

### **COURSE CARD**

### 1. Basic information

Course name in English:	Interdisciplinary seminar - in the field of func materials – physicochemical and mechanical properties	
Course name in Polish:	Seminarium Interdyscyplinarne w zakresie mater funkcjonalnych – właściwości fizykochemiczn mechaniczne	riałów
Number of hours:	15	
Type of course:	Elective course	
Form of course:	seminar	
Code of course:	W03NCH-SD0066S / NCQ100365S	
Course leader:	Professor Andrzej Miniewicz	
Faculty of the course leader:	W3 Faculty of Chemistry	
Email address of the course leader:	Andrzej.miniewicz@pwr.edu.pl	
Scientific discipline(s) assigned to	Architecture and urban planning	
the course (doctoral students	Automation, electronic, and electrical engineering	
representing the marked disciplines can participate in the	Information and communication technology	
course):	Biomedical engineering	$\boxtimes$
,	Chemical engineering	
	Civil engineering and transport	
	Mechanical engineering	
	Environmental engineering, mining, and energy	
	Mathematics	
	Chemical sciences	$\boxtimes$
	Physical sciences	
	Management and quality studies	

## 2. Objectives

Seminar is a didactic form based on preparation by each student a presentation on the subject linked with the seminar title and its oral presentation to the audience. Each presentation will be discussed by participants of the seminar and presenter will comment or answer the questions. Discussion is chaired by teacher. Teacher can evaluate presentation and makes comments both critical and underlining the positive features.

#### 3. Content

Detailed information about the course content, including topics and form of classes.

No.	Topic	Number of	Form of classes
		hours	
1	Introduction, presentation of subjects, agenda	2	seminar
2	Student's presentations and discussion	2	seminar



3	Student's presentations and discussion	2	seminar	
4	Student's presentations and discussion	2	seminar	
5	Student's presentations and discussion	2	seminar	
6	Student's presentations and discussion	2	seminar	
7	Student's presentations and discussion	2	seminar	
8	Summary	1	seminar	
9			Select form	
10			Select form	
11			Select form	
12			Select form	
13			Select form	
14			Select form	
15			Select form	

# 4. Prerequisites

List of prerequisites relating to knowledge, skills and other competences for course participants.

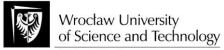
 $Knowledge\ of:\ FUNCTIONAL\ MATERIALS,\ NANOTECHNOLOGY,\ Physics\ and\ chemistry:\ properties$ 

and phenomena, Skills: English language

## 5. Learning outcomes

List of learning outcomes at level 8 of the Polish Qualifications Framework assigned to the course (mark the learning outcomes in the last column).

Symbol	Learning outcome	
	KNOWLEDGE. Doctoral student knows and understands:	
SzD_W3	the main trends in the development of the scientific or artistic disciplines covered	$\boxtimes$
	in the curricula;	
SzD_W4	research methodology;	$\boxtimes$
SzD_W5	the rules for the dissemination of scientific results, including in open access	
	mode;	
SzD_W6	the fundamental dilemmas of modern civilization;	
SzD_W7	the legal and ethical conditions of scientific activity;	
SzD_W8	the economic and other relevant conditions of scientific activity;	
SzD_W9	basic principles of knowledge transfer to the economic and social spheres and	
	commercialisation of results of scientific activity and know-how related to these	
	results.	
	SKILLS. Doctoral student is able to:	
SzD_U2	use knowledge from different fields of science or art to creatively identify, formulate and innovatively solve complex problems or perform research tasks, in particular:	
	<ul> <li>define the purpose and subject of scientific research, formulate a research hypothesis,</li> </ul>	



Doctoral School

	- develop research methods, techniques and tools, and use them creatively,	
	- draw conclusions on the basis of scientific research;	
	critically analyse and evaluate the results of scientific research, expertise and	
	other creative work and their contribution to knowledge development;	
	transfer the results of scientific activities to the economic and social spheres;	
SzD_U3	communicate on specialised topics to the extent that they enable an active	X
	participation in the international scientific community;	
SzD_U4	disseminate research results, including in popular forms;	$\boxtimes$
SzD_U5	initiate debates and participate in a scientific discourse;	$\boxtimes$
SzD_U6	be able to speak a foreign language at B2 level of the Common European	$\boxtimes$
	Framework of Reference for Languages to a level that enables them to participate	
	in the international scientific and professional environment;	
SzD_U7	plan and implement an individual or collective research or creative activity,	
_	including in an international environment;	
SzD_U8	independently plan and act for one's own development and inspire and organize	
_	the development of others;	
SzD_U9	plan classes or groups of classes and implement them using modern methods and	
_	tools.	
	SOCIAL COMPETENCES. Doctoral student is ready to:	
SzD_K3	fulfilling the social obligations of researchers and creators, initiate public interest	
	activities, thinking and acting in an entrepreneurial way;	
SzD_K4	maintaining and developing the ethos of research and creative environments,	$\boxtimes$
	including:	
	- carrying out scientific activities in an independent manner,	
	- respecting the principle of public ownership of research results, taking into	
	account the principles of intellectual property protection.	

### 6. Evaluation

Short description of the method(s) used to evaluate the learning outcomes assigned to the course, e.g., exam, test, report, presentation, etc.

#### Teacher evaluates:

- 1. Scientific content of the seminar
- 2. Graphical layout and logic of the presentation
- 3. Ability to speak correctly and precisely
- 4. Skills in answer to the questions
- 5. Level of understanding of presented subject
- 6. Activity in discussions

#### Conditions of crediting the course

<ol> <li>Quality of presentation.</li> </ol>	0.7 of grade	(1-10 pts.)
2. Activity in discussions.	0.2 of grade	(1-10 pts.)
3. Presence.	0.1 of grade	(1-7 pts.)



## 7. Teaching methods

Short description of the teaching methods used during the course, e.g., multimedia presentation, discussion, literature studies, developing written documents, own work, etc.

Presentation, discussion, literature studies

#### 8. Literature

List of primary and secondary literature used to prepare the course and including additional knowledge for participants, e.g., books, textbooks, research papers, standards, web pages, etc.

Current scientific literature, reviews and books related to the subject

#### 9. Other remarks

Additional remarks, comments, (e.g., language of the course)