



People's Democratic Republic of Algeria
Ministry of Higher Education and Scientific Research
Sétif 1 University – Ferhat Abbas

Faculty: Sciences

Master's Degree in Medical Physics

Presentation and objective of the Speciality:

The master's program in medical physics aims to train students in the field of applied physics to healthcare. The main objective of this training is to acquire knowledge that meets the needs of disciplines related to the use of radiation in medicine for diagnostic or treatment purposes. It provides students with the necessary knowledge to integrate into the professional world, such as medical imaging centers, nuclear medicine facilities, cancer treatment centers, and facilities using various types of ionizing and non-ionizing radiation. It also highlights the ability to integrate into research teams at universities for academic research purposes (PhD or other).

Admission requirements:

- ❖ Bachelor's degree in Applied Physics (Medical Physics)
- ❖ Bachelor's degree in Radiation Physics

Career Prospects/Professions:

- ❖ Cancer Centers
- ❖ Medical Imaging Centers
- ❖ University Hospitals
- ❖ Radiotherapy and Nuclear Medicine Centers
- ❖ Private Clinics for Radiotherapy and Nuclear Medicine
- ❖ Laboratories and Research Centers in the Field
- ❖ Teaching and Research (Universities and Others)

Organization of Studies and Official Duration of the Program:

Program Overview:

Semester 01:

- Radiation-Matter Interactions and Applications
- Radiation Detection and Measurement Chains
- Fundamentals of Image Processing
- Probability, Statistics, and Stochastic Processes
- Living Systems Architecture
- Physicochemical Properties of Biological Media
- Computer Science and Networks 1
- Bibliographic Research Project
- Nuclear Regulations
- English

Semester 02:

- Biological Effects of Ionizing Radiation
- Dosimetry in Medical Physics
- Advanced Methods in Medical Image Processing
- Applied Mathematics
- Computer Science and Networks 2
- Radiation Protection in Hospitals
- Status of the Medical Physicist

Semester 03:

- Therapeutic Uses and Metrology of Ionizing Radiation
- Molecular Imaging
- Magnetic Resonance Imaging, Ultrasound, and Echography
- X-Ray Radiology
- Numerical Modeling of Ionizing Radiation
- Treatment Planning System (TPS) in Radiotherapy
- Innovative Methods in Medical Physics

Semester 04:

- Internship in a research laboratory or company, culminating in a thesis and defense.

Training Canvas:

- Radiation-matter interactions and applications
- Detection and radiation measurement chains
- Fundamentals of image processing
- Probability, statistics, and stochastic processes
- Biological architecture
- Physico-chemical properties of biological media
- Dosimetry in Medical Physics
- Applied mathematics
- Computer science and networks 2
- Radiation protection in hospital settings
- X-ray Radiology

Advanced training modules:

- Biological effects of ionizing radiation
- Advanced methods in medical image processing
- Therapeutic uses and metrology of ionizing radiation
- Molecular imaging
- Magnetic resonance imaging; ultrasound and echography
- Numerical modeling of ionizing radiation
- Radiotherapy treatment planning system (TPS)

Language of instruction:

French and English

Training framework:

The tables provided in the previous section "Program Overview"

Curriculum Highlights:

The Master's in Medical Physics is designed to train students in the field of applied physics to health. The primary objective of this program is to equip students with the knowledge necessary to address the challenges raised in disciplines related to the use of radiation in medicine for diagnostic or treatment purposes. It provides the essential skills for students to integrate into professional settings such as medical imaging centers, nuclear medicine centers, cancer treatment centers, and facilities that utilize all types of ionizing and non-ionizing radiation. Additionally, it emphasizes the ability to join research teams in universities for academic research (doctorate or other advanced studies).

Admission Information:

The current application of Articles 171 and 1023 of Decrees:

- ❖ Skills and knowledge acquisition are assessed every six months through continuous assessment and a final exam.
- ❖ Progress from the first to the second year is automatic if the student has completed the first two semesters of the training program.
- ❖ The student's assessment focuses on, depending on the training program: lectures, practical work, tutorials, and practical internships.

Coordinator of the Program: Pr. Seif. E. CHOUABA

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