

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Fundamentals of Electrotechnics and Electronics		Code 1010702211010700636
Field of study Chemical Technology	Profile of study (general academic, practical) general academic	Year /Semester 1 / 1
Elective path/specialty Industrial Electrochemistry	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: - Classes: - Laboratory: 30 Project/seminars: -		No. of credits 3
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) university-wide
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 3 100% 3 100%
Responsible for subject / lecturer: dr hab. inż. Krzysztof Jurewicz email: krzysztof.jurewicz@put.poznan.pl tel. 61 665 3657 Wydział Technologii Chemicznej ul. Berdychowo 4 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	The student should be familiar with the issues of a electricity included in the program of lectures "Elements of electrical engineering and electronics" (I degree studies in Chemical Technology). - Theoretical knowledge on the topics which is listed in the instructions to the currently implemented exercise and literature cited there.
2	Skills	The student should be able to pursue self-directed learning
3	Social competencies	The student should understand the need for further self-learning and the learning of others (students)
Assumptions and objectives of the course: approximation in terms of practical theoretical knowledge learned from the lectures in the field of electrical engineering, electronics and metrology for a better understanding of the principles of construction and operation of electrical equipment, power supply systems, control and measurement systems and control systems and automatic control, which are used in chemical industrial processes and laboratory studies and develop skills connecting electrical circuits and the measurements with particular emphasis on the needs of electrochemistry.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Student has an basic knowledge of the fundamentals of electrical engineering and electronics - [K_W11] 2. Student has an established knowledge of the health and safety of electrical engineering - [K_W10]		
Skills:		
1. Student has the ability to present a professional research results in the form of a report - [K_U06] 2. Student is able to critically assess the practical suitability of the use of new developments in chemical technology - [K_U17] 3. Student is able to critically assess the results of experimental studies and to determine the direction of further research leading to solutions to the problems of electrical engineering - [K_U21]		
Social competencies:		
1. Student follows all the rules of teamwork; is aware of the responsibility for joint ventures and achievements at work - [K_K04] 2. Student is able to think and act in a creative and enterprising - [K_K06]		

Assessment methods of study outcomes		
<p>Forming Evaluation: Audit questions during exercise, evaluation of reports on the realization of the exercise. Summary Evaluation: Validation of the Forming Evaluation and final objective exam in writing. The exam consists of computing task and theoretical questions with assigned the number of points for the task and each question. The exam is passed after obtaining over 50% of the points. Student may take the exam after completing the lab.</p>		
Course description		
<p>Exercise 1: Measurements of current, voltage and power in DC circuits. Exercise 2: Measurement of resistance by different methods. Exercise 3: SEM measurement with compensation method. Exercise 4: Nonlinear electrical elements and semiconductor temperature sensors. Exercise 5: Examination of SCRs. Exercise 6: Bipolar transistors. Exercise 7: Operational amplifier. Exercise 8: Analog and digital integrated circuits. Exercise 9: Digital control circuits with relays and contactors. Exercise 10: The study of the dynamic properties of linear systems. Exercise 11: Automatic control system. Potentiostat. Exercise 12: Two-joint temperature regulations.</p>		
Basic bibliography:		
<p>1. Elektrotechnika I elektronika dla nie-elektryków, Praca zbiorowa WNT 2013 r. (ISBN: 978-83-63623-64-7) 2. Wł. Opydo, Elektrotechnika i elektronika dla nie-elektryków, Skrypt PP 3. Instrukcje do ćwiczeń</p>		
Additional bibliography:		
<p>1. P. Fabijański, A. Wójcik. Praktyczna elektrotechnika ogólna. Wyd.REA (ISBN: 83-7141-515-X) 2. T. Stacewicz, A. Kotlicki. Elektronika w laboratorium naukowym. PWN, Warszawa 1994 r. 3. J. Parchański, Miernictwo elektryczne I elektroniczne WSiP (ISBN: 83-02-07042-4) 4. J. Pasierbiński, M. Rusek, Elementy i układy elektroniczne w pytaniach i odpowiedziach WNT (ISBN: 83-204-3182-4)</p>		
Result of average student's workload		
Activity	Time (working hours)	
1. Laboratory	30	
2. Consultation lab	10	
3. Preparation for laboratory	18	
4. Consultation exam	10	
5. Exam Preparation	15	
6. Exam	2	
Student's workload		
Source of workload	hours	ECTS
Total workload	85	3
Contact hours	52	0
Practical activities	30	0