DOCTORAL SCHOOL OF WROCŁAW UNIVERSITY OF SCIENCE AND TECHNOLOGY

SUPERVISOR DECLARING/CONDUCTING COURSE: Renata Krzyżyńska
DEPARTMENT: Faculty of Environmental Engineering W7
SCIENTIFIC DISCIPLINE: Environmental Engineering, Mining and Energy

COURSE CARD

Course name in Polish: Warsztat badacza
Course name in English: Research skills
Course language Polish
The course is intended for all PhD students: YES / ~~NO~~
~~1) basic course~~
~~2) specialist course~~
~~3) seminar~~
~~4) humanistic course~~
~~5) language~~
6) research skills

Subject code: IGQ100029W

* delete as applicable

	Lecture	Foreign language course	Seminar	Mixed forms
Number of hours of organized classes in university (ZZU)				30
Grading				Presentation, report, activity
Number of ECTS points				0

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knowledge of a given discipline at the second level of studies.
2. Pre-defined research topic of PhD.

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COURSE OBJECTIVES

C1 To gain basic knowledge on academic career.
C2 To gain skills related to searching for, evaluating and organizing information from scientific databases.
C3 To gain skills related to methodology of research work.
C4 To gain skills required to prepare a presentation of a scientific work.
C5 To gain skills required to write a scientific publication.
C6 To gain skills required to prepare applications for research funding and scholarships from various sources of funding.
C7 To gain skills of scientific cooperation in research teams, including international cooperation.

C8 To gain basic knowledge on knowledge transfer and commercialization of research results.
C9 Stimulation of their own creativity and entrepreneurship.
C10 Encouraging and motivating PhD students thinking outside the box, creative thinking and openness to cooperation with the business community.

Form of classes – mixed forms (mix)		Number of hours
Mix1	Academic career (doctoral school principles, legal acts, academic career path, promotion rules). The Polish, European and World higher education system area. Lecture and group discussion.	2
Mix2	Searching for, evaluating and organizing information from scientific databases. Lecture and group discussion.	2
Mix3	Methodology of research work. Methods of creative work. Lecture and group discussion.	2
Mix4	Innovation. Cooperation between science and business.	2
Mix5	Best practices. Striving for academic excellence. Creativity and Californian enthusiasm. Lecture and group discussion.	2
Mix6	Best practices. Technology Parks. Lecture and group discussion.	
Mix7	Presentation of research results. Lecture and group discussion.	2
Mix8	Writing of scientific papers. Protection of intellectual property rights. Lecture and group discussion.	2
Mix9	Preparation of applications (projects, grants) for research funding. Lecture and group discussion.	2
Mix10	Scientific cooperation. Team building. Lecture and group discussion.	2
Mix11	Inventiveness, creative work and problem solving. Brainstorm. Knowledge transfer and commercialization of research results. Lecture and group discussion.	2
Mix12	Presentation on a selected topic related to the planned PhD thesis. Seminar.	8
Mix13	Preparation of a report documenting the implementation of tasks related to: information retrieval, methodology and planning of scientific research, writing scientific papers, writing grant applications, scientific cooperation, knowledge transfer and commercialization of research results. Self work.	
	Total hours	30

TEACHING TOOLS USED

N1. Lecture
N2. Presentation
N3. Discussion
N4. Self work
N5. Group work, some classes may take place outside the WUST (e.g. meetings at the headquarters of innovative high-tech companies, start-ups or dedicated workshops / conferences)

ACHIEVED SUBJECT LEARNING OUTCOMES

Type of learning outcome	Code of learning outcome	Assessment of learning outcome
Knowledge	**P8S_WK**	Presentation, participation in discussion
Skills	**P8S_UK**	Presentation, participation in discussion
Skills	**P8S_UO**	Report, participation in discussion
Social competence	**P8S_KK**	Presentation, report, participation in discussion
Social competence	**P8S_KO**	Report, participation in discussion

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Robert E. Berger, "A Scientific Approach to Writing for Engineers and Scientists", Wiley-IEEE Press 2014
[2] Joshua Schimel, "Writing Science: How to Write Papers That Get Cited and Proposals That Get Funded"
[3] N. Patel, "Technical Presentations", IEEE Books
[4] Crossing the chasm, Marketing and selling High-Tech Products to Mainstream Customers, Geoffrey A. Moore, HarperCollins Publishers Inc. 2011
[5] Building Creative Competence in Globally Distributed Courses through Design Thinking, Comunicar, 37, v. XIX, 2011
[6] Game Storming, A Playbook for Innovators, Rulebreakers, and Changemakers, Dave Gray, Sunni Brown, James Macanufo, O'Reilly Media, Inc. 2010

SECONDARY LITERATURE:

[7] Legal acts
[8] Search tools, e.g., scholar.google, ieeexplore.com
[9] Literature related to a particular scientific discipline
[10] Regulations of research funding institutions (NCN, NCBR, FNP)

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

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