STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Engineering of Selected Processes**		Code **1010702111010722580**
Field of study **Chemical and Process Engineering**	Profile of study (general academic, practical) **(brak)**	Year /Semester **1 / 1**
Elective path/specialty **Chemical Engineering**	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: **1** Classes: **-** Laboratory: **-** Project/seminars: **2**		No. of credits **3**
Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(brak)**	
Education areas and fields of science and art **technical sciences** **Technical sciences**		ECTS distribution (number and %) **3 100%** **3 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	The student should know the basic laws the of mass, heat and momentum transfer, fundamentals of chemical engineering and chemical reactor engineering. He should also have knowledge about the design of the apparatus of the chemical and food industries, etc.
2	**Skills**	Ability to solve elementary problems of chemical engineering on the basis of their knowledge of mathematics, physics and chemistry, the ability to acquire information from the indicated sources.
3	**Social competencies**	The student is conscious of the advantages and limitations of individual and group work in solving the problems of an industrial nature. In addition, the student knows the limits of his knowledge and sees the necessity of its deepening

Assumptions and objectives of the course:

Introduction of students for basic knowledge of the processing of the chemical industry, food, agriculture pharmaceutical, cosmetics and plastics, and the acquisition by the student design skills in your chosen equipment manufacturing industry in the scope defined by the curriculum content appropriate to the the field of study

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

Knowledge:

1. The student should individual solve a technological problem for the design of process equipment in the chemical and related industries, as well as appropriately choose equipment and process parameters occurring in them - [[K_W04]]

2. The student should be aware of the dangers and threats resulting from the selected processes and reactions that occur in the processing industry - [[K_W09]]

3. The student has a thorough knowledge of the chemical and mechanical processes and processing techniques associated with chemical engineering and can solve basic tasks associated with this - [[K_W03, K_W13]]

Skills:

1. The student has the skill to present the project in the form of a report or presentation - [[K_U06]]

2. The student has skill to teamwork - [[K_U02]]

3. The student has a well established knowledge of chemical and process engineering, and can use it to design and planning processes. - [[K_U09]]

4. The student is able to formulate simple conclusions based on the results of calculations and measurements made and possibly improve or correct them - [[K_U13]]

Social competencies:

1. The student has the skill to work in a team and knows the rules operation and responsibility for the group entrusted with the task - [[K_K05]]
2. The student is aware of the consequences of incorrect use of industrial waste affecting the environment - [[K_K02]]

Assessment methods of study outcomes

The written examination

The report and the presentation of the project

Course description

1. Selected mechanical processes

List of the most important signs

1.1.Comminuting, comminution theories

1.2. Selected machinery and equipment for the crushing

1.2.1. Crushers

1.2.2. Crusher and mills

1.3. Agglomeration of products

1.3.1. Granulation

1.3.2. The tableting and briquetting

1.3.3. The sintering

1.4. Example of calculating the ball mill

1.5. Example of calculating a plate granulator

2. Processing of plastics

2.1. Molding

2.2. Pressing

2.3. Extrusion characteristics of extruder

2.4. Calendering

2.5. Injection

2.6. Rubber

3. Selected processes in the processing industry, such as:

3.1. The production line for coating of tablets

3.2. Line for granulation of sawdust

3.3. Instalation technology for utilization of stillage or spent grain malting

3.4. Instalation technology for the production of diesel from rapeseed oil and biofuels

3.5. Technological line for the production of mayonnaise

3.6. Installation of feed mixing plants

4. Basic concepts in the diagnosis process

5. Food Additives

5.1. Cellulose derivatives: carboxymethylcellulose sodium salt, hydroxypropylmethylcellulose and methylcellulose

5.2. Guar gum

5.3. Xanthan gum

5.4. Gelatine

5.5. Arabic gum

Basic bibliography:

1. Różańska S., Broniarz-Press L., Inżynieria Wybranych Procesów Przetwórczych, Wydawnictwo Politechniki Poznańskiej, Poznań 2011.

2. W. N. Stabnikow, W. D. Popow, W. M. Łysianskij, F. A. Biedko, Procesy i aparaty w przemyśle spożywczym, WNT, Warszawa 1978.

3. K. Pijanowski, M. Dłużewski, Ogólna technologia żywności, WNT, Warszawa 1972.

4. T. Kiljański, M. Dziubiński, J. Sęk, K. Antosik, Wykorzystanie pomiarów właściwości reologicznych płynów w praktyce inżynierskiej, EKMA Krzysztof Antosik. Warszawa 2009.

5. P. P. Lewicki, Inżynieria procesowa i aparatura przemysłu spożywczego, WNT, Warszawa 1982.

6. J. Korbicz, J. M. Kościelny, Z. Kowalczuk, W. Cholewa, Diagnostyka procesów, Modele, Metody sztucznej inteligencji. Zastosowania, WNT, Warszawa 2002.

7. Sikora R., Przetwórstwo tworzyw wielkocząsteczkowych, Wydawnictwo Edukacyjne Zofii Dobkowskiej, Warszawa 1993.

8. Kubiński W., Inżynieria i technologie produkcji, Redakcja Uczelnianych Wydawnictw Naukowo-Dydaktycznych AGH, Kraków 2008.

Additional bibliography:

1. Heim A., Kochański B., Pyć K.W., Rzyski E., Projektowanie aparatury chemicznej i spożywczej, Wydawnictwo Politechniki Łódzkiej, Łódź 1993.
2. Imeson A., Food Stabilisers, Thickeners and Gelling Agents, John Wiley & Sons Ltd, United Kingdom, 2010.
3. Rutkowski A., Gwiazda S., Dąbrowski K., Kompendium dodatków do żywności, Hortimex, Konin, 2003.
4. Błasiński H., Młodziński B., Aparatura przemysłu chemicznego, WNT, Warszawa 1971.
5. 5. Pikoń J., Aparatura chemiczna, Warszawa, PWN 1983

Result of average student's workload

Activity	Time (working hours)
1. Preparation exam	23
2. The exam	2
3. Preparation for project classes	10
4. Project preparation	40

Student's workload

Source of workload	hours	ECTS
Total workload	75	3
Contact hours	45	2
Practical activities	30	1