



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Identification of Organic Compounds -advanced level

		Course
Field of study		Year/Semester
Environmental Protection Technologies		III/5
Area of study (specialization)		Profile of study
-		general academic
Level of study		Course offered in
First-cycle studies		Polish
Form of study		Requirements
full-time		elective

		Number of hours
Lecture	Laboratory classes	Other (e.g. online)
0	30	0
Tutorials	Projects/seminars	
0	0	
Number of credit points		
3		

		Lecturers
Responsible for the course/lecturer:		Responsible for the course/lecturer:
prof. dr hab. inż. Adam Voelkel		

Prerequisites
Basic physical, inorganic, organic and analytical chemistry on academic level; Can use basic laboratory techniques of separation and cleaning of chemical compounds

Course objective

Gaining the skills of the application of spectroscopic methods (UV, IR, NMR (1H NMR, 13C NMR; 2D NMR), MS, Raman) for identification of organic compounds and determination of their structure.

Course-related learning outcomes

Knowledge

1. knowledge in the field of techniques, methods connected with identification of organic pollutants in the environment - [K_W07,K_W09]
2. can describe methods, techniques, tools and materials used for the solution of simple problems connected with identification of substances during solving the problems connected with the field of study - [K_W05, K_W12, K_W13]



Skills

1. Student can select the proper spectroscopic technique for basic qualitative and quantitative determination of organic compounds - [K_U11, K_U12, K_U13]
2. has basic skills for maintenance of basic tools (methods) for solving the problem in the field of environment analysis - [K_U15, K_U18]
3. Student can use specialist English . - [K_U03, K_U05, K_U08]

Social competences

Student understands the need to supplement her/his education and increasing professional competences. - [K_K01]

2. Student has the awareness to obey the engineer ethic rules. - [K_K02, K_K05]
3. Student can act and cooperate in the group accepting different roles. - [K_K03]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Permanent control before laboratory classes. Written reports from exercises

Programme content

Course will offer the extension of the knowledge on the techniques applying the interactions of electromagnetic radiation with the molecules of organic compounds as well as the possibilities of their use for identifications of organic species. Possibilities and limitations of: UV/VIS, IR/FTIR, NMR (¹H NMR, ¹³C NMR; 2D NMR), MS, Raman are discussed. Sample preparation is presented during laboratory practice..

Teaching methods

laboratory classes

Bibliography

Basic

1. Spektroskopowe metody identyfikacji związków organicznych, R.M. Silverstein,
F.X. Webster, D.J. Kremler, PWN, Warszawa, 2007
2. Metody spektroskopowe wyznaczania struktury związków organicznych, L.A. Kazicyna,
N.B. Kupletska, PWN, Warszawa, 1974
3. Określanie struktury związków organicznych metodami spektroskopowymi, M. Szafran,
Z. Dega-Szafran, PWN, Warszawa, 1988



4. Metody spektroskopowe i ich zastosowanie do identyfikacji związków organicznych,

W. Zieliński, praca zbiorowa, WNT, Warszawa, 1995.

5. Spektroskopia mas związków organicznych, A. Płaziak, wyd. UAM, Poznań, 1997.

Additional

1. N.P.G. Roeges, A guide tot He complete interpretation of infrared spectra of organic structures, Wiley, Chichester, 1994.

2. J.S. Splitter, F. Turecek, Application of mass spectrometry to organic stereochemistry, VCH, New York, 1994.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	45	2,0
Student's own work (literature studies, preparation for laboratory) ¹	30	1,0

¹ delete or add other activities as appropriate