COURSE SPECIFICATION

Basics of Biophysics and Clinical Measurements

Faculty of Medicine– Mansoura University

(A) Administrative information

(1) Program offering the course:	**Postgraduate master degree of Anesthesia and Surgical Intensive Care**
(2) Department offering the program:	**Anesthesia** and Surgical Intensive Care department
(3) Department responsible for teaching the course:	**Anesthesia** and Surgical Intensive Care department.
(4) Part of the program:	First part
(5) Date of approval by the Department`s council	20-4-2016
(6) Date of last approval of program specification by Faculty council	9-8-2016
(7) Course title:	**Basics of Biophysics and Clinical Measurements**
(8) Course code:	**ANET 528 BCM**
(9) Credit hours	**2hours**
(10) Total teaching hours:	30 lecture

(B) Professional information

(1) Course Aims:

The broad aims of the course are as follows:

- Enable the candidates to acquire high level of knowledge where they must demonstrate an awareness of and responsiveness in dealing with physical principles, monitoring, breathing system help to improve practice in field of anesthesia, intensive care and pain management.
- The course aim to prepare candidates for optimal management strategies of technical errors during practice.

(2) Intended Learning Outcomes (ILOs):

On successful completion of the course, the candidate will be able to:

A- Knowledge and Understanding

A1	Discuss biological signals and their measurement
A2	Define factor affecting & clinical application of density.
A3	Define, factor affecting & types of viscosity.
A4	Describe factors affecting rate of diffusion.
A5	Explain factors affecting solubility of gases in liquid & its clinical application.
A6	Define (osmosis, osmotic pressure, osmolarity, osmolality, tonicity, critical temperature, critical pressure, heat capacity,latent heat, specific latent heat, latent heat of vaporization, vapor, saturated vapor pressure, boiling point .
A7	Define temperature, methods of measurment(non electical & electrical)

A8	Explain characters, factors affecting & clinical application of laminar & turbulent flow)
A9	List methods of gas flow measurment.
A10	Discuss liquid & blood volume measurment (measuring container method, dye dilution technique & radioactive isotope dilution technique).
A11	Explain methods of pressure measurment(liquid manometer & mechanical pressure gauge).
A12	Discuss clinical application of transducers.
A13	Recognize types & complication of surgical diathermy.
A14	Explain indications, mechanism of action, precausion with defibrillator.
A15	List indications, methods of implantation& hazards of pacemaker.
A16	Describe clinical consideration of MRI.
A17	Underline protocol of management of airway fire.
A18	Explain idea, factors affecting performance & safety features of flowmeter.
A19	Classify anesthetic vaporizers, its design.
A20	List types of Mapleson system.
A21	Discuss meaurement of COP(noninvasive & invasive methods).
A22	Describe O2 haemoglobin dissociation curve.
A23	Discuss value, principle & disadvantages of pulse oximetry.
A24	Explain principle, types, indication & values of capnography.
A25	Dicuss principle of bispectral index.
A26	Describe moitoring of neuromuscular blockades.
A27	Discuss structure, functions & clinical application of biomembrane.

B- Intellectual skills

B1	Use monitoring for solving critical clinical problems.
B2	Integrate clinical measurement during practice with clinical condition

(3) Course content:

Subjects	Lectures
Basic physics for the anesthetists	6
Anesthesia apparatus	6
Breathing systems.	6
Biomembrane	2
Preoperative checking of equipment and environment	2
The Operating Room:	2
Medical Gas Systems, Environmental Factors.	6
Total teaching hours	30

(4) Teaching methods:

4.1: Lecture

4.2: Small group discussion with case study and problem solving

(5) Assessment methods:

5.1: Written exam

5.2: MCQ exam

5.3: Structured oral exam

Written exam: 144
MCQ exam: 36
Structured oral exam: 120

(6) References of the course:

6.1: Basic physics and measurment in anaesthesia 5th ed

6.2: Clinical anesthesiology 4th ed

(7) Facilities and resources mandatory for course completion:

Lecture halls, clinical rounds and data show.

Course coordinator: Dr. Maged Talaat Salama

Head of the department: Prof.Dr. Mona Abdelglil Hashish

Date: 20/4/2016