

GEOMETRY AND GRAPHICS IN LANDSCAPE ARCHITECTURE

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Abstract: Despite its long practical history landscape architecture is still young as an academic discipline. In Poland the interest in landscape architecture began to grow in the last quarter of the 20th century and only recently became really vivid. The studies cover a wide range of subjects connected mainly with natural science. Students also get the chance to develop their artistic skills through the medium of art classes. Students of landscape architecture obtain a Master of Science degree, therefore technical subjects such as geometry or engineering graphics remain particularly significant. Teaching methods which make the taught subject relevant to the future occupations of the students, or are closely related to the faculty, draw a favourable response from the students. The article presents the whole range of examples of tasks, which are relevant to the profession connected with the landscape architecture and outlines the issues which are taught in descriptive and engineering geometry classes. Nowadays, it is difficult to observe students' craving for purely theoretical academic knowledge. To be well received it has to be 'smuggled' under the guise of practical use and immediate usefulness in their vocation. Anyway, it seems that what is most important is the result. Theoretical knowledge should be a good foundation for the future work of graduates and will hopefully develop them intellectually.

Keywords: descriptive geometry, applied geometry, engineering graphics, landscape architecture.

Landscape architecture – as we read in encyclopaedia - is the art of shaping people's space in relation to its natural components and according to its cultural traditions; it is the skill to relate, in harmonious way, the buildings and their setting according to the natural and cultural conditions. [1] It is a field of knowledge connected with shaping people's living space by means of plants, water and architectural elements. It takes into account various factors which create the spirit of the landscape - such as natural components, e.g.: landforms, existing plants, soil, climate, as well as the prevailing culture, local traditions or social needs. Its essential function is to create and protect the beauty of people's living spaces and of the natural scenery of the country. The most significant roles of landscape architecture are to shape and transform the existing open spaces, as well as renewing landscape and architectural assumptions (gardens, parks, squares, streets).¹ Landscape architecture can be dated as far back as the gardening of the ancient gardeners - who are called today the masters of planning and arranging gardens - who, basing on the experience and observations of the nature created their own architectural assumptions without using any standardised graphic notation system. [2] Its origins lie also in the ancient town planning of the urban complexes or parks. Nowadays, landscape architecture is understood as the association of three basic fields: architecture, town planning

¹ Designs of the green spaces in housing estates, private gardens, headquarters, shopping complexes, renewing historical park and garden assumptions and projects of street furniture, lighting, man-made bodies of water with plants, winter gardens, etc. are the most popular results of the landscape architects' work in the field of design.

and spatial planning. Despite its long practical history, it is still young as an academic discipline. First research institutions - chairs of the Landscape Architecture - appeared at the end of the 19th century in a few of the Universities in the United States (e.g. Harvard University) or in France (École Nationale Supérieure d'Horticulture in Versailles). In Poland - apart from few forerunners², who were active before the Second World War - the interest in landscape architecture began to grow in the last quarter of the 20th century and only recently became really vivid. At most universities, if it is present at all, it does not have a deep-rooted tradition or numerous generations of graduates. The studies of landscape architecture cover a wide range of subjects connected mainly with natural science³. Students also get a chance to develop their artistic skills through the medium of art classes⁴. Students of landscape architecture obtain a respectable degree: Master of Science, therefore, technical subjects⁵ such as geometry or engineering graphics (which include descriptive geometry, technical drawing and informatics in the landscape architecture) remain particularly significant.⁶ However, subjects connected with informatics and computer graphics, which acquaint them with computer-aided architectural design programs (AutoCAD or Autodesk Land, which connects the previous one with the Land Descop) are the most popular among the students.⁷ Landscape architecture students, unlike the students of other faculties, willingly use Corel to create their designs. Probably, they use the program for economic reasons. Anyway, it can also mean that the students have more artistic, than technical, attitude towards designing. Teaching methods which make the taught subjects relevant to the future occupations of the students, or are closely related to the specialty, draw a favourable response from the students. To operate the computer programmes students have to cope with variety of tasks. Mini-projects of landscape architecture, architectural detail, small in scale town planning and street, garden or park furniture seem to be popular among the students. The pictures below present examples of the tasks in which the students, basing on the playground designs, learned to create and insert their own sets of drawings. On the base of the mini-project of the street in the housing estate, students got acquainted with the function of rounding, filling the surface with hachure or image gradient.

² E.g. professor Franciszek Polkowski-Krzywda (1881 – 1949): architect, garden designer; one of the creators of Polish landscape architecture school; professor at The Academy of Fine Arts (ASP), Warsaw University of Life Sciences (SGGW) and Warsaw University of Technology.

³ E.g. plant biology, physiography, dendrology, ecology, phytosociology, geodesy, pedology, plant protection.

⁴ E.g. freehand drawing, painting, sculpture and garden art history.

⁵ E.g. mathematics with elements of statics, whole range of subjects connected with designing of landscape architecture objects, buildings.

⁶ The subjects mentioned above cover up to 180 hours – it is a considerable number compared with technical universities.

⁷ The Basic aims of the subject are to acquaint the students with the interface and the functioning of the program, drawing tools and editing tools, with methods of showing dimensions, introducing descriptions of drawings, introducing elements from some programs into documents, creating drawing blocks and 3D objects, preparing sheets for printing and working on the scanned base.

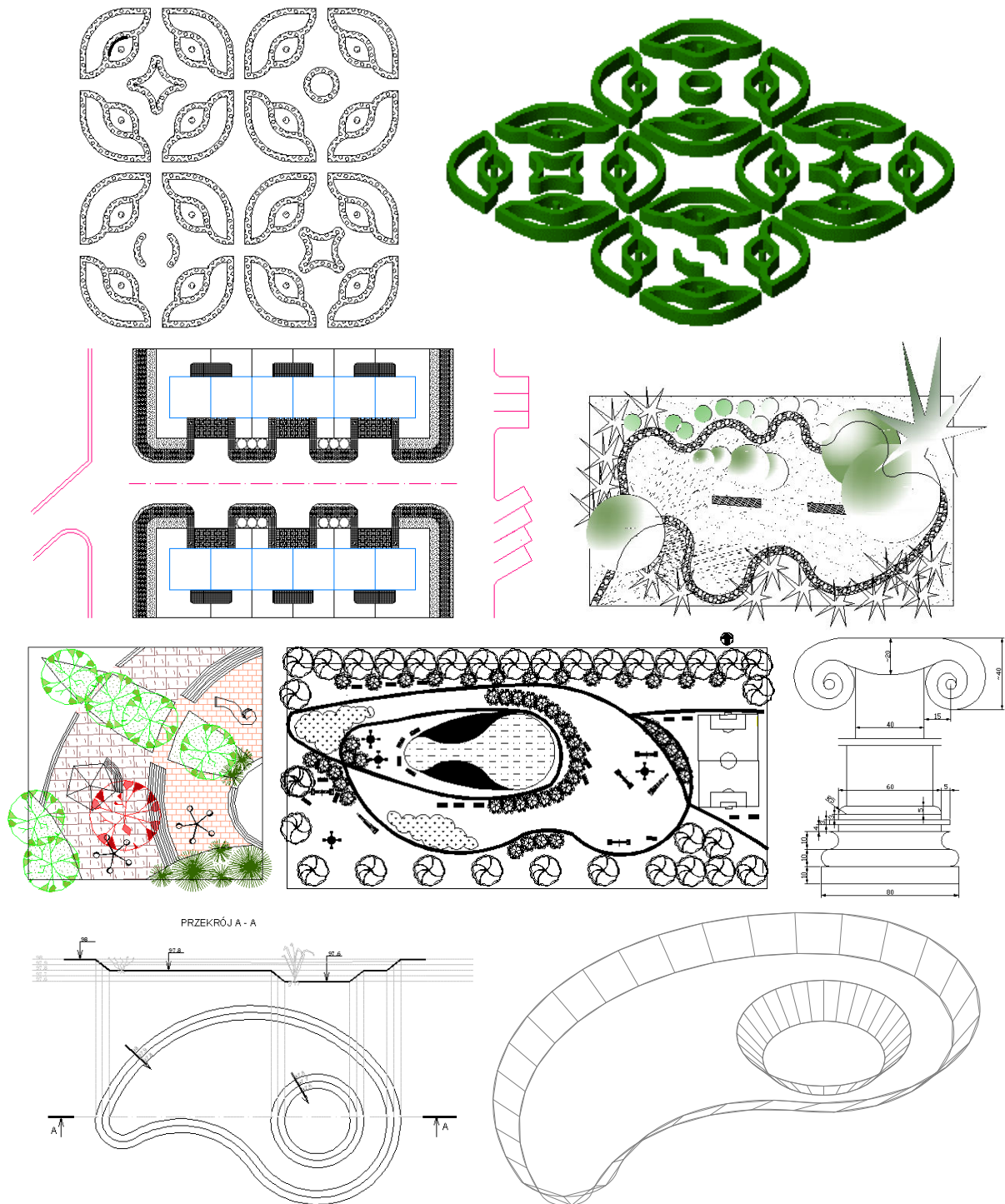


Fig. 1 Examples of the works of Landscape Architecture students.⁸

The computer-aided architectural design programmes are the most popular among the students since they realise that the programmes are used in design classes during the studies

⁸ Schematic project of the part of the housing estate, in which students use editing tools such as ‘array’, ‘offset’, ‘chamfer’ and ‘fillet’; park paths indicated by means of a curve adjusted to polyline, or spline; on the base of the playground project, students learn to make and insert ‘drawing blocks’ into documents, while using their imagination and creativity; architectural detail; example of the drawing of baroque garden, created by means of editing tools – ‘mirror image’ modification, offset and copy of the basic curve – which is presented in the picture by means of shaded line; using marking projection in the project of multi-level pond.

and will remain necessary in their future work. Unfortunately, the awareness of the importance of developing skills in descriptive and engineering geometry (the names of those subjects differ according to the faculty and the university) is undervalued.

Students generally do not appear fully aware of the fact that the gaps in their geometry knowledge (terminology, basic concepts and issues) result in considerable difficulties even in carrying out some of the instructions of graphic programmes.⁹ Due to its appliance in geodesy and cartography, marking projection is fundamental issue in the subjects connected with geometry. Careful attention is paid to shaping the terrain, hills, slopes and land shaping, benching, creating embankments and excavations (next to the roads, paths, watercourses and other water reservoirs, confining the attention to the projects of multi-level man-made ponds). Currently, it is difficult to observe students' craving for purely theoretical academic knowledge. To be well received it has to be 'smuggled' under the guise of practical use and immediate usefulness in their vocation. Anyway, it seems that what is most important is the result. Theoretical knowledge should be a good foundation for the future work of the graduates and will hopefully develop them intellectually.

References

- [1] Powszechna encyklopedia PWN © Wydawnictwo Naukowe PWN SA 2007.
- [2] Enge T. O., Schröer C. Fr.: Garden Architecture in Europe. Benedykt Taschen Verlag 1992.

GEOMETRIA I GRAFIKA W ARCHITEKTURZE KRAJOBRAZU

Mimo swych wiekowych korzeni praktycznych w świecie akademickim architektura krajobrazu jest kierunkiem stosunkowo młodym. W Polsce zainteresowanie nim na nieco szerszą skalę przypada na ostatnie ćwierćwiecze XX w. a znaczniejszy rozmach osiąga dopiero dziś. Kształcenie studentów na tymże kierunku obejmuje cały szereg przedmiotów związanych z bardzo szeroko rozumianym przyrodoznawstwem, a także przedmiotów plastycznych rozwijających zdolności artystyczne. Jest to jednak równocześnie kierunek inżynierski, stąd też w programach studiów poczesne miejsce zajmują także przedmioty techniczne, a wśród nich te związane z geometrią i grafiką inżynierską. Pozytywny oddźwięk u studentów zdają się wywoływać metody dydaktyczne łączące tematykę wykładanych przedmiotów z przyszłymi zagadnieniami branżowymi, bądź, choć w minimalnym stopniu, wykorzystujące analogie do problematyki ściśle związanej z kierunkiem studiów. W artykule przedstawiono cały szereg przykładowych zadań wykorzystujących praktyczne analogie do tematów branżowych kierunku. Omówiono też charakterystyczny, dla specyfiki kierunku, rys wykładanych zagadnień geometrii wykreślnej i inżynierskiej. U współczesnych studentów rzadko kiedy można zaobserwować głód czysto teoretycznej wiedzy akademickiej. By była z chęcią przyjęta trzeba ją nijako „przemycać” pod płaszczykiem praktycznego zastosowania i bezpośredniej przydatności w zawodzie. Najważniejszym jednak zdaje się efekt, by w ten czy inny sposób była przyjęta i owocowała w przyszłej pracy i sprawności intelektualnej naszych absolwentów.

⁹ The difficulties are often connected with drawing curves – sectors of circles of specified parameters, skills in recognizing curves' angles and basic circle quadrants' angles, identifying apparent and absolute point's coordinates or evident sizes of object's elements resulting from the relation to other component parts. Obviously, that kind of unconsciousness goes much deeper than just the gaps in academic knowledge.