COURSE SPECIFICATION

Basics of Biophysics

Faculty of Medicine- Mansoura University

(A) Administrative information

(1) Program offering the course:	**Postgraduate Doctorate degree of Anesthesia and Surgical Intensive Care**
(2) Final award / degree	**MD degree**
(3) Department offering the program:	**Anesthesia** and Surgical Intensive Care and pain management department
(4) Department responsible for teaching the course:	**Anesthesia** and Surgical Intensive Care and pain management department
(5) Part of the program:	First part
(6) Date of approval by the Department`s council	20/4/2016
(7) Date of last approval of program specification by Faculty council	9-8-2016
(8) Course title:	**Basics of Biophysics and clinical measurements**
(9) Course code:	**ANET 628 BB** **ANET628 CM**

(10) Credit hours	**5 hours**
(11) Total teaching hours:	75 lecture

(B) Professional information

(1) Course Aims:

The broad aims of the course are as follows:

- Enable the candidates to acquire clinical skills where they must demonstrate an awareness of and responsiveness to the larger context in relation to their practice.
- The course aim to prepare physicians as senior practitioners, educators, researchers, and administrators capable of practicing and construction of appropriate, optimal management strategies of complications and critically ill patients.
- Allowing candidates to have the experience in collecting scientific data, how to prepare a research project, writing essays and scientific papers.

(2) Intended Learning Outcomes (ILOs):

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

A- Knowledge and Understanding

A1	Define fundamental & derived SI units
A2	Discuss neuromuscular monitoring
A3	Define, factor affecting & types of viscosity.
A4	Explain factors affecting solubility of gases in liquid & its clinical application.
A5	Explain measurment of osmolarity.

A6	List gas laws.
A7	Define temperature, methods of measurment (non electical & electrical)
A8	Explain laminar & turbulent flow profiles
A9	Discuss (Bernouli, ventori & coanda effect).
A10	List methods of gas flow measurment.
A11	Explain metods of gas supply
A12	Discuss soda lime and Co2 absorption
A13	Describe scavenging systems
A14	Discuss liquid & blood volume measurment (measuring container method, dye dilution technique & radioactive isotope dilution technique).
A15	Explain methods of pressure measurment(liquid manometer & mechanical pressure gauge).
A16	Discuss clinical application of transducers.
A17	Recognize types & complication of surgical diathermy.
A18	Explain concept of capacitor, inductance and their applications.
A19	List indications, methods of implantation& hazards of pacemaker.
A20	Describe clinical consideration of MRI.
A21	List hazards of laser & its protective safety measures.
A22	Underline protocol of management of airway fire.
A23	Discuss methods exist to prevent electrocution in theatre
A24	Explain idea, factors affecting performance & safety features of flowmeter.
A25	Classify anesthetic vaporizers, its design, factors affecting performance & modern vaporizers.
A26	Explain classification and function of breathing system.
A27	Discuss meaurement of COP(noninvasive & invasive methods).
A28	Describe O2 haemoglobin dissociation curve.
A29	Discuss value, principle & disadvantages of pulse oximetry.

A30	Discuss measurement of PH in blood sample
A31	Explain principle, types, indication & values of capnography.
A32	Dicuss principle of bispectral index.
A33	Describe concept of ultrasound.
A34	Explain clinical importance of humidity

B- Intellectual skills

B1	Interprets monitoring for solving critical clinical problems.
B2	Construct appropriate management strategies for patients with common diseases, both acute and chronic of all body system during anesthesia.
B3	Integrate statistical results of clinical examination from history, physical and laboratory test findings into an appropriate management under anesthesia.

(3) Course content:

Subjects	Lectures
SI units	3
Gas flow	6
Gas supply and delivery	6
Measurement of oxygen, Co2 and anesthetic agents	8
Temperature and humidity	4
Pressure and COP measurement	6
Anesthesia apparatus	6
Breathing systems	6

Preoperative checking of equipment and environment	6
The Operating Room safety	6
Equipment	12
Vaporizers	6
Total teaching hours	75

(4) Teaching methods:

4.1: Lecture

4.2: Small group discussion with case study and problem solving

(5) Assessment methods:

5.1: Written exam for 3hours including MCQ in basics of biophysics after 6 months (one semester) of date of registration for graduate studies for M.D.

Percentage of each Assessment to the total mark:

Written exam: 80Marks

MCQ exam: 20Marks

(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