

FACULTY:	Institute of Technology and Education
FIELD OF STUDY:	Materials Science and Engineering
COURSE TITLE:	FUNDAMENTALS OF MATERIALS SCIENCE
LECTURER'S NAME:	dr hab. Kazimierz Reszka, University Professor
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ECTS POINTS FOR THE COURSE:	2
ACADEMIC YEAR:	2014/2015
SEMESTER: (W – winter, S – summer)	W/S
HOURS IN SEMESTER:	30
LEVEL OF THE COURSE: (1 st cycle, 2 nd cycle, 3 rd cycle)	1 st cycle
TEACHING METHOD: (lecture, laboratory, group tutorials, seminar, other-what type?)	Lectures (30h)
LANGUAGE OF INSTRUCTION:	English
ASSESSMENT METOD: (written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?)	Written exam, class test
COURSE CONTENT:	The course covers the following topics: Bravais lattices. Crystal lattice types. The crystallographic planes and directions – Miller indexes. Crystallographic defects. Point, line, planar and bulk defects. A grain boundary. Polycrystalline materials. Cold work and recrystallization; mechanism of the plastic strain. Strain hardening of metals. Recrystallization - changes of the metal property after the recrystallization. Arrangements of the phase equilibrium. Definition of the phase. Type of phases. Two-component diagrams types. Metastable Iron-Carbon (Fe-Fe ₃ C) phase diagram: phases definitions in the Fe-Fe ₃ C phase diagram, transformations (eutectic and eutectoid and peritectic. Polymer, composite and ceramic materials. Kinds of the chemical bonds. The structure difference between amorphous and crystal solids. The atomic structure difference between metals and ceramic materials. Definition of composite material. The role of matrix and reinforcement in composite materials. Contemporary construction materials.
ADDITIONAL INFORMATION:	Required knowledge: fundamentals of physical and chemical laws
RECOMMENDED LITERATURE	1.W.D.Callister,Jr. Fundamentals of Materials Science and Engineering (An Interactive e-Text), J.Wiley &Sons (2001) 2. W.D.Callister,Jr. Science and Engineering (An Introduction) J.Wiley &Sons (2007)