung volumes & capacities	2 h.	21st week
D) REVISIONS			
		6 h.	11 <sup>th</sup> , 15 <sup>th</sup> , 22 <sup>nd</sup> weeks

**6-Student Assessment :**

**a. Methods used:**

6-1.Final Written examination to assess (a1-15),(b1-b5)

6-2. Final Oral examination to assess (a1-15),(b1-b5) (d2& d6)

6-3. Final Practical examination to assess a4, (b1-b5), (c1-c6), (d1)

6-4. Periodical exams (2 assessment exams )to assess (a1-15),(b1-4)

One examination in May and the other in September, for the students who failed, to pass the course

**b. Assessment schedule:**

Assessment	Week
1. First assessment.	12th week
2. Second assessment.	24th week
3. Midyear examination.	17th week
4. Final written examination.	36th week
5. Final oral examination.	36th week
6. Final practical examination.	33rd week

**c. Weighing of assessments:**

Exam	Marks	% of Total
Periodical assessment (2 examinations)	25	10%
Midyear examination	25	10 %
written examination	125	50%
Oral examination.	50	20%
Practical examination.	25	10%
Total	250	100%

**d. Attendance criteria:**

- Practical attendance: The minimal attendance in practical and tutorial classes is 75%.
- Practical books

**e. Grading System**

Examination	Topic	Description	Marks
2Periodical Exams	Sheet exams.	MCQ	25 marks = 10%
Midyear exam	Sheet examination	MCQ	25 marks = 10%
Final examination	1.Written examination (3 hours)	MCQ and short questions in all studied systems;( define, problem solving , define ,draw and label ,explain the mechanism of ,compare ,enumerate) Blood Respiration Cardiovascular System Autonomic Nervous system	20 marks = 16% 25 marks = 20% 40 marks = 32% 20 marks = 16%



Examination	Topic	Description	Marks
		Excitable tissues	20 marks = 16% Total 125marks= 50%
	2.Practical examination.	2 hours examination.	15 marks for the exam in form of MCQ 10 marks how to do the experiments  Total 25marks = 10%
	3.Oral examination	Each student is evaluated by 2 examiners	Total 50 marks = 20%
Total			250 Marks = 100 %

The minimum passing score is 150 marks (60% of the total marks) provided that, at least 37.5 mark (30% of written exam) are obtained in the final written examination.

Passing grades are:

<b>Excellent</b>	85%
<b>Very Good</b>	≥75% - < 85%
<b>Good</b>	≥ 65% - < 75%
<b>Pass</b>	≥ 60% - < 65%

Examination Description:

Summative assessments are the only used assessment methods at the end of the year (no formative assessment). They are matched with the ILOs and faculty by laws.

### **7- List of references**

7-1. Course notes

Department book; written by the staff members.

7-2. Text book

1. Guyton C., Hall E. " Human Physiology and Mechanisms of Disease" . 6<sup>th</sup> ed., Saunders 1997.
2. Kim E. Barrett, Susan M. Barman " Gagnong's review of Medical physiology " . 24<sup>th</sup> ed., Scott Boitano and Heddwen Brooks , 2012.

7-3. Recommended books

1. Kaplan Medical Staff ."Kaplan medical USMLE step 1 Physiology Lecture Notes". 2012.
2. Caroll R.G. "Elsevier's Integrated Physiology". In series of Elsevier's Integrated. Mosby, 2006

1. Physiology: Board Review series

7-4. Periodicals and web sites

1. www.Medscap.com
2. www.pubmed.org.

### **8-Facilities for learning and teaching resources**

1. Lecture halls: One in the 2<sup>nd</sup> floor of the faculty building for the theoretical lectures supplied with writing board, overhead projector, slide projector and data show.
2. Two lecture halls in the department (capacity 70 students), supplied with writing

board, overhead projector, slide projector and data show.

3. Four laboratories, capacity 75 students /lab, supplied with written board and data show.

We verify that the above Course and the analysis of students and external evaluator opinions are accurate.

Course coordinator and head of department  
name.....signature.....Date.....

Head of quality assurance unit:  
name.....signature.....Date.....

**(A) Intended learning outcomes of the course**

**University: Tanta**  
**Faculty: medicine**  
**Department: Physiology**

<b>The name of course</b>	Physiology for 1st year
<b>Code of course</b>	TMED.01:03

<b>Topics of the course Theoretical and practical</b>	<b>Week Study</b>	<b>Knowledge &amp; Understanding</b>	<b>Intellectual Skills</b>	<b>Professional Skills</b>	<b>General transferable skills</b>
General physiology	First 2 weeks	a1-a5	b1-b2	c1	d1-2
Autonomic nervous system	2nd to 12th week	a7	b2-b3. b4	c1	d1-2
Nerve & muscles	2nd to 18th week	a6-a15	b1-b2	c6	d1-2
blood	2nd to 11th week	a3-a6-a14	b1-b3	c2	d1-2, d5
respiration	11th to 25th week	a10-a11-a13	b1-b3, b4,b5	c3-c4	d1-2, d5
Cardiovascular system	5th to 30th week	a8-a9-a12	b2-b3, b4,b5	c4-c5-c6	d1-2, d5
other activities		a1-a15	b1-b4		d1-d6

Matrix of the course ILO,s with the Program ILO,s

		Matrix of the course ILO,s with the Program ILO,s																
Course ILOS	program ILO	knowledge & understanding				Intellectual skills				Professional & practical skills				General , transferable, Professional Attitude and communication skills				
	knowledge & understanding	a.1.	a1															
a.2.		a3																
a.3.		a1																
a.4.		a1																
a.5.		a1																
a.6.		a1																
a.7.		a1																
a.8.		a1																
a.9.		a1																
a.10.		a1																
a.11.		a1																
a.12.		a3																
a.13.		a1																
a.14.		a1																
a.15.		a1																
Intellectual skills	b.1.					b1d												
	b.2.					b1d												
	b.3.					b1d												
	b.4.					b1d												
	b.5.					b4												
Professional & practical skills	c.1.									c1f								
	c.2.									c15								

Matrix of the course ILO,s with the Program ILO,s																	
program ILO		knowledge & understanding				Intellectual skills				Professional & practical skills				General , transferable, Professional Attitude and communication skills			
		Course ILOS															
	c.3.									c18							
	c.4.																
	c.5									c16							
	c.6									c1f							
General , transferable, Professional Attitude and communication skills	d.1.													d15			
	d.2.																
	d.3.													d12			
	d.4.													d13			
	d.5.													d14			
	d.6.													d8	d9		