History of Medical Physics Department of Tabriz Medical School

The Department of Medical Physics at Tabriz University's Faculty of Medicine began its official activities in 1947 as part of the Physiology and Biophysics Department, teaching various medical science courses in the university's campus. Initially, it was primarily responsible for teaching physics courses in various university fields including general Medicine, dentistry, pharmacy, nursing and midwifery, operating room, rehabilitation, laboratory sciences, various health-related areas, and radiology. With the increase of specialized academic staff and professors who had gone abroad for further education, the department of medical physics expanded its activities to include scientific research and holding scientific conferences. With the efforts of the department head, Dr. Khalil Gholipour . and with the support of the Faculty of Medicine and Tabriz University, the first Iranian Congress on Medical Physics was held in 1991. At the same time, postgraduate courses in medical physics at the master's degree level were initiated and the first group of graduate students started their studies in the field of Medical Physics. Department of Medical Physics and offers courses in general education as well as a master's degree program in medical physics. In terms of research activities, the department has collaborated with other universities in the country, resulting in nearly 398 published research articles, 16 books related to medical physics, active participation in international and domestic congresses, and 18 registered inventions. So far, the Department of Medical Physics has admitted 124 non-continuous graduate students in medical physics (Tabriz and Urmia International Branch), with 20 of them currently enrolled. In September 2022, the department started offering a specialized PhD degree program with the admission of three students. With six full-time academic members, the Department of Medical Physics carries out research activities in non-ionizing radiation (especially lasers), bioelectrics and bioimpedance, dosimetry and radiation protection, radiation biology, nuclear medicine and intensified magnetic resonance imaging. The department also has general medical physics, radiobiology, radiation dosimetry, laser therapy, and bioelectrics laboratories.

Introduction of Medical Physics

This field is to apply physical technology in the diagnosis and treatment of diseases, as well as in assessing and maintaining basic health and conducting research in the field of medicine. This discipline involves the study of physics theory and practice, electronics, mathematics, and bioinformatics.A non-continuous Master's degree program in medical physics provides students with the opportunity to become familiar with measurement, imaging, and treatment techniques for diseases using physical technology. In this degree program, students are able to conduct fundamental and applied research in the field of medical physics by utilizing principles of physics, electronics, mathematics, and bioinformatics. Additionally, a Master's degree program in medical physics prepares students for further doctoral studies or employment in the medical industry and medical research.

Selection conditions in this field

Selection conditions in this field:In addition to having the general conditions of approved selection, the participants in the entrance exam for Master of Medical Physics The Supreme Planning Council must have at least a bachelor's degree in the fields of physics, biophysics, radiology and radiotherapy.

History of Master of Medical Physics

The history of medical physics in the history of medicine shows the originality and feeling of the need of the medical profession ,It has been customary to use basic tools with simple physics principles in ancient medicine in the diagnosis and treatment of diseases since many years ago, Is. Since the end of the 19th century with the discovery of X-rays and after that with the use of other ionizing and non-ionizing radiations and inventions and developments, Various methods of imaging or radiation therapy, knowledge of medical physics, a significant contribution to improving the level of health ,Humans have played. Medical physics is used in many sub-branches today, which can generally be classified as Medical imaging, dosimetry and radiation protection, nuclear medicine, ultrasound waves, radiation therapy, radiobiology and topics, He divided others such as biomechanics, bioelectricity, light and laser, etc. The first department of medical physics in Iran with Tehran University and Faculty of Medicine was established in 1313 to teach medical physics as one of the courses To provide basic sciences for students in the field of medicine, after that in 1355 the first teaching group of the undergraduate course Master's degree in medical physics at Jundishapur University and after the revolution in 1362 and 1368, master's courses.continuous and doctorate (D.Ph) was established for the first time in the Faculty of Medical Sciences of Tarbiat Modares University.Student admission, the start of formal training for postgraduate courses, the latest revision of the Master's program in medical physics It was carried out in 1374 and in certain universities that met the basic admission requirements, the education and training of experts Master's degree in the mentioned field was actually implemented. Medical physics is an important part of the specialized courses of radiology, nuclear medicine.It includes physical medicine and radiotherapy.

The importance of a master's degree in medical physics

Maintaining health is a fundamental and important pillar of our religious beliefs. With the aim of paying attention to human dignity and preserving values religious, education and training of skilled and experienced manpower in various scientific fields based on the rich national and Islamic culture and with Emphasizing national priorities can provide a suitable basis for establishing social justice in providing services to the people.Achieving this goal is possible through the establishment of proper human communication and the level of health of the society by increasing compatibility Humans improve with environmental changes. According to the above point of view, the training of senior experts in medical physics with enough capabilities can benefit the society from many advantages:

- Increasing the quality of functioning of the devices and preventing the repetition of paraclinical tests and medical imaging - Effective diagnosis and treatment using new methods and tools and reducing the suffering and suffering of patients and high costs.

- Optimum use of limited foreign exchange and rial resources to meet priority needs

- Prevention and reduction of harmful injuries caused by unprincipled performance of non-technical operators.

- The existential philosophy of this field of training human resources in order to achieve the acceptable and expected quality in the science of medical physics

To participate in education, research and provide health services based on the standards and needs of the society

The necessity of the Medical Physics master's program

The mission of this course is to teach and improve the knowledge of medical physics, to create the ability of graduates to acquire science and Learning the knowledge of Medical Physics independently, expanding their knowledge and ability to provide practical services in diagnostic departments and Treatment and acceptance is the responsibility of laboratories and scientific workshops related to this field. Therefore, the training of a senior professional expert and empowered to:

- Improving the knowledge of medical physics and acquiring advanced science and new technology in this field.

- Implementation and supervision of quality control programs for imaging devices, radiation therapy, nuclear medicine and laser in the centers

- Implementation and supervision of protection programs for employees, patients and ordinary people of society against radiation. Medical diagnosis and treatment.- Implementation and supervision of treatment design of radiation therapy centers and optimization of diagnostic and treatment methods.

The future of the medical physics master's program

Currently, the dependence of medical sciences on the achievements and technologies of Medical Physics field is increasing more and more It is increasing now. In view of this, the training of professional and capable specialists who are able to cooperate with internal units The department and external department of the university and by using new scientific achievements to respond to the changing needs of the society It will improve the health level of society. The continuation of this process in the future will make it possible for our country to become one of the main centers Education and training of the force in this field in Asia and we are able to make new achievements in the theoretical and practical part in

this field.to present the country, the region and the world and realize self-sufficiency in this branch of experimental sciences in the country.

The purpose of the Master of Medical Physics

A- Manpower training through the non-continuous master's course in medical physics in order to acquire the necessary capabilities in the field Relevant for taking up specialized careers

B- Development of medical physics education appropriate and coordinated with the needs of educational, research, health, diagnostic and treatment centers Desirable, acceptable and expected level

C- Expanding the knowledge of medical physics in related sciences and improving health care and diagnostic and treatment methods in medicine.

The position of the Master of Medical Physics in the health system:

Graduates of the master's degree in medical physics will be responsible for the following roles:

educational- service – research

Description of duties of Master of Medical Physics

The professional duties of the graduates of the non-continuous master's degree in medical physics are:

1 - Educational:

Theoretical and practical training in the field of medical physics and related topics for students at different levels and fields of science Medicine and staff of service and research departments related to imaging, radiotherapy and nuclear medicine and active departments In cases of ionizing and non-ionizing radiation.

2 - Research:

Carrying out and participating in university research projects and other scientific centers in the direction of scientific and technological development, science production dependent and their use in diagnosis, treatment and prevention in order to improve health standards.

3 - Service:

- Calibration, quality control and dosimetry of various medical imaging devices and radiotherapy, nuclear medicine and Non-ionizing systems and radiation protection monitoring of environments and radiation sources related to these devices and patients and personnel exposed to radiation

-Participating in the development of techniques, designing new imaging and radiotherapy protocols and helping to choose image methods Surgery and treatment based on new technologies in the field of health.

- Designing field therapy in radiotherapy and brachytherapy based on the needs and orders of oncologists and radiotherapists and quality control and Supervision of dosimetry and dose accuracy of patients and personnel in radiotherapy and nuclear medicine departments.

- Supervising Lab Hot and how to transport and use radioactive materials in nuclear medicine departments

- Supervising the safe use of ionizing and non-ionizing radiation in medical and industrial radiation centers in accordance with regulations and standards International and national responsible centers and organizations and implementation of dose calculation programs and evaluation of related devices and equipment.

Learning programs

- Using new teaching methods and techniques

- Inclusive education through direct involvement of students in the educational environment and field

- Using new information technologies to encourage students to self-study and acquire new information

- Determining appropriate solutions to create constructive interaction with departments and organizations that use graduates

- Creating procedures for regular review and updating of the course program and solving deficiencies

- Establishing appropriate relationships with other educational institutions for regional and international educational and research exchanges

- Adopting appropriate policies to connect educational and research activities with related clinical departments

General characteristics of the medical physics educational program (master's degree)

The length of the period and the shape of the system

:According to the educational regulations of the master's course approved by the Supreme Planning Council, the length of the master's course in medical physics is 2 years.

The exam items for the entrance exam with their corresponding coefficients are as follows

١ - General physics (mechanics, electricity, magnetism, heat, sound, light and sufficient vision) (factor 4)

2- Nuclear and atomic physics (factor 3)

3- Mathematics (factor 2)

4- Physiology and anatomy (factor 2)

5- specialized language (factor 2)