Polish course name	**PROJEKTOWANIE PROCESOWE MATERIAŁÓW**
English course name	**PROCESS DESIGN OF MATERIALS**
Course code	**WIP-MDL-D1-PDOM-04**
Field of study	**Materials design and logistics**
Level of qualification	**First degree**
Form of study	**Full-time**
Semester	**4**
Number of ECTS points	**4**
Ways of assessment	**Exam**

Number of hours per semester

Lecture	Seminar	Classes	Laboratory	Project
15				30

TEACHERS:

Dr inż. Artur Hutny,

Dr hab. inż. Marek Warzecha, prof. PCz.,

Dr hab. inż. Adam Cwudziński, prof. PCz.,

Dr Bernadeta Gajda.

COURSE OBJECTIVES:

› **C1** Teaching the principle of a methodical approach to issues related to the design of technology and process installations.

› **C2** Teaching students the basic elements of industrial design.

PRELIMINARY REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES:

1. Basic knowledge of the technology of production processes.
2. Knowledge of the basics of the theory of process engineering.
3. Knowledge of selected issues of mechanical and chemical processes.
4. Ability to work independently and in a group.
5. Ability to use literature sources and internet resources.

COURSE CONTENT

LECTURE

- **L1, L2** Basic concepts and definitions related to process design.
- **L3, L4** Measures of economic efficiency of production, profitability of the enterprise.
- **L5, L6** Characteristics of the components of the process design.
- **L7, L8** Schematic diagram of the process with material and energy balance.
- **L9, L10** A diagram of the course of technology along with the determination of the amount of emissions.
- **L11, L12** Stages of constructional preparation of production.
- **L13** Technology optimization.
- **L14, L15** Preparation of design and technological documentation.

PROJECT

- **P1** Familiarizing students with the rules of passing the course, assigning individual topics for project tasks.
- **P2 - P8** Preparation of an industrial technology project of a selected method in iron metallurgy.
- **P9 - P14** Preparation of an industrial technology project of the selected method in aluminium metallurgy.
- **P15 - P18** Development of a process diagram along with a material and energy balance.
- **P19 - P24** Design of industrial recycling technology.
- **P25 - P30** Design of industrial metal recovery technology.

BASIC REFERENCES

1. Praca zbiorowa pod red. L. Synoradzki i J. Wisialski: Projektowanie procesów technologicznych. Od laboratorium do instalacji przemysłowej, Wyd. OWPW, Warszawa 2019 r.
2. M. Ulewicz, J. Siwka: Procesy odzysku i recyklingu wybranych materiałów, Wyd. WIPMiFS Politechniki Częstochowskiej, Częstochowa, 2010 r.
3. Grajewski P.: Organizacja procesowa, projektowanie i konfiguracja, Wyd. PWE, Warszawa 2007 r.

4. Mróz J., Recykling i utylizacja materiałów odpadowych w agregatach metalurgicznych, Wyd. Politechniki Częstochowskiej, Częstochowa 2006 r.
5. Jowsa J. Inżynieria procesów kadziowych w metalurgii stali, Wyd. Pol. Częstochowska, Częstochowa, 2008 r.

SUPPLEMENTARY REFERENCE MATERIALS

Domestic and foreign trade magazines.

LEARNING OUTCOMES

› **EU1** The student has knowledge of the methodical solution of the design task related to the technological process.
› **EU2** The student has knowledge of the components of the design of modern technologies and process installations.

TEACHING TOOLS

› Lecture with the use of audiovisual aids.
› Use of technical literature, textbooks, scripts, technical journals and conference materials, including English - language in the field of the subject.
› E-learning platform of the Częstochowa University of Technology or other distance learning tools.

WAYS OF ASSESSMENT (F – FORMATIVE, P – SUMMATIVE)

› **F1**. Assessment of preparation for design classes.
› **F2**. Assessment of studies assigned individually to students of project tasks included in the curriculum of the subject.
› **P1**. Assessment of the mastery of the teaching material being the subject of the lectures - exam.
› **P2.** Assessment of the mastery of the teaching material being the subject of the project task.

STUDENT WORKLOAD

Form of activity	Number of hours	ECTS
Contact hours with the teacher		
Lectures	15	0,6

Seminar		0
Classes		0
Laboratory		0
Project	30	1,2
Test		
Exam	4	0,16
Total contact hours	49	1,96
Student's own work		
Getting acquainted with the indicated literature	10	0,4
Preparation for seminar		0
Preparation for classes		0
Preparation for lab		0
Project preparation	30	1,2
Consultation	4	0,16
Preparation for the exam	7	0,28
Total student's own work	51	2,04
Total number of hours/ ECTS points for the course	**100**	**4,0**

ADDITIONAL INFORMATION

Timetable of classes	https://wip.pcz.pl/dla-studentow/plan-zajec/studia-stacjonarne
Information about the consultation (time + place)	https://wip.pcz.pl/dla-studentow/konsultacje-dla-studentow

MATRIX OF LEARNING OUTCOMES REALISATION

Learning outcome	**Reference of given outcome to outcomes defined for whole program**	**Course objectives**	**Course content**	**Ways of assessment**
EU 1	K_W02,	C1, C2	L1 - L15,	F1, F2, P1, P2

	K_U04,		P1 - P30	
EU 2	K_W02, K_U04,	C1, C2	L1 - L15, P1 - P30	F1, F2, P1, P2

FORM OF ASSESSMENT - DETAILS

EU1 The student has knowledge of the methodical solution of the design task related to the technological process.

› 2,0 The student has no knowledge about the methodical solution of a design task related to the technological process.

› 3,0 The student has sufficient knowledge about the methodical solution of a design task related to the technological process.

› 3,5 The student has a fairly good knowledge of the methodical solution of a design task related to the technological process.

› 4,0 The student has a good knowledge of the methodical solution of a design task relating to the technological process to a good degree.

› 4.5 The student has an almost very good knowledge of the methodical solution of a design task related to the technological process.

› 5,0 The student has a very good knowledge of the methodical solution of the design task concerning the technological process.

EU2 The student has knowledge of the components of the design of modern technologies and process installations.

› 2.0 The student has no knowledge of the design components of modern technologies and process installations.

› 3,0 The student has a sufficient knowledge of the design components of modern technologies and process installations.

› 3,5 The student has a fairly good knowledge of the design components of modern technology and process installations.

› 4,0 The student has a good knowledge of the design components of modern technologies and process installations.

› 4,5 The student has an almost very good knowledge of the design components of modern technologies and process installations.

› 5,0 The student has a very good knowledge of the design components of modern technologies and process installations.