1.	**Field of study**	**Medical Physics**
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2025/2026 (winter term)
4.	Level of qualifications/degree	first-cycle studies (in engineering)
5.	Degree profile	general academic
6.	Mode of study	full-time
7.	ISCED code	0533 (Physics)
8.	Number of semesters	7
9.	Degree	inżynier (Engineer - Bachelor's Degree with engineering competencies)
10.	General characteristics of the field of study and the assumed concept of education	The aim of the Medical Physics studies, carried out at the Faculty of Science and Technology of the University of Silesia, is to educate specialists with appropriate qualifications to use modern physical methods in medicine, both in diagnostics and therapy. The studies shape the profile of a Medical Physicist so that he not only performs tasks in cooperation with a doctor, but is also able to take on new challenges emerging in medicine and related fields. The content-related side of education is supervised by the Program Council, composed of scientists from the University of Silesia and clinics, hospitals, universities cooperating with the faculty and the private sector. Meetings of the Program Council are held once a year, with the participation of representatives of students of both levels of education. Thanks to the close cooperation of the Faculty's staff with the Polish Society of Medical Physics, Students of the Faculty can practice in various clinical facilities in several provinces. Currently, both PTFM and the Section of Young Medical Physicists PPSM established in 2023, to which students of the field may belong, help. Education in the first degree of the field of Medical Physics is carried out in the field of two specialties, lasting 7 semesters: Specialty: Clinical Dosimetry The subject of the course meets the legal requirements regarding the involvement of a medical physicist in clinical activities, i.e. the student gains in-depth knowledge of nuclear medicine and radiotherapy. Issues related to clinical dosimetry as well as non-medical applications of ionizing radiation and radiological protection are equally widely discussed. The student gets acquainted with a wide set of dosimetric techniques and devices. He expands the knowledge gained towards clinical applications during professional practice carried out in various medical facilities, not only in the Silesian Voivodeship. Specialty: Electroradiology The student learns about imaging methods using X-rays, ultrasounds and magnetic resonance imaging. After completing professional practice in diagnostic imaging laboratories, he is predisposed to determine the appropriate parameters of examinations in classical radiology, computed tomography, mammography, thermovision and magnetic resonance tomography. In addition, a graduate of the specialty of electroradiology has the knowledge to perform quality control tests of radiological devices. The graduate also performs biopotential tests, e.g. electrocardiography, electroencephalography, nerve conduction tests. Students of the Faculty of Medical Physics of the University of Silesia can benefit from the experience of employees of various state and private institutions and institutions, in the broadly understood medical sector, including: the National Research Institute, the National Institute of Oncology M. Skłodowska-Curie Branch in Gliwice (Department of Nuclear Medicine and Oncological Endocrinology, Department of Radiotherapy Planning, Department of Medical Physics), Diagnostic Center HELIMED in Katowice, Katowice Oncology Center Radiotherapy Department on Raciborska Street in Katowice, Clinics and Departments of the Medical University of Silesia, SPSK No. 7 of the Medical University of Silesia in Katowice Upper Silesian Medical Center named after prof. Leszek Giec, ul. Ziołowa 45/47, Independent Public Healthcare Institution, Multidisciplinary Hospital ul. Chełmońskiego 28 in Jaworzno, Beskidzkie Centrum Onkologii Ul. Wyzwolenia 18 43-300 Bielsko-Biała, NZOZ MCD Voxel in Zabrze ul. May 3, 13-15 in Zabrze and Bytom, the ScanX Diagnostic Imaging Center, NUMED Katowice and the Laboratory of Radiological Measurements GLCENTER Sp. z o. o., and even IFJ PAN in Krakow. Undoubtedly, close cooperation of units pursuing the field of Medical Physics, i.e. the Institute of Biomedical Engineering and the Institute

		of Physics, with clinics, private institutions and research units from all over Poland, contributes to the acquisition of high research and professional competences by students, and also improves the learning outcomes, enriches study program and diversifies the implementation of the didactic process. The field of Medical Physics is currently implemented at the first degree, as full-time, first-cycle engineering, 7-semester studies. It should be emphasized that both the specializations and the subjects pursued during the studies were prepared after discussions conducted in a wide group of Medical Physicists, in particular those who are highly qualified practitioners. Therefore, the group of experts creating this field of study significantly went beyond the Program Council of Medical Physics. All this was aimed at meeting the expectations of potential employers, and thus the labor market for Graduates. Education at the first degree of studies ends with the defense of an engineering thesis, which the Student prepares during the last three semesters. The implementation of the experimental part enables the Student to participate in scientific research conducted both at the University and health care units. The scope of the topics of the works is very wide and includes the fields of medical physics, biophysics, nuclear physics, solid state physics, which means that the student deepens his specialist knowledge, gains the ability to precisely formulate conclusions based on the measurements made, as well as the ability to cooperate in an interdisciplinary team. An important element of education in the field of Medical Physics is the acquisition of knowledge, not only theoretical on physical or medical basics, but above all practical, necessary to practice the profession. At this level, apprenticeships play a huge role, the number of which is the largest in comparison to other majors implemented both at the Institute and other universities in the country. Obligatory professional practice takes place in institutions related to the curriculum implemented in the field of Medical Physics. It is worth emphasizing that the professional practice is aimed at, on the one hand, supplementing the student's practical knowledge, and on the other hand, confronting the theoretical knowledge acquired so far in professional work conditions. For some students, internships contribute to starting a professional career at an early stage of studies, thanks to presenting themselves in a given institution. It often happens that a student receives a job or internship offer at the institution where he did his student internship. In the field of Medical Physics, it is allowed to voluntarily increase the number of hours of professional practice by the interested student, however, before signing the relevant agreement with the appropriate institution, the Dean or Vice-Dean each time agrees to complete additional hours/days of professional practice. For years, apprenticeships in the field of Physics have been held in health care and research and development institutions that have signed agreements and cooperate with the University of Silesia. From 2023, apprenticeships and internships will be able to be carried out not only in selected clinics and hospitals in the Silesian Voivodeship, but also in the largest clinical centers from other provinces. This is the result of the efforts and close cooperation of the Faculty staff with the Polish Society of Medical Physics, which resulted in the establishment of the Section of Young Medical Physicists at PPSM, to which Students of the Faculty may belong. Signing bilateral agreements with individual institutions ensures the implementation of the required content of education, which in turn ensures an appropriate level of classes and gives the possibility of supervision by the internship coordinator on the part of the faculty. The key content of education in the Clinical Dosimetry specialty includes major subjects, such as: ionizing radiation dosimetry, radiological protection and the use of isotopes in medicine, carried out in the form of 1-semester lectures and one or two parts of laboratories, in the winter and summer semesters. Extensive laboratory classes take into account the professional needs of medical physicists in the field of various applications of ionizing radiation and safe work with its sources (radiotherapy, environmental measurements, monitoring of exposure to ionizing radiation, industrial and scientific applications of isotopic sealed sources), through the implementation of these classes, both in laboratories class Z at the Institute of Physics of the University of Silesia, as well as in radiotherapy laboratories equipped with accelerators and other devices used in radiotherapy, e.g. HDR in brachytherapy. In addition, these classes teach the use of advanced scientific and research equipment, such as spectrometers and ionizing radiation dosimeters of

		all types, as well as medical equipment in the form of linear accelerators, scintigraphs and gamma scintillation cameras. Laboratory classes conducted in small groups (2-3 people) enable students not only to learn the practical use of knowledge acquired during lectures, but also to teach teamwork, planning measurement experiments, developing the results and interpreting them according to the objectives of the exercise. The above activities enable the achievement of learning outcomes in the form of the Student's ability to use basic dosimetric equipment (i.e. ionization chamber, electrometer, radiometer with G-M counter, activity counters, scintillation and thermoluminescence detectors), the ability to obtain information from literature, databases and other sources , the ability to integrate the obtained information in order to interpret the results of laboratory experiments, draw conclusions, and formulate and justify opinions on the estimated exposure to ionizing radiation and the measures taken for radiological protection. The implementation of laboratory tasks requires the use of professional literature in English, in the form of dosimetry reports, recommendations of international medical physics societies and online databases, which is conducive to the development of competence in the field of professional English terminology. In order to meet the expectations of the market, students, as part of the second part of Radiation Protection, learn to design laboratories using ionizing radiation, in accordance with applicable laws, previously acquired knowledge in the field of physics and using international guidelines. As far as elective courses are concerned, studies in the specialty of Clinical Dosimetry offer a specialist lecture in the field of ionizing radiation detectors in clinical applications, which responds to the needs of employers in relation to the profession of medical physicist, dosimetrist, radiological protection inspector of all types. This lecture allows you to achieve such learning outcomes as the ability to choose the right measurement method for a specific problem and the expected result, knowledge of the advantages and limitations of dosimetric devices based on the physical basis of operation of a wide range of ionizing radiation detectors, but also to familiarize students with current directions of technical development in in the field of clinical dosimetry (X-ray diagnostics, radiotherapy, nuclear medicine). While carrying out internships in radiotherapy centers, the student is involved in the work of interdisciplinary teams consisting of physicists, electroradiology technicians, doctors and service technicians of medical equipment, engaging in quality control of medical devices, radiotherapy planning and modeling work. Thus, he gains additional competencies in the field of communication skills in a diverse professional group, learning about various aspects of the clinical work of a medical physicist. The key contents of education in the Electroradiology specialty include imaging methods using X-rays, ultrasounds and the phenomenon of magnetic resonance. In addition to theoretical knowledge, the student undergoes professional practice in diagnostic imaging laboratories of health care facilities. The graduate is predisposed to determine the appropriate parameters of examinations in classical radiology, computed tomography, mammography, thermovision and magnetic resonance tomography and to perform quality control tests. Another group of tests performed by electroradiologists are biopotential tests, e.g. electrocardiography, electroencephalography and nerve conduction tests. First-cycle studies in the field of Electroradiology end with a final exam, before the Committee with the participation of radiologists, electroradiologists and a medical physicist. After passing the practical exam, the student obtains the opportunity to work as an electroradiology technician in diagnostic laboratories of the health service. While carrying out the engineering diploma thesis, the student is involved in the scientific and research work of the employees of the Faculty of Science and Technology of the University of Silesia, related to, among others, with the development of existing or the development of new measurement methods and techniques in the field of ionizing radiation detection in various radiological situations, and has the ability to research and test new methods and materials in the field of radiological protection, or modern methods of imaging diagnostics. In order to maintain a high level of education in medical physics, only full-time studies are conducted, because in addition to lectures, students must complete laboratory classes at the parent unit as well as at medical centers cooperating with the University of Silesia, as well as summer internships. Of great importance in achieving high learning outcomes is also the considered and respected maximum number of students in groups -

		e.g. in laboratory groups there are no more than 10, and in the case of laboratory classes in clinics, with equipment or patients, no more than 5. In the case of the electroradiology specialty, 160 hours of holiday practice are obligatory, while the others have an obligatory 60 hours. Apprenticeships in the field of Medical Physics play a very important role. This results both from the expectations of potential employers, whose representatives are members of the Medical Physics Program Council, and directly from the recommendations of the European Federation of Organizations for Medical Physics (EFOMP) and the guidelines of the Bologna Education System. Student apprenticeships are aimed at acquiring practical skills related to the specialization pursued in the field of study and preparing them for future professional work. Their purpose is: • developing the ability to use the knowledge gained during studies, • shaping the skills necessary in future professional work, • preparing the student for independence and responsibility for the tasks entrusted to him, • creating favorable conditions for professional activation of students on the labor market. This is especially important for students of medical physics, because it is an interdisciplinary course that covers many fields of science, such as: physics, mathematics, medicine, biology, engineering, information technology, electronics. According to the curriculum for the field of medical physics, an important task of education in this field of study is: "Preparation of physicists to work in interdisciplinary teams (composed of doctors, biologists, chemists, technicians) and to act as experts in the field of quality management systems, in fields related to medical physics, safety quality management systems, technical quality of imaging procedures, preparation and support for custom procedures. Some students take part in domestic or foreign scientific internships and volunteer work, which, with the Dean's consent, can be counted as internships. Internships should be organized in the period free from didactic classes, i.e. in the months of June-September. In exceptional cases, with the consent of the Dean, students may do the internship on a different date, if it does not interfere with the course of studies. The subject matter of diploma theses (engineering at the first level of education) is very wide, due to the interdisciplinarity of the field of medical physics. It takes into account both the needs of the medical world and the interests of students, and is associated with the ever-increasing introduction of the achievements of modern physics into the world of medicine. Works are carried out in various research groups of the Faculty of Science and Technology and in numerous medical facilities. Subjects of diploma theses carried out in external centers, such as: Medical University of Silesia, Oncology Center in Gliwice, Oncology Center in Katowice, Clinical Hospital No. 7 in Katowice, Municipal Hospital in Zabrze, Upper Silesian Medical Center; Katowice-Ochojec, University Clinical Center of prof. K. Gibińskiego SUM in Katowice, concerns current problems related to diagnostics and medical therapy. During the preparation of their theses, Diplomats take advantage of the research capabilities of modernly equipped medical centers and the experience of specialists working in them. Some engineering works are inspired by research commissioned by the economic environment, which may result in grants and implementations. Some diploma theses also include issues of an engineering nature, e.g. related to the development of new technical or IT solutions. Students of medical physics, carrying out their engineering and master's theses, gain practical skills based on the necessary theoretical knowledge, allowing for an in-depth analysis of the results of spectroscopic, microscopic, calorimetric, thermovision, audiometric, ophthalmological, spirometric, ECG, EEG and other tests. Teaching students to use the most modern equipment for solving problems related to diagnostics and medical therapy may in the near future contribute to the introduction of these methods to everyday practice in health care centers. The purpose of well-methodically planned diploma theses is to prepare young people for life in a rapidly changing world. It is important to shape the advantages of character and mind, which they will need in the future, for conscious participation in the life of society, for a flexible approach to changes. The use of the apparatus, scientific and didactic potential of the Faculty and cooperating units allows for the implementation of such assumptions and the provision of appropriately qualified employees in the health service, supporting doctors in their work, both in diagnosis and therapy, and flexible movement of Graduates on the labor market.

		In addition, supporting the conduct of research by students and the presentation of their results is carried out through: Scientific Circles (Student Scientific Circle of Medical Physics - SKNFM), during a seminar in which students present the results of their research on the project of their diploma thesis. Students of medical physics working at SKNFM have the opportunity to expand their knowledge in various fields of physics by participating in scientific research of employees of various research groups of the Faculty, as well as popularizing science by conducting shows and lectures for schoolchildren.
11.	Information on the relationship between the studies and the university's strategy as well as the socio-economic needs that determine the conduct of studies and the compliance of learning outcomes with these needs	The study is a part of the University's strategy by tightening cooperation with the economic environment towards the implementation of new diagnostic and therapeutic methods and by education of staff who are important in the health care.
12.	Specializations	Clinical Dosimetry Electroradiology
13.	General description of the specialization	<u>Clinical Dosimetry</u> The didactic program dedicated to Clinical Dosimetry covers areas that, in accordance with applicable law, require the involvement of a medical physicist, i.e. nuclear medicine and radiotherapy, as well as extended issues related to clinical dosimetry, as well as non-medical applications of ionizing radiation and radiation protection. During numerous and extensive laboratory classes, the student gets acquainted with a wide set of dosimetric techniques and devices. He broadens the acquired knowledge towards clinical applications, during professional practice held in medical facilities, after the second and third year of studies. During them, the student participates in medical procedures requiring the involvement of a medical physicist, in the areas of dosimetry and quality control in radiotherapy, nuclear medicine, CT/MRI diagnostics and/or interventional radiology. Thanks to the extended course in the field of radiation protection, the student is prepared to design radiological shields for all applications of ionizing radiation, which is supported by engineering skills in the field of computer science in medicine, computer graphics and medical equipment. In addition, graduation allows you to apply for the license of a radiological protection inspector in non-medical applications (IOR-1) and in X-ray diagnostics (IOR-R), and after obtaining the appropriate professional experience - also in radiotherapy (IOR-3). The graduate has extensive knowledge enabling the selection of dosimetric methods and equipment, for solving problems in the field of radiological protection, environmental measurements, clinical dosimetry, as well as a developed scientific apparatus (in the field of medical statistics), allowing for reliable measurement design and proper interpretation of the obtained results. After passing the appropriate state exam, which takes place during professional work, he obtains the license to operate accelerators for medical purposes and brachytherapy devices, which directly allows him to work in radiotherapy facilities. <u>Electroradiology</u> Education in the Electroradiology specialization enables the student to become familiar with various methods of imaging studies, using X-rays, ultrasounds or the phenomenon of magnetic resonance. After completing the professional practice in medical centers and passing the final exam, before the Committee with the participation of radiologists, electroradiologists and medical physicist, he is predisposed to determine the appropriate parameters of tests in classical radiology, computed tomography, mammography, thermovision or magnetic resonance imaging and to perform quality control tests physical parameters of radiological equipment.
14.	The semester from which the specializations starts	5
15.	Percentage of the ECTS credits for each of the scientific or artistic	Clinical Dosimetry: • *[leading discipline]* physical sciences (natural sciences): 100%

	disciplines to which the learning outcomes are related to the total number of ECTS credits (along with the indication of the leading discipline)	Electroradiology: • *[leading discipline]* physical sciences (natural sciences): 100%
16.	Number of ECTS credits required to achieve the qualification equivalent to the level of study	210
17.	Percentage of the ECTS credits for optional modules in relation to the total number of ECTS credits	Clinical Dosimetry: 30%, Electroradiology: 30%
18.	Total number of ECTS credits that a student must obtain in the modules taught	Clinical Dosimetry: 144, Electroradiology: 146
19.	Number of ECTS credits that a student must obtain in modules assigned to disciplines within the humanities or social sciences (not less than 5 ECTS) - in the case of fields of study assigned to disciplines within the fields other than, respectively, humanities or social sciences	Clinical Dosimetry: 6, Electroradiology: 6
20.	Number of ECTS credits - higher than 50% of the total number of credits - that a student must obtain: • in general university programmes within a module connected with research carried out in the scientific or artistic disciplines to develop his/her knowledge and research skills; • in practical programmes within a module to develop practical skills	Clinical Dosimetry: 189, Electroradiology: 191
21.	Total number of ECTS credits that a student must obtain in internships	Clinical Dosimetry: 3, Electroradiology: 7
22.	Internships (hours and conditions) in the case of practical programmes and in general university programme - if such requires internship	Internships are an integral part of the study program, carried out by students in individual fields, levels, profiles and forms of study. Internships are to help in confronting the knowledge acquired during studies with the requirements of the labour market, acquiring skills useful in the profession, learning about practical issues related to working in positions for which the student is prepared during the course of studies. The internship is to familiarize the student with professional language relevant to a specific industry and work culture. The rules for the organization of internships are set out in the Rector's ordinance. Detailed rules of apprenticeship taking into account the specifics of particular fields of study are set out in the field's of study apprenticeship regulations, in particular: learning outcomes assumed to be achieved by the student during the apprenticeship, framework apprenticeship program including a description of issues, dimension of apprenticeship (number of weeks of practice); form of internship (continuous, mid-year), criteria for choosing the place of internship, obligations of the student staying in the internship, obligations of the academic tutor, conditions for completing the internship

		by the student and conditions for exemption from the internship obligation in whole or in part. The number of ECTS and the number of hours are specified in the course structure.
23.	Graduation requirements	The condition for admission to the diploma examination is to achieve the learning outcomes provided for in the study program, to obtain a certificate of an appropriate level of language proficiency in a foreign language and to obtain positive grades for the diploma dissertation. The condition for graduation is to pass the diploma examination with at least a satisfactory result. A graduate receives a higher education diploma confirming obtaining the qualifications of the appropriate degree. Detailed rules of the diploma process and the requirements for the diploma thesis are set out in the Rules and Regulations of Studies at the University of Silesia and the diploma regulations.