Course code: ……. **Plan position:** ……

A. INFORMATION ABOUT THE COURSE

B. Basic information

Name of course	***Chemical engineering***
Field of studies	Chemical Technology
Level of studies	First degree
Profile of studies	General academic
Form of studies	Stationary
Specialty	1. Chemical process technology 2. Bioengineering 3. Chemistry and technology of cosmetics
Unit responsible for the field of studies	Faculty of Chemical Technology and Engineering / Division of Chemical and Biochemical Engineering
Name and academic degree of teacher(s)	Sylwia Kwiatkowska-Marks, BEng PhD, Justyna Miłek, BEng, PhD, Ilona Trawczyńska, BEng, PhD Sławomir Żak, BEng, PhD
Introductory courses	Physical chemistry
Introductory requirements	No prerequisites

C. Semester/week schedule of classes

Semester	Lectures (W)	Auditorium classes (Ć)	Laboratory classes (L)	Project classes (P)	Seminar (S)	Field classes (T)	Number of ECTS points
Winter	30^{E}	15	30				8

2. LEARNING OUTCOME

No.	Learning outcomes description	The reference to the learning outcomes of specific field of study	The reference to the learning outcomes for the area
KNOWLEDGE			
W1	The student has knowledge of chemical engineering.	K_W13	P6S_WG
W2	The student knows the basic methods, techniques, tools and materials used in solving simple engineering problems related to technology and chemical engineering.	K_W15	P6S_WG
SKILLS			
U1	Student uses knowledge to design and implement simple chemical processes and unit operations and explains basic phenomena related to important processes in chemical technology and engineering.	K_U07	P6S_UW
U2	The student is supposed to solve basic engineering problems in chemical processing.	K_U18	P6S_WG

SOCIAL COMPETENCES			
K1	The student understands the need for learning and motivation to develop their competences.	K_K01	P6S_KK
K2	The student is aware of the responsibility for jointly performed problems to cooperate with other chemists.	K_K04	P6S_KK P6S_KO

3. TEACHING METHODS

A. Traditional methods used

Standard lecture with presentation. Laboratory experiments and calculations (classes) performed by students under supervision of academic staff. Outdoor classes - visits of production companies.

B. Distance learning methods used

Synchronous method (classes conducted in a way that ensures direct interaction between the student and the teacher in real time, enabling immediate flow of information, the method can be used only if it is provided for in the study plan for a given cycle of education):
e.g. remote lecture in the form of videoconference, remote discussion, etc.

Asynchronous method used as an auxiliary (a method that does not ensure direct interaction between the student and the teacher in real time, used only as an auxiliary / complementary method):

e.g. online educational videos, online multimedia presentations, etc.

4. METHODS OF EXAMINATION

Written exam from lectures during winter/summer examination session, written tests from laboratories and from classes.

5. SCOPE

Lectures	Flow of fluid. Movement of particles in fluids. Gravitational dust collection. Hydraulic Classification. Fluidization. Filtration. Mixing. Heat transfer and its application. Introduction to mass transfer. Drying.
Auditorium classes	Solving of engineering problems in unit operations.
Laboratories	Experiments on momentum and heat transfer.

6. METHODS OF VERIFICATION OF LEARNING OUTCOMES

LEARNING OUTCOME	Form of assessment					
	Oral examination	Written exam	Colloquium	Project	Presentation	Reports
W1	x	x				
W2	x	x				
U1			x		x	
U2			x		x	
K1					x	
K2					x	

7. LITERATURE

Basic literature	1. McCabe W.L., Smith J.L. Unit operations of chemical engineering. McGraw-Hill's, New York, 1985. 2. Chpey N. P. Handbook of Chemical Engineering Calculations. McGraw – Hill's, New York, 2004. 3. Himmelblau D.M. Basic Principles and Calculations in Chemical. Prentice Hall, London, 1982.

	4. Wankat P. C. Separation Process Engineering: Includes Mass Transfer Analysis. Prentice Hall, 2016.
Supplementary literature	1. http://en.wikibooks.org/wiki/Introduction_to_Chemical_Engineering_Processes 2. Perry R.H., Green D.W. Perry's Chemical Engineers' Handbook. Mc Graw – Hill, New York, 1997.

8. TOTAL STUDENT WORKLOAD REQUIRED TO ACHIEVE EXPECTED LEARNING OUTCOMES EXPRESSED IN TIME AND ECTS CREDITS

Student's activity		Student workload– number of hours
Classes conducted under a direct supervision of an academic teacher or other persons responsible for classes	Participation in classes indicated in point 1B	75
	Supervision hours	5
Student's own work	Preparation for classes	40
	Reading assignments	40
	Other (preparation for exams, tests, carrying out a project etc)	40
Total student workload		200
	Number of ECTS points	**8**