1.	**Field of study**	**Materials Science and Engineering**
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2019/2020 (winter term), 2020/2021 (winter term), 2021/2022 (winter term), 2022/2023 (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	0715 (Mechanics and metal trades)
8.	Connection between the field of study and university development strategy, including the university mission	An interdisciplinary field of study Materials Engineering delivered on all 3 levels of eduction integrates very well with two strategic objectives identified in the University of Silesia Development Strategy. These are: "Innovative education and modern teaching offer" and "Active cooperation of the University with its environment". As a university field of study the 'Materials Engineering' delivered here distinguishes by an increased emphasis on basic modules, like physics or chemistry, parallel to maintaining modules from the field of modern materials technologies, testing methods, or materials modelling methods. A modern teaching offer includes two specialities: Materials Science and Biomaterials. The latter speciality introduced in 2009 expands and makes the hitherto studies offer more attractive. It allows directing students towards specific issues of materials for the application in medicine, stomatology and veterinary science. Graduates of this speciality will fill the gap existing on the market for a long time, between engineers involved in biomaterials and doctors applying such materials in practice. The theoretical and practical knowledge is delivered in a way combining traditional lectures and practical classes, using modern multimedia carriers and Internet. A close relationship with the industry is one of priority objectives of education in the Materials Engineering field of study, allowing students to learn the specificity of relevant branches of industry, the technological or inventive needs. This field of study students have training and professional traineeships, prepare diploma theses under a direction and at request of industrial companies. On the one hand this allows a better use of educated students' scientific potential and on the other hand adapting the syllabus to the labour market needs.
9.	Number of semesters	7
10.	Degree	inżynier (Engineer - Bachelor's Degree with engineering competencies)
11.	Specializations	Biomaterials Materials Science
12.	The semester from which the specializations starts	3
13.	Percentage share of scientific or artistic disciplines in education (along with the indication of the leading discipline)	• *[leading discipline]* materials engineering (engineering and technology): 100%
14.	Percentage of the ECTS credits for each of the scientific or artistic disciplines to which the learning outcomes are related to the total number of ECTS credits (along with the indication of the leading discipline)	Biomaterials: • *[leading discipline]* materials engineering (engineering and technology): 100% Materials Science: • *[leading discipline]* materials engineering (engineering and technology): 100%
15.	Number of ECTS credits required to achieve the qualification equivalent to the level of study	Biomaterials: 210, Materials Science: 210
16.	Percentage of the ECTS credits for	Biomaterials: 37%,

	optional modules in relation to the total number of ECTS credits	Materials Science: 37%
17.	Total number of ECTS credits that a student must obtain in the modules taught	Biomaterials: 189, Materials Science: 189
18.	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	Biomaterials: 6, Materials Science: 6
19.	Graduation requirements for a particular specialization	Biomaterials - passing effects of individual modules education, - obtaining required ECTS points acc. to the syllabus, - passing trainesships acc. to the curriculum Materials Science - passing effects of individual modules education, - obtaining required ECTS points acc. to the syllabus, - passing trainesships acc. to the curriculum
20.	Organization of the process of obtaining a degree	Students of the first level studies, inspired by their own interests, choose engineer diploma thesis supervisors after semester 5 of studies. Together with supervisors students determine the subject, objective, and scope of thesis as well as tasks to be implemented acc. to the pattern placed on the Institute of Materials Science website. The diploma obtaining is related to passing a diploma examination, consisting of two parts. The first part is related to the thesis presented by the student. It consists in the presentation of achievements resulting from the diploma thesis development and in showing the subject-matter knowledge related to the dealt topic. The second part is a knowledge exam, related to the studied speciality. The final mark of the diploma examination is determined by the Examination Commission in accordance with requirements included in the regulations of studies at the University of Silesia. The engineer exam is taken at the Examination Commission appointed by the Deputy Dean appropriate for the field of studies. The Examination Commission consists of the chairman and minimum two members (thesis supervisor and/or tutor, thesis reviewers).
21.	Internships (hours and conditions) in the case of practical programmes and in general university programme - if such requires internship	Biomaterials Level 1 students after year three have a 160 h long (4 weeks) professional traineeship in an enterprise/work place. The principles of traineeship receiving and passing are regulated by the Regulation of the Rector of the University of Silesia of 27 June 2007 on the organisation of students professional traineeships at the University of Silesia and duties of traineeship supervisors with later amendments and annexes. Traineeships are organised in companies, work places, enterprises, which business profile is strictly related to the profile of education. Materials Science Level 1 students after year three have a 160 h long (4 weeks) professional traineeship in an enterprise/work place. The principles of traineeship receiving and passing are regulated by the Regulation of the Rector of the University of Silesia of 27 June 2007 on the organisation of students professional traineeships at the University of Silesia and duties of traineeship supervisors with later

		amendments and annexes. Traineeships are organised in companies, work places, enterprises, which business profile is strictly related to the profile of education.
22.	Total number of ECTS credits that a student must obtain in internships	Biomaterials: 6, Materials Science: 6
23.	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	Biomaterials: 138, Materials Science: 137
24.	General description of the programme	Materials Engineering is an interdisciplinary field of science, which analyses the influence of materials' chemical and physical structure on their electrical, mechanical, optical, surface, chemical, magnetic and thermal properties as well as on various combinations of those properties. Materials engineering comprises a number of modern physical and chemical research techniques, which may be used to characterise both the structure and properties of materials. These techniques aim at studying the influence of structure on materials properties, in particular those, which are practically used in various technologies. This enables working out methods of obtaining materials featuring precisely defined practical properties. These studies influence not only the planned structure of end products but also help to develop effective methods of their production and processing. The research carried out within materials engineering leads to working out new materials, although it is commonly applied also to improve materials already used.
25.	General description of the specialization	<u>Biomaterials</u> The 'Biomaterials' speciality extends and makes the hitherto offer of Materials Engineering studies more attractive. The education contents delivered within the speciality are oriented towards the specific nature of materials for application in medicine, stomatology and veterinary science. The progress continuing in medicine imposes higher and higher requirements on biomaterials properties, including their biocompatibility. The main issues related to biomaterials include: materials choice for implants and their applications, the influence of a living body environment on the implant behaviour, basic assumptions of bioavailability, tissue reaction mechanisms, biophysical, biochemical and biomechanical requirements imposed on implants, corrosion and abrasion as well as degradation of diverse biomaterials, technologies for surface layers application on implants, implants structural issues. All this forces educating highly specialised employees, scientific and technical staff working on designing, modelling, studying the properties and structure as well as placing biomaterials on the market. Graduates of this speciality will fill the gap existing on the market for a long time, between engineers involved in biomaterials and doctors applying such materials in practice. <u>Materials Science</u> The education contents delivered within the 'materials science' speciality enable educating specialists equipped with the knowledge of the most recent achievements of physics, chemistry and metallurgy related to obtaining modern materials and modelling them, taking into account the modern manufacturing technologies (e.g. nanotechnologies). Graduates of this speciality have the skill of comprehensive functional assessment of diverse material groups, of current analysis of their practical parameters, important for the processes of materials manufacturing and processing for specific applications. Students during the studies acquire the skill of using the scientific-technical information and have the knowledge allowing an efficient communication with teams of people. Graduates have the knowledge of IT and IT systems implementation, are prepared to participate in the work that requires the application and obtaining of modern materials, in industry, in research and service establishments as well as in small and medium-size enterprises. Moreover, having

		an in-depth knowledge of basic sciences and general knowledge of materials technology, they are capable of effective communication both with engineers employed in business entities and organisations and also with the scientific staff working on modern materials.