COURSE PROGRAMME

1.	Field of study	Materials Science and Engineering
2.	Academic year of entry	2016/2017 (winter term) *The number and date of a Faculty Council's resolution: 02/9.1/2016 (29.02.2016 r.)*
3.	Level of qualifications/degree	first-cycle studies (in engineering)
4.	Degree profile	general academic
5.	Mode of study	full-time
6.	ISCED code	0715 (Mechanics and metal trades)

Learning outcomes

7.	Description of learning outcomes	Attachment no. 1
8.	Model learning outcomes	

Programme of study

9.	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.
10.	Number of semesters	7
11.	Degree	inżynier (Engineer - Bachelor's Degree with engineering competencies)
12.	Area (or areas - for joint or interdisciplinary studies) of education to which the programme is assigned and the leading discipline of art or science for the POL-on system	technical studies [materials engineering]

13.	Areas, fields and disciplines of art or science to which the learning outcomes of the field of study are related, indicating the **percentage**	• technical studies
		  • technology - 100%
		  • materials engineering

	shares in which the programme of study refer to the various fields of science	
14.	Specializations	Biomaterials Materials Science
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 each of the areas to which the learning outcomes are related to the total number of ECTS credits	Biomaterials technical studies - 100% Materials Science technical studies - 100%
17.	Percentage of the ECTS credits for optional modules in relation to the total number of ECTS credits	Biomaterials: 37%, Materials Science: 37%
18.	Total number of ECTS credits that a student must obtain in the modules taught	Biomaterials: 189, Materials Science: 189
19.	Number of ECTS credits that a student must obtain in modules from humanities or social science areas of education (not less than 5 ECTS) - in the case of fields of study assigned to areas other than, respectively, the humanistic or social studies	Biomaterials: 6, Materials Science: 6
20.	Modules description (including learning outcomes, number of ECTS credits and assessment methods of the learning outcomes)	Attachment no. 2
21.	Course structure	Attachment no. 3
22.	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
23.	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).
24.	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.
25.	Total number of ECTS credits that a student must obtain in internships	Biomaterials: 6, Materials Science: 6
26.	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 area to develop his/her knowledge and research skills; • in practical programmes within a module connected with vocational preparation to allow a student to develop practical and social skills	Biomaterials: 139, Materials Science: 138
27.	Minimum staff resources and staff to student ratio	Attachment minimum staff

Additional information

28.	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.
29.	General description of the specialization	Biomaterials 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. Materials Science 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.
30.	Learning outcomes coverage matrix	Attachment no. 4
31.	1.Description of Faculty Research Activity in an Appropriate Field of Knowledge	Attachment no. 5
32.	2.Method of Taking Into Account Results of Graduate Carriers Monitoring	Attachment no. 6
33.	3.Method of Taking into Account Results of the Analysis of Planned Effects of Education Conformity with the Labour Market Needs	Attachment no. 7

34.	4.Way of International Models Utilisation	Attachment no. 8
35.	5.Way of Cooperation with External Stakeholders	Attachment no. 9
36.	6.Description of the Internal Education Quality System	Attachment no. 10

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(pieczęć i podpis Dziekana)