

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

SUPERVISOR/TEAM/ DECLARING/CONDUCTING COURSE: Prof. dr hab. inż. Piotr Młynarz

DEPARTMENT: Chemical Department

SCIENTIFIC DISCIPLINE: Chemical Sciences

COURSE CARD

Course name in Polish: Zastosowanie metod spektroskopowych w chemii strukturalnej

Course name in English: Application of spectroscopic methods in structural chemistry

Course language Polish / 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: NCQ100262W

* delete as applicable

	Lecture	Foreign language course	Seminar	Mixed forms
Number of hours of organized classes in university (ZZU)	30			
Grading	Exam	Exam	Oral presentation	Exam, inspection, evaluation classes
Number of ECTS points	0			

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Organic Chemistry
2. Inorganic Chemistry

COURSE OBJECTIVES
NCQ100262W

PROGRAM CONTENTS

Form of classes – lecture (Lec)		Number of hours
Lec1	Overview of spectroscopic methods	2
Lec2	Practical solution of structures based on spectra data	2
Lec3	Theoretical aspects of NMR spectroscopy	2
Lec 4	One dimensional NMR data analysis	2
Lec 5	Two dimensional NMR data analysis	2

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Lec 6	Special examples of NMR application	2
Lec 7	Dynamic NMR spectroscopy	2
Lec 8	NMR of metal complexes	2
Lec 9	Theoretical aspect of IR spectroscopy	2
Lec 10	Introduction to Raman spectroscopy	2
Lec 11	Application of group theory in spectral data analysis	2
Lec 12	Introduction to MS spectrometry	2
Lec 13	Symmetry of the molecule in spectra data analysis	2
Lec 14	Application of group theory in analysis of spectra analysis	2
Lec 15	Egzam	2
Total hours:		30

Form of classes – foreign language course (Lng)		Number of hours
Lng1		
Lng2		
Lng3		
..		
Total hours:		

Form of classes – seminar (Sem)		Number of hours
Sem1		
Sem2		
Sem3		
...		
Total hours:		

Form of classes – mixed forms (mix)		Number of hours
Mix1		
Mix2		
Mix3		
...		
Total hours		

TEACHING TOOLS USED
N1. Power point presentations N2. N3.

ACHIEVED SUBJECT LEARNING OUTCOMES		
Type of learning outcome	Code of learning outcome	Assessment of learning outcome
Knowledge	P8S_WG	student has a sound knowledge of basic subjects such as

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		mathematics, physics, chemistry or others - has an advanced knowledge fundamental to a field relevant to his/her research, including the most advanced methods of research and verification of results achieved
Knowledge		
...		
Skills	P8U_U	- is able to classify scientific publishers, including scientific journals, and scientific achievements according to accepted rules for: - journals included in international databases Scopus and Web of Science - impact factor (if), - quoting, - Hirsch index, - i10-indicator
Skills		
...		
Social competence		
Social competence		
...		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

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- [1] Gross Jurgrn Mass Spectrometry
- [2] Mitchell Terence N. NMR-from spectra to structures
- [3] Max Diem, Eds, Vibrational Spectroscopy for Medical Diagnosis
- [4] Friebolin, Horst, Basic one and two dimmensional NMR spectroscopy
- [5] Materials provided by lecturer

SECONDARY LITERATURE:

- [1] Eljchartt Andrzej, NMR w cieczach: zarys teorii i metodologii.
- [2] Greaves John, Mass spectrometry for novice.

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

Prof. dr hab. inż. Piotr Mlynarz, Piotr.Mlynarz@pwr.edu.pl