Detailed course description (SUBJECT CARD)

Course title: Selected topics	in chemistry and chemical technology
Course code:	
Classification of a course gro	oup:
Course type:	field-related
	obligatory
Field of study:	chemistry
Level of study:	second-cycle*
Profile of study:	general academic*
Mode of study:	full-time programme*
Specialty (specialisation):	
Year of study:	2
Semester:	3
Teaching modes and teachin	g hours:
	lectures – 15
Language/s of instruction: E	nglish
Number of ECTS credits (acc	ording to the study programme): 1
* – leave the appropriate option	

1. Course objectives:

Familiarize with subjects of high current societal and economical impact

2. Relation of the field-related learning outcomes to modes of teaching and methods of verification as well as to assessment of student's learning outcomes:

symbol	assumed learning outcomes a student who completed the course:	teaching modes	verification methods and learning outcomes assessment
Knowledge: a student knows and understands			
K2A_W02	Has a well-established and expanded knowledge of the selected specialty	Lecture	presentation

3. The content of study programme ensuring learning outcomes (according to the study programme):

Obtaining extended and in-depth knowledge of chemical technology and related areas. Gaining knowledge of the latest trends in the development of chemical and material technologies. Mastering the ability to communicate with specialists and non-specialists in the field of chemical technology in a foreign language.

4. Description of methods of determination of ECTS credits:

Type of activity	Number of hours / ECTS credits
Number of course hours regardless of a teaching mode	15/0,5
Student's workload 1*	15/0,5
Student's workload 2*	-
Student's workload n*	-
The other**	-
Total hours:	30
Number of ECTS credits allocated to a course	1

Explanation:

* - student's workload - fill in the types of activities, e.g. preparation for a course, interpretation of results, making a course report, preparation for an exam, studying sources, making a project, presentation and report, doing written assignment, etc.

- the other e.g. extra course hours

5. Summary indexes:

- number of course hours and ECTS credits at the course with a direct participation of academic teachers or other persons running the course and supervising students; 15/0,5
- number of course hours and ECTS credits at the course related to the scientific activity conducted at the Silesian University of Technology in a discipline or in disciplines to which a field of study is assigned - in the case of studies with a general academic profile;15/0,5
- number of course hours and ECTS credits at the course developing practical skills- in the case of practical

studies;-

- number of course hours conducted by academic teachers employed by the Silesian University of Technology as their primary workplace.15/0,5
- 6. Persons conducting particular modes of courses (name, surname, academic degree or degree in arts, title of professor, business e-mail address):

Lectures: Tomasz Krawczyk, dr hab. inż, e-mail: tomasz.krawczyk@polsl.pl Aleksandra Rybak, dr hab. inż., e-mail: aleksandra.rybak @polsl.pl

- 7. Detailed description of teaching modes:
 - 1) lectures:
 - detailed programme's content:
 - The program covers the following topics
 - 1. Natural and anthropogenic causes of climate change, natural cycles
 - 2. Fossil fuels, applications, transport, side effects of mass use
 - 3. Alternative energy sources
 - 4. The use of membrane technologies in water and wastewater treatment
 - 5. Separation of gas mixtures (polymer, inorganic, composite membranes
 - 6. The use of membranes in industry, environmental protection and energy
 - 7. Characteristics of organic-inorganic hybrid membranes and their applications
 - teaching methods, including distance learning:
 - 1. Multimedia presentation
 - 2. Participation in the discussion forum at https://platforma.polsl.pl
 - 3. Interactive tools during the lecture
 - form and criteria for semester completion, including retake tests, as well as conditions for admission to the examination:
 - 1. Completion of the lecture is based on a positive assessment of two presentations on a selected topic
 - 2. The condition for a positive evaluation is obtaining a positive evaluation from both presentations.
 - 3. An improvement from a rating of 3.0 or higher to a higher one is possible once and is done orally.
 - course organisation and rules of participation in the course, with an indication whether a student's attendance is obligatory

Attendance at lectures is not obligatory

- 2) description of other teaching modes:
- 8. Description of the method for determining the final grade (rules and criteria for evaluation, as well as the final grade calculation method in the case of a course comprising more than one teaching mode, taking into account all teaching modes and all exam dates and credit tests including retake exams and tests):

The final grade for the subject corresponds to the arithmetic mean of the marks from the two presentations. Both partial marks must be at least 3.0.

- 9. Method and procedure for making up for
 - student's absence from the course,
 - Depending on the form of the missed classes, it is determined by the tutor during consultations in accordance with the forms of conducting classes and the conditions of passing specified in point 7 of this sheet.
 - differences in study programmes for students changing their field of study, changing university or resuming studies at the Silesian University of Technology,

Depending on the arrears, it is determined by the tutor during consultations in accordance with the forms of conducting classes and the conditions of passing specified in point 7 of this sheet.

10. Prerequisites and additional requirements, taking into account the course sequence:

knowledge of general chemistry, basics of physics, English

- 1. Recommended sources and teaching aids:
 - David J. C. MacKay, Sustainable Energy without the hot air (2009), Uit Cambridge Ltd, Cambridge, United Kingdom
 - H. Strathmann, Introduction to Membrane Science and Technology, Wiley-VCH, 2011
 - R.W. Baker, Membrane Technology and Applications (third edition), J. Wiley and Sons Ltd., Chichester 2012
 - Oscillations of the baseline of solar magnetic field and solar irradiance on a millennial timescale, V.
 V. Zharkova, S. J. Shepherd, S. I. Zharkov & E. Popova , Scientific Reports volume 9, Article number: 9197 (2019)
 - M. Mulder, Basic Principles of Membrane Technology, Kluwer Academic Publisher 1991
 - M. Bodzek, J. Bohdziewicz, K. Konieczny, Techniki membranowe w ochronie środowiska, Wydawnictwo Politechniki Śląskiej, Gliwice 1997
 - Narębska (red.): Membrany i membranowe techniki rozdziału. Wydawnictwo Uniwersytetu Mikołaja Kopernika, Toruń 1997.
- 2. Description of teachers' competences (e.g. publications, professional experience, certificates, trainings etc. related to the programme contents implemented as a part of the course):

dr. hab. inż. Tomasz Krawczyk: is the author of publications in the field of chemistry and chemical technology, has many years of experience in conducting didactic classes related to chemical technology, chemistry and process simulation.

dr. hab. inż. Aleksandra Rybak: is the author of publications in the field of chemistry and membrane technologies, has many years of experience in conducting classes related to chemistry and membrane technology

3. Other information: