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CAD GEOMETRIC DESIGN

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The changes that have been taking place in tertiary education system since 1989 significantly affect the curricula of departments conducted at universities and schools of technology. The decreasing number of didactic hours designated for completion of specific subjects of education forces the restriction of the curriculum contents possible to be performed at the courses. This also applies to the topics related to widely understood geometry and engineering graphics. This also refers to the curriculum of "Engineering drawing and descriptive geometry" conducted at the Faculty of Energy and Environmental Engineering of Silesian University of Technology since academic year 2006/2007 for the department of Environmental Engineering covering 30h (15h lectures and 15h design classes), due to the number of hours so dramatically restricted, impedes the detailed presentation of essential topics to the students, related to the structure of polyhedral and plane penetration, design of connectors. The impossibility to accomplish the design tasks so important in the engineering education curriculum was the main prerequisite to prepare the curriculum of the subject "CAD Geometric Design", which in the form of an optional subject was implemented by the Council of the Faculty of Energy and Environmental Engineering for the students of the 6th semester of full time bachelor studies and the students of the second semester of full-time master studies. [1] [2]

The classes in the subject „CAD Geometric Design" have been conducted since 2013/2014. The number of didactic hours assumed in the study curriculum for the subject comprises 30h of lectures and 30h of laboratory classes. The lecture part enables the discussion on the theoretical geometric topics necessary for the performance of the design tasks developed for the students as part of the laboratory classes conducted in the computer lab. In the course of semester the students prepare two introductory designs and six major design tasks comprising the topics of: intersection of polyhedrons, intersection of planes and surfaces, structure of extensions, optimising assumed design solutions, considering the correctness of applied geometric solutions. [Fig. 1, 2] The individualised design tasks are developed by the students in AutoCAD.

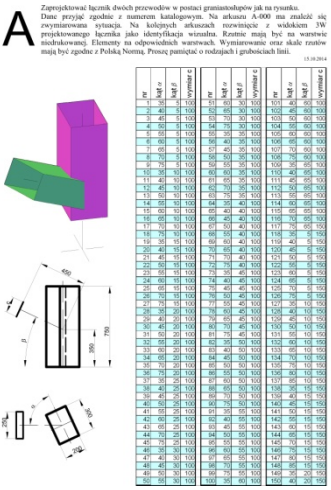

Fig. 1 Assumptions for the design comprising polyhedral penetration topics

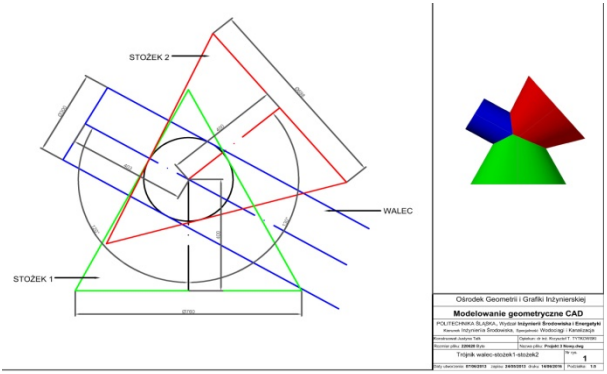

Fig. 2 Student work – design work comprising plane penetration topics – preliminary assumptions for the design and view of the assumed solution.

References:

[1] Polański S.: Zastosowanie rozwinięć powierzchni w technice, PWN, Warszawa 1970

[2] Tytkowski K.T.:Available Pipe Connectors Versus Their Geometrical Correctness. The Journal Biuletyn of Polish Society for Geometry and Engineering Graphics, vol. 25, 2013