



**Physiology
PHY 302**

Basic Information

Program(s) Title	Bachelor of Medicine and Surgery; MB,BCh
Department offering the course	Physiology
Academic year / Level	First year
Date of specification approval	25 / 7 /2012
Total Teaching Hours	Total: 243 Lecture: 145 Practical: 42 Tutorials: 26 Demonstration: 30 Integrated seminars (between physiology, anatomy, biochemistry & histology): 30
Allocated Marks	250 Marks
Allocated Duration	October through May (as per student)
Course Director	Prof. Dr. Faten M. Ali Diab Head of Department
Teaching Staff	7 Professors 4 Assistant Professors 6 Lecturers 8 Assistant lecturers 9 Demonstrators



Professional Information

1- Overall Aims of Course

Physiology Course Provides Students with:

- Aim 1** Knowledge of normal function and regulation of different body systems.
- Aim 2** Understanding of the mechanisms underlying the function of organ systems.
- Aim 3** Understanding alterations of normal functions and mechanisms of disease.
- Aim 4** Ability to test and evaluate the functions of different body systems.

2- Intended Learning Outcomes of Course (ILOs)

A. Recall of Knowledge and Understanding:

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

	Course ILO	Program ILO
a1	Describe important cellular mechanisms of body homeostasis in, blood, cardiovascular, respiratory, nerve and muscle and autonomic nervous systems and biophysics.	A1
a2	Recognize the function of blood, cardiovascular, respiratory, nerve and muscle and autonomic nervous systems.	A4
a3	Describe physiological changes during growth and aging as regards blood, cardiovascular, respiratory, nerve and muscle and autonomic nervous systems.	A5
a4	Describe altered function of blood, cardiovascular, respiratory, nerve and muscle and autonomic nervous systems of human body given in clinical context of various diseases.	A6
a5	Discuss biostatistic principles and their role in serving the public health sector and scientific research.	A9

B. Intellectual Skills

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



Course ILO		Program ILO
b1	Integrate the basic physiological facts of biophysics, blood, cardiovascular, respiratory, nerve and muscle and autonomic nervous systems with clinical data.	B1
b2	Correlate functional alterations of common pathological conditions and diseases in biophysics, blood, cardiovascular, respiratory, nerve and muscle and autonomic nervous systems with clinical data.	B2
b3	Use problem solving skills in a variety of practical and clinical situations related to blood, cardiovascular, respiratory, nerve and muscle and autonomic nervous.	B5

C. Professional and Practical Skills

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

Course ILO		Program ILO
c1	Measure arterial blood pressure (palpatory and auscultatory methods).	C1
c2	Identify auscultatory areas of the heart and lungs and auscultate heart sounds and breathing sounds.	C1
c3	Palpate the arterial pulse and comment properly.	C1
c4	Test the response of the microcirculation (reactive hyperemia, ischemic pain, capillary fragility test, triple response).	C1
c5	Determine major blood groups by slide agglutination test.	C1
c6	Estimate and Interpret Erythrocyte Sedimentation Rate, osmotic fragility test and hematocrite value	C1
c7	Assess haemostatic functions (bleeding time, clotting time), hemoglobin content estimation.	C1
c8	Record the respiratory movement by the stethograph.	C1
c9	Calculate and interpret blood indices.	C1
c10	Comment on electrocardiogram, and spirogram	C1
c11	Comment on graphs recorded from observed demonstrations on isolated organs e.g. skeletal muscles and heart.	C1
c12	Comment on observed demonstrations on the effect of some drugs on intestinal motility and comment on the graph.	C1



c13	Practice basics of health and patient's safety and safety procedures during all examinations.	C6
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D. General and Transferable Skills

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

Course ILO		Program ILO
d1	Respect superiors, colleagues and any other members of the health profession.	D3
d2	Communicate ideas and arguments effectively.	D7
d3	Be prepared for the lifelong learning needs of the medical profession.	D8
d4	Work constructively and cooperatively within a team.	D9
d5	Practice self and peer evaluation.	D10
d6	Manage time effectively.	D11

3- Course Contents

Topics	Teaching and Learning Methods				
	%	L	T	P/ C	O
BIOPHYSICS -Introduction to physiology of cell - Body fluids - Homeostasis - Transport across cell membrane -Electrical property of cell membrane -Cardiovascular and respiratory biophysics	9 %	14			
Nerve & muscle -Nerve structure and properties, factors affecting the effectiveness of an electric stimulation - Strength –duration curve – Resting membrane potential. - Action potential -Excitability changes during	11%	16		8 4	4



<p>action potential -Nerve conduction and mixed nerve - Neuromuscular junction and neuromuscular transmission -Skeletal muscle and excitation contraction coupling -Skeletal muscle contraction -Energy sources, skeletal muscle metabolism & types of skeletal muscle fibers - Adaptation of Skeletal muscle fibers for training - Gradation of skeletal muscle contraction - Difference between cardiac & skeletal muscle - Difference between smooth & skeletal muscle</p>					
<p>AUTONOMIC NERVOUS SYSTEM - General organization of the autonomic nervous system - Comparison of somatic and autonomic nervous system - Divisions of autonomic nervous system and autonomic ganglia and comparison between sympathetic and parasympathetic nervous system. -Distribution and functions of sympathetic nervous system. -Distribution and functions of para-sympathetic nervous system. -Chemical transmission at autonomic junctions, -Regulation of autonomic functions by higher centers.</p>	9 %	12		2 2	2
<p>BLOOD PHYSIOLOGY - Introduction and red blood cells - Blood groups and blood transfusion - Haemostasis - Leukocytes & immune system</p>	12%	18		12 6	8



<p>CARDIOVASCULAR SYSTEM Introduction & cardiac properties -Functional & structural aspects of the CVS, Functional Components of the vascular system Heart -Functional characteristics of the circulation -Functional structure of the heart -Electrical activity of the heart, Excitability -Automaticity, -Conductivity, -Contractility -Contractile response of cardiac muscle ECG - normal ECG -Cardiac Arrhythmias -Cardiac cycle -Cardiac output -Cardiac Reserve and Heart Failure -Arterial blood pressure -Cardiovascular Regulatory Centers -Functions and Control of arterioles - Heart Rate and Its regulation -Venous Circulation - Microcirculation - Special Circulations - Circulatory Response to Exercise - Pathophysiology of the Circulation</p>	40%	56		14 8	10
<p>RESPIRATORY PHYSIOLOGY -Functional structure of the respiratory system: -Respiratory processes and Pulmonary Ventilation -Mechanics of respiration - Airway resistance -Elastic behavior of the lung</p>	17%	24		6 6	6



-Lung volumes and capacities -Gas exchange -Ventilation /perfusion ratio -Gas transport between lung and tissues, Oxygen Transport, Carbon Dioxide Transport, Hypoxia, Oxygen toxicity, Cyanosis -Pulmonary function tests -Regulation of respiration -Respiratory adjustments in health and disease					
BIOSTATISTICS - Importance of statistics in medicine, special references of biostatistics, differences between vital biostatistics and biostatistics, usages of biostatistics in medicine - types of variables -- quantitative and qualitative variables(median –mean – mode), measures of dispersion (range – variant – standard deviation)	2 %	5			
Total	100%	145		68 (42+26)	60 (30D+30I)

L: lecture, T: Tutorial, P: Practical, C: Clinical, EL: e-learning, O: Others (.e.g self directed learning ; SDL), D: Demonstration EOW, I: Integrated seminars

3- Teaching and Learning Methods

Teaching/ Learning Methods	Recall of Knowledge/ Understanding	Intellectual skills	Professional/ Practical	GTS
4.1-Lectures	a1-a4			
4.2- Tutorials	a1-a4	b1-b3		d1,d2 ,d5,d6



4.3- Practical			c1-c13	d1,d4, d5,d6
*4.4- E-learning classes	a1- a4	b1-b3		
**4.5- Self directed learning	a1- a4	b1-b3		d2,d3, d4, d5,d6

GTS: general transferable skills

***E-learning**

**homework assignments, topics for self directed learning

Facilities Required for Teaching and Learning

- Halls for tutorials
- Computer laboratory for e-learning classes and e-exams
- Audiovisuals

4- Teaching and learning methods for students with learning difficulties

- 1- Revision lectures and tutorial classes outside schedule
- 2- Assignments

5- Student Assessment Methods

6.1 Methods:

Type	Time	Assessment Method	ILOs Measured
Formative Assessment		Monthly assessments in tutorials	a1-a4 b1-b3
		Online quizzes (MCQs)	a1-a4 b1-b3
		Others	
Summative Assessment	Continuous Assessment	Home Assignments	a1-a4 b1-b3 d2,d3, d4, d5,d6
		Presentations	-
		Mid Term Written Exams [MCQ]	a1-a4 b1-b3



	Mid Year	Written Exam [MCQ]	a1-a4 b1-b3
	Final	WRITTEN EXAM	a1-a4 b1-b3
		PRACTICAL EXAM	c1-c13
		ORAL EXAM	a1-a4 b1-b3

6.2 Time Schedule

Week	Method
Week 4 Week 8 Week 16 Week 20 Available to students all through the year	Formative Assessment:(without marks) <ul style="list-style-type: none"> • Monthly Assessments in Tutorials
Monthly Week 10 (Mid Term Exam -1) Week 14 (Mid Year exam) Week 22 (Mid Term Exam -2)	Continuous Assessment <ul style="list-style-type: none"> • Research • Written Exams(MCQ)
END of YEAR	Practical Exam (skills & OSPE)
	Written Exam <ul style="list-style-type: none"> • Multiple Choice Questions • Short Essay
	Oral Exam



6.3 Weighing of Assessments

		Method		Weight %
Continuous Assessment	20%	Midterm exam-1 Midterm exam-2		8 % (20 Mark)
		Research		2 % (5 Mark)
		Written Exam		10 % (25 Mark)
Mid-Year Exam				
Final	80%	50%	Written Exam	50 % (125 Mark)
		30%	Oral Exam	10 % (25 Marks)
			Practical Exam (skills)	10 % (25 Marks)
			Practical Exam (OSPE)	10 % (25 Marks)
Total			100% (250 Mark)	

6- List of References

7.1	Course Notes
	Department lecture notes
7.2	Essential Books (Text Books) (Available at department and faculty library)
	Review of medical physiology. (2009).William F. Ganong .Twenty fourth edition..Mc Graw Hill. LIBRAIRE DU LIBAN
	Text Book of medical physiology. (2006). Guyton& Hall .Eleventh edition. Inter-national edition. ELSEVIER SAUNDERS.
7.3	Recommended Books
	Review of medical physiology. (2009).William F. Ganong .Twenty fourth edition.Mc Graw Hill. LIBRAIRE DU LIBAN
	Text Book of medical physiology.(2006). Guyton& Hall .Eleventh edition. Inter-national edition. ELSEVIER SAUNDERS.
7.4	Periodicals, Web Sites, etc



	http://www.cvphysiology.com/
	http://advan.physiology.org/
	http://www.pennmedicine.org/health_info/animationplayer/
	http://spot.colorado.edu/~dubin/bookmarks/b/320.html

Table of specification

Unit topic	Teaching Hours 145	Weight	Marks 250
Biophysics	14	9 %	22.5
Biostatistics	5	2 %	5
Nerve & muscle	16	11 %	27.5
Autonomic Nervous System	12	9 %	22.5
Blood	18	12 %	30
Cardiovascular System	56	40 %	100
Respiratory Physiology	24	17 %	42.5

Course Coordinator	Date
Dr. Mona Ahmed ahmed	25 / 7 / 2012

Head of the department:

Professor Dr / Faten Mahmoud Ali Diab

Date: 25 / 7 / 2012