# COURSE DESCRIPTION CARD - SYLLABUS

Course name
RESEARCH WORKSHOP 2 [S5SD1>PB2]

## Course

Proposed by Discipline
architecture and urban planning
automation, electronics, electrical engineering and space technologies
chemical sciences
civil engineering, geodesy and transport
environmental engineering, mining and energy
information and communication technology
management and quality studies
materials engineering
mechanical engineering

Year/Semester
4/8

Level of study
Doctoral School

Course offered in
English

Form of study
full-time

Requirements
compulsory

## Number of hours

Lecture
0

Laboratory classes
0

Other
0

Tutorials
60

Projects/seminars
0

## Number of credit points

6,00

## Coordinators

supervisors of Phd students

## Lecturers

## Prerequisites

Knowledge: PhD student has the knowledge resulting from the scope of completed university studies, necessary to implement the doctorate in the chosen discipline. Skills: PhD student is able to organize his own workshop using modern research methods; is able to formulate and verify research hypotheses, plan and conduct research and scientific experiments as well as analyze, interpret, critically evaluate, develop and present research results. Social competencies: PhD student is prepared to take social responsibility for studying at doctoral school; understands the need to deepen, update and popularize knowledge especially regarding the achievements of science and technology. Has the ability to work in a team, is open to cooperation with other people.

## Course objective

The supervisor cooperates with the doctoral student following the appropriate and well-defined master/ apprentice relationship model, present in scientific communities, from which both parties benefit. The main aim of the course is to focus on substantial work to realize the individual research plan. The supervisor teaches the doctoral student the principles of writing scientific texts (articles) and the ethical and legal aspects of scientific activity, including the social responsibility of science and scientific ethics, as well as, in particular, data management and the methodology applied to realize their research topic. In the frame of the Research workshop, the supervisor works with the doctoral student, supervises the preparation of the doctoral dissertation, develops and determines the method of communication with the doctoral student, and provides the doctoral student with substantive and methodological assistance regarding their scientific work. The supervisor enables the doctoral student to participate in the research work of the Unit, as well as consults and discusses the obtained results, indicates directions, and assesses the doctoral student's scientific development and progress in the preparation of the doctoral dissertation. In addition, the supervisor supports the doctoral student's activity in obtaining grants and mobility scholarships, developing the doctoral student's ability to conduct research and collaborate in various research teams.

## Course-related learning outcomes

Knowledge:
A PhD student who graduated from doctoral school knows and understands:
1. global achievements, covering theoretical foundations as well as general and selected specific issues that are related to the subject of the doctoral disertation being prepared, to the extent that enables revision of existing paradigms, [P8S_WG/SzD_W01],
2. scientific research methodology necessary to implement the undertaken research problem, [P8S_WG/ SzD_W03],
3. principles of disseminating results of scientific activity, also in an open access mode, [P8S_WG/ SzD_W04],
4. the impact of the conducted scientific activity on solving dilemmas of the contemporary civilization, [P8S_WK/SzD_W05],
5. the importance of knowledge transfer to the economic and social sphere as well as those of commercialization of results of scientific activities and know-how related to these results [P8S_WK/ SzD_W07].

Skills:
A PhD student who graduated from doctoral school can:
1. use knowledge from different branches of science to creatively identify, formulate and innovatively solve complex problems or to perform research tasks such as:
- define the aim and subject of scientific research, form a research hypothesis,
- develop research methods, techniques and tools and use them creatively,
- draw conclusions on the basis of research results, [P8S_UW/SzD_U01]
2. critically analyze and assess scientific research results, work of experts and other creative activities together with their contribution into knowledge development, [P8S_UW/SzD_U02],
3. communicate on specialist issues on the level that allows active participation in the international scientific community, [P8S_UK/SzD_U04],
4. share results of scientific activity also in a popular form, [P8S_UK/SzD_U05],
5. initiate debates, [P8S_UK/SzD_U06],
6. take part in scientific discourse, [P8S_UK/SzD_U07],
7. plan and implement individual and team research projects, also in the international community, [P8S_UO/ SzD_U09],
8. independently plan and act for their self-development as well as inspire and organize development of others, [P8S_UU/SzD_U010].

Social competencies:
A PhD student who graduated from the doctoral school is ready to:
1. critically assess achievements within a given scientific discipline, [P8S_KK/SzD_K01],
2. critically evaluate their own contribution to development of a given scientific discipline, [P8S_KK/ SzD_K02],
3. fulfilling the social obligations of researchers and creators, [P8S_KO/SzD_K04],
4. maintain and develop the ethos of research and creative communities, including:
- conducting independent scientific activity,

- respecting the principle of public ownership of the results of scientific activities, including the principles of intellectual property protection. [P8S_KR/SzD_K07].

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

An assessment is based on the doctoral student’s involvement in implementing the doctoral project, including the analysis of results and their description as part of the doctoral dissertation, the doctoral student’s public presentations at conferences or seminars, the dissemination of their achievements, and conducting scientific discussions.

The assessment concerns:
- the PhD student's knowledge of issues and proper scientific research methods necessary to implement the undertaken research problem,
- the PhD student's knowledge of adequate presentation and defence of individual ideas and the awareness of the relevance of own results for science or technology.
- the PhD student's ability to solve an assigned problem in doctoral dissertation and an ability to substantiate the applied solution method and obtained results as well as to share own results in the scientific community,
- the PhD student's ability to critically reflect on their own achievements and contribution to science or technology and to conduct independent scientific activity.

Assessment criteria are:
- level of detail and correctness of acquired knowledge, positive attitude to scientific research,
- correctness of the applied solution, dilligence and quality of performance,
- quality of critical reasoning, use of referencing and supporting evidence in drawing conclusions.

The following grading scale is used to assess learning outcomes: very good (5.0), good plus (4.5), good (4.0), satisfactory plus (3.5), satisfactory (3.0), unsatisfactory (2.0). The subject is considered as not completed in the case of a grade of 2.0.

## Programme content

Ongoing supervision over the realization of the individual research plan and the individual education program.

## Course topics

1. Supporting the interdisciplinarity of the doctoral student's research and identifying opportunities for cooperation with various teams.
2. Setting the direction of research, analyzing and discussing of the scientific results.
3. Supporting the interdisciplinarity of the doctoral student's research and identifying opportunities for cooperation with various teams.
4. Setting the direction of research, analyzing and discussing of the scientific results.
5. Verification of the progress of the doctoral student's research work.
6. Agreeing research plans and monitoring their implementation.
7. Substantive assistance in the preparation of the presentation of research results.
8. Indicating opportunities for and assistance in the preparation of applications for research funding and/or research internships.
9. Caring for the scientific development of the doctoral student and the high quality of the doctoral dissertation prepared.
10. Substantive supervision of the doctoral student work.

## Teaching methods

Direct cooperation with the doctoral student, workshops and training, consultations and discussion of the obtained results.

## Bibliography

Basic:

Scientific publications and books related to PhD student's dissertation proposed by supervisor.

Additional:
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## Breakdown of average student's workload

| | Hours | ECTS |
|---|---|---|
| Total workload | 150 | 6,00 |
| Classes requiring direct contact with the teacher | 60 | 2,00 |
| Doctoral student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) | 90 | 4,00 |