

**TEMPLATE FOR COURSE SPECIFICATIONS**

*Cairo University*  
*Faculty of Medicine*  
*Department of Medical Physiology\_\_\_\_\_.*

## Course Specifications

**Course title: Medical Physiology For First Year**

**(Code) PHY-103**

- **Department offering the course : Medical Physiology Department .**
- **First academic year of M.B.& B.Ch. program**
- **Date of specification approval**

### **A) Basic Information:**

- **Allocated marks: 250 marks**
- **Course duration: 30 weeks of teaching**
- **Teaching hours:**

<b>Total</b>	<b>210 hrs ,</b>
<b>Theoretical</b>	<b>150 hrs,</b>
<b>Tutorials</b>	<b>30 hrs</b>
<b>Practical</b>	<b>30 hrs</b>

### **B) Professional Information:**

#### **1- Overall Aim of the Course:**

- To acquire an appropriate functional background of cells , tissues& systems.
- To integrate physiological data & mechanisms with the ongoing basic sciences: anatomy , histology & biochemistry and clinical applications.

- To follow the rapidly changing and inflating details about molecular biology & genetics.
- To explore in detail the functions of the autonomic , the neuromuscular , the respiratory and cardiovascular systems as well as their integration to achieve homeostasis.
- To develop the basic scientific research skills as well as effective communication and team work attitudes.

## **2- Intended Learning Outcomes (ILOs):**

### **a- Knowledge and understanding:**

*By the end of the course, students should be able to:*

- A1- Describe the cellular functions at the organelle and molecular level.
- A2- Classify the functional organization of sympathetic and parasympathetic nervous systems.
- A3- Point out the basis of excitability ( membrane potentials) in all living cells especially in nerve and muscle cells.
- A4- Explain the functions of the nerve cell and muscle fiber grossly and at the molecular level.
- A5- Point out and explain the functions of different components of blood.
- A6- Describe the structure , properties and functions of cardiac muscle grossly and at the molecular level.
- A7- Point out the dynamics of blood and lymph flow and describe physiology of circulation through special organs.
- A8- Describe the physiology of pulmonary ventilation, exchange of gases in the lung , and blood gas transport.
- A9- Point out the physiology of regulation of respiration in health and disease states .
- A10 - Describe some biophysical laws and their relation to human physiology.

### **b- Intellectual skills:**

- b1- Interpret the most important physiological laboratory results ( blood , Respiratory , neuromuscular ), to distinguish a physiological from a pathological condition.
- b2- Comment , on some clinical parameters such as : ECG & pulmonary functions for a normal individual.
- b3- Integrate physiology with other basic and clinical sciences.

c- practical skills:

*By the end of the course, students should be able to:*

- C1- Perform hematological tests : estimation of blood Hb, bleeding & clotting times , determination of the hematocrite value , the bleeding & clotting times and blood groups.
- C2- Perform the most important respiratory function tests.
- C3- Perform the measurement of the arterial blood pressure.
- C4- Manipulate a stethoscope hearing heart and respiratory sounds.
- C5- Record and read an electrocardiogram.
- C6- Present physiological scientific data in a graphical form.

d- General and transferable skills:

*By the end of the course, students should be able to:*

- d1- Work separately or in a team to research and prepare a scientific topic.
- d2- Present clearly and effectively a scientific topic in a tutorial , a staff meeting or the yearly scientific day.
- d3- Present physiological data in a graphical form.

e. Professional attitude and behavioral skills

e1-Respect and follow the institutional code of conduct.

f.Communication skills

By the end of the course, students should be able to:

- f1-Work effectively in a group in lab .
- f2- Respects the role of staff and co-staff members regardless of degree or occupation.

### **3- Course contents:**

<b>Subject</b>	<b>Lectures (hrs)</b>	<b>Tutorial / Small group discussion (hrs)</b>	<b>Practical (hrs)</b>	<b>Total (hrs)</b>	<b>% of Total (approximately)</b>
1- Introduction to human physiology	4	-	-	4	1.9
2- Autonomic nervous system	20	6		26	12.3
3- Excitable tissues	26	6	6	39	18.5
4- Blood	26	6	9	41	19.5
5- Cardiovascular system	38	9	9	56	26.5
6- Respiratory system	30	3	6	39	18.5
8- Biophysics	6			6	2.8
Total	150	30	30	210	100

### **III-A) TOPICS:**

#### **1. Introduction to human physiology.**

- Body compartments & body fluids & homeostasis.
- The cell membrane : functions and transport.
- Intercellular communication & control systems.

#### **2. Autonomic nervous system .**

- Functional organization of autonomic outflow
- Chemical transmission.

#### **3. Excitable tissues.**

- Membrane potentials.
- Nerve action potential.
- Skeletal muscle contraction & its properties .
- Neuromuscular transmission.
- Plain muscles : electrical & mechanical properties.

#### **4. Blood.**

- Composition and function.
- Plasma proteins.
- Red blood cells and anemia.
- White blood cells and immunity.
- Blood platelets, hemostasis , abnormalities and anticlotting mechanisms.
- Blood groups.

#### **5- Cardiovascular.**

- Cardiac muscle properties.
- Electrical properties of c. muscle : sinus rhythm, action potential.
- ECG : methods of recording normal record and common abnormalities.
- Mechanical properties of c. muscle.
- Cardiac cycle . Heart sounds.
- Cardiac output , and factors affecting it.
- Work of the heart, mechanical efficiency .
- Cardiac reserve & metabolism of cardiac muscle.
- Hemodynamics.
- Arterial blood pressure , factors controlling it and its regulation.
- Capillary & lymphatic circulation, special circulation : coronary , pulmonary and cerebral.
- Hemorrhage ,shock and muscle exercise.

#### **6- Respiratory system.**

- Functional anatomy.
- Pulmonary ventilation , compliance , work of breathing and V/P ratio.
- Pulmonary functions tests.
- Exchange of gases through the pulmonary membrane.
- Blood gas transport.
- Regulation of respiration.
- Hypoxia , cyanosis , and dyspnea.
- Effect of hyperbaric oxygen & deep sea diving.

**7- Biophysics:** selected topics related to the excitable tissues , CVS and respiratory system.

### **III-B) Tutorial / Small Group Discussions**

- a- Preparation of assignments
- b- Presentation
- c- Case scenarios, reports and problem solving

### **III-C) PRACTICAL CLASSES:**

- 1- Performing hematological tests : estimation of blood Hb, bleeding & clotting times , determination of the hematocrite value , the bleeding & clotting times and blood groups.
- 2- Performing the most important respiratory function tests.
- 3- Measurement of the arterial blood pressure.
- 4- Using the stethoscope for hearing heart and respiratory sounds.
- 5- Recording and reading the electrocardiogram.
- 6- Present physiological scientific data in a graphical form.

### **4- Teaching and learning methods:**

#### **A-METHODS USED:**

- A1-Lectures: the students are divided into groups ( according to faculty system).
- A2-Tutorials classes : two groups ( about 60 students each )
- A3-Practical training : small groups training ( about 25 students each )
- A4-A yearly scientific day for students , in the form of small group presentations. The titles of the subjects are determined during several meetings with staff.

#### **B- Methods for disabled students:**

- Supporting Learning Classes can be arranged for disabled students.
- Procedures for availability of faculty member for individual student consultations and academic advice:
  1. Office hours of each staff members.
  2. Availability of email communication.

### **TEACHING PLAN:**

**Lectures:** One hour lecture daily (for five days /week), Time from September to May; Students will be divided into groups according to faculty system.

**Tutorials:** In two small lecture halls (60 students each), three hours/ 2 weeks (during 3 months each term). The tutorial class is scheduled and previously announced (2 weeks before). The subject, which are conversationally directed are lagging by few weeks to the related branches and systems given at that time in the lectures. Special topics from the curriculum- of special interest – are exclusively discussed in the tutorial classes.

**Practical classes:** In two big labs a 3hr/ 2 weeks (alternating with the tutorial classes) small groups (25 students) is scheduled and the planned practical tests are announced two weeks before.

#### **A- Time plan:**

<b>Item</b>	<b>Time schedule</b>	<b>Teaching hours</b>	<b>Total hours</b>
Lectures	<u>5</u> times/week; one hour each between September to May	1hr	150hrs
Practical	<u>3</u> hours / <u>2</u> week	3hrs	30hrs
Tutorial	<u>3</u> hours /2 week	3hrs	30hrs
<b>Total</b>			<b>210hrs</b>

### **4-D) TEACHING AND LEARNING FACILITIES:**

Facilities used for teaching this course include:

- Lecture halls: provided by the faculty.
- Small group classes: in the department.
- Information technology / AV aids: available in computer- assisted classes in the department.
- Laboratory: laboratory facilities to perform the required experiments are available in the department.

## 5- Students Assessment methods:

### 5-A) ATTENDANCE CRITERIA:

The minimal acceptable attendance in the practical & tutorial is 70%. Students who fail to attend this percentage ( in each half of the year will not be allowed to take the midyear and end of the year final theoretical exam and the end of the year practical exam.

### 5-B) Assessment TOOLS:

<b>Tool</b>	<b>Purpose (ILOs)</b>
Written examination	To assess knowledge , understanding & intellectual skills.
Oral examination	To assess knowledge & understanding , intellectual and presentation skills.
Practical examination	To assess some practical and intellectual skills

### 5-C) TIME SCHEDULE:

<b>Exam</b>	<b>Week</b>
1- Mid term test1 at First half of the academic year	November
2- Mid-year exam	January
3- Mid term test2 at Second half of the academic year	March
4- Practical exam	April
5- Final exam	May



#### 5-D) GRADING SYSTEM:

Examination	Marks allocated	% of Total Marks
1- Formative assessment	-	
2- Mid-term	10	20%
3- Mid-year	40	
4- Second half	-	
5- Final exam:		
a- Written	125	50%
b- Practical	40	16%
c- Oral	30	12%
6- Assignments & other activities	5	2%
<b>Total</b>	<b>250</b>	

- The minimum passing score is **150 marks**, provided at least **30 marks** are obtained in the final written exam.
- Passing grades are: **EXCELLENT**  $\geq 85\%$ , **VERY GOOD**  $75 < 85\%$ , **GOOD**  $65 < 75\%$  **AND FAIR**  $60 < 65\%$ .

#### 5-E) Examinassions description:

Examination	Description
1- Formative Assessment	Usually carried out during the course, to give feedback to students. It is not be part of grading process
2- Mid term test1	Objectively structured questions.
3- Mid-year	MCQ ( single best opinion ) + true & false + cases + problem solving + matching items .
4- Mid term test2	Objectively structured questions.
5- Final exam:	
a- Written	MCQ ( single best opinion ) + true & false + cases + problem solving + matching items +short essay Qs. In the lab , at multiple phases through the practical courses . In front of two separate examiners ( an internal & external)
b- Practical	
c- Oral	
6- Assignments & other activities	Distributed according to the performance of students in practical & tutorial classes between: Attendance, Attitude, Discussion ,Assignments &Presentations

## **6- List of references:**

6.1- Basic materials: Department book : written by staff members ( 5 volumes) Is available for purchase by students from bookshops installed in the faculty.

6.2- Essential books (text books):

Guyton AC, Hall JE : Textbook of Medical Physiology, Last Edition. Saunders.

Ganong WF: Review of Medical Physiology", Last edition. Lange Medical Books/ Mc Graw – Hill.

6.3- Recommended books:

Johnson LR :Essential Medical Physiology .Last Edition. Raven Press.

6.4- Periodicals, Web sites, ... etc:

## **7- Facilities required for teaching and learning:**

Facilities used for teaching this course include:

- Lecture halls:
- Small group classes
- Laboratory
- Information technology / AV aids
- Models etc

**Course Specification Updating Team:** Curriculum Committee of Medical Physiology Department

**Head of the department:** Prof. Dr. Maha Gamal

**Revised by Prof. Dr .....** Quality assurance unit