COURSE DESCRIPTION CARD - SYLLABUS

Course name
Introduction to technology and Industry of the future [S1Log2>WdTiPP]

Course

Field of study
Logistics

Year/Semester
1/1

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes
0

Other
0

Tutorials
15

Projects/seminars
0

Number of credit points

4,00

Coordinators

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Lecturers

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Prerequisites

Knowledge of mathematics and physics in middle school. Ability to solve simple problems in mathematics and physics. Group work, interest in technology.

Course objective

To familiarize students with the basic problems associated with the development of technology, make aware of the logic of changes in manufacturing techniques and human relationships with technology and the environment. The systemic nature of these compounds is emphasized. Familiarizing students with modern trends in the development of technology and technology as well as the organization of human work aims to develop practical skills in identifying, understanding and describing contemporary techniques and technologies used in industry and services.

Course-related learning outcomes

Knowledge:

1. Student knows basic issues of construction, technology and modern manufacturing technology related to logistics [P6S_WG_01].
2. Student knows basic issues of mechanics, construction and operation of machines and machine tools related to production logistics [P6S_WG_02].

Skills:
1. Student is able to apply to solve a problem falling within the scope of general technical problems, as well as appropriate experimental and measurement techniques, including computer simulation, to solve basic probems within logistics and its specific issues, as well as supply chain management [P6S_UW_03].
2. Student is able to assess and analyse critically in terms of economics a selected general technical problem within the production logistics and its specific issues [P6S_UW_06].
3. Student is able to identify changes in requirements, standards, regulations, technical progress and the reality of modern production systems, and on their basis identify needs to supplement knowledge [P6S_UU_01].

Social competences:
1. Student is aware of initiating activities related to the formulation and communication of information and interaction in society in the field of production logistics and contemporary manufacturing [P6S_KO_02].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Knowledge acquired on lectures is veryfied by two 45-minuts examinations realized on 7 i 15 lecture. Each examination is consist with 10-15 questions (closed and open), estimated diferently. Treshold attest: 50% points.
Tutorials: Attest examination: oral answers, open questions, multi-choice test and activity on tutorials. Treshold attest: 50% points.

Programme content

Lecture: Elements of the history of technology against the background of human evolution and the development of societies. Determinants of successive technological revolutions. Techniques and technologies concerning materials (e.g. metal working, casting, machining, heat and thermo-chemical treatment) and conditions of their implementation from the point of view of priorities of stages of industry development. Connections used in machine construction, principles of construction and operation of machine components (bearings, gears, couplings, brakes). Techniques and technologies in production and distribution, transport and other logistic processes. Selected problems of contemporary technical civilization. Ethical problems of the user and creator of technology in the face of modern means of technology. Modern methods of production and division of responsibility in automated production systems. Basic features of cyber-physical systems.
Tutorials: Accounting and designing exercises on topics related to lectures.

Course topics

List of Sentence Equivalents Describing Aspects of the Industry of the Future

- Elements of the history of technology against the background of human evolution and the development of societies.
- Techniques and technologies related to materials (e.g. moulding, casting, machining, heat and thermo-chemical treatment).
- Connections used in mechanical engineering.
- Principles of design and function of machine components (bearings, gears, couplings, brakes).
- Energy techniques and technologies (energy sources, transmission and conversion).
- Information techniques and technologies.
- Techniques and technologies in various fields of human activity.
- Technology and human labour.
- Selected problems of contemporary technical civilisation.
- Ethical problems of the user and creator of technology.
- History of inventions and their impact on the development of societies.

- The development of technology in different historical periods.
- Key figures in the history of technology and their achievements.
- The impact of the Industrial Revolution on technology and society.
- Technological innovation in the 20th and 21st centuries.
- The impact of technology in shaping the modern world.
- The interaction between technology and culture.
- Sustainability in a technological context.
- Changes in production techniques and their impact on the labour market.
- Automation and robotisation in industry.
- The role of research and development in technological progress.
- Challenges of technology in the context of globalisation.
- Protection of intellectual property in technology.
- Technology and environmental protection.
- Technological security and its importance for society.

Teaching methods

Lecture: Lectures with multimedia presentation.
Tutorials: exercise method, accounting and design tasks.

Bibliography

Basic:
1. Tytyk E., Butlewski M., Wprowadzenie do techniki, Wydawnictwo Politechniki Poznańskiej, Poznań, 2008.
2. Tomaszewski Z., Wprowadzenie do techniki - materiały do ćwiczeń i wykładów, Wydawnictwo Politechniki Poznańskiej, Poznań, 2002.
3. Erbel J. (red.), Encyklopedia technik wytwarzania stosowanych w przemyśle maszynowym, tom I, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2001.
4. Erbel J. (red.), Encyklopedia technik wytwarzania stosowanych w przemyśle maszynowym, tom II, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2001.

Additional:
1. Okoniewski S.,Technologia maszyn, WSiP, Warszawa, 1999.
2. Orłowski B., Powszechna historia techniki, Oficyna Wydawnicza Mówią Wieki, Warszawa, 2010.
3. James P., Thorpe N., Dawne wynalazki, Świat Książki, Warszawa, 1997.
4. Butlewski, M. (2017). Taxonomy of responsibility allocation in Human-Machine Systems with different levels of automation. In MATEC Web of Conferences (Vol. 137, p. 01002). EDP Sciences.

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	55	2,00