

Polish course name	TECHNICZNE PRZYGOTOWANIE PRODUKCJI
English course name	TECHNICAL PREPARATION OF PRODUCTION
Course code	WIP-MDL-D1-TPOP-07
Field of study	Materials design and logistics
Level of qualification	First degree
Form of study	Full-time
Semester	7
Number of ECTS points	4
Ways of assessment	Test

Number of hours per semester

Lecture	Seminar	Classes	Laboratory	Project
30		15		15

TEACHERS:

Dr inż. Małgorzata Łągiewka,

Dr inż. Cezary Kolamsiak.

COURSE OBJECTIVES:

- › **C1** Provide students with knowledge in the field of modern manufacturing techniques.
- › **C2.** Acquisition by students of practical skills in the selection of technologies for the production of metals and metal products depending on the type and purpose.

**PRELIMINARY REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER
COMPETENCES:**

1. Basic knowledge of physics, chemical and materials science.
2. Basic knowledge of basic manufacturing techniques and production processes.
3. Ability to work independently and in a group.
4. Ability to use literature sources and internet resources.

COURSE CONTENT

LECTURE

- › **L1, L2** Manufacturing processes - an introduction.
- › **L3, L4** Organisation of production preparation processes.
- › **L5 - L8** Typical stages of structural production preparation.
- › **L9 - L12** Overall work on technology preparation.
- › **L13 - L16** Technological preparation of production.
- › **L17 - L20** Organisational production preparation.
- › **L21 - L24** Making models, prototypes.
- › **L25 - L28** Types of technology documents.
- › **L29, L30** Production planning.

CLASSES

- › **C1** To familiarise students with the rules for passing the course.
- › **C2** Research and experimental work.
- › **C3** Design of new and improvement of old products.
- › **C4** Preparation of design documentation.
- › **C5** Making prototypes.
- › **C6** Design of new technological processes.
- › **C7** Improvement of existing technological processes.
- › **C8** Design of required tooling and special production equipment.
- › **C9** Participation of technologists in start-up and mastering of new production.
- › **C10** Ongoing maintenance of production.
- › **C11** Development of technical normatives (labour standards, material consumption standards, etc.).
- › **C12** Development of normatives of technical preparation of production - normatives of labour intensity of work.
- › **C13** Labour costs.
- › **C14** Lengthening and shortening the production cycle.
- › **C15** Standardisation - the process of creating and applying uniform standards.

PROJECT

- › **P1, P2** Prepare construction documentation of the selected product.

- › **P3 - P5** Prepare technological documentation of the selected product.
- › **P6, P7** Preparation of normatives of material consumption.
- › **P8, P9** Preparation of normatives of live work.
- › **P10, P11** Develop normatives of material consumption.
- › **P12, P13** Design of technological equipment.
- › **P14, P15** Production implementation.

BASIC REFERENCES

1. T. Lis: Współczesne metody otrzymywania stali, Wyd. Politechniki Śląskiej, Gliwice 2000 r.
2. A. Ghosh: Secondary Steelmaking: Principles and Applications, CRC Press, 2001 r.
3. J. Jowsa: Inżynieria procesów kadziowych w metalurgii stali, Wyd. Pol. Częst., Częstochowa, 2008 r.
4. Y. Sahai, T. Emi: Tundish Technology for Clean Steel Production, World Scientific Press, 2008 r.
5. Botor J. Podstawy metalurgicznej inżynierii procesowej, Wyd. Politechniki Śląskiej, Gliwice, 1999 r.
6. M. Holzer: Procesy metalurgiczne i odlewnicze stopów żelaza. Podstawy fizykochemiczne, Wyd. PWN, Warszawa 2013 r.
7. Blacha L. Metalurgia próżniowa, Wyd. Politechniki Śląskiej, Gliwice 2005 r.
8. A. Kosowski: Podstawy odlewnictwa, Wydawnictwo Naukowe AKAPIT, Kraków, 2008 r.
9. T. Warchała: Technologia modelu i formy. Cz. I i II. Skrypt P.Cz., Częstochowa 1984,1985 r.
10. J.L. Lewandowski: Masy formierskie i rdzeniowe. PWN, Warszawa 1991 r.
11. M. Skarbiński, J. Skarbiński: Technologiczność konstrukcji maszyn. WNT, Warszawa 1987 r.
12. M. Perzyk i inni: Materiały do projektowania procesów odlewniczych”; PWN, Warszawa, 1990 r.
13. A.Tabor, J.S. Rączka: Projektowanie odlewów i technologii form Fotobit, Kraków, 1998 r.

14. W. Gorecki: Inżynieria wytwarzania i przetwórstwa płaskich wyrobów metalowych. Wyd. Politechniki Śląskiej 2006 r.
15. J. Łuksza, A. Skołoszewski, F. Witek, W. Zachariasz: Druty ze stali i stopów specjalnych. Wydawnictwo Naukowo-Techniczne, Warszawa 2006 r.
16. J. Herian: Wybrane techniki wytwarzania wyrobów metalowych. Wydawnictwo Politechniki Śląskiej 2004 r.

SUPPLEMENTARY REFERENCE MATERIALS

1. Poradnik inżyniera. Odlewnictwo tom 1 i 2. Praca zbiorowa. WNT, Warszawa 1986 lub dostępne wydanie.
2. J. Hankus: Budowa i własności mechaniczne lin stalowych. Główny Instytut Górnictwa, Katowice 2000 r.
3. B. Maligowski, M. Pofelski: Wyroby z drutu. Wyd. Śląsk, 1970 r.
4. J. Kasprzak: Liny stalowe. Wyd. Śląsk, 1973 r.

LEARNING OUTCOMES

- › **EU1** The student has a basic knowledge of the processes of producing metals and alloys, casting and plastic forming of metal products.
- › **EU2** The student knows the basic machines, devices and tools for the production of metal products.
- › **EU3** The student is able to use the basic knowledge in the field of technological processes used in the production of metal products to design the finished product.

TEACHING TOOLS

- › Lecture with the use of audiovisual means.
- › Specialist laboratory.
- › Computer software.
- › CUT e-learning platform (possible use).

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

- › **F1.** Assessment of preparation for laboratory classes.
- › **F2.** Assessment of preparation for design classes.
- › **P1.** Assessment of the ability to prepare technological documentation.

STUDENT WORKLOAD

Form of activity	Number of hours	ECTS
Contact hours with the teacher		
Lectures	30	1,2
Seminar		
Classes	15	0,6
Laboratory		
Project	15	0,6
Test		
Exam		
Total contact hours	60	2,4
Student's own work		
Getting acquainted with the indicated literature	10	0,4
Preparation for seminar		
Preparation for classes	10	0,4
Preparation for lab		
Project preparation	10	0,4
Consultation	4	0,16
Preparation for the test	6	0,24
Total student's own work	40	1,6
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	Course objectives	Course content	Ways of assessment
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	outcomes defined for whole program			
EU 1	K_W02, K_W07, K_U04, K_U05, K_K02,	C1, C2	L1 - L30 C1 - C15 P1 - P15	F1, F2, P1
EU 2	K_W02, K_W07, K_U04, K_U05, K_K02,	C1, C2	L1 - L30 C1 - C15 P1 - P15	F1, F2, P1
EU 3	K_W02, K_W07, K_U04, K_U05, K_K02,	C1, C2	L1 - L30 C1 - C15 P1 - P15	F1, F2, P1

FORM OF ASSESSMENT - DETAILS

EU1 The student has a basic knowledge of the processes of producing metals and alloys, casting and plastic forming of metal products.

- › 2,0 The student has no basic knowledge of the processes of producing metals and alloys, casting and plastic forming of metal products.
- › 3,0 The student has some knowledge of the processes of producing metals and alloys, casting and plastic forming of metal products.
- › 3,5 The student almost knows the processes of producing metals and alloys, casting and plastic forming of metal products.
- › 4,0 The student knows well the processes of producing metals and alloys, casting and plastic forming of metal products.
- › 4,5 The student knows almost very well the processes of producing metals and alloys, casting and plastic forming of metal products.
- › 5,0 The student knows very well the processes of producing metals and alloys, casting and plastic forming of metal products.

EU2 The student knows the basic machines, devices and tools for the production of metal products.

- › 2,0 The student does not have basic knowledge about machines, devices and tools for the production of metal products.
- › 3,0 The student has some knowledge of machines, devices and tools for the production of metal products.

- › 3,5 Student knows almost about the machines, devices and tools used to manufacture metal products.
- › 4,0 The student knows well the machines, devices and tools for the production of metal products.
- › 4,5 The student knows almost the machines, devices and tools used to manufacture metal products.
- › 5,0 The student knows the machines, devices and tools for the production of metal products very well.

EU3 The student is able to use the basic knowledge in the field of technological processes used in the production of metal products to design the finished product.

- › 2,0 The student is not able to use the knowledge of technological processes used in the production of metal products to design a finished product.
- › 3,0 The student is able to partially use the basic knowledge of technological processes used in the production of metal products to design a finished product.
- › 3,5 The student can almost use the basic knowledge of the technological processes used in the production of metal products to design the finished product.
- › 4,0 The student is able to use the basic knowledge in the field of technological processes used in the production of metal products to prepare the finished product design.
- › 4,5 The student is able to use the basic knowledge in the field of technological processes used in the production of metal products almost very well to perform the design of the finished product
- › 5,0 Student to make good use of the basic knowledge in the field of technological processes used in the production of metal products to design the finished product.