COURSE DESCRIPTION CARD - SYLLABUS

Course name
Machining [S1IBio1E>OS]

Course

Field of study
Biomedical Engineering

Year/Semester
2/4

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
English

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
15

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

dr hab. inż. Damian Przestacki prof. PP
damian.przestacki@put.poznan.pl

Lecturers

Prerequisites

Basics knowledge: of: machining and materials science. Ability to solve elementary problems related to selection of tool materials and cutting conditions for various construction materials Understanding of knowledge expanding necessity, willingness to cooperation in the team.

Course objective

1. Transfer of knowledge to students about the types and kinematics of cutting, grinding and tool materials
2. Introduction of energetic aspects (forces, torque, power, heat, temperature) in machining, and tribologic in tools exploitation

Course-related learning outcomes

Knowledge:
Knowing the basic problems related to machine parts' manufacturing technologies.
Student should characterize and grade basic machining methods.

Skills:
Student is able to gather the information from catalogues and literature and other properly selected

sources, make an interpretation and formulate the conclusions and justify the opinions.
Student is able to identify to technical problem, evaluate its difficulty, and propose the scheme of its analysis and solution.
Student is able to select the appropriate manufacturing technologies in order to form the products, their structure and properties.

Social competences:
Student is able to solve the formulated problems, develop and spread his skills unassisted.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: written exam covering practical and theoretical issues. Individual elements of the exam are scored on a point scale, to pass the exam it is required to collect at least 50% of the total number of points. Laboratories: tests, assessment of active participation in classes. Points are awarded for both items. Completion of exercises after exceeding the threshold of 50% of the total number of points

Programme content

Lecture:
1. Purpose and essence of machining against a background of other technologies
2. Types and methods of cutting and grinding
3. Area of cut characterization and decohesion mechanisms
4. Surface texture formation during machining
5. Tribologic problems during the tools' exploitation
6. Technological surface layer and its properties
7. Machining economic effectiveness
8. Cutting ability of various materials

Laboratory:
1. Turning application in manufacturing technology
2. Drilling application in manufacturing technology
3. Grinding application in manufacturing technology
4. Construction of cutting tools and tool materials analysis
5. The geometrical and physical surface's layer valuation after various machining methods
6. The valuation of tool's life of tools made of various materials
7. The valuation of cutting ability of various materials

Course topics

none

Teaching methods

Lecture: multimedia presentation.
2. Laboratory exercises: performing exercises, discussion, team work.

Bibliography

Basic:
1. Filipowski R., Marciniak M.: Techniki obróbki mechanicznej i erozyjnej. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2000.
2. Grzesik W.: Podstawy skrawania materiałów konstrukcyjnych. WNT, Warszawa 2010.
3. Kosmol J. (pod red.): Techniki wytwarzania - obróbka wiórowa i ścierna. Wydawnictwo Politechniki Śląskiej, Gliwice 2002.

Additional:
1. Shaw M.C. - Metal Cutting Principles; Oxford Univ. Press., Oxford 1996.
2. Tőnshoff M. K., Denkena B.: Spanen. Grundlagen. Springer Verlag Berlin Heidelberg 2004.
3. Żebrowski H. (red.): Techniki wytwarzania. Obróbka wiórowa, ścierna i erozyjna. Oficyna Wydawnicza Politechniki Wrocławskiej. Wrocław 2004.

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