Dosimetry and quality control in medical physics - course description

General information

Course name	Dosimetry and quality control in medical physics
Course ID	13.2-WF-FizD-DQCMP-S17
Faculty	Faculty of Physics and Astronomy
Field of study	Physics
Education profile	academic
Level of studies	Second-cycle studies leading to MS degree
Beginning semester	winter term 2018/2019

Course information

Semester	1
ECTS credits to win	6
Course type	obligatory
Teaching language	english
Author of syllabus	• dr hab. Jarosław Piskorski, prof. UZ

Classes forms

The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Lecture	15	1	-	-	Exam
Laboratory	30	2	-	-	Credit with grade

Aim of the course

The aim of the course is to teach the students the foundations of dosimetry and quality control to the extent that is required in healthcare centres. After completing the course the sudent is able to work with any dosimetric equipment that can be encountered in modern healthcare as well as being able to describe the purpose and procedure of quality control in the medical setting.

Prerequisites

Competed course in radiological protection and basics of nuclear medicine.

Scope

1. Trends in medical exposures
2. Units used in dosimetry, conversions, tables and software
3. Exposure and exposure cut-offs determination,
4. Practical methods of exposure determination, operating medical dosimeters
5. Patient and staff dose assesment
6. Metrology and calibration requirements
7. Clinical applications,
8. Standards in dosimetry,
9. Quality control procedures in diagnostic nuclear medicine
10. Radiopharmaceutics contaminations and the related risks
11. Quality control pipeline in diagnostic nuclear medicine,
12. Quality control in therapeutic nuclear medicine,
13. Quality tests and procedures in therapeutic nuclear medicine,
14. Handling of faults and accidents.

Teaching methods

Lecture and nuclear medicine lab, visits and training at the nuclear medicine division of the local hospital

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
The student can perform most dosimetric measurements with the equipment provided.	• K2_W03 • K2_W04 • K2_U02 • K2_U04 • K2_K01	• a discussion • activity during the classes	• Lecture • Laboratory

Outcome description	Outcome symbols	Methods of verification	The class form
The student is able to prepare a report from a dosimetric or quality control procedure. The students can work in a group towards this end	• K2_W06 • K2_W07 • K2_U01 • K2_U05 • K2_U10 • K2_U12 • K2_K03	• a discussion • activity during the classes	• Lecture • Laboratory
The student is able to describe the aims and the importance of quality control in nuclear medicine, both diagnostic and therapeutic	• K2_W01 • K2_W07 • K2_U07 • K2_K01 • K2_K05	• a discussion • activity during the classes	• Lecture • Laboratory
The student can name the risks connected with modern nuclear and imaging medicine. The student is able to describe the risks related with exposure to ionizing radiation connected with various nuclear medicine procedures.	• K2_W03 • K2_W04 • K2_W07 • K2_U01 • K2_U07 • K2_K01	• a discussion • activity during the classes	• Lecture • Laboratory
The student is able to assist during quality control procedure at a medical centre.	• K2_W03 • K2_W04 • K2_U01 • K2_U02 • K2_U11 • K2_K01 • K2_K03	• a discussion • activity during the classes	• Lecture • Laboratory
The student is able to name and use the dosimetric units used in nuclear medicine and is also able to convert between them using appropriate tables and software.	• K2_W01 • K2_U01 • K2_U05	• a discussion • activity during the classes	• Lecture • Laboratory
The student is able to independently read the documentation of dosimetric equipment as well as describing the purpose and inner working of this equipment.	• K2_W03 • K2_W04 • K2_U02 • K2_U11 • K2_U14 • K2_K01	• a discussion • activity during the classes	• Lecture • Laboratory

Assignment conditions

Lecture: Passing the examination involving detailed knowledge of dosimetric units, procedures as well as quality control procedures.
Lab: The final grade will be granted based on the grades achieved during laboratory exercises and hospital practice. These will be determined by reviewing the reports prepared by the students.

Recommended reading

RECOMMENDED READING:
[1] F. Jaroszyk, Biofizyka, Wydawnictwo Lekarskie PZWL, Poznań 2008.
[2] Patient Dosimetry and Quality Control in Diagnostic Radiology: Radiation dose measurements, quality criteria and quality control in digital and interventional radiology
[3] https://www.iaea.org/About/Policy/GC/GC53/GC53InfDocuments/English/gc53inf-3-att2_en.pdf

Further reading

Notes

Modified by dr hab. Piotr Lubiński, prof. UZ (last modification: 27-06-2018 23:00)