

Title:	Materials Science and Engineering Manufacturing (Metals)
Lecture hours:	30 (KON.)
Study period: (summer/winter)	Winter or summer
Number of credits:	4 ECTS
Assessment methods:	Reports, preparation of a presentation on a given topic,
Language of instruction:	English
Prerequisites:	Rudiments of Physics.
Course content:	Overview of the main groups of engineering materials, technical, natural and engineering materials - comparison of their structure, properties and applications. Types of bonds between atoms in basic groups of engineering materials. Crystalline systems. Basic concepts of thermodynamics: metal diffusion, solidification, nucleation, crystal growth. Systems and characteristics of phase transformations. Metals and their alloys. Ferrous and non-ferrous metals. Metallurgy. Comparison of metals and their alloys - utility, properties and applications. Principles of selection of engineering materials in mechanical engineering. Fundamentals of material design, sources of information about engineering materials, their properties and applications.
Learning outcomes:	The result of the course will be acquainting with the structure, properties, production and application of metallic materials used in industrial engineering.
Name of lecturer:	dr. inż. Andrzej Trafarski;
Contact (email address):	trafarski@ukw.edu.pl
Literature:	<ul style="list-style-type: none"> - D.W. Pashley, Materials Science and Materials Engineering Imperial College Press, Distributed by: World Scientific Publishing Co. ISBN 1-86094-106-0 - Zainab Raheem, Materials-science-and-engineering-8th-edition-callister, Baghdad University College of Science, April 2019 - M. Oka, H. Okamoto, Metallurgical and Materials Transactions A 19A, 447 (1988) - Smith, W F. Principles of materials science and engineering. United States: N. p., 1986. Web - Milton Ohring Engineering Materials Science, Academic Press, Inc. ISBN 0-12-524995-0 - William F. Smith, Javad Hashemi Foundations of Materials Science and Engineering, McGraw Hill International Edition, 2006 - James F. Shackelford, Introduction to Materials Science for Engineers, Pearson International Edition, 2005 - Encyclopedia of materials science and engineering, MB Bever - 1985 - Dobrzański L.A., Materiały inżynierskie i projektowanie materiałowe. Podstawy nauki o materiałach i metaloznawstwo, WNT, Warszawa 2006. - Blicharski M. 2009, Inżynieria materiałowa Stal, Wydawnictwo WNT 2009 - Rudnik S., Metaloznawstwo, PWN, Warszawa 1994. - Ashby M.F., Jones D.R.H., Materiały inżynierskie, WNT, Warszawa 1997. - Karpiński T., Inżynieria produkcji, WNT, Warszawa, 1996. - Grzesik W.: Podstawy skrawania materiałów konstrukcyjnych. WNT, Warszawa 2010.