

# Computer-assisted Geodetic Drawing at the Faculty of Geodesy

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**Abstract:** *The tasks of Geodetic Drawing as a subject at the Faculty of Geodesy is to make the students familiar with the technique of drawing being the basis for further practice, especially in cartography and GIS, but also in other areas where it is necessary to represent the space and spatial relationships visually. So far, the exercises were organized as free-hand drawing. In the academic year 2002/2003 the student programs started to be made by means of computers in accordance with contemporary demands of digital technology and spatial visualization following the user needs.*

**Key words:** Geodetic Drawing, Faculty of Geodesy, computer-assisted drawing.

## 1. Introduction

The universal character of drawing as a visual medium in scientific researches, education of pupils and students and in visual communication was pointed out in the book "Drawing in Science" edited by M. Lapaine [3].

Cartography is defined as the art of gathering, processing, storing and estimating the space-related data, and especially their cartographic presentation. Map is a structured model of spatial relationships derived from measurements. In a wider sense, it is a digital model suitable for graphic presentation, and in a narrower sense it is an analogous (graphic) model [2]. The research object of cartography is first of all the conversion or transcription of the reality into the sign model – *drawing* – graphic presentation in the plane called cartographic presentation [4].

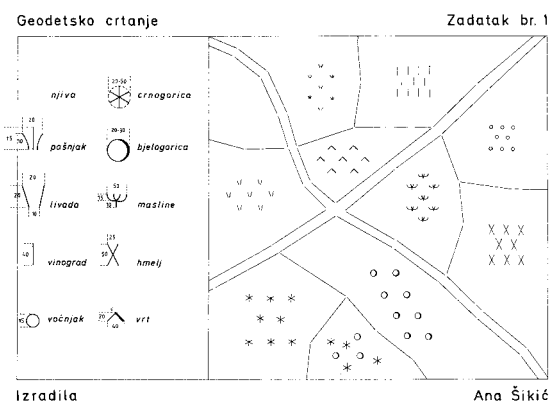
## 2. The courses of Geodetic Drawing

The courses in Geodetic Drawing are under the competence of the Department for Cartography. According to the curriculum of the Faculty of Geodesy [5], there are 30 periods of exercises foreseen for the courses of Geodetic Drawing during the I. semester of the undergraduate studies, and the subject is scored with two ECTS scores.

The goal of the subject is to make the students acquire the skills and patterns of geodetic drawing being the basis for further production of topographic and cadastral plans, designing plans, map production and similar.

The program of exercises encompasses the following contents: Drawing carriers and their properties. Accessories, tools and devices for the production of drawings. Expression by means of drawing. Basic graphic elements: point, line and surface. Complex drawn sign for representing the object properties. Optical illusions. Lettering on drawing. Manuscript and topographic lettering in technique. Production of geodetic drawings with basic geometric and graphic elements, with various numbers, with complex signs and lettering. Production of a simple geodetic drawing [1], [5].

So far, the exercises were organised in the manner of free-hand drawing. The program encompassed the production of three drawing tasks and the production of facsimile description (Fig. 1). The students are acquainted with the computer-aided drawing during the demonstration exercises. The assessment of the acquired skills is carried out by means of free-hand drawing.



**Fig. 1: Minimized students' work from Geodetic Drawing made with free-hand drawing in the academic year 1997/1998.**

## 3. Computer-assisted courses

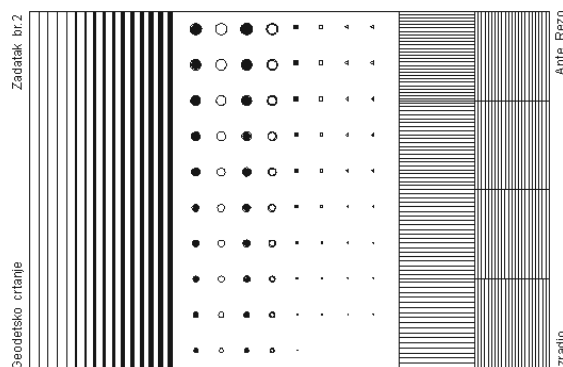
In the academic year 2002/2003 the drawing accessories: pencils, triangles and others have been replaced by computers.

This academic year (2002/2003) there was a poll carried out at the beginning of the I. term among the students about their background knowledge and usage of personal computers. The poll leaflets were filled in by 111 students of the I. term, and the questions were, among others: which secondary school they have finished, whether they own a computer, whether they are acquainted with the basics of informatics, whether they use any of CAD program and similar.

The poll has shown that, although 74% own a computer, only 16% of them can say for themselves that they are well acquainted with the basics of informatics. Referring to the question about being familiar with CAD program, only 39% of students answered that they know AutoCAD, and only one student knows the basics of the work with the program Micro Station.

The students who came to the Faculty of Geodesy after graduating from the Secondary school of geodesy or the Secondary technical school have learned to work with AutoCAD well, and after their knowledge has been assessed, they were released from attending the exercises. The assessment (the so called colloquium) was taken by 42 students, and all of them confirmed their background knowledge in computers assisted drawing and have been released from attending the exercises. It can be pointed out that the average mark at the colloquium was very good (4.2).

One of the great problems in organising the courses in Computers assisted geodetic drawing is the number of computers available, and we speak here about 13 computers Pentium 133 with 32 MB RAM. It is obvious that there are too few computer available and that the configuration is too weak.



**Fig. 2: Minimized students' work in Geodetic Drawing made by means of computer assisted drawing in the academic year 2002/2003.**

Thanks to a large number of students who were released from attending the exercises after

having passed the colloquium, the course could be done in 4 groups with 20 students in each, i.e. with 2 students at one computer. The students have made two drawing tasks within the frame of the exercises in Geodetic Drawing and have the file folder case described on computers (Fig. 2).

#### 4. Conclusion

The computers are used in almost all phases of designing, business and production. New theories and practice require better and more perfect tools so it could be possible to orient oneself in ever larger amount of technical knowledge. The computer has become inevitable, very efficient tool for solving practical problems.

In this paper it has been presented how the courses in Geodetic Drawing are organised by applying computers. The drawing by means of AutoCAD is faster and simpler because it is possible to correct errors and enter the changes into the drawing, and the drawing can be saved permanently and simply.

However, at the Faculty of Geodesy there is still the problem of a small number of computers left, having weak configurations, i.e. the computers available for students. The fact that students come from various secondary schools is also a great problem, and it is very difficult, especially in the I. term, to equalize their background knowledge and organise the courses.

#### 5. References

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