

**DOCTORAL SCHOOL OF WROCLAW UNIVERSITY OF SCIENCE AND  
TECHNOLOGY**

**SUPERVISOR DECLARING/CONDUCTING COURSE:** Prof. dr hab. inż. Andrzej Miniewicz

**DEPARTMENT:** Chemical Department

**SCIENTIFIC DISCIPLINE:**, Chemical Sciences

**COURSE CARD**

**Course name in Polish: Seminarium interdyscyplinarne – w zakresie materiałów funkcjonalnych –właściwości fizykochemiczne i mechaniczne**

**Course name in English: Interdisciplinary seminar on functional materials – physiochemical and mechanical properties**

**Course language: english**

**University-wide general course type\*:**

**The course is intended for all PhD students: YES / NO**

~~1) BASIC COURSE~~

~~2) SPECIALIST COURSE~~

**3) SEMINAR**

~~4) HUMANISTIC COURSE~~

~~5) LANGUAGE~~

**Subject code: NCQ100263S**

\* delete as applicable

	Lecture	Foreign language course	Seminar	Mixed forms
Number of hours of organized classes in university (ZZU)			15	
Grading	Exam	Exam	Oral presentation	Exam, inspection, evaluation classes
Number of ECTS points			0	

**PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES**

1. Basic knowledge on master degree level of chemical and physical sciences

**COURSE OBJECTIVES**

C1 Mastering of skills in preparation and oral presentation of seminar via delivering multimedia presentation in English (preferably) language or Polish language

C2 Acquiring advanced knowledge in the branch of science directly related to the field of PhD candidate research, including the most recent scientific achievements described in literature

C3 Development of skills to conduct a scientific discussion in a group of PhD candidates in English or Polish

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**PROGRAM CONTENTS**

<b>Form of classes</b>		<b>Number of hours</b>
Sem 1	Introduction to subjects of seminar. Presentation of general themes and their choice by PhD candidates. Presentation of conditions of crediting of the seminar. Presentation of hints how to prepare good presentation and how to deliver it to the audience.	2
Sem 2	Individual oral seminars of PhD candidates followed by scientific discussion of all listeners, comments of seminar chairman with some critical suggestions of further seminar improvement.	13
Total hours		15

**TEACHING TOOLS USED**

- N1. Methods of audio-visual presentations  
 N2. Scientific discussion with members of the group on the subject related to the seminars

**ACHIEVED SUBJECT LEARNING OUTCOMES**

<b>Type of learning outcome</b>	<b>Code of learning outcome</b>	<b>Assessment of learning outcome</b>
Knowledge	P8S_WG	Depth of understanding of the subject and participation in discussion
Knowledge		
...		
Skills	P8S_UW, P8S_UK	Individual evaluation of oral seminar in the form of presentation
Skills		
...		
Social competences	P8S_KKK	Evaluation of PhD candidates activity during seminar cycle

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**PRIMARY AND SECONDARY LITERATURE**

**PRIMARY LITERATURE:**

- [1] Introduction to Nanoscience and Nanotechnology, G. L. Hornyak, J. Dutta, H. F. Tibbals, A. K. Rao, CRC Press (2008)
- [2] The Physics and Chemistry of Nanosolids, F.J. Owens, C.P. Poole Jr., Wiley-Interscience (2008)
- [3] Introduction to Nanotechnology, C.P. Poole Jr., F.J. Owens, Wiley-Interscience 2003

**SECONDARY LITERATURE:**

- [1] Current publications from scientific journals
- [2] Materials Today
- [3] Advanced Materials
- [4] Nature
- [5] Science

**SECONDARY LITERATURE:**

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

Prof. dr hab. eng. **ANDRZEJ MINIEWICZ**, e-mail: [andrzej.miniewicz@pwr.edu.pl](mailto:andrzej.miniewicz@pwr.edu.pl),