

Unit offering the subject: Faculty of Chemistry - University of Opole		
masters	Field of study: Chemistry	Speciality: chemistry
Course code:	Course title: General Crystallography	
Year of study:1 Semestr: 2	The number of hours and the form of classes: 30L, 30W, 0S, 15Lab	Number of credit allocated: 5 ECTS
Unit giving the course: <i>Faculty of Chemistry, Division of Crystallography</i>		
Name teachers: Lecture: Dr Krzysztof Ejsmont Workshop: Dr Maciej Bujak, Dr Bartosz Zarychta Specialization laboratory (Practice): Dr Maciej Bujak, Dr Krzysztof Ejsmont, Dr Bartosz Zarychta		
Prerequisites: Basic background in materials science and introductory knowledge of quantum mechanics or solid state physics. Students should refresh their basic mathematical skills, including elementary concepts of differential equations, trigonometry and matrices.		
Assessment procedures and performance criteria: The grading for the course-will be determined on the basis of the number of points scored out of a possible 50 points. The completion of such course shall include passing a final exam with a mark of at least 60%.		
Objective of the course (expected learning outcomes and competences to be acquired): The objectives of the course are to gain basic knowledge of the crystalline state of matter and the principles of X-ray diffraction techniques.		
Course contents: 1. Lattices, planes, directions and their properties. 2. The crystalline state of matter. 3. Symmetry and point groups. 4. Translation symmetry, Bravais lattices and space groups. 5. Properties of the electromagnetic radiation and its interactions with matter. 6. Diffraction from a crystal - Bragg's Law. 7. Crystal structure determination.		
Learning outcomes: Students will learn the basic principles of the arrangement of atoms to form crystal structures, how these atoms are coordinated and bonded and how this is reflected in the external form, chemical composition, and physical properties of the crystals. The course will provide students with the knowledge and skills to use X-ray diffraction and the most common physical methods to identify and characterize crystals.		
Recommended literature: P. Luger, <i>Modern X-ray Analysis on Single Crystals</i> , Walter de Gruyter and Co., Berlin 1980 (in English). W. Borchardt-Ott, <i>Crystallography</i> , 2nd ed. Berlin: Springer-Verlag, 1995. (in English) C. Hammond, <i>The basics of crystallography and diffraction</i> , Oxford University Press, 2005.(in English) G. R. Desiraju, <i>The weak hydrogen bond in structural chemistry and biology</i> , Oxford : Oxford University Press, 1999. (in English) P. Müller, <i>Crystal structure refinement : a crystallographer's guide to SHELXL</i> , 1st publ. Oxford : University Press, 2007. (in English) M. Van Meerssche, J. Feneau-Dupont. <i>Krystalografia i chemia strukturalna</i> , PWN, Warszawa 1984. (in		

Polish)

Z. Bojarski, E. Łagiewka, *Rentgenowska analiza strukturalna*. PWN, Warszawa 1988. (in Polish)

Z. Bojarski, H. Habla, M. Surowiec. *Materiały do nauki krystalografii*, PWN, Warszawa 1986. (in Polish)

Z. Bojarski, M. Gigla, K. Stróż, M. Surowiec *Krystalografia*, PWN, Warszawa 1996. (in Polish)

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