Learning outcomes of the programme:

1.	**Field of study**	**Chemistry**
2.	Academic year of entry	2017/2018 (summer term)
3.	Level of qualifications/degree	second-cycle studies
4.	Degree profile	general academic

Code of the learning outcome of the programme	**Learning outcomes** The graduate:	Codes of the learning outcomes of the areas of education to which the learning outcome of the programme is related
	KNOWLEDGE	
CH_W01	has extensive knowledge of chemistry, its history, significance for the development of the exact sciences, learning about the world and the history of humanity	X2A_W01
CH_W02	has advanced knowledge of such chemistry disciplines as analytical chemistry, physical chemistry, theoretical chemistry, inorganic chemistry	X2A_W01
CH_W03	has extensive knowledge with regard to modern measurement technologies applied in chemical analysis, in particular chromatography	X2A_W01
CH_W04	has extensive knowledge with regard to modern measurement technologies applied in chemical analysis, in particular chromatography	X2A_W01
CH_W05	is able to explain the advanced notions of X-Ray crystallography, electronography and neutronography	X2A_W01
CH_W06	has advanced knowledge in the area of the major and specialization	X2A_W01
CH_W07	knows higher mathematics to a degree that enables understanding, description and modelling of medium complexity chemical processes	X2A_W02, X2A_W03
CH_W08	knows the notions of chemoinformatics and is able to enumerate chemoinformatic methods applied in the data analysis	X2A_W04
CH_W09	knows selected advanced calculation techniques used to solve typical problems in the area of chemistry	X2A_W04
CH_W10	knows specialist IT tools in order to assess, in terms of statistics, the experimental outcomes and calculations and to prepare presentations	X2A_W04
CH_W11	knows the theoretical basics of operating measurement instruments	X2A_W05
CH_W12	has general knowledge of the current development trends and recent discoveries in the area of chemistry	X2A_W06
CH_W13	knows the basic health and safety principles indispensable when preparing their own (measurement) stand allowing for independent research	X2A_W07
CH_W14	knows and is able to explain the legal and ethical aspects related to protection of intellectual property, industrial property and copyright law as well as the necessity to manage the resources of intellectual property, is able to use the sources of patent information	X2A_W08, X2A_W09, X2A_W10
CH_W15	has an in-depth knowledge of selected scientific methods and knows the issues characteristic for the scientific discipline not related to the programme	
	SKILLS	
CH_U01	is able to indicate proper conditions for the chromatographic separation of simple chemical substances	X2A_U01
CH_U02	is able to determine the structure, spectral characteristic and properties of chemical compounds in various states of aggregation of matter and describes the chemical reactions in the light of theoretical chemistry	X2A_U01
CH_U03	consciously deepens the knowledge of the chosen major and specialization	X2A_U04, X2A_U07
CH_U04	plans and conducts basic scientific research in the area of chemistry	X2A_U01
CH_U05	is able to select the method and instruments necessary in order to conduct a specific chemical analysis taking into account economic aspects	X2A_U01
CH_U06	applies selected spectroscopic methods to determine the structure of chemical compounds and interpret the spectrum of non-complex molecular systems	X2A_U01
CH_U07	is able to solve problems related to the structure, reactivity and interactions of molecules	X2A_U01
CH_U08	determines the structure of simple particles with the use of methods of molecular mechanics and quantum chemistry	X2A_U01
CH_U09	is able to apply the acquired methods in order to obtain monocrystals	X2A_U01
CH_U10	prepares samples for research purposes and applies diffraction to solve analytical, identification and structural problems	X2A_U01
CH_U11	searches for the information in the structural databases	X2A_U01

CH_U12	applies simple molecule editors	X2A_U04
CH_U13	analyses data with the use of chemoinformatic/chemometric methods	X2A_U01
CH_U14	develops and critically examines their research outcomes	X2A_U02
CH_U15	is able to find the information indispensable for a specific purpose in the professional literature, databases and other sources	X2A_U03
CH_U16	is able to draw conclusions on the basis of literature data and critically examine these data	X2A_U03
CH_U17	relates to national and international scientific journals in the area of chemistry	X2A_U03
CH_U18	is able to associate information from various branches of chemistry and related sciences, is able to explain selected problems in the area of biology, environmental protection, pharmacy and medicine	X2A_U04
CH_U19	is able to explain in speech and writing their own and others' research outcomes	X2A_U01, X2A_U02, X2A_U05
CH_U20	justifies and describes the purpose of the research conducted, its methodology and significance	X2A_U05
CH_U21	is able to explain in speech and writing popular scientific issues concerning the outcomes of scientific discoveries in the area of chemistry and related sciences	X2A_U06
CH_U22	independently acquires knowledge of specific issues and determines the directions of their education	X2A_U07
CH_U23	prepares written assignments in the area of chemistry and/or other related sciences including the purpose, methodology of research, its outcomes and significance in the context of related research	X2A_U08
CH_U24	prepares and performs presentations in Polish and English concerning the issues in chemistry and related sciences of popular scientific and specialist nature	X2A_U09
CH_U25	uses the English language to a degree necessary to peruse professional literature; is able to communicate in the English language at B2+ level	X2A_U10
CH_U26	plans their research necessary to challenge the hypotheses contained in Master's thesis	X2A_U01, X2A_U02, X2A_U05
CH_U27	applies principles of sustained development while conducting research, acts in compliance with health and safety principles and handles chemicals with caution	X2A_U01
CH_U28	is able to operate the specialist measurement instruments and software (in case of theoretical work) in order to obtain research outcomes for the purposes of the Master's thesis	X2A_U01, X2A_U02, X2A_U03
CH_U29	is able to identify and conduct analysis, at an advanced level, of problems on the basis of the information obtained in the course of studying a discipline not related to the chosen programme	
SOCIAL COMPETENCES		
CH_K01	is aware of their knowledge and understands the necessity of life-long learning	X2A_K01, X2A_K07
CH_K02	is able to inspire and organise the learning process of others	X2A_K01
CH_K03	demonstrates responsibility for the entrusted scope of research, for their own work and the work of others	X2A_K02, X2A_K06
CH_K04	is aware of the responsibility for the jointly undertaken assignment related to teamwork	X2A_K02
CH_K05	understands the necessity of systematic work over long-term projects	X2A_K02, X2A_K03, X2A_K04
CH_K06	understands the significance of intellectual integrity and acts ethically	X2A_K04
CH_K07	is responsible for the safety of their work and the work of others	X2A_K04, X2A_K06
CH_K08	is used to consult objective sources of scientific information and applies the principles of critical thinking while solving practical problems	X2A_K05
CH_K09	is able to critically approach the information disseminated in the media, in particular concerning the exact sciences	X2A_K04, X2A_K06
CH_K10	understands the necessity to popularise the research outcomes and the selected chemistry issues	X2A_K04, X2A_K06
CH_K11	plans their professional and scientific career	X2A_K07
CH_K12	understands the necessity of an interdisciplinary approach towards the problems solved, integrates the knowledge of various disciplines and practices self-education with the view to deepening the knowledge gained	