SYLLABUS

Name: Machines and technological equipment
Name in Polish: Maszyny i urządzenia technologiczne
Name in English: Machines and technological equipment

Information on course:

Course offered by department:	Faculty of Organisation and Management
Course for department:	Silesian University of Technology
Study level and form:	Bechelor's degree, Full-time
Term:	winter semester 2023/2024
Coordinator of course edition:	Andrzej Wieczorek PhD

Default type of course examination report:
ZAL
Language:
English
Course homepage:
https://platforma.polsl.pl/roz/
ECTS
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Short description:
Course objectives: providing structured knowledge and acquiring skills and social competences related to the theoretical and practical aspects of the construction and operation of machines and devices used in selected technological processes.
Description:
2023/2024 1) lectures: - detailed programming content: 1. Introduction to the subject. Production system and production process. Basic characteristics of machines. History of machine development. Features of machines and devices. 2. Basic parameters of machines operation. Methods of assessing the work of machines. Monitoring the operation of machines. 3. Strategies for managing the machine park and ways to improve its efficiency. 4. Machine development in the context of Industry 4.0. 5. Machines and devices in mining processes. Mining machinery and equipment. 6. Machines and devices in processing. Metallurgical machinery and equipment. Machines and devices in the production of electricity. 7. Machines and devices in machining processes. 8. Machines and devices in assembly processes. 9. Assemblies and systems of machines and devices. Elements and construction units. 10. Drives for machines and devices. Machine controlling. 11. The influence of the human factor on the operation of machines and devices. Student’s attendance in lectures is non-obligatory. 2) laboratory - detailed programming content: The student prepares a multimedia documentation of the selected technological machine. The task includes: 1. Selection of a technological machine. 2. Collecting information on the selected machine (operating and maintenance documentation, operating instructions, photos, videos, animations). 3. Selection of an IT tool enabling the construction of an interactive, multimedia version of the documentation of the selected machine, 4. Creating a multimedia documentation of a selected machine.

5. Presentation of work during classes.
Student's attendance in laboratories is obligatory.

3) project
- detailed programming content:
The student prepares a project on a selected group of technological machines and devices. The study includes:
1. Selection of the technological system.
2. Description of the technological system.
3. Description of the system's operation.
4. Analysis of negative events for the technological system.
5. Planning and implementing preventive actions for the technological system.
6. Presentation of work during classes.

Student's attendance in project is obligatory.

The final grade is determined based on the grade from laboratories, project, and lecture.

Number of ECTS: 5.

Hours:
Lectures – 30
Laboratories – 15
Project – 15

Students work: 60 with teacher + 90 own their own = 150 hours.

Bibliography:

• Thaler, George J., Wilcox, Milton L., Electric machines: dynamics and steady state, New York; London; Sydney: John Wiley & Sons, Inc.,
1966.
• Shigley, Joseph Edward, Theory of machines, 1981, Publisher: Tata Mcgraw Hill, 1981.
• Theory of machines and mechanisms, Bielsko-Biała: Wydawnictwo Akademii Techniczno-Humanistycznej, 2008.
• Macha, Ewald, Reliability of machines, Oficyna Wydawnicza, Opole, 2001.

Additional:
• Stecuła K., Brodny J., Meaning of Knowledge to the Increased Effectiveness of the Use of Mining Machines, [in:] Silesian University of
Technology Scientific Papers, Organization and Management, Scientific Paper No. 111, Management in Mining Production, Economic,
Social and Technical Perspectives and Experiences, Gliwice 2017, p. 27-37.
• Stecuła K., Brodny J., Generating Knowledge About the Downtime of the Machines in the Example of Mining Enterprise, [in:]
Proceedings of 17th International Multidisciplinary Scientific GeoConference SGEM 2017, Vol. 17, Exploration and Mining, Issue 13,
Albena Bulgaria 2017, pp. 359-366.
• Stecuła K., Brodny J., Palka D., Analysis of Reasons for Unplanned Stoppages of Machines in the Example of the Longwall Shearer, [in:]
CBU International Conference Proceedings 2017: Innovations in Science and Education, Vol. 5, Prague 2017, p. 1210-1214.
• Stecuła K., Brodny J., Tutak M., Informatics platform as a tool supporting research regarding the effectiveness of the mining machines'
work, [in:] CBU International Conference Proceedings 2017: Innovations in Science and Education, Vol. 5, Prague 2017, p. 1215-1219.
• Brodny J., Stecuła K., Tutak M., Application of the TPM strategy to analyze the effectiveness of using a set of mining machines,

Proceedings of 16th International Multidisciplinary Scientific GeoConferences SGEM 2016, Book 1, Vol. II, Albena Bulgaria, sierpień 2016,
ISBN 978-619-7105-56-8, ISSN 1314-2704, DOI: 10.5593/sgem2016B12.

Learning outcomes:

Knowledge:
a student knows and understands:
K1A_W06: at an advanced level - selected facts, objects and phenomena as well as their methods, theories and conditions explaining the complex relationships between them, constituting basic general knowledge in the field of mechanical engineering, in the field of machines and technological devices
K1A_W14: basic processes occurring in the life cycle of devices, facilities and technical systems in the field of machines and technological devices

Skills:
a student can:
K1A_U07: design - in accordance with the given specification - and perform a simple technical system and implement the technological process, using appropriately selected methods, techniques, tools and materials in the field of machines and technological devices
K1A_U08: make a critical analysis of how existing technical solutions work and evaluate these solutions in the field of machines and technological devices

Social competences:
a student is prepared to:
K1A_K06: cultivating and disseminating models of proper conduct in the work environment and beyond, independent decision-making and critical
assessment of own actions, the actions of teams he manages and organizations in which he participates and accepting responsibility for the effects of these actions in the field of machines and technological devices

Assessment methods and assessment criteria:

Lecture: wirtten final work
Laboratory: preparing a documentation
Project: preparing a project

Practical placement: