COURSE SPECIFICATION

(Medical Radiation Physics)

Faculty of Medicine– Mansoura University

(A) Administrative information

(1) Programme offering the course:	Postgraduate Master degree of Clinical Oncology and Nuclear Medicine/ CONM517
(2) Department offering the programme:	Clinical oncology and nuclear medicine department
(3) Department responsible for teaching the course:	Clinical oncology and nuclear medicine department
(4) Part of the programme:	First part
(5) Date of approval by the Department`s council	**7/6/2016**
(6) Date of last approval of programme specification by Faculty council	9/8/2016
(7) Course title:	**Medical Radiation Physics**
(8) Course code:	CONM517MRP
(9) Credit hours	1 lecture 1 clinical
(10) Total teaching hours:	15hourslectures 30 hours clinical

(B) Professional information

(1) Course Aims:

The broad aims of the course are as follows: (either to be written in items or as a paragraph)

1- provide the candidate with the various radiotherapeutic tools used in day to day oncological practice, and be aware of indications, contraindications, normal tissue tolerances (adult and pediatrics) and the management of radiation reactions and complications.

2- give the principles of radiation protection, the legal framework for protection .

3- educate the technique-based specialities:

2D treatment techniques, 3D treatment techniques,Conformal radiotherapy.

IMRT techniques, Brachy therapy.

(2) Intended Learning Outcomes (ILOs):

Intended learning outcomes (ILOs); Are four main categories: knowledge & understanding to be gained, intellectual qualities, professional/practical and transferable skills.

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

A- Knowledge and Understanding

A1 :explain the basic radiotherapeutic procedures (external beam, brachytherapy, intraoperative)

A2: define physics knowledge to safely use ionizing radiation

A3: Recognize cross sectional imaging which contribute to the localization of tumors for diagnosis, treatment planning and assessment of response.

A4: Identify methods and devices of radiation measurement.

A5: express basic principles of nuclear medicine.

A6: describe total and hemibody

A7: discuss conformal, stereotactic, and intraoperative therapy.

following intellectual qualities:

B- Intellectual skills

B1: Interpret different treatment approaches and optimize solutions to clinical problems based on physical concepts and advanced radiotherapy techniques (conformal, stereotactic).

B2: Distinguish the methods of radiation protection.

B3: demonstrate application and characters of electron beam.

B4: illusterate total and hemibody irradiation.

B5:apply highly charged particles.

C– Professional/practical skills

C1: Designs the plan of treatment to System-based site specialities:

- **breast cancer**
- **thoracic malignancy**
- **upper and lower gastrointestinal (GI)**
- **head and neck**
- **sarcomas**
- **gynaecological oncology**
- **urological malignancy and germ cell tumours**
- **neuro-oncology**
- **skintumours**
- **lymphomas**
- **pediatrics oncology**

C2: Applies Technique-based specialities:

2D treatment techniques **3D treatment techniques.**

Conformal radiotherapy.

C3:adjust different beams, fractionation, machines according to tumor and site of treatment.

C4: be able to detect target delineation, organ at risk with CT planning.

C5:Assess use of gamma camera and isotopes.

Course content: 15 hours

Subjects	Lectures
***Medical radiation physics and physical aspects of radiation protection.**	2
***External beam dosimetry and treatment planning.**	2
***Clinical application of electron beam therapy**	2
High linear energy transfer and heavy charged particles	1
Intraoperative radiation therapy	2
Conformal and stereotactic therapy	2
Total body and hemibody irradiation	2
Basic principles of nuclear medicine, physics , diagnostic and therapeutic studies, and radioimmunoassay	2
Total teaching hours	15

(3) Course content: 30 hours clinical

Clinical skills	Teaching hours
Radiation protection	2
External beam dosimetry	**2**
Treatment planning	**2**
Clinical application of electron beam therapy	**2**
Hemibody irradiation	**2**
CT planning	**2**
Isodose curves	**2**
Radiotherapy machines	**2**
3D planning	**2**
Dose fractionation	**2**
Gamma camera	**2**
Normal tissue tolerance	**2**
Radioisotopes dealing	**2**
Target delineation	**2**
Diagnostic and therapeutic use of isotopes	**2**

(4) Teaching methods:

4.1: lectures.

4.2: scientific meetings.

(5) Assessment methods:

5.1: written exam for assessment of Knowledge and intellectual. Skills.

5.2: oral exam for assessment of Knowledge, intellectual, and practical skills and structured oral exam.

5.3: OSCEclinical exam for assessment of, intellectual, and practical skills and OSCE stations.

Assessment schedule:

Assessment 1 written exam held after 6 months of registration.

Assessment 2: oral exam held after 6 months of registration and structured oral exam.

Assessment 3: OSCCE clinical exam held after 6 months of registration and OSCE stations.

Assessment 4: MCQ exam held at the end of the first semester (15^{th} week).

Percentage of each Assessment to the total mark:

Written exam:144 marks,

MCQ:36 marks.

Oral exam: 60 marks,20%of the first part final exam.

clinical exam: 60 marks, 20% of the first part final exam.

(6) References of the course:

6.1: Text books:

● **PerezCA, Brady LW,HalperinEC,etal.,**editors**.***Principles and Practice of RadiationOncology*. 5th ed. Philadelphia:Lippincott Williams&Wilkinns; 2008.

●**Hansen EK and Roach M.**: *Handbook of Evidence-based Radiation Oncology*.1st edition. New York: springer science+ business media, LLC; 2007.

●**Casciato DA,** editor. *Manual of clinical oncology*.6th edition. Philadelphia: Lippincott Williams&Wilkins; 2009.

●**DeVita VT, Hellman S, Rosenberg SA,** editors**.** *Principles and Practice of Oncology*.8th ed. Philadelphia: Lippincott; 2008.

6.3. Journals:

International journal of radiation oncology, biology &physics.

(7) Facilities and resources mandatory for course completion:

Candidates and their learning are supported in a number of ways:
□Candidates logbook
□ Programme Specification
□Extensive library and other learning resources
□Computer laboratories with a wide range of software
□Intranet with a wide range of learning support material
□MSc/MD Dissertation Supervisor

Course coordinator:

Prof.d: Soumaya Eiteba

Assisstant prof: Rasha Abdel Latif

Head of the department:

Prof.d: Ibrahim Awad

Date:

P.S. This specification must be done for each course.