



UNIVERSITÀ DEGLI STUDI DI TORINO

ID

VP07\_DIP\_FIS

## Visiting Professor Program Academic year 2019/2020

**DEPARTMENT OF PHYSICS**

**TEACHING COMMITMENT: 20 hours**

### COURSE TITLE

Biomedical Physics Laboratory

### TEACHING PERIOD

1st term

### SCIENTIFIC AREA

Medical physics

### LANGUAGE USED TO TEACH

English

### COURSE SUMMARY

This course aims at providing the basics on the experimental techniques for the detection of radioisotopes and the measurement of their activity in environmental samples and on the modern techniques in medicine through laboratory activities where the students make use of advanced instrumentations for precision measurements. These activities are preceded by lessons where the physics principles on which the techniques are based are reviewed, together with the operating principles of the instrumentation and the measurement and data analysis procedures.

### LEARNING OBJECTIVES

The teaching will provide solid skills with experimental techniques in the field of medical and health physics. In particular, students will acquire knowledge and understanding of the physics of the interaction of radiation with matter and of the nuclear magnetic resonance, the signal reconstruction and analysis techniques, the functional principles of dosimeters and HPGE detectors and of their acquisition systems, the principles of image reconstruction techniques via NMR measurements, the backprojection and filtering algorithms for the reconstruction of images from projections.

The laboratory activity aims at providing the skills for applying with a critical attitude the concepts studied to a set of measurements with high precision instrumentation.

### **LAB ACTIVITIES**

The laboratory activity will focus on dosimetry, gamma ray spectroscopy with HPGE, relaxometric measurements with nuclear magnetic resonance and image reconstruction through magnetic resonance and X-ray computed tomography.

### **VISITING PROFESSOR PROFILE**

The candidate should have a long standing experience and technical skills in the field of physics applied to medicine, in particular on the use of instrumentation for dosimetry and on the techniques for the dosimetric characterization of irradiation fields.

### **CONTACT PERSON AT THE DEPARTMENT**

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