LEARNING OUTCOMES FOR *COMPUTER SCIENCE AND ECONOMETRICS*

studies of first degree; education profile: general academic

Placing the field of *computer science and econometrics* within other disciplines
The field of *computer science and econometrics* offered by Faculty of Mathematics, Computer Science and Econometrics at the University of Zielona Góra, has been placed within the discipline of Formal Sciences. However, due to its specificity, some of the field-specific learning outcomes relate to Social Sciences learning outcomes.

Code	Upon successful completion of first degree studies in the field of *computer science and econometrics*, students:	Relation to discipline-specific learning outcomes
KNOWLEDGE		
K_W01	understand the significance of computer science, econometrics and mathematics for the development of society and economy	X1A_W01
K_W02	demonstrate basic knowledge of economics, management, finance, law, and computer science	X1A_W01 S1A_W02
K_W03	have theoretical knowledge of mathematics necessary for modeling and analyzing problems in computer science, as well as for modeling and analyzing phenomena in economics	X1A_W01 X1A_W02 X1A_W03 X1A_W04 S1A_W06
K_W04	know statistical and econometric methods and tools necessary for analyzing economic phenomena, both in macro and microeconomic scale	X1A_W01 X1A_W02 X1A_W03 S1A_W06
K_W05	know fundamentals of both computational techniques and programming used for solving practical problems, and in economic applications	X1A_W01 X1A_W02 X1A_W04 S1A_W06
K_W06	know quantitative models and methods which support making rational economic decisions	X1A_W02 X1A_W03 S1A_W06
K_W07	know practical applications of basic probability distributions	X1A_W02 X1A_W03
K_W08	know basic concepts and theorems concerning relational database model	X1A_W01

K_W09	know classification principles and functionality of information systems, know life cycle of an information system and know at least one software development methodology (process)	X1A_W01 X1A_W04 X1A_W05
K_W10	know fundamentals of computer system design and are familiar with at least one object-oriented programming language	X1A_W01 X1A_W04
K_W11	demonstrate the knowledge of computer architecture, know basic functions of an operating system, basic information concepts and information techniques	X1A_W01 X1A_W05
K_W12	know basic concepts and principles of how computer networks and the Internet operate	X1A_W01 X1A_W05
K_W13	have achieved English language proficiency equivalent to level B2 of European Framework of Reference for Languages and are familiar with specialist terminology from selected branches of computer science, econometrics and mathematics	X1A_W01
K_W14	know basic principles of occupational health and safety	X1A_W06
K_W15	have basic knowledge of the law and ethics related to scientific research activities and teaching, as well as to forms of individual entrepreneurship	X1A_W07 X1A_W09
K_W16	know and understand basic concepts relating to protection of industrial property and copyright law; know how to use patent information resources	X1A_W08
SKILLS		
K_U01	are able to construct a line of logical reasoning and apply it to the studied branches of knowledge	X1A_U01 X1A_U02 X1A_U03
K_U02	are able to interpret and explain functional dependencies expressed in a form of formulae, tables, graphs, diagrams and can apply them to practical issues	X1A_U01 X1A_U02 X1A_U03
K_U03	are able to analyze simple economic phenomena and processes	S1A_U02 S1A_U03 S1A_U04
K_U04	use proper analysis tools to analyze economic phenomena relating to finance	S1A_U02 S1A_U03 S1A_U04
K_U05	can use tools for recording basic economic operations	S1A_U05
K_U06	are able to interpret economic laws	X1A_U01

K_U07	know basic terms from linear algebra and are able to use them to solve simple problems	X1A_U01 X1A_U02
K_U08	are able to solve linear equations systems	X1A_U01
K_U09	are able to define functions and recurrence relations	X1A_U01
K_U10	use the concept of graph; are able to use previously studied properties and theorems to find parameters of a graph	X1A_U01
K_U11	compute limits of sequences and functions; analyze continuity of elementary functions; define convergent series and are able to analyze convergence of elementary number series	X1A_U01 X1A_U02
K_U12	are able to use basic theorems and methods of differential and integral calculus, especially in optimization problems	X1A_U01 X1A_U02 X1A_U03 X1A_U04
K_U13	use the concept of probability space; are able to give different examples of discrete and continuous probability distributions and discuss selected random experiments and mathematical models (including econometric ones) in which these distributions can be found	X1A_U01
K_U14	can use basic theorems of probability and theorems of mathematical statistics in typical models	X1A_U01
K_U15	can give an interpretation of generally used descriptions of model and empirical distributions	X1A_U02
K_U16	are able to conduct statistical inference in typical statistical and econometric models, also with the use of computer tools	X1A_U02
K_U17	using appropriate tools, are able to evaluate and compare bank deposits, as well as investment projects; are also able to create investment strategies and estimate their return and risk	X1A_U01 X1A_U02 X1A_U05 X1A_U06 S1A_U04 S1A_U07
K_U18	are able to calculate net single and installment premiums for life insurances	X1A_U01 X1A_U05 X1A_U06 S1A_U02
K_U19	can present a decision problem, especially one concerning managing an economic organization, in the form of a formal model and are able to use appropriate methods and algorithms for solving optimization problems	X1A_U01 X1A_U02 X1A_U04 S1A_U02 S1A_U07

K_U20	recognize problems, including practical issues, which can be solved with the use of algorithms and can specify such problems	X1A_U04 X1A_U06
K_U21	can define requirements concerning information systems and technologies and can select software which meets the needs of an organization	X1A_U01 X1A_U05 X1A_U06
K_U22	are able to plan an information technology enterprise	X1A_U05 X1A_U06
K_U23	are able to analyze and design information technology systems using CASE tools	X1A_U04 X1A_U05 X1A_U06 X1A_U07
K_U24	use with understanding the concept of a business process	X1A_U05 X1A_U06
K_U25	are able to construct and analyze an algorithm in accordance with specification, and write it in a selected programming language	X1A_U01 X1A_U04
K_U26	are able to compile, start and test an independently written computer program	X1A_U01 X1A_U04
K_U27	are able to explain the concept of n-layer architecture	X1A_U04 X1A_U06
K_U28	are able to construct a fragment of reality using complex data structures and simple object structures	X1A_U01 X1A_U06
K_U29	have the ability to normalize database relational schemas	X1A_U01
K_U30	are able to read and construct database diagrams describing models of practical problems of intermediate complexity	X1A_U01 X1A_U04
K_U31	can create an internet document and place it on a server	X1A_U04
K_U32	can perform an analysis of how net applications and protocols operate	X1A_U01 X1A_U06
K_U33	can properly format a text, prepare a presentation and use computer programmes for data analysis	X1A_U06 X1A_U07
K_U34	know their interests and are able to broaden them; are able to make contacts with specialists within their discipline	X1A_U06 X1A_U07 X1A_U09

K_U35	are able to use and present both in speech and writing methods of at least one of the following academic disciplines: information technology and its branches, discrete mathematics and graph theory, operations research (used in economics), mathematical statistics and its applications in economics	X1A_U06 X1A_U08 X1A_U09
K_U36	have acquired English language proficiency in the field of computer science, econometrics and mathematics according to the requirements for level B2 of European Framework of Reference for Languages	X1A_U08 X1A_U09 X1A_U10
SOCIAL COMPETENCES		
K_K01	graduates understand the need for lifelong education	X1A_K01 X1A_K05 S1A_K01 S1A_K07
K_K02	are able to obtain information from specialist literature and the Internet independently, also in foreign languages	X1A_K01
K_K03	are able to formulate precise questions in order to deepen their understanding of a given topic or to find missing elements of reasoning	X1A_K01 X1A_K02 S1A_K01 S1A_K02
K_K04	understand the significance of intellectual honesty, both in their own and in other people's activities, and are aware of the need to respect copyrights	X1A_K04
K_K05	understand the importance of systematic work on long term projects	X1A_K02 X1A_K03
K_K06	understand the need to popularize selected branches of computer science and selected mathematical methods applied in economics	X1A_K06 S1A_K05
K_K07	understand social aspects of practical application of acquired knowledge and skills, and are aware of the responsibility relating to those aspects	X1A_K06
K_K08	have the ability to deepen their knowledge and skills required for a project in progress	X1A_K07
K_K09	can interact and work in a team	X1A_K02