Part *B) of the study programme*

Description of the process resulting in the achievement of learning outcomes

Faculty offering the field of study:	Faculty of Chemistry
Field of study:	chemistry
Level of study:	first cycle (BSc)
Level of the Polish Qualifications Framework:	Level 6
Degree profile:	general academic
Allocation of the field of study within academic or artistic discipline(s), to which learning outcomes for a given field of study refer:	Discipline: chemical sciences (100%) Major discipline: chemical sciences
Mode of study:	full-time programme
Number of semesters:	6
Number of ECTS required for the award of qualifications corresponding to the level:	180
Total number of teaching hours:	2130
Professional degree awarded to the graduate:	BSc
The relationship between the study programme and NCU mission and strategy:	Programme of first-degree Chemistry is closely related to the mission of the Nicolaus Copernicus University involving the development and dissemination of knowledge. At the Faculty of Chemistry research in all major fields of experimental and theoretical chemistry are conducted for years. The results of these studies are well known not only in the country but in the international arena and published worldwide as well as presented during national and international scientific conferences. Teaching first degree chemistry is taught at university level, and other forms of education and popularization are implemented, corresponding to the current and future needs and aspirations of society. According to the strategy of Nicolaus Copernicus University the teachers and students work

	are evaluated and self-estimated, measure of which is reliability, high quality and a deep commitment to the universal ethical values.

Courses/course modules along with expected learning outcomes *

Course module	Course	Expected learning outcomes	Forms and methods of teaching ensuring the achievement of learning outcomes ….	Methods of verifying and assessing expected learning outcomes achieved by the student
Basic course module I	Informatics in chemistry (+ USOS) Mathematics Health and safety training and ergonomics Fundamentals of analytical chemistry Physics Physical chemistry Fundamentals of quantum chemistry Organic chemistry Inorganic chemistry	As knowledge of the foundations of analytical, physical, organic, inorganic, quantum chemistry and biochemistry. Has knowledge of basic terms, concepts, principles and laws of physics and their universal nature. He knows the postulates of quantum mechanics and their application to the description of atoms and molecules. He knows the role of computer simulations in chemistry and is able to use software package for data analysis and development. Knows the basic rules of safety and health at work in chemistry. Knows the basics of linear algebra, calculus and statistics necessary for the description and modeling of phenomena. Gains skills of geometric interpretation of problem solving, knowledge of elementary functions (single and multi-variable), their properties, the ability to manipulate matrices, solving systems of linear equations (including functions of several variables). He/she can plan and take measurements of chemical and physical values, and analyze samples by classical methods. Can suggest a chemical reaction mechanism and identify functional groups of organic compounds. Can conduct experiments in the field of organic and inorganic chemistry. Can use basic quantum numerical methods for qualitative description of the properties, structure, and reactivity of chemical systems. Is able to estimate the results of experiments and apply the methods of linear algebra and mathematical analysis of selected topics in physics and chemistry. using the mathematical analysis apparatus to the study of functions and determining their approximate value. Is able to calculate basic parameters of a random variable. Works unassisted with large amounts of information, recognizes relations and correctly draws conclusions using the principles of logic. Is set to the best execution of the task. He knows and restricts the rules and standards of being a chemist.	Lecture: introductory method - problematic lecture, informative (conventional) Exercises: independent work of students Laboratory: independent student work; experiment method; methods with the use of a computer	Continuous assessment (involvement of conscientiousness, theoretical preparation for classes, manual proficiency, knowledge and respecting safety regulations); Written tests; short tests; evaluation of individual exercise reports; final test; written exam

		Develops the ability to think logically.		
Major course module II	Instrumental analysis Environmental chemistry and ecology Applied and materials chemistry Chemical technology and engineering Fundamentals of chemistry of biological processes and bioanalitycs	Acquires knowledge of theoretical and practical aspects of the implementation of the familiar qualitative and quantitative analysis of instrumental methods and principles of operation of the apparatus. Knows the techniques of sample collection and preparation for analysis of environmental matrices, indicators of water quality, toxicity tests, methods of waste neutralization. Knows the basic aspects of construction of the materials and chemicals and methods of determine their properties. Knows how to use the materials for a particular purpose and knows practical indications of their management methods after usage. Has knowledge of the basics of the technology and chemical engineering It can collect environmental samples and perform quantitative analyzes using instrumental methods based on analytical procedures. Can prepare reports. Can find the relationship between behavior of the material during its formation and use and its physicochemical properties, composition and type of structure. Is able to solve problems related to the implementation processes. It is set to the best execution of the task. He knows and restricts the regulations and standards of being a chemist, including ethical standards; understand the social role of the profession; understands and appreciates the importance of intellectual honesty, attention to health and the environment in his/her own and other people activities. Establishes and maintains long-term and effective cooperation with others; seeks to achieve team goals through proper planning and organization of teamwork; motivates employees to the effort in order to achieve his/her objectives.	Lecture: introductory method - problematic lecture, informative (conventional) Exercises: independent work of students Laboratory: independent student work; experiment method	written or oral exam credit - final test for assessment, preparation of the project for assessment, preparation paper The continuous assessment determined by the lecturers (commitment, diligence, theoretical preparation for classes, manual proficiency, knowledge and compliance with health and safety regulations); written tests of "tickets"; assessment of individual reports on the exercises performed; final colloquium
Course module III diploma work	Seminar Diploma laboratory Diploma project	Knows the basic properties of inorganic and organic compounds, the types of reactions and their mechanisms. Has specialized knowledge in the field of chemistry and can use it during a presentation at a seminar and writing the thesis. Knows the rules of health and safety enough to work unassisted on a test or measurement. Thinks creatively to improve existing solutions. Fully independently carries out agreed objectives, taking sometimes difficult decisions. Can independently search for and critically evaluate information in the literature	Seminar: discussion, preparation of the paper Laboratory: independent student work; experiment method	Diploma exam, Credit The continuous assessment determined by the lecturers (commitment, diligence, theoretical preparation for classes, manual proficiency, knowledge and compliance with health and safety regulations); presentation of results
Course module IV general chemistry	General chemistry – basic level General chemistry –	Has knowledge of basic chemistry. Can perform basic laboratory operations and measurements. Is able to analyses and estimate the results of experiments. Can plan a simple chemical experiment and choose the	Lecture: introductory method - problematic lecture, informative (conventional)	written or oral exam credit - final test for assessment The continuous assessment determined by the lecturers

	advanced level	equipment necessary for its implementation. He knows and restricts the regulations and standards of being a chemist, including ethical standards; understand the social role of the profession; understands and appreciates the importance of intellectual honesty, attention to health and the environment in his/her own and other people activities	Exercises: independent work of students Laboratory: independent student work; experiment method	(commitment, diligence, theoretical preparation for classes, manual proficiency, knowledge and compliance with health and safety regulations); written tests of "tickets"; assessment of individual reports on the exercises performed; final colloquium
Elective course module V	Course related to chemistry studies (to be chosen from the available list) Blocks of items to choose Physical Education	Acquires additional chemical knowledge. He meets new analytical methods and the interpretation of research results and methods. Acquires the binding ability of the chemical properties of the chemical structure. Has an extended knowledge of basic chemistry departments, its development and importance for the progress of science and the knowledge of the world and of human development. Has in-depth knowledge in his/her chosen field of chemistry. Can apply modern analytical apparatus. Can use the extended knowledge of the fundamental branches of chemistry and use it creatively in terms of his/her speciality. Knows the limitations of his/her knowledge and understands the need to continue learning throughout life; can independently take action to broaden and deepen knowledge of chemistry. Can interact in a team (assuming there different roles) and creatively solve problems relating to research and chemical synthesis. Is able to prioritize appropriately to solve chemical problems. Is aware of professionalism, appreciation of intellectual honesty and respect for professional ethics, both in his own activities and others. Is able to formulate and present opinions on the fundamental chemical issues and developments in this discipline. Has knowledge of physical culture and knows how to lead health-promoting lifestyle. Promotes the sport and pursue his/her own preferences in the field of physical culture.	Lecture: introductory method - problematic lecture, informative (conventional) Exercises: independent work of students Laboratory: independent student work; experiment method	written or oral exam credit - final test for assessment The continuous assessment determined by the lecturers (commitment, diligence, theoretical preparation for classes, manual proficiency, knowledge and compliance with health and safety regulations); written tests of "tickets"; assessment of individual reports on the exercises performed; final colloquium Credit without assessment
Elective course module VI, e.g., university-wide courses or courses included in another field of study	Bioethics or Philosophy of Nature University-wide courses English in chemistry	Acquires general knowledge from other fields and disciplines, including the humanities. Takes skill of directing his/her own learning and interdisciplinary interests. Is set to the constant acquisition of new knowledge, sees the limitations of his/her knowledge and understands the need for continuous learning. Nabiera umiejętności samodzielnego kierowania własnym	Lecture: introductory method - problematic, informative (conventional) lecture. Exercises: Cognitive and communication method using various techniques, media,	Determined by lecturers, pass mark or exam written or oral exam The continuous assessment determined by the lecturers (commitment, diligence,

		rozwojem intelektualnym i zainteresowaniami interdyscyplinarnymi. Achieves B2 reference level	authentic materials	preparation for classes)
Course module VII Internships	Internships	Acquires knowledge about the functioning of various branches of the chemical industry and related (food, cosmetics, pharmaceuticals etc.) and meets the practical aspects of technological processes. Can bind the research process and analytical technology practice. He works steadily and has a positive approach to the difficulties standing in the way of the objective pursued; miss deadlines; understands the need for systematic work on all projects.	Laboratory: experiment method	Assessment basing on the practice register

Internships	
Duration of internships	120 hours
Form of internships	laboratory work
Rules of internships	rules of internship are set out in the internship regulations

Detailed allocation of ECTS credits

Academic or artistic disciplines, to which learning outcomes refer:

	Artistic or academic discipline	**ECTS credits**	
		number	**%**
1.	**Chemical sciences**	**180**	**100**

Course modules	**Course**	**No of ECTS credits**	**No of ECTS credits in the discipline:** *(enter names of disciplines)*****					**No of ECTS credits for**	**No of ECTS credits obtained by the student in classes conducted with direct contact with the teacher or tutor**	**No of ECTS credits obtained by the student as a result of: courses related to academic activity within a discipline or disciplines, to which the field of study is assigned ******/ courses focused on training practical skills *********
			chemical sciences	**physical sciences**	**mathematics**	**philosophy, linguistics**	**other**			
Course module I basic subject	Informatics in chemistry (+ USOS)	6	6						2,8	6
	Mathematics	12			12				5,2	
	Health and safety training and ergonomics	1	1						0,4	
	Fundamentals of	12	12						6,6	12

	analytical chemistry									
	Physics	6		6					3	
	Physical chemistry	19	19						9.4	19
	Fundamentals of quantum chemistry	5	5						3	5
	Organic chemistry	15	15						9,4	15
	Inorganic chemistry	12	12						10,2	12
Major course module II	Instrumental analysis	8	8						5,6	8
	Environmental chemistry and ecology	7	7						3,2	7
	Applied and materials chemistry	2	2						1,2	2
	Chemical technology and engineering	3	3						1,6	3
	Fundamentals of chemistry of biological processes and bioanalitycs	4	4						2,6	4
Course module III diploma work	Seminar	1	1					1	0,8	1
	Diploma laboratory	6	6					6	3	6
	Diploma project	7	7					7	7	7
Course module IV general chemistry	General chemistry – basic level	16-17	16-17					16-17	8,2-9	16-17
	General chemistry – advanced level									
Elective course module V	Course related to chemistry studies (to be chosen from the available list)	2	2					2	1,2	2
	Blocks of items to choose from	18	18					18	9	18
	Physical Education									
Elective course module VI, e.g.,	Bioethics or Philosophy of Nature	4				4		4	1,2	

university-wide courses or courses included in another field of study	University-wide courses	2-3					2-3	2-3		
	English in chemistry	7				7			4,8	
Course module VII Internships	Internships	4	4					4		4
RAZEM:			**180**	**6/180**	**12/180**	**11/180**	**2-3/180**	**60/180**	**97,4/180**	**147/180**
			100%	**3,3%**	**6,7%**	**6,1%**	**1,1-1,7%**	**33,3-%**	**54,1%**	**81,7%**

* the description of a course sylabus is attached to the study programme
** The programme of practical studies provides for vocational internships that last at least:
- 6 months – on first cycle and long cycle studies,
- 3 months – on second cycle studies.
*** The diploma project is:
- obligatory on second cycle and long cycle studies,
- optional on first cycle studies.

**** names of academic and artistic disciplines must be compliant with the regulation of the Minister of Science and Higher Education of 20 September 2018 on fields of science and academic disciplines and artistic disciplines (Journal of Laws [Dz. U.] of 2018, item 1818)
***** refers to general academic profile
****** refers to practical profile

The study programme – Part B) – Description of the process resulting in the achievement of learning outcomes (with information under the table referring to the date of its adoption by the Faculty Board and the academic year it is to be effective from) must be signed by the Dean of the Faculty

This study programme is effective as of I semester of the academic year 2019/2020.

This study programme was adopted by the Board of the Faculty of Chemistry on 13th march 2019.
(faculty name) (date of the Faculty Board's meeting)

/-/ prof. dr hab. Edward Szłyk

(Dean's signature)