Efekty uczenia się dla kierunku studiów *Mechatronika*
nabór 2020/2021
Studia I stopnia – profil praktyczny

Poziom Polskiej Ramy Kwalifikacji – poziom 6
Tytuł zawodowy uzyskany przez absolwenta - inżynier
Przyporządkowanie efektów kształcenia do odpowiednich dyscyplin naukowych

automatyka, elektronika i elektrotechnika   - 63 %

informatyka techniczna i telekomunikacja   - 21 %

inżynieria mechaniczna   - 16 %

Symbol	Efekty uczenia się dla kierunku *Mechatronika*. Po ukończeniu studiów I stopnia na kierunku studiów *Mechatronika* absolwent:	Kod składnika opisu Polskiej Ramy Kwalifikacji – charakterystyki szczegółowe P6S
WIEDZA		
K_W01	Student knows and understands at an advanced level the methods and theories explaining the complex dependencies in the fields science (mathematics, physics) necessary to formulate and solve tasks related to mechatronics	P6S_WG
K_W02	Student has advanced knowledge in the field of materials science, necessary to understand at an advanced level the complex relationships between mechatronic systems, the phenomena taking place there and the practical application of this knowledge in mechatronics	P6S_WG
K_W03	Student has advanced knowledge in the field of mechanical engineering, necessary to understand at an advanced level the complex relationships between mechatronic systems, the phenomena occurring there, and to apply this knowledge in practice through the use of appropriate methods, tools and technologies.	P6S_WG
K_W04	Student has advanced knowledge in the field of technical informatics and telecommunications, necessary to understand at an advanced level the complex dependencies of mechatronic systems and to apply this knowledge in practice through the use of appropriate methods, tools and technologies.	P6S_WG
K_W05	Student has advanced knowledge of automation, electronics and electrical engineering, necessary to understand at an advanced level the complex dependencies of mechatronic systems and to apply this knowledge in practice through the use of appropriate methods, tools and technologies.	P6S_WG
K_W06	Student knows and understands selected specific issues in the field of technical computer science related to programming, computer networks, databases, engineering graphics as well as practical applications of this knowledge.	P6S_WG
K_W07	Student knows and understands selected specific issues in the field of mechanical engineering as well as practical applications of this knowledge.	P6S_WG
K_W08	Student knows and understands selected specific issues in the field of automation, electronics and electrical engineering related to: designing automation systems, control systems, robotics and practical applications of this knowledge.	P6S_WG

K_W09	Student knows and understands selected specific issues related to materials used in mechatronics, as well as practical applications of this knowledge.	P6S_WG
K_W10	Student has detailed knowledge related to the application of the following in mechatronics: methodology of structured and object-oriented programming, database technology, computer networks and information security, embedded systems.	P6S_WG
K_W11	Student has advanced knowledge of technical standards and norms as well as the life cycle of mechatronic devices, facilities and systems.	P6S_WG
K_W12	Student knows and understands the issues related to obtaining information and issues related to distance learning and the practical application of this knowledge.	P6S_WG
K_W13	Student knows and understands the concepts of intellectual property protection, copyright, industrial property. In addition, he can use the resources of Patent Information.	P6S_WG
K_W14	Student knows and understands the general principles of the conduct and development of business and the various forms of personal entrepreneurship, with particular emphasis on the specificity of the mechatronic industry.	P6S_WK
K_W15	Student knows and understands the economic, legal and ethical determinants of engineering activities, with particular understanding of the legal, ethical and moral responsibility of the engineer in the context of constructed mechatronic systems.	P6S_WK
K_W16	Student is familiar with the current state and the latest development trends in mechatronics	P6S_WK
K_W17	Student has knowledge of management, with particular emphasis on: quality management, applying the principles of work organization and management, taking into account the principles of ergonomics and occupational health and safety, task planning and project management. A graduate can apply the above knowledge both in the role of an employee and running a business.	P6S_WK
UMIEJĘTNOŚCI		
K_U01	Student is able to obtain information (in Polish and English) through the selection of sources, integrate them, make their interpretation, critical analysis and synthesis, as well as draw conclusions and formulate opinions.	P6S_UW
K_U02	Student is able to use their knowledge - to formulate and solve problems and perform tasks typical for professional activity in the mechatronics industry.	P6S_UW
K_U03	Student has experience related to the maintenance of technical devices and systems typical for the mechatronics industry.	P6S_UW
K_U04	Student has experience in solving practical engineering tasks, gained in an environment dealing with engineering issues.	P6S_UW
K_U05	Student has experience and skills to use the norms and standards applicable in the mechatronics industry.	P6S_UW
K_U06	Student has linguistic skills in the use of foreign language enabling communication in the work environment.	P6S_UW
K_U07	Student is able to use information and communication techniques with particular emphasis on the creation of project documentation, the use of engineering graphics (CAD software) for the purposes of implementing projects and smaller tasks in the field of mechatronics	P6S_UW
K_U08	Student is able to plan and carry out experiments, including measurements and computer simulations, interpret the obtained results	P6S_UW

	and draw conclusions - with particular emphasis on modern IT tools such as LabView or Matlab, typical for an engineer's workshop.	
K_U09	Student is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks. Student is able to make decisions in the context of the quality and effectiveness of action and economic realities as to the participation of simulation and experimental methods in the implementation of engineering projects.	P6S_UW
K_U10	Student is able to see and diagnose non-technical aspects, including legal, social, environmental and economic aspects in the context of the functioning of mechatronic systems at the stage of formulating and solving design, construction, implementation and operational tasks.	P6S_UW
K_U11	Student has the skills to work in an industrial environment and knows the safety rules related to work in industry.	P6S_UW
K_U12	Student is able to estimate the costs, initially assess the economic effects of engineering activities.	P6S_UW
K_U13	Student is able to evaluate the effectiveness, functionality and economics of existing devices and mechatronic systems.	P6S_UW
K_U14	Student is able to see problems, imperfections in functioning or newly designed mechatronic systems, identify the problem and formulate a specification of simple solutions for the perceived simple engineering problems.	P6S_UW
K_U15	Student is able to assess the suitability and choose the appropriate methods tools and materials to solve a simple engineering task in the field of Mechatronics.	P6S_UW
K_U16	Student is able to use appropriate methods, techniques and tools - in accordance with the given specification - to design and implement a simple device, object, system or process, typical for Mechatronics.	P6S_UW
K_U17	Student is able, using specialized terminology, to prepare documentation in Polish or English and a presentation of an engineering project in the field of mechatronics.	P6S_UK
K_U18	Student is able to take part in a debate - to present and evaluate various opinions and positions, and to discuss them.	P6S_UK
K_U19	Student has language skills in the use of foreign language in the field of mechatronics, allowing for communication at the B2 level.	P6S_UK
K_U20	Student is able to work individually and in an engineering team and in interdisciplinary teams. Student has the skills and knowledge of techniques allowing for efficient communication with other team members	P6S_UO
K_U21	Student is able to plan and implement self-education during professional work as well as take care of the physical condition.	P6S_UU
KOMPETENCJE SPOŁECZNE		
K_K01	Student is ready to critically assess their knowledge and the content received.	P6S_KK
K_K02	Student correctly identifies and resolves dilemmas related to the performance of the profession by recognizing the importance of knowledge in solving cognitive and practical problems and consulting experts.	P6S_KK
K_K03	Student is able to properly identify priorities to achieve the goal set by himself or others.	P6S_KK
K_K04	Student understands the need to communicate to society - incl. through the mass media - information about technological achievements and other aspects of an engineer's activity and is able to convey such information in a commonly understood manner.	P6S_KO

K_K05	Student is ready to initiate actions for the public interest.	P6S_KO
K_K06	Student is able to think and act in an entrepreneurial and creative manner and is ready to start up and develop individual entrepreneurship in the mechatronics industry.	P6S_KO
K_K07	Student the student is able to inspire group members, be the creator and animator of the organization of its work, take various roles and challenges in the group, obeying the rules of professional ethics and caring for the achievements and traditions of the profession.	P6S_KR