THE EDUCATION PROGRAMME AT THE CRACOW UNIERSITY OF TECHNOLOGY DOCTORAL SCHOOL effective since the academic year 2023/2024

I
General provisions

1. The educational programme of the Cracow University of Technology Doctoral School, hereinafter referred to as the Doctoral School or the CUT DS, has been developed pursuant to the act *Law on the Higher Education and Science* of the 20th July 2018 (J. of L. of 2022, item 574, as amended), *the Act* of the 22nd December 2015 *on the Integrated Qualifications Systems* (J. of L. of 2020, item 226) and *the Regulation of the Minister of Science and Higher Education* of the 14th November 2018 *on the second degree characteristics of learning outcomes for levels 6 – 8 qualifications according to the Polish Qualifications Framework* (J. of L. of 2018, item 2218).
2. The Doctoral School provides education in the disciplines in which Cracow University of Technology is entitled to confer academic degrees. Disciplines in which education is provided have been specified in the Regulation of the CUT Rector on establishing the CUT DS.
3. A doctoral student receives education at the Doctoral School in one discipline or in an interdisciplinary mode.
4. The education programme, upon the motion of the CUT Doctoral School Council and having obtained the opinion of the University Council of the Doctoral Students' Association , is approved by the Senate. The list of modular courses is approved by the President of the Scientific Council of the relevant discipline.
5. The education cycle at the Doctoral School lasts 8 semesters. In reasonably justified cases, subject to the CUT DS Head's consent, the education cycle may last 6 semesters.
6. Tuition at the Doctoral School may be offered in Polish or English.
7. The number of the ECTS points assigned to the education programme at the Doctoral School is at least 40 ECTS.
8. Classes stipulated in the education programme at the Doctoral School are mandatory.
9. Detailed rules for achieving learning outcomes and the forms of their evaluation have been specified in the syllabuses of individual courses.
10. Completion of the Doctoral School education programme leads to achieving the learning outcomes reflecting their general characteristics for the level 8 qualification of the Polish Qualifications Framework specified in the effective regulation of the Minister of Science and Higher Education of the 14th November 2018 on the second degree characteristics of learning outcomes for levels 6 – 8 qualifications according to the Polish Qualifications Framework (J. of L. of 2018, item 2218).
11. The doctoral student's education cycle at the Doctoral School ends with the submission of their doctoral dissertation.

II
Time Schedule of the Education Programme (8 semesters)

Semester	Courses	ECTS	Symbol of the learning outcomes at the CUT DS	Reference to		Number of hours
				universal first degree characteristics of the PQF*	the second degree characteristics of learning outcomes**	
1	**Pedagogy and Psychology (15h)**	1	E_W05, E_U10, E_U11	P8U_W, P8U_U	P8S_WK, P8S_UU	75h
	English (15h)	1	E_U04, E_U08	P8U_U	P8S_UK, P8S_UK	
	Selected aspects of conducting scientific research (45h): a) Obtaining grants b) Scientific research methodology c) Scientific information d) Intellectual property protection – patent bases e) Ethics in scientific research	3	E_W03, E_W04, E_W05, E_W06, E_W07, E_U01, E_U03, E_U09, E_K04, E_K05, E_K06, E_K07	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_WK, P8S_UW, P8S_UO, P8S_KO, P8S_KR	
2	**Modular courses** selected from the list **(30h)**[1]	2	E_W01, E_W02, E_U01, E_K01, E_K03	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_KK	60h
	English (15h)	2	E_U04, E_U08	P8U_U	P8S_UK, P8S_UK	
	Doctoral seminar in the discipline (15h)	2	E_W01, E_W02, E_U01, E_U02, E_U06, E_U07, E_U09, E_U10, E_K01, E_K02, E_K03, E_K07	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_UK, P8S_UO, P8S_UU, P8S_KK, P8S_KR	

3	**Modular courses** selected from the list **(30h)**[1]	2	E_W01, E_W02, E_U01, E_K01, E_K03,	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_KK,	45h
	Doctoral seminar in the discipline (15h)	2	E_W01, E_W02, E_U01, E_U02, E_U06, E_U07, E_U09, E_U10, E_K01, E_K02, E_K03, E_K07	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_UK, P8S_UO, P8S_UU, P8S_KK, P8S_KR	
4	**Modular courses** selected from the list **(30h)**[1]	2	E_W01, E_W02, E_U01, E_K01, E_K03,	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_KK,	45h
	Doctoral seminar in the discipline (15h)	2	E_W01, E_W02, E_U01, E_U02, E_U06, E_U07, E_U09, E_U10, E_K01, E_K02, E_K03, E_K07	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_UK, P8S_UO, P8S_UU, P8S_KK, P8S_KR	
5	**Modular courses** selected from the list **(30h)**[1]	2	E_W01, E_W02, E_U01, E_K01, E_K03,	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_KK,	45h
	Doctoral seminar in the discipline (15h)	2	E_W01, E_W02, E_U01, E_U02, E_U06, E_U07, E_U09, E_U10, E_K01, E_K02, E_K03, E_K07	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_UK, P8S_UO, P8S_UU, P8S_KK, P8S_KR	
6	**Economics or philosophy (15h)**	2	E_W05, E_W06, E_K06	P8U_W, P8U_K	P8S_WK, P8S_KO	30h
	Doctoral seminar in the discipline (15h)	2	E_W01, E_W02, E_U01, E_U02, E_U06, E_U07, E_U09, E_U10, E_K01, E_K02, E_K03, E_K07	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_UK, P8S_UO, P8S_UU, P8S_KK, P8S_KR	
7	**Preparation of the doctoral dissertation**	2	E_W04, E_U05, E_K07	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UK, P8S_KR	15h

8	**Preparation for the doctoral dissertation defence**	1	E_U05, E_U06, E_U07, E_K07	P8U_U, P8U_K	P8S_UK, P8S_KR	10h
1-6	**Professional internship**[2]	10	E_U10, E_U11	P8U_U	P8S_UU	75h

[*] The description of the assumed learning outcomes encompasses all the universal first degree characteristics specified in the act of the 22nd December 2015 on the Integrated Qualifications System (J. of L. of 2016, item 64, as amended) relevant for a given level of the Polish Qualifications Framework (PQF).

[**] All second degree characteristics of learning outcomes specified in the regulation of the Minister of Science and Higher Education of the 14th November 2018 on the second degree characteristics of learning outcomes for levels 6 – 8 qualifications according to the Polish Qualifications Framework (J. of L. of 2018, item 2218).

NOTES:

1. Modular courses are elective courses within the framework of specific disciplines in which education is provided. In the case of interdisciplinary education, the doctoral student selects modular courses in the disciplines in which they develop their doctoral thesis.
2. The scope of the professional internship in the form of teaching classes or participation in teaching classes:
   I year – 15 h
   II year – 30 h
   III year – 30 h

III
Time Schedule of the Education Programme (6 semesters)

Semester	Courses	ECTS	Symbol of the learning outcomes at the CUT DS	Reference to		Number of hours
				universal first degree characteristics of the PQF*	the second degree characteristics of learning outcomes**	
1	**Pedagogy and Psychology (15h)**	1	E_W05, E_U10, E_U11	P8U_W, P8U_U	P8S_WK, P8S_UU	75h
	English (15h)	1	E_U04, E_U08	P8U_U	P8S_UK, P8S_UK	
	Block A – Selected aspects of conducting scientific research (45h): a) Obtaining grants b) Scientific research methodology c) Scientific information d) Intellectual property protection – patent bases e) Ethics in scientific research	3	E_W03, E_W04, E_W05, E_W06, E_W07, E_U01, E_U03, E_U09, E_K04, E_K05, E_K06, E_K07	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_WK, P8S_UW, P8S_UO, P8S_KO, P8S_KR	
2	**Modular courses** selected from the list **(30h)**[1]	2	E_W01, E_W02, E_U01, E_K01, E_K03	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_KK	60h
	English (15h)	2	E_U04, E_U08	P8U_U	P8S_UK, P8S_UK	
	Doctoral seminar in the discipline (15h)	2	E_W01, E_W02, E_U01, E_U02, E_U06, E_U07, E_U09, E_U10, E_K01, E_K02, E_K03, E_K07	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_UK, P8S_UO, P8S_UU, P8S_KK, P8S_KR	

3	**Modular courses** selected from the list **(30h)**[1]	2	E_W01, E_W02, E_U01, E_K01, E_K03,	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_KK,	45h
	Doctoral seminar in the discipline (15h)	2	E_W01, E_W02, E_U01, E_U02, E_U06, E_U07, E_U09, E_U10, E_K01, E_K02, E_K03, E_K07	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_UK, P8S_UO, P8S_UU, P8S_KK, P8S_KR	
4	**Modular courses** selected from the list **(30h)**[1]	2	E_W01, E_W02, E_U01, E_K01, E_K03,	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_KK,	45h
	Doctoral seminar in the discipline (15h)	2	E_W01, E_W02, E_U01, E_U02, E_U06, E_U07, E_U09, E_U10, E_K01, E_K02, E_K03, E_K07	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_UK, P8S_UO, P8S_UU, P8S_KK, P8S_KR	
5	**Modular courses** selected from the list **(30h)**[1]	2	E_W01, E_W02, E_U01, E_K01, E_K03,	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_KK,	60h
	Doctoral seminar in the discipline (15h)	2	E_W01, E_W02, E_U01, E_U02, E_U06, E_U07, E_U09, E_U10, E_K01, E_K02, E_K03, E_K07	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_UK, P8S_UO, P8S_UU, P8S_KK, P8S_KR	
	Preparation of the doctoral dissertation (15h)	2	E_W04, E_U05, E_K07	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UK, P8S_KR	
6	**Economics or philosophy (15h)**	2	E_W05, E_W06, E_K06	P8U_W, P8U_K	P8S_WK, P8S_KO	40h
	Doctoral seminar in the discipline (15h)	2	E_W01, E_W02, E_U01, E_U02, E_U06, E_U07, E_U09, E_U10, E_K01, E_K02, E_K03, E_K07	P8U_W, P8U_U, P8U_K	P8S_WG, P8S_UW, P8S_UK, P8S_UO, P8S_UU, P8S_KK, P8S_KR	
	Preparation for the doctoral dissertation defence (10h)	1	E_U05, E_U06, E_U07, E_K07	P8U_U, P8U_K	P8S_UK, P8S_KR	

1-6	**Professional internship**[2]	10	E_U10, E_U11	P8U_U	P8S_UU	75h

* The description of the assumed learning outcomes encompasses all the universal first degree characteristics specified in the act of the 22nd December 2015 on the Integrated Qualifications System (J. of L. of 2016, item 64, as amended) relevant for a given level of the Polish Qualifications Framework (PQF).

** All second degree characteristics of learning outcomes specified in the regulation of the Minister of Science and Higher Education of the 14th November 2018 on the second degree characteristics of learning outcomes for levels 6 – 8 qualifications according to the Polish Qualifications Framework (J. of L. of 2018, item 2218).

NOTES:

1. Modular courses are elective courses within the framework of specific disciplines in which education is provided. In the case of interdisciplinary education, the doctoral student selects modular courses in the disciplines in which they develop their doctoral thesis.
2. The scope of the professional internship in the form of teaching classes or participation in teaching classes:
   I year – 15 h
   II year – 30 h
   III year – 30 h

IV

Cracow University of Technology

CUT Doctoral School

Field of science: field of engineering and technology sciences

Scientific disciplines: architecture and urban sciences; automatic control, electronics and electrical engineering; information and communication technology; chemical engineering; civil engineering and transport; materials engineering; mechanical engineering; environmental engineering, mining and energy.

Level of the Polish Qualifications Framework: 8 PQF

Learning outcomes symbols	**LEARNING OUTCOMES**	**Reference to**	
		universal first degree characteristics of the PQF[1]	the second degree characteristics of learning outcomes of the PQF[2]
1	2	**3**	**4**
	KNOWLEDGE: THE GRADUATE KNOWS AND UNDERSTANDS	**Descriptor code**	**Descriptor code**
E_W01	the global scientific achievements encompassing the theoretical foundations as well as general problems and selected detailed problems – specific to the given scientific discipline – to the extent enabling revision of the existing paradigms	P8U_W	P8S_WG
E_W02	major development trends of the scientific disciplines in which the education is received	P8U_W	P8S_WG
E_W03	the methodology of scientific research	P8U_W	P8S_WG

E_W04	principles of dissemination of scientific activity results, also in the open access mode	P8U_W	P8S_WG
E_W05	the fundamental dilemmas of the contemporary civilization	P8U_W	P8S_WK
E_W06	the economic, legal, ethical and other important conditions of scientific activity	P8U_W	P8S_WK
E_W07	the basic principles of knowledge transfer to the economic and social spheres as well as of commercialization of scientific activity results and the know-how related to these results	P8U_W	P8S_WK
	SKILLS: THE GRADUATE IS ABLE TO	**Descriptor code**	**Descriptor code**
E_U01	use knowledge from various fields of science or the field of art for creative identification and innovative solution of complex problems or performing tasks of the research nature, and in particular: - to define the objective and subject of scientific research, - to formulate a research hypothesis, - to develop research methods, techniques and instruments and use them in a creative way, - to draw conclusions based on scientific research.	P8U_U	P8S_UW
E_U02	to perform a critical analysis and evaluation of scientific research results, expert activities and other creative types of work, as well as their contribution to the development of knowledge	P8U_U	P8S_UW
E_U03	to transfer scientific activity results to the economic and social spheres	P8U_U	P8S_UW
E_U04	to communicate on specialist matters to the extent enabling active participation in the international scientific environment	P8U_U	P8S_UK
E_U05	to disseminate scientific activity results, also in popular forms	P8U_U	P8S_UK

E_U06	to initiate a debate	P8U_U	P8S_UK
E_U07	to participate in a scientific discourse	P8U_U	P8S_UK
E_U08	to have the proficiency in a foreign language at the level B2 according to the Common European Framework of Reference for Languages, enabling participation in an international scientific and professional environment	P8U_U	P8S_UK
E_U09	to plan and execute individual and team research projects, also in an international environment	P8U_U	P8S_UO
E_U10	to independently plan and act for the benefit of their own development and to organise other persons' development	P8U_U	P8S_UU
E_U011	to plan classes or class sets and deliver them with the use of modern instruments and methods	P8U_U	P8S_UU
	SOCIAL COMPETENCES: THE GRADUATE IS PREPARED FOR	**Descriptor code**	**Descriptor code**
E_K01	critical evaluation of the achievements within a given scientific discipline	P8U_K	P8S_KK
E_K02	critical evaluation of their own contribution to the development of a given scientific discipline	P8U_K	P8S_KK
E_K03	recognition of the significance of knowledge in solving cognitive and practical problems	P8U_K	P8S_KK
E_K04	meeting the social obligations of researchers and creators	P8U_K	P8S_KO
E_K05	initiating actions for the benefit of the public interest	P8U_K	P8S_KO
E_K06	thinking and acting in the entrepreneurial manner	P8U_K	P8S_KO
E_K07	maintaining and developing the ethos of research and creative communities, including:	P8U_K	P8S_KR

	- performing their scientific activities in an independent way, - respecting the principle of public ownership of scientific activity results, without prejudice to the principles of intellectual property protection.		

Explanation of the used symbols:

1. Universal PQF levels characteristics (of the first degree):

P = PQF level (8)
U = universal characteristic
W = Knowledge
U = Skills
K = Social competences

Example:
P8U_W = PQF level 8, universal characteristics, knowledge
"The graduate knows and understands the global scientific achievements and the practical implications resulting thereof"

2. Characteristics of PQF levels typical of qualifications attained in higher education (of the second degree):

P = PQF level (8)
S = characteristics typical of qualifications attained in higher education

W = Knowledge
G = Range and depth – completeness of the cognitive perspective and interdependencies
K = context and conditions, consequences

U = Skills
W = Knowledge utilization – problem solved and tasks performed
K =Communication – receiving and creating statements, dissemination of knowledge in the scientific community and proficiency in a foreign language
O = Work organization – planning and team work
U = Learning – planning one's own development and other persons' development

K = Social competences
K = Evaluation – a critical approach
O = Responsibility – meeting one's social obligations and acting for the benefit of the general public interest
R = Professional role – independence and ethos development

Example:
P8S_WG = PQF level 8, characteristics typical of qualifications attained in higher education, knowledge – depth and range.
"The graduate knows and understands the global scientific achievements encompassing the theoretical foundations as well as general problems and selected detailed problems – specific to the given scientific discipline"

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[1] The description of the assumed learning outcomes encompasses all the universal first degree characteristics specified in the act of the 22nd December 2015 on the Integrated Qualifications System (J. of L. of 2016, item 64, as amended) relevant for a given level of the Polish Qualifications Framework.
[2] All second degree characteristics of learning outcomes specified in the regulation of the Minister of Science and Higher Education of the 14th November 2018 on the second degree characteristics of learning outcomes for levels 6 – 8 qualifications according to the Polish Qualifications Framework (J. of L. of 2018, item 2218).