NTUA

NATIONAL TECHNICAL UNIVERSITY OF ATHENS

FACULTY OF RURAL AND SURVEYING ENGINEERING
CARTOGRAPHY LABORATORY

General

The Faculty of Rural and Surveying Engineering of NTUA offers a diploma in engineering after a five-year program of studies, including the implementation of a thesis. The Faculty is divided into three departments:

- The Department of Topography,
- The Department of Geography and Regional Planning,
- The Department of Rural Technology and Development.

The three departments cover relevant topics of scientific and engineering fields, by offering undergraduate courses and PhD degree by research.

The Cartography Group is a team within the staff of Topography Department. The group is responsible for:

- the educational activities of the Department related to Cartography,
- the operation of the Cartographic Laboratory,
- the research projects and studies in the field of Cartography and Geographical Information Systems.

The Cartography related courses offered in the Department, cover the areas of:

- Basic Cartographic Principles
- Elements of the History of Cartography
- Map Projections
- Analytical Cartography
- Thematic Cartography
- Map Production
- Digital Mapping

Research and Teaching

Of special interest is the research done by the students who work for their thesis in the field of Cartography, covering the above mentioned areas. A list of theses topics carried out lately, indicating the areas of interest, is given below.

- Design of a National Atlas of Greece using GIS technology.
    - Part 1. Atlas of the Physical Environment.
    - Part 2. The Demographic Atlas.
    - Part 3. The Industrial Atlas.
    - Part 4. Atlas of Education.

- Design of special purpose atlases.
    - The atlas of Zagorohoria
    - The atlas of Pilio.
    - The digital geographical atlas of Ionian islands.
- Design of digital tourist maps.
    - The island of Scopelos.
    - The island of Ios.
    - The map of Lassithi Valley
    - The map of Mykonos.
- Mapping for Cadastral purposes for the island of Cyprus.
- Design of symbols for tourist maps.
- Software development for the creation of electronic atlases.
- Cartographic generalization of point and area symbols.
- Digital techniques for hill shading.
- Algorithms for the determination of optimal paths in linear networks.
- Digital image processing for cartographic applications (R to V conversion).
- Road network management using GIS technology.
- Algorithm for computing equidistant lines.
- Mountainous Cartography. A case study for Parness mountain.
- A data dictionary supporting multiscale cartographic production.
- Development of a user interface for map compilation.
- Automation in map production.

PHD studies

Along with the staff in the research group of Cartography, there are six graduate students working towards their PHD on topics related to,

- map visualization,
- mapping for teaching purposes,
- spatio-temporal modelling,
- determination of accuracy of digital map,
- expert systems in Cartography.

Research Projects

The members of the group of Cartography have participated in the analysis and implementation of the following research projects:

- The development of wave energy resource atlas in Europe with pc Arc/Info.
- Design of symbols for town planning.
- A comprehensive study of hydro-aquistic elements of Aegean sea-Amphitritie.
- A GIS application for the Road network of the Municipality of Athens.
- Greek national road network databank.
- Development of the National Standard for the exchange of digital geospatial data.
- Design of an information system for regional planning.

Future Trends and Planning

Research

Current research is focused on the following topics:

- Cartographic generalization.
- Fractal geometry applications in Cartography.
- Map visualization (hill shading).
- Visual perception.
- Human-computer interaction in terrain visualization.
- Cultural and social aspects in special purpose mapping.
- Study of historical data in old maps of Greece.
- Mapping archaeological data using GIS technology.
- Electronic atlases and electronic charts.
- Three dimensional modelling in geoscientific applications.
- Database design.
- Road database design.
- Modelling of objects with undetermined boundaries.
- Accuracy issues of spatial data bases.
- Integrated solutions utilising GIS tools.
- Formalizing imprecise geographic knowledge.
- Representing spatio-temporal change in socio-economic units.
- Navigation in space under constraints.
- VR modelling using symbolic representations.
- Expert systems in Cartography.

Teaching

Teaching experience in Cartography has shown the nessecity of offering an extra course, that is the fourth one, covering in more extent the area of Analytical Cartography. More specifically the course should cover the following topics:

- measurments from maps,
- methods of interpolations and
- cartographic transformations

by using mainly computer methods and contemporary technics.

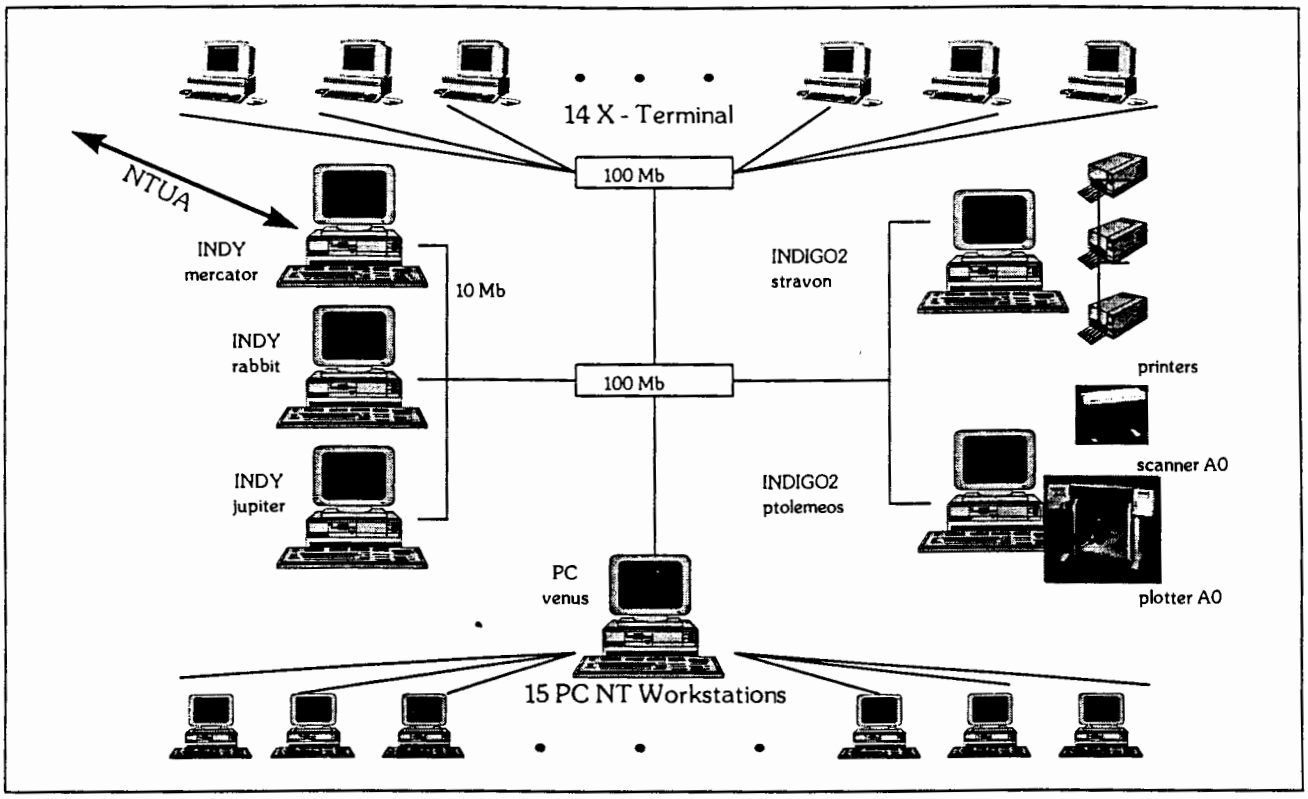
Among the plans of the teaching stuff is also the reorganization of the existing teaching material used in all the Cartography offered courses, including:

- the reformation of the practical exercises, so that the students could get acquainted to the most recent scientific technics, and
- the revision of the existing textbooks, so that the new trends in Cartography and the results of present research could be included.
- new curriculum developments at the undergraduate and graduate levels.

Formal graduate program starting September 1998.

Facilities

The Laboratory's digital cartographic system is presented in the following image:



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