

**Formularz opisu przedmiotu (formularz sylabusu) na studiach wyższych,
doktoranckich, podyplomowych i kursach doszkalających**

A. Ogólny opis przedmiotu

Nazwa pola	Komentarz
Name of the subject (in Polish and English)	Technologia i inżynieria chemiczna Chemical technology and engineering
Unit offering the subject	Faculty of Chemistry
Unit for which the subject is offered	Faculty of Chemistry
Subject code	0600-S1-O-TIC
ERASMUS code	13301
Number of ECTS credits	3 ECTS
Method of assessment	lecture- examination tutorial- graded credit
Language of instruction	English
Designation whether a subject may be credited more than once	No
Allocation of the subject to subject groups	Obligatory subject
Total student workload	Contact hours with teacher - 45 contact hrs: - participation in lectures - 15 hrs - participation in seminar - 30 hrs Self-study hours: - individual work - 15 hrs - preparation of the assessment process - 15 hrs Altogether: 75hrs (3ECTS) 75h: 25h/ECTS = 3 ECTS
Learning outcomes - knowledge	W1: knows basic rights and chemical nomenclature - K_W01. W2: has knowledge in the basics of the technology and chemical engineering - K_W15.
Learning outcomes - skills	U1: know how to use chemical nomenclature and concepts of general chemistry- K_U01. U2: is able to solve the basic problems related to the implementation of technological processes - K_U15.
Learning outcomes - social competencies	K1: Knowledgeable of how to work effectively, the correct drawing conclusions. It is conscientious, thorough and systematic - K_K01, K_K02. K2: aims to acquire new knowledge, see the need for continuous improvement of professional competence - K_K05.
Teaching methods	Lecture: Conventional lecture using multimedia presentations. Seminar: Searching teaching methods: the tasks entrusted to students in the form of papers, presentations, discussion, classical problem method.
Prerequisites	Basic knowledge of general, analytical and physical chemistry
Brief description of the subject	The aim of the course is to acquaint students with selected aspects of modern chemical technologies, including the principle of rational use of raw materials and energy complex development of industrial waste on the basis of selected processes in the field of inorganic technology. Classes also cover issues related to sustainable development, with the

	introduction of the principles of "green chemistry" into industrial practice and the generation of energy from renewable sources.
Complete description of the subject	<p>Lecture The choice of technological process conditions, kinetics of processes, contact processes, fuel gasification, fuel degassing, thermal and catalytic cracking, the principles of technology, unit operations, raw materials, fuels, detailed technologies – HNO₃, NH₃, H₂SO₄, Na₂CO₃, CO(NH₂)₂, ceramic mortars, technologies of phosphoric compounds processing, fertilizers, electrochemical and metallurgical industry, fundamental organic synthesis (synthesis based on carbon monoxide and hydrogen gas, sulfonation and nitration of inorganic compounds, selective reduction and hydrogenation processes, and chlorination).</p> <p>Seminar Non-waste technological processes; utilization of industrial waste products (especially inorganic) on the base of some selected technological processes; sewage treatment, combustion gases purification from heat and power station; pulp and paper industry, sugar industry, dairy industry, glass-making industry, cosmetic industry, explosive industry, spirit industry; production and processing of plastics, paints and lacquers; phosphoric fertilizers; soda industry, nitric industry, phosphoric industry – waste disposal (new technologies).</p>
Literature	<p>Literature: A. Diepen, J.A. Moulijn, M. Michiel Chemical Process Technology, John Wiley&Sons, 2001. R. E. Kirk-Othmer, Encyclopedia of Chemical Technology, John Wiley&Sons, New York 2007. http://www.chemexpo.com</p>
Assessment methods & criteria	<p>Lecture: written examination - W01, W15, U01, U15, K01, K05 Seminary: credit grade - W01, W15, U01, U15, continuous assessment of student in the class (class participation, commitment, diligence, preparation for classes), evaluation of individually prepared projects - K01, K03, K05. Assessment criteria: Thresholds evaluate compatibles with the rules of UMK Lecture: written examination (multiple choice test questions and open-ended questions) Seminary: credit rating based on continuous observation of the student in the class, class participation, commitment, diligence, preparation for classes, evaluation of individually prepared projects. satisfactory - 50-60%, satisfactory plus - 61-65%, good - 66-75%, good plus - 76-81%, very good - 82-100%</p>
Work placement	not applicable

B) Opis przedmiotu cyklu

Nazwa pola	Komentarz
Didactic cycle	2014/2015 S (summer)
Method of assessment of the subject in the cycle	<i>lecture- written examination seminar- graded credit</i>
Type of classes, number of hours of classes and methods of assessment	Lecture - 15 hrs; examination Seminar - 30 hrs; graded credit
Subject coordinator	<i>Dr Krzysztof Mazurek</i>

Subject teachers	Lecture: <i>Dr Krzysztof Mazurek</i> Seminar: <i>dr hab. Urszula Kielkowska, dr Krzysztof Mazurek</i>
Nature of the subject	Obligatory subject
	Lecture group - all students Seminar group- 22 students
Time and place	Faculty of Chemistry, date will be specified later
Learning outcomes	As in part A
Assessment methods & criteria	As in part A
List of topics	<p>Lecture:</p> <ol style="list-style-type: none"> 1. Physicochemical basis of technological processes. 2. Technological rules. 3. Technological diagrams. 4. Raw materials of chemical industry. 5. Tasks chemical technology, the choice of technological process conditions and its division into separate steps (unit operations, unit processes). 6. Rules of rational use of energy and raw materials based on the selected processes of inorganic technology. 7. "Green Chemistry" - selected issues. <p>Seminar:</p> <ol style="list-style-type: none"> 1. Extending the knowledge in the technological terms given, non-waste technological processes. 2. Utilization of waste products in chemical industry, especially inorganic industry (selected technologies). 3. Method of wastewater and CHP gas purification. 4. Pulp and paper industry.
Teaching methods	As in part A
Literature	As in part A