STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Fundamentals of chemical technology / chemical reactors**		Code **xxx**

Field of study **Environmental Protection Technologies**	Profile of study (general academic, practical) **general academic**	Year /Semester **3/5**

Elective path/specialty **-**	Subject offered in: **Polish**	Course (compulsory, elective) **elective**

Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **full-time**

No. of hours Lecture: **-** Classes: **-** Laboratory: **-** Project/seminars: **15**	No. of credits **1**

Status of the course in the study program (Basic, major, other) **basic**	(university-wide, from another field) **university-wide**

Education areas and fields of science and art **technical sciences** **technical sciences**	ECTS distribution (number and %**)** **1 100%** **1 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	**W1** The graduate has a knowledge of mathematics which allows him/her to use mathematical methods to describe chemical processes and to perform calculations needed in engineering practice.
2	**Skills**	**U1** The graduate can obtain necessary information from literature, databases and other sources related to chemical sciences, interpret them properly, draw conclusions, formulate and justify opinions.
3	**Social competencies**	**K1** The graduate understands the need to develop and improve their professional, personal and social competences.

Assumptions and objectives of the course:

Achieving knowledge in the field of chemical technology

Study outcomes and reference to the educational results for a field of study

Knowledge:	
1. The graduate has a knowledge of mathematics which allows him/her to use mathematical methods to describe chemical processes and to perform calculations needed in engineering practice.	**K_W01, T1A_W01**
2. The graduate knows the foundations of kinetics, thermodynamics and catalysis of chemical processes.	**K_W08, T1A_W03**

Skills:	
1. The graduate works individually and works effectively in a team.	**K_U02, T1A_U02**
2. The graduate uses computer programs assisting the implementation of typical tasks in *environmental protection technologies*.	**K_U07, T1A_U08**

Social competencies:	
1. The graduate can cooperate and work in a group, accepting various roles in it.	**K_K03, T1A_K03**

Assessment methods of study outcomes
Evaluation of developed projects

Course description
Students develop projects related to the mathematical description of chemical reactors using non-linear algebraic and differential equations.

Basic bibliography:
1 J. Szarawara, J. Skrzypek, A. Gawdzik, "Podstawy inżynierii reaktorów chemicznych", WNT Warszawa 1991.
2 A.Burghardt, G. Bartelmus, „Inżynieria reaktorów chemicznych", PWN Warszawa 2001.
3 M. Wiśniewski, K. Alejski, Podstawy technologii chemicznej i inżynierii reaktorów, Wyd. P. P., Poznań 2017.

Additional bibliography:
1 S. Bretsznajder, W. Kawecki, J. Leyko, R. Marcinkowski, "Podstawy ogólne technologii chemicznej", WNT Warszawa 1973.
2 A. L. Myers, W.D. Seider, "Obliczenia komputerowe w inżynierii chemicznej", WNT Warszawa 1979.

Result of average student's workload	
Activity	**Time (working hours)**
1. Participation in classes	15
2. Realization of the project tasks	5
3. Participation in consultations related to the implementation of the project	5

Student's workload		
Source of workload	**hours**	**ECTS**
Total workload	25	1
Contact hours	20	
Practical activities	5	