

Cracow University of Technology

## Course syllabus

binding for the doctoral students of the CUT Doctoral School commencing their studies  
in the academic year 2022/2023

### Information on the course

Name of the course in Polish	Alternatywne procesy technologiczne
Name of the course in English	Alternative processes in technology
Number of the ECTS points	1
Language of instruction	Polish/English
Category of the course	Elective
Field of education	Engineering and Technology
Discipline of education	Chemical Engineering
Person responsible for the course Contact	Izabela Czekaj, <i>doctus habilitatus</i> , DSc, prof.of CUT izabela.czekaj@pk.edu.pl

### Type of course, number of hours in the study programme curriculum

Semester	Credit type (G / NG)*	Lecture	Practical class	Laboratory	Computer laboratory	Project class	Seminar
5	G	15	0	0	0	0	0

\*G – graded credit, NG – non-graded credit

### Course objectives

Code	Objective description
Objective 1	To acquaint doctoral students with alternative raw materials to obtain a given end product.
Objective 2	To acquaint doctoral students with alternative products obtained from the same raw material.
Objective 3	To acquaint doctoral students with the role of a catalyst in technological processes

### Learning outcomes

Code	Description of the learning outcome adjusted to the specific characteristics of the discipline	Learning outcome symbol in the CUT SD	Methods of verification
<b>OUTCOMES RELATED TO KNOWLEDGE</b>			
EUW1	The doctoral student knows and understands the processing of chemical raw materials.	E_W01, E_W02	Involvement in class activities; giving a paper; a test
EUW2	The doctoral student knows and understands selected unit processes illustrating alternative technological schemes.	E_W01, E_W02	Involvement in class activities; giving a paper; a test
<b>OUTCOMES RELATED TO SKILLS</b>			

EUU1	The doctoral student is able to solve a given technological problem on the basis of literature data.	E_U01	Giving a paper; a presentation
EUU2	The doctoral student is able to present the examined issue.	E_U01	Giving a paper; a presentation
<b>OUTCOMES RELATED TO SOCIAL COMPETENCES</b>			
EUK1	The doctoral student is prepared to critically evaluate the technological methods used and to analyse the possibilities of applying the best alternative technological process on a given market, described in the subject literature.	E_K01, E_K03	Involvement in class activities; evaluating a presentation

### Course outline

No.	Contents	Learning outcomes for the course	No. of hours
<b>LECTURE</b>			
W1	Alternative methods for obtaining styrene and ethylene dichloride.	EUW1, EUW2, EUU1, EUK1	2
W2	Alternative methods for the production of fuels and energy.	EUW1, EUW2, EUU1, EUU2, EUK1	2
W3	Alternative methods for obtaining phenol.	EUW1, EUW2, EUU1, EUU2, EUK1	2
W4	Alternative methods for the production of urea.	EUW1, EUW2	2
W5	Alternative methods for the production of melamine.	EUW1, EUW2	2
W6	Alternative catalytic methods in organic technology.	EUW1, EUW2, EUU1, EUU2, EUK1	2
W7	Alternative technological methods in organic technology – developing new technologies.	EUW2, EUU1, EUU2, EUK1	3

### The ECTS points statement

WORKING HOURS SETTLEMENT	
Type of activity	Average number of hours (45 min.) dedicated to the completion of an activity type
<b>SCHEDULED CONTACT HOURS WITH THE ACADEMIC TEACHER</b>	
Hours allotted in the syllabus	15
Consultations	5
Examination / course credit assignment	1
<b>HOURS WITHOUT THE PARTICIPATION OF THE ACADEMIC TEACHER</b>	
Independent study of the course contents	5
Preparation of a paper, report, project, presentation, discussion	4
<b>ECTS POINTS STATEMENT</b>	
Total number of hours	30

The ECTS points number	1
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### Preliminary requirements

No.	Requirements
1	Raw materials and processes in chemical technology.
2	Physical chemistry.

### Course credit assignment conditions / method of the final grade calculation

No.	Description
COURSE CREDIT ASSIGNMENT CONDITIONS	
1	80% attendance in class. Presentation of a paper.
METHOD OF THE FINAL GRADE CALCULATION	
Weighted average of the test and presentation grades.	

### Additional information

None
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### The course reading list

1	Scientific journals — <i>Przemysł Chemiczny, Chemik, Catalysis Today, Hydrocarbon Processing, Wiadomości, Chemiczne, J. of Catal. Appl. Catal., Nafta, Chem. Rev.</i>
2	J.A. Moulijn, M. Makkee and A. van Diepen - <i>Chemical process technology</i> . John Wiley and Sons Ltd, Chichester, 2001.
3	Klaus Weissermel, Hans-Jürgen Arpe - <i>Industrial Organic Chemistry</i> , WILEY-VCH Verlag, 2003.