



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Development trends in manufacturing processes [S1ZiIP2>TRPW]

Course

Field of study

Management and Production Engineering

Year/Semester

4/7

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

elective

Number of hours

Lecture

15

Laboratory classes

15

Other

0

Tutorials

0

Projects/seminars

0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

Basic knowledge of the basics of machine construction, manufacturing technology and material processing. Logical thinking, analysis of occurring phenomena, use of knowledge obtained from scientific, technical and popular science literature. Understanding the need to learn and acquire new knowledge.

Course objective

Familiarization with the directions of development of waste-free technologies.

Course-related learning outcomes

Knowledge:

1. Student has detailed knowledge of waste-free technologies, knows contemporary trends and directions of their development.
2. Student has knowledge of the impact of the manufacturing process on the quality of the product.
3. Student has detailed knowledge of the directions of development of manufacturing processes.

Skills:

1. Student is able to select a manufacturing technology depending on the requirements.

2. Student is able to assess the quality of the product.
3. Student is able to make a product using non-destructive technologies.

Social competences:

1. Student is able to work on a given task independently and cooperate with team members, using the synergy of knowledge and experience.
2. Student understands the need for continuous education in order to improve professional engineering qualifications.
3. Student is able to think and act in a creative and entrepreneurial manner.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:

Written assessment conducted at the end of the semester (assessment if at least 50.1% of correct answers are obtained). Assignment of grades to percentage ranges of results: <90-100> very good; <80-90) good plus; <70-80) good; <60-70) satisfactory plus; <50-60) satisfactory; <0-50) unsatisfactory.

Laboratories:

Laboratory assessment: Final grade on a scale of 2 to 5 - average of the grades from the labs (all must be assessed positively, above grade 2)

Programme content

Characteristics of selected special casting production methods. Review of currently used polymer shaping technologies and directions of development of plastics processing technologies. Review of currently innovative technologies in metal plastic processing. Directions of development of plastic processing technologies.

Course topics

Lecture:

Structure and trends in global production of products in various sectors of industry and economy. Directions of technological development. Casting or forging. Repairs and hardfacing of castings. Special casting technologies, their advantages and limitations. Discussion of development directions in plastics processing (technologies of processing polymer-wood composites, nanocomposites, biodegradable polymers). Review of currently innovative technologies in plastic metal processing. Directions of technological development: - use of new or modified construction materials in machine construction and other fields (e.g. automotive, medicine), - use of new generation drives and controls in technological machines and devices (e.g. CNC centers for cutting, bending pipes and rods, mechanical and liquid stamping), - use of metal powders for products and tools, - use of ecological lubricants, etc. Automated production lines and quality control systems.

Laboratory:

Making of instrumentation used in the melted model method. Making castings using special casting methods. Preparation of the station and execution of connections of various materials in the form of sheets using the pressing method. Use of rubber and other materials as tools for shaping sheets in plastic processing. Shaping the edges of holes using thermal drilling technology.

Teaching methods

Lecture: multimedia presentation illustrated with examples given on the board, solving tasks.

Bibliography

Basic:

1. Poradnik Odlewnika, Sobczak J., Wyd. Stowarzyszenia Technicznego Odlewników Polskich, Tom 1, Kraków 2013.
2. Perzyk M., Waszkiewicz S., Kaczorowski M., Jopkiewicz A.: Odlewnictwo. WNT, Warszawa 2000.
3. Przetwórstwo tworzyw wielkocząsteczkowych, Sikora R., Wyd. Żak, Warszawa, 1993.
4. Bociąga E. : Specjalne metody wtryskiwania tworzyw polimerowych, PWN-WNT, 2008.
5. Richert J.: Innowacyjne metody przeróbki plastycznej. Wydawnictwa AGH 2010.
6. Psyk V., Kurka P., Kimme S., Werner M., Landgrebe D., Ebert A., Schwarzendahl M., Structuring by

electromagnetic forming and by forming with an elastomer punch as a tool for component optimisation regarding mechanical stiffness and acoustic performance, "Manufacturing Review" 2015, vol. 2.

Additional:

1. Górny Z. :Odlewnicze stopy metali nieżelaznych. WNT Warszawa 1992
2. Braszczyński J. : Teoria procesów odlewniczych. PWN Warszawa 1989
3. Tochowicz St., Klisiewicz Z., Metalurgia próżniowa stali, Wyd. Śląsk, Katowice 1979.
4. Aspekty rozwoju recyklingu w Polsce, Merkisz - Guranowska A., WITE, 2005.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	1,00