Cracow University of Technology

Course syllabus

binding for the doctoral students of the CUT Doctoral School commencing their studies in the academic year 2022/2023

Information on the course

Name of the course in Polish	Wybrane aspekty prowadzenia badań naukowych
Name of the course in English	Selected aspects of conducting scientific research
Number of the ECTS points	3
Language of instruction	Polish
Category of the course	Mandatory
Field of education	Engineering and Technology
Discipline of education	All disciplines
Person responsible for the course Contact	Prof. Leszek Wojnar, *doctor habilitatus* in Engineering leszek.wojnar@pk.edu.pl

Type of course, number of hours in the study programme curriculum

Semester	Credit type (G / NG)*	Lecture	Practical class	Laboratory	Computer laboratory	Project class	Seminar
1	G	45	0	0	0	0	0

*G – graded credit, NG – non-graded credit

BLOCK 1

Name in Polish	Etyka w badaniach naukowych
Name in English	Research Ethics
Person responsible for the block Contact	Jacek Jaśtal, *doctor habilitatus*, prof. of CUT jacek.jastal@pk.edu.pl Co-teacher: Marek Pyka, *doctor habilitatus*, prof. of CUT marek.pyka@pk.edu.pl

Course objectives

Code	Objective description
Objective 1	Introducing students to the basic concepts of applied ethics necessary to understand the social and non-technical considerations of scientific activities.
Objective 2	Introducing students to the basic principles of good practice in scientific research and the rules of working in research teams.
Objective 3	Developing an attitude of professional responsibility and an awareness of the social and interpersonal aspects and consequences of scientific activities.

Learning outcomes

Code	Description of the learning outcome adjusted to the specific characteristics of the discipline	Learning outcome symbol in the CUT DS	Methods of verification
OUTCOMES RELATED TO KNOWLEDGE			
EUW1	The student explains the main concepts of applied ethics.	E_W01, E_W02	final test
EUW2	The student explains the principles of good practice in scientific research.	E_W01, E_W02	final test
OUTCOMES RELATED TO SKILLS			
EUU1	The student is able to independently analyse ethical problems in scientific research.	E_U01	final test
OUTCOMES RELATED TO SOCIAL COMPETENCES			
EUK1	The student is aware of the importance of the social aspects and implications of scientific activities.	E_K01, E_K03	final test

Course outline

No.	Contents	Learning outcomes for the course	No. of hours
LECTURE			
W1	Introduction to applied ethics and scientific research ethics; social responsibility of the researcher; typical conflicts of interest in research and the rules for avoiding them.	EUW1, EUW2, EUU1	2
W2	Good research practice: principles of scientific integrity, practices regarding research procedures and handling scientific data, authoring and publishing practices, review and peer review practices.	EUW1, EUW2, EUK1	2
W3	Good practice regarding relationships in research teams, research institutions; practices regarding the formation of young research staff.	EUW2, EUU2, EUK1	1
W4	Ethical requirements for the conduct of research involving humans and animals.	EUW2, EUU2, EUK1	1
W5	The key legal acts governing the ethical and social aspects of research work. Ethics committees, their objectives and rules of operation.	EUW2, EUU2, EUK1	1

Working hours settlement

Type of activity	Average number of hours (45 min.) dedicated to the completion of an activity type
SCHEDULED CONTACT HOURS WITH THE ACADEMIC TEACHER	
Hours allotted in the syllabus	7
Consultations	1
Examination / course credit assignment	1
HOURS WITHOUT THE PARTICIPATION OF THE ACADEMIC TEACHER	
Independent study of the course contents	4

Preparation of a paper, report, project, presentation, discussion	2

Preliminary requirements

No.	Requirements
1	Not specified. It is assumed that a graduate of a second-cycle degree programme in any field of study has the learning outcomes necessary for participation in the course.

Completion criteria for the block / method of the formative grade calculation

No.	Description
COMPLETION CRITERIA	
1	Class attendance. Any lack of attendance should be accounted for.
2	Successful completion of the final test.
METHOD OF THE FORMATIVE GRADE CALCULATION	
The grade obtained on the final test.	

Additional information

None

The course reading list

1	P. Singer (ed.), Przewodnik po etyce, Warszawa 1998.
2	C. Whitbeck, Ethics in Engineering Practice and Research, Cambridge 1998.
3	W. Galewicz (ed.) – Etyczne i prawne granice badań naukowych, Kraków 2009.
4	R. Morawski, Etyczne aspekty działalności badawczej w naukach empirycznych, Warszawa 2011.
5	R. Chadwick, Encyclopedia of Applied Ethics, San Diego 1998.

BLOCK 2

Name in Polish	Metodyka badań naukowych
Name in English	Methodology of scientific research
Person responsible for the block Contact	Prof. Leszek Wojnar, *doctor habilitatus* in Engineering leszek.wojnar@pk.edu.pl

Course objectives

Code	Objective description
Objective 1	Learning about and characterising the different elements of the scientific method.
Objective 2	Preparation for the correct development of the doctoral dissertation, which is usually the first major research paper.

Learning outcomes

Code	Description of the learning outcome adjusted to the specific characteristics of the discipline	Learning outcome symbol in the CUT DS	Methods of verification
OUTCOMES RELATED TO KNOWLEDGE			
EUW1	The doctoral student knows and understands the various stages of the classical scientific method and the possibilities of its modification.	E_W03, E_W06	test
EUW2	The doctoral student knows the formal and customary rules for preparing a doctoral dissertation.	E_W03, E_W04	test
OUTCOMES RELATED TO SKILLS			
EUU1	The doctoral student is able to evaluate the correctness of the formulation of a scientific problem and the feasibility of the overall plan to solve it.	E_U01	test
EUU2	The doctoral student is able to make preliminary research plans and edit papers for publication in an appropriate way.	E_U01	test
OUTCOMES RELATED TO SOCIAL COMPETENCES			
EUK1	The doctoral student is prepared to engage in a scientific discussion.	E_K01, E_K02, E_K07	test

Course outline

No.	Contents	Learning outcomes for the course	No. of hours
LECTURE			
W1	Elements of the history of the development of science. Problems of defining scientific concepts and problems. Types of scientific research.	EUW1	2
W2	The transition from practical to scientific knowledge. The classical scientific method and its modifications.	EUW1, EUU1, EUU2	2
W3	Criteria for recognising research as scientific. The significance of critical thinking in scientific work. Elements of copyright law.	EUU1, EUK1	2
W4	Formal and legal aspects of the doctoral degree procedure.	EUW2	2
W5	An appropriate choice of dissertation subject matter. Thesis - significance and errors of formulation. Formulation of conclusions.	EUW2, EUU1, EUU2	2
W6	Presentation of scientific research findings. Academic style. Significance and selection of illustrative material.	EUU2, EUK1	2

Working hours settlement

Type of activity	Average number of hours (45 min.) dedicated to the completion of an activity type
SCHEDULED CONTACT HOURS WITH THE ACADEMIC TEACHER	
Hours allotted in the syllabus	12
Consultations	2
Examination / course credit assignment	1

HOURS WITHOUT THE PARTICIPATION OF THE ACADEMIC TEACHER	
Independent study of the course contents	6
Preparation of a paper, report, project, presentation, discussion	-

Preliminary requirements

No.	Requirements
1	Not specified. It is assumed that a graduate of a second-cycle degree programme in any field of study has the learning outcomes necessary for participation in the course.

Completion criteria for the block / method of the formative grade calculation

No.	Description
COMPLETION CRITERIA	
1	Class attendance. Any lack of attendance should be accounted for.
2	Successful completion of the final test (multiple choice test).
METHOD OF THE FORMATIVE GRADE CALCULATION	
The grade obtained on the test.	

Additional information

None

The course reading list

1	Collective work ed. by Rev. S. Janeczek — Metodologia nauk, Lublin, 2019, Wydawnictwo KUL
2	Zieliński J., Metodologia pracy naukowej. Wydawnictwo Aspara, Warszawa 2012
3	Apanpwicz J., Metodologia ogólna. Wyższa Administracji i Biznesu, Gdynia 2002 https://wsaib.pl/images/files/E-Publikacje/MO.pdf
4	Kawa J., Metodologia, metodyka, metoda jako podstawa wywodu naukowego. Studia prawnoustrojowe 21, 2013, pp.169-188 https://bazhum.muzhp.pl/media/files/Studia_Prawnoustrojowe/Studia_Prawnoustrojowe-r2013-t-n21/Studia_Prawnoustrojowe-r2013-t-n21-s169-188/Studia_Prawnoustrojowe-r2013-t-n21-s169-188.pdf

BLOCK 3

Name in Polish	Informacja naukowa
Name in English	Scientific Information
Person responsible for the block Contact	Marzena Marcinek, MEng marzena.marcinek@pk.edu.pl

Course objectives

Code	Objective description
Objective 1	Introduction to the basic concepts and problems of scientific information, concerning the gathering, processing and presentation of information, publishing models, bibliometrics in the evaluation of publications and the scientific achievements of individuals, research teams and institutions.

Objective 2	Acquiring the ability to use sources of scientific information, to assess the quality of information and select journals, publishers and repositories appropriate to one's needs.
Objective 3	Acquiring the ability to use reference management software (reference manager).

Learning outcomes

Code	Description of the learning outcome adjusted to the specific characteristics of the discipline	Learning outcome symbol in the CUT DS	Methods of verification
OUTCOMES RELATED TO KNOWLEDGE			
EUW1	The doctoral student knows and understands the functioning of general and domain-specific sources of scientific information and the rules for using and evaluating them.	E_W04	Test results in the e-course
EUW2	The doctoral student knows and understands the legal and ethical considerations and rules for the dissemination of the results of scientific activities, also in the open access mode.	E_W04, E_W06	Discussion, test results in the e-course
OUTCOMES RELATED TO SKILLS			
EUU1	The doctoral student is able to formulate criteria and retrieve scientific and professional information from information sources appropriate to the research needs.	E_U01	Assignments and exercises in the e-course, discussion
EUU2	The doctoral student is able to collect and process bibliographic information in a reference manager.	E_U05	Assignments and exercises in the e-course, project
EUU3	The doctoral student is able to critically evaluate publications and other sources of information, select ways of sharing/disseminating information appropriate to their needs, and participate in a scholarly discourse online.	E_U05, E_U07	Assignments and exercises in the e-course, project
OUTCOMES RELATED TO SOCIAL COMPETENCES			
EUK1	The doctoral student is prepared to critically evaluate achievements within a given scientific discipline and to recognise the significance of knowledge in solving cognitive and practical problems.	E_K01, E_K03	Assignments and exercises in the e-course, discussion

Course outline

No.	Contents	Learning outcomes for the course	No. of hours
LECTURE			

W1	The search for, collection and management of information • professional, multidisciplinary and discipline-specific information sources (scientific directories and search engines, databases, portals and services, repositories of publications and research data) • information search strategies and criteria • publication identifiers • bibliography styles • tools for organising and presenting bibliographic information	EUW1, EUW2, EUU1, EUU2	3
W2	Evaluation of scientists' written output • bibliometric indicators in the evaluation of publications, researchers and institutions • bibliometric tools in the WoS and Scopus databases • InCite i SciVal Publishing models - traditional, hybrid, open access. The concept and types of open access; licences, including CC.	EUW1, EUW2, EUU2, EUK1	2
W3	The scientist online: • ORCID and other identifier systems • scientific social networks Dissemination of information • selection of dissemination venues appropriate to needs • publication fraud	EUW1, EUW2, EUK1	4

Working hours settlement

Type of activity	Average number of hours (45 min.) dedicated to the completion of an activity type
SCHEDULED CONTACT HOURS WITH THE ACADEMIC TEACHER	
Hours allotted in the syllabus	9
Consultations	1
Examination / course credit assignment	1
HOURS WITHOUT THE PARTICIPATION OF THE ACADEMIC TEACHER	
Independent study of the course contents, including completion of exercises recommended in the e-course	4
Project preparation, solving tests	3

Preliminary requirements

No.	Requirements
1	Sufficient command of English to read professional literature

Completion criteria for the block / method of the formative grade calculation

No.	Description
COMPLETION CRITERIA	

1	Class attendance. Any lack of attendance should be accounted for.
2	Successful completion of the individual e-course end-of-module tests and the final test.
3	Individual project preparation.
METHOD OF THE FORMATIVE GRADE CALCULATION	
Weighted average of grades on the project and the tests.	

Additional information

None

The course reading list

1	„Badawcze kompetencje informacyjne w pracy naukowej" – a MOOC e-course on the Navoica platform

BLOCK 4

Name in Polish	Ochrona własności intelektualnej - bazy patentowe
Name in English	Intellectual property protection - patent databases
Person responsible for the block Contact	Łukasz Wściubiak, MA lukasz.wsciubiak@pk.edu.pl

Course objectives

Code	Objective description
Objective 1	Discussion of the essence and scope of protection, as well as, in this context, the freedom to pursue one's own creative activity, both for goods protected by copyright (works) and for industrial property (inventions, utility models, industrial designs, trademarks).
Objective 2	Transfer of knowledge on the circulation of intellectual property goods, i.e. problems related to entering into civil law contracts, including licences.
Objective 3	Transfer of knowledge on accountability in the event of a breach of others' intellectual property rights and on asserting one's own rights to protect the results of creative work.

Learning outcomes

Code	Description of the learning outcome adjusted to the specific characteristics of the discipline	Learning outcome symbol in the CUT DS	Methods of verification
OUTCOMES RELATED TO KNOWLEDGE			
EUW1	The doctoral student knows and understands the economic, legal, ethical and other relevant considerations of scientific activities.	E_W06	Involvement in class activities, test
EUW2	The doctoral student is familiar with the basic principles of knowledge transfer to the economic and social sphere as well as the commercialisation of the results of scientific activities and the know-how related to these results.	E_W07	Involvement in class activities, test
OUTCOMES RELATED TO SKILLS			

EUU1	The doctoral student is able to critically analyse and evaluate the results of scientific research, expert activities and other works of a creative nature, as well as their contribution to the development of knowledge.	E_U02	Involvement in class activities, test
EUU2	The doctoral student has the skills necessary to transfer the results of scientific activities to the economic and social sphere.	E_U03	Involvement in class activities, test
OUTCOMES RELATED TO SOCIAL COMPETENCES			
EUK1	The doctoral student is prepared to think and act in an entrepreneurial manner.	E_K06	Involvement in class activities, test

Course outline

No.	Contents	Learning outcomes for the course	No. of hours
LECTURE			
W1	The concept of intellectual property and its place in the legal system and the sources of law. Copyright protection, in particular the concept of a work, exclusions from protection, identification of the rightholder, personal vs. property rights, authorised use of others' works, software protection	E_W06, E_W07, E_U03, E_K06	4
W2	Protection of an invention, in particular the principles of obtaining protection, the procedure, scope and duration of protection and international systems of protection. Utility model vs. industrial design. The purpose of a trademark. Civil and criminal liability for intellectual property infringement. Searching patent databases.	E_W07, E_U02, E_U03, E_K06	5

Working hours settlement

Type of activity	Average number of hours (45 min.) dedicated to the completion of an activity type
SCHEDULED CONTACT HOURS WITH THE ACADEMIC TEACHER	
Hours allotted in the syllabus	9
Consultations	1
Examination / course credit assignment	2
HOURS WITHOUT THE PARTICIPATION OF THE ACADEMIC TEACHER	
Independent study of the course contents	4
Preparation of a paper, report, project, presentation, discussion	2

Preliminary requirements

No.	Requirements
1	Knowledge of the sources of law in Poland.
2	Ability to use search engines.

Completion criteria for the block / method of the formative grade calculation

No.	Description
COMPLETION CRITERIA	
1	Class attendance. Any lack of attendance should be accounted for.
2	A positive grade on the final test.
METHOD OF THE FORMATIVE GRADE CALCULATION	
The grade obtained on the final test.	

Additional information

None

The course reading list

1	Rafał Golat: „Prawo autorskie i prawa pokrewne", Warszawa, 2021, Wydawnictwo CH Beck.
2	Piotr Kostański, PhD, Łukasz Żelechowski, *doctor habilitatus*: „Prawo własności przemysłowej" Warszawa, 2020, Wydawnictwo CH Beck.

BLOCK 5

Name in Polish	Pozyskiwanie grantów
Name in English	Searching and applying for grant
Person responsible for the block Contact	Irena Śliwińska, MEng irena.sliwinska@pk.edu.pl

Block objectives

Code	Objective description
Objective 1	Introduction to research funding opportunities, with particular emphasis on grants available at the early stages of a career.
Objective 2	Acquisition of skills in searching databases of projects financed by Polish and European Commission funds.
Objective 3	Acquisition of skills for preparing research grant applications.

Learning outcomes

Code	Description of the learning outcome adjusted to the specific characteristics of the discipline	Learning outcome symbol in the CUT DS	Methods of verification
OUTCOMES RELATED TO KNOWLEDGE			
EUW1	The doctoral student knows and understands which institutions fund scientific research.	E_W06	Involvement in class activities, preparation of a course assignment.
OUTCOMES RELATED TO SKILLS			
EUU1	The doctoral student is able to search databases of funded projects in order to determine the current state of knowledge and look for research gaps in their field. They are able to plan research projects.	E_U09	Involvement in class activities, discussion, preparation of a course assignment.

EUU2	The doctoral student is able to navigate the portals of research grant funding institutions, and to search for currently open calls.	E_U09	Involvement in class activities, preparation of a course assignment.
EUU3	The doctoral student is familiar with good practice for preparing a grant application and the general principles for evaluating research funding applications.	E_U09	Involvement in class activities, discussion.
OUTCOMES RELATED TO SOCIAL COMPETENCES			
EUK1	The doctoral student is prepared to critically evaluate their own contribution to the development of a given scientific discipline.	E_K02	Involvement in class activities, discussion.

Course outline

No.	Contents	Learning outcomes for the course	No. of hours
LECTURE			
W1	Planning a scientific career. Development paths for a scientist. Searching for a grant idea. International research cooperation.	E_U09, E_K02	2
W2	Discussion of the current range of Polish and international research grants, with particular emphasis on grants for young scientists.	E_W06, EU09	3
W3	Discussion of grant applications based on the example of an application in the calls for proposals of the National Science Centre and Horizon Europe. Providing practical tips for preparing an application. Presentation of the evaluation criteria.	E_U09	3

Working hours settlement

Type of activity	Average number of hours (45 min.) dedicated to the completion of an activity type
SCHEDULED CONTACT HOURS WITH THE ACADEMIC TEACHER	
Hours allotted in the syllabus	8
Consultations	1
Examination / course credit assignment	1
HOURS WITHOUT THE PARTICIPATION OF THE ACADEMIC TEACHER	
Independent study of the course contents	5
Preparation of a course assignment	3

Preliminary requirements

No.	Requirements
1	Not specified. It is assumed that a graduate of a second-cycle degree programme in any field of study has the learning outcomes necessary for participation in the course.

Completion criteria for the block / method of the formative grade calculation

No.	Description
COMPLETION CRITERIA	

1	Class attendance. Any lack of attendance should be accounted for.
2	Preparation of a course assignment.
METHOD OF THE FORMATIVE GRADE CALCULATION	
The course assignment grade.	

Additional information

The classes cover the following topics: planning a scientific career, planning and implementation of research projects, searching for external sources of funding and preparation of a grant application. The classes will be conducted based on current call documentation of Polish research funding institutions, documentation of the Horizon Europe framework programme calls and available databases of implemented projects.

The reading list

1	Kwiek, M. (2020). Międzynarodowa współpraca badawcza w Europie w świetle dużych danych i jej globalne konteksty. Nauka, 1: 35-66. doi:10.24425/nauka.2020.132621
2	Internet websites and online articles: https://euraxess.ec.europa.eu/worldwide/japan/hear-it-expert-twelve-tips-how-prepare-erc-grant-proposal https://euraxess.ec.europa.eu/worldwide/japan/unofficial-guide-writing-eu-research-grant-proposals https://cordis.europa.eu/ https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/home https://projekty.ncn.gov.pl/

Course credit assignment conditions / method of the final grade calculation

No.	Description
COURSE CREDIT ASSIGNMENT CONDITIONS	
1	Positive formative grades in all blocks 1-5.
METHOD OF THE FINAL GRADE CALCULATION	
Arithmetic mean of the formative grades rounded to the nearest 0.5.	