



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Identification of organic compounds [S1IFar2>IZO]

### Course

Field of study

Pharmaceutical 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

30

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

0

### Number of credit points

2,00

### Coordinators

prof. dr hab. inż. Ewa Kaczorek  
ewa.kaczorek@put.poznan.pl

### Lecturers

### Prerequisites

1. Basic knowledge of inorganic, organic, physical and analytical chemistry. 2. Experience in basic laboratory techniques in synthesis, isolation and purification chemical compounds. 3. Understanding the need for further training and increasing professional and personal competences.

### Course objective

To acquire the ability to use spectroscopic methods (UV, IR, Raman, NMR) and mass spectrometry to identify organic compounds and determine their structure.

### Course-related learning outcomes

Knowledge:

1. Student has knowledge of techniques and methods for the characterization and identification of chemicals, typical environmental pollution. Student is able to describe the methods, techniques, tools and materials used in solving simple problems related to the identification of the substance with which it may encounter realizing pharmaceutical engineering tasks. [K\_W7]

Skills:

1. Student uses spectroscopic methods for basic qualitative and quantitative determinations organic compounds. Student is able to determine the suitability and choose tools (methods) to solve the problem with scope of pharmaceutical engineering. [K\_U8]

Social competences:

1. Student understands the need to improve professional qualifications. Student is responsible for the tasks carried out in the team. [K\_K1]

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Stationary / on-line credit through e-courses:

The lecture ends with a written test verifying the knowledge acquired during the course (or is verified by two 45-minute tests carried out during the 7th and 15th lectures). Credit consists of 20 test questions (multiple-choice test) and 5 open questions. Minimum number of points to pass: 50% of points.

### Programme content

The program covers the following topics:

1. Interaction of electromagnetic radiation with matter.
2. Theoretical basis: UV/VIS, IR, Raman, NMR and MS spectroscopy.
3. Interpretation of spectra.

### Course topics

The programme focus on the use of electromagnetic radiation interaction with molecules of organic compounds and the possibilities of using these phenomena to identify them. The theoretical base, which are necessary to understand the principles of UV / VIS, IR, Raman, NMR and MS are discussed. Moreover, opportunities and limitations of the above research techniques are presented. The scope of information presented allows individual spectra interpretation. The experimental technique is sufficiently presented to contact with operator of highly specialized equipment.

### Teaching methods

Lecture with multimedia presentation, discussion with students.

### 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 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	55	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00