



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Identification of organic compounds [S11ChiP1>IZO1]

### Course

Field of study

Chemical and Process Engineering

Year/Semester

3/5

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

0

Projects/seminars

0

### Number of credit points

2,00

### Coordinators

prof. dr hab. inż. Ewa Kaczorek  
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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:

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On-line / stationary credit through e-courses

The lecture ends with a written test verifying the knowledge acquired during the course. Credit consists of 20 test questions (multiple-choice test) and 5 open questions. Minimum number of points to pass: 50% of points.

Oral and written assessment of student knowledge prior to laboratory sessions, plus a final test on the interpretation of a set of spectra. Written reports on completed exercises.

### Programme content

Issues relating to the use of spectroscopic methods to identify organic compounds and determine 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 the self-maintenance of popular equipment and 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. Kupletskaya, 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 to the 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	50	2,00
Classes requiring direct contact with the teacher	35	1,20
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	15	0,80