## Basic Information

<table>
<thead>
<tr>
<th><strong>Program(s) Title</strong></th>
<th>Bachelor of Medicine and Surgery; MB,BCh</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Department offering the course</strong></td>
<td>Physiology</td>
</tr>
<tr>
<td><strong>Academic year / Level</strong></td>
<td>First year</td>
</tr>
<tr>
<td><strong>Date of specification approval</strong></td>
<td>25 / 7 / 2012</td>
</tr>
</tbody>
</table>
| **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:

<table>
<thead>
<tr>
<th>Course ILO</th>
<th>Program ILO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a1 Describe important cellular mechanisms of body homeostasis in, blood, cardiovascular, respiratory, nerve and muscle and autonomic nervous systems and biophysics.</td>
<td>A1</td>
</tr>
<tr>
<td>a2 Recognize the function of blood, cardiovascular, respiratory, nerve and muscle and autonomic nervous systems.</td>
<td>A4</td>
</tr>
<tr>
<td>a3 Describe physiological changes during growth and aging as regards blood, cardiovascular, respiratory, nerve and muscle and autonomic nervous systems.</td>
<td>A5</td>
</tr>
<tr>
<td>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.</td>
<td>A6</td>
</tr>
<tr>
<td>a5 Discuss biostatistic principles and their role in serving the public health sector and scientific research.</td>
<td>A9</td>
</tr>
</tbody>
</table>

B. Intellectual Skills
By the end of the course, students will be able to:
## Course ILO

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

### C. Professional and Practical Skills

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

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

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

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

3. Course Contents

<table>
<thead>
<tr>
<th>Topics</th>
<th>Teaching and Learning Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
</tr>
<tr>
<td>BIOPHYSICS - Introduction to physiology of cell - Body fluids - Homeostasis - Transport across cell membrane - Electrical property of cell membrane - Cardiovascular and respiratory biophysics</td>
<td>9%</td>
</tr>
<tr>
<td>Nerve &amp; muscle - Nerve structure and properties, factors affecting the effectiveness of an electric stimulation - Strength–duration curve – Resting membrane potential. - Action potential - Excitability changes during</td>
<td>11%</td>
</tr>
<tr>
<td>Module</td>
<td>Percentage</td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td><strong>AUTONOMIC NERVOUS SYSTEM</strong></td>
<td>9%</td>
</tr>
<tr>
<td>- General organization of the autonomic nervous system</td>
<td></td>
</tr>
<tr>
<td>- Comparison of somatic and autonomic nervous system</td>
<td></td>
</tr>
<tr>
<td>- Divisions of autonomic nervous system and autonomic ganglia and comparison between sympathetic and parasympathetic nervous system.</td>
<td></td>
</tr>
<tr>
<td>- Distribution and functions of sympathetic nervous system.</td>
<td></td>
</tr>
<tr>
<td>- Distribution and functions of para-sympathetic nervous system.</td>
<td></td>
</tr>
<tr>
<td>- Chemical transmission at autonomic junctions,</td>
<td></td>
</tr>
<tr>
<td>- Regulation of autonomic functions by higher centers.</td>
<td></td>
</tr>
<tr>
<td><strong>BLOOD PHYSIOLOGY</strong></td>
<td>12%</td>
</tr>
<tr>
<td>- Introduction and red blood cells</td>
<td></td>
</tr>
<tr>
<td>- Blood groups and blood transfusion</td>
<td></td>
</tr>
<tr>
<td>- Haemostasis</td>
<td></td>
</tr>
<tr>
<td>- Leukocytes &amp; immune system</td>
<td></td>
</tr>
<tr>
<td>Module</td>
<td>Weight</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>CARDIOVASCULAR SYSTEM</td>
<td>40%</td>
</tr>
<tr>
<td>Introduction &amp; cardiac properties</td>
<td></td>
</tr>
<tr>
<td>- Functional &amp; structural aspects of the CVS, Functional Components of the vascular system Heart</td>
<td></td>
</tr>
<tr>
<td>- Functional characteristics of the circulation</td>
<td></td>
</tr>
<tr>
<td>- Functional structure of the heart</td>
<td></td>
</tr>
<tr>
<td>- Electrical activity of the heart, Excitability</td>
<td></td>
</tr>
<tr>
<td>- Automaticity, Conductivity, Contractility</td>
<td></td>
</tr>
<tr>
<td>- Contractile response of cardiac muscle</td>
<td></td>
</tr>
<tr>
<td>ECG</td>
<td></td>
</tr>
<tr>
<td>- normal ECG</td>
<td></td>
</tr>
<tr>
<td>- Cardiac Arrhythmias</td>
<td></td>
</tr>
<tr>
<td>- Cardiac cycle</td>
<td></td>
</tr>
<tr>
<td>- Cardiac output</td>
<td></td>
</tr>
<tr>
<td>- Cardiac Reserve and Heart Failure</td>
<td></td>
</tr>
<tr>
<td>- Arterial blood pressure</td>
<td></td>
</tr>
<tr>
<td>- Cardiovascular Regulatory Centers</td>
<td></td>
</tr>
<tr>
<td>- Functions and Control of arterioles</td>
<td></td>
</tr>
<tr>
<td>- Heart Rate and Its regulation</td>
<td></td>
</tr>
<tr>
<td>- Venous Circulation</td>
<td></td>
</tr>
<tr>
<td>- Microcirculation</td>
<td></td>
</tr>
<tr>
<td>- Special Circulations</td>
<td></td>
</tr>
<tr>
<td>- Circulatory Response to Exercise</td>
<td></td>
</tr>
<tr>
<td>- Pathophysiology of the Circulation</td>
<td></td>
</tr>
<tr>
<td>RESPIRATORY PHYSIOLOGY</td>
<td>17%</td>
</tr>
<tr>
<td>- Functional structure of the respiratory system:</td>
<td></td>
</tr>
<tr>
<td>- Respiratory processes and Pulmonary Ventilation</td>
<td></td>
</tr>
<tr>
<td>- Mechanics of respiration</td>
<td></td>
</tr>
<tr>
<td>- Airway resistance</td>
<td></td>
</tr>
<tr>
<td>- Elastic behavior of the lung</td>
<td></td>
</tr>
</tbody>
</table>
- 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)

<table>
<thead>
<tr>
<th></th>
<th>2 %</th>
<th>5</th>
</tr>
</thead>
</table>

**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

<table>
<thead>
<tr>
<th>Teaching/ Learning Methods</th>
<th>Recall of Knowledge/ Understanding</th>
<th>Intellectual skills</th>
<th>Professional/ Practical</th>
<th>GTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1- Lectures</td>
<td>a1-a4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2- Tutorials</td>
<td>a1-a4</td>
<td>b1-b3</td>
<td>d1,d2,d5,d6</td>
<td></td>
</tr>
</tbody>
</table>
Facilities Required for Teaching and Learning

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

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:

<table>
<thead>
<tr>
<th>Type</th>
<th>Time</th>
<th>Assessment Method</th>
<th>ILOs Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Formative Assessment</strong></td>
<td>Monthly assessments in tutorials</td>
<td>a1-a4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b1-b3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Online quizes (MCQs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a1-a4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b1-b3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Others</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Summative Assessment</strong></td>
<td>Home Assignments</td>
<td>a1-a4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b1-b3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presentations</td>
<td></td>
<td>d2,d3, d4, d5,d6</td>
</tr>
<tr>
<td></td>
<td>Mid Term Written Exams [MCQ]</td>
<td></td>
<td>a1-a4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b1-b3</td>
</tr>
<tr>
<td></td>
<td>Mid Year</td>
<td>Final</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>----------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Written Exam [MCQ]</td>
<td>a1-a4 b1-b3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>WRITTEN EXAM</td>
<td>a1-a4 b1-b3</td>
<td></td>
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<tr>
<td></td>
<td>PRACTICAL EXAM</td>
<td>c1-c13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ORAL EXAM</td>
<td>a1-a4 b1-b3</td>
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### 6.2 Time Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Method</th>
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</thead>
<tbody>
<tr>
<td>Week 4</td>
<td>Formative Assessment:(without marks)</td>
</tr>
<tr>
<td>Week 8</td>
<td>- Monthly Assessments in Tutorials</td>
</tr>
<tr>
<td>Week 16</td>
<td></td>
</tr>
<tr>
<td>Week 20</td>
<td></td>
</tr>
<tr>
<td>Available to students all through the year</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Continuous Assessment</td>
</tr>
<tr>
<td></td>
<td>- Research</td>
</tr>
<tr>
<td></td>
<td>- Written Exams(MCQ)</td>
</tr>
<tr>
<td>Monthly</td>
<td></td>
</tr>
<tr>
<td>Week 10</td>
<td>Practial Exam (skills &amp; OSPE)</td>
</tr>
<tr>
<td>Week 14</td>
<td></td>
</tr>
<tr>
<td>Week 22</td>
<td></td>
</tr>
<tr>
<td>END of YEAR</td>
<td>Written Exam</td>
</tr>
<tr>
<td></td>
<td>- Multiple Choice Questions</td>
</tr>
<tr>
<td></td>
<td>- Short Essay</td>
</tr>
<tr>
<td></td>
<td>Oral Exam</td>
</tr>
</tbody>
</table>
6.3 Weighing of Assessments

<table>
<thead>
<tr>
<th>Method</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Continuous Assessment</strong></td>
<td></td>
</tr>
<tr>
<td>Midterm exam-1</td>
<td>8 % (20 Mark)</td>
</tr>
<tr>
<td>Midterm exam-2</td>
<td></td>
</tr>
<tr>
<td>Research</td>
<td>2 % (5 Mark)</td>
</tr>
<tr>
<td><strong>Mid-Year Exam</strong></td>
<td></td>
</tr>
<tr>
<td>Written Exam</td>
<td>10 % (25 Mark)</td>
</tr>
<tr>
<td><strong>Final</strong></td>
<td></td>
</tr>
<tr>
<td>Written Exam</td>
<td>50 % (125 Mark)</td>
</tr>
<tr>
<td>Oral Exam</td>
<td>10 % (25 Marks)</td>
</tr>
<tr>
<td>Practical Exam (skills)</td>
<td>10 % (25 Marks)</td>
</tr>
<tr>
<td>Practical Exam (OSPE)</td>
<td>10 % (25 Marks)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100% (250 Mark)</td>
</tr>
</tbody>
</table>

6- List of References

7.1 Course Notes
Department lecture notes

7.2 Essential Books (Text Books) (Available at department and faculty library)

7.3 Recommended Books

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

<table>
<thead>
<tr>
<th>Unit</th>
<th>Teaching Hours</th>
<th>Weight %</th>
<th>Marks 250</th>
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</thead>
<tbody>
<tr>
<td>Biophysics</td>
<td>14</td>
<td>9%</td>
<td>22.5</td>
</tr>
<tr>
<td>Biostatistics</td>
<td>5</td>
<td>2%</td>
<td>5</td>
</tr>
<tr>
<td>Nerve &amp; muscle</td>
<td>16</td>
<td>11%</td>
<td>27.5</td>
</tr>
<tr>
<td>Autonomic Nervous System</td>
<td>12</td>
<td>9%</td>
<td>22.5</td>
</tr>
<tr>
<td>Blood</td>
<td>18</td>
<td>12%</td>
<td>30</td>
</tr>
<tr>
<td>Cardiovascular System</td>
<td>56</td>
<td>40%</td>
<td>100</td>
</tr>
<tr>
<td>Respiratory Physiology</td>
<td>24</td>
<td>17%</td>
<td>42.5</td>
</tr>
</tbody>
</table>

Course Coordinator

Dr. Mona Ahmed ahmed

Date: 25/7/2012

Head of the department:

Professor Dr / Faten Mahmoud Ali Diab

Date: 25/7/2012