



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Methods of organic compounds analysis [S1TCh2>MAZO]

### Course

Field of study

Chemical Technology

Year/Semester

3/6

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

15

Other

0

Tutorials

15

Projects/seminars

0

### Number of credit points

3,00

### Coordinators

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### Lecturers

### 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 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\_W03, K\_W11]
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\_W07, K\_W15]

Skills:

1. Student can select the proper spectroscopic technique for basic qualitative and quantitative determination of organic compounds - [K\_U11, K\_U16, K\_U20]
2. has basic skills for maintenance of basic tools (methods) for solving the problem in the field of environment analysis - [K\_U07, K\_U21]
3. Student can use specialist English - [K\_U03]

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:

On-site exam / online exam via e-learning courses: The knowledge acquired during the lecture is verified by a written exam consisting of 20 multiple-choice questions and 5 open-ended questions. Passing threshold: 50% correct answers. The test questions are multiple choice. The final grade may take class participation into account.

For practical classes: Class active participation (minimum 4 times) – 10%, completion of a comprehensive assignment – written midterm test – 90%.

For laboratory classes: Theoretical preparation for laboratory sessions (test / oral response), completion of 4 laboratory exercises, and analysis of the obtained results along with preparation of reports from the practical exercises.

## Programme content

Issues concerning the application of spectroscopic methods for identification of organic compounds and determination of their structure.

## Course topics

Problems of the course are connected with the application of the interaction of electromagnetic radiation with the molecules of organic compounds and its use for identification of organic species. The theoretical background enabling the understanding the rules of UV/VIS spectroscopy, IR, NMR and MS. The possibilities and limitations of these techniques are presented and discussed. Sample preparation methods are discussed and further used during laboratory classes. Experimental technique is presented on level enabling contact with the operator of more sophisticated equipment.

## Teaching methods

lecture, 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.
6. Spektrofotometria UV/VIS w analizie chemicznej, T. Nowicka-Jankowska, E. Wieteska, K. Górczyńska, A. Michalik, PWN, Warszawa 1988

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	3,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00