



## **Geodetic Education for the Earth's and Space exploration. Impact of recent trends and practical needs**

**M. Doufexopoulou**, B.A. Massinas

Department of Surveying, National Technical University of Athens (NTUA), Greece  
(mairiedf@central.ntua.gr/ Fax: +30-210-7722670)

### **Introduction**

Geodesy the oldest of Earth related disciplines has been deeply affected in its aims and objectives over the last 50 years. Presently Geodesy contributes more as a discipline that provides an accurate geo-reference (positioning in various scales and accuracies) for all types of data that monitor phenomena related or depending on the Earth's activity. Geodesy cannot be considered only as the discipline used mainly to map the Earth. In contrary the geodetic measurements strongly depend on several physical parameters while the same measurements contribute to establish models that describe the attitude of physical factors. A main consequence is that the content of Education in Geodesy needs a drastic revision and frequent up-dates.

The criteria that should be used to revise the content of Education in Geodesy are various and sometimes contradictory. At present it is quite difficult to separate educational subjects with a geodetic background from subjects that contribute to achieve special tasks or develop skills. From pure educational point of view the course designers have to face a balance between the needs to increase the duration of geodetic courses from needs to update the content of education due to the actual devaluation of certain subjects.

### **Analysis**

The aim of this work is to differentiate the two groups of actual criteria needed in revising the content of the Geodetic Education at the present time. These two sorts

depend on quite different demands that are contradictory in setting up an educational curriculum. However both sorts of criteria relate to two principal features: The first is the strong involvement of informatics in most aspects of education and the second one the very fast devaluation of the subject topics and of the needed skills. The first feature introduces need to add new matter not directly relevant to the subject of geodesy that increases the course duration against the time needed for subject topics. The second one defines needs 1) to set up flexible ways to review and up-date the subject's matter 2) To define which are today the target groups needing geodetic education 3) to prepare concise and attractive presentations to learners with goal to activate their interest in the utility of the subject course.

### **Synthesis**

Actual needs in Education demand to set up the concrete criteria: which are the target students presently, which are the aims and objectives in a certain "educational unit" / course and based on these to set up the exact educational needs in the content of a course and in its duration. These demands should be fulfilled within an effective educational process that would allow the future professionals to adapt their knowledge fast to any new tasks and / or applications. Certain of these needs are not relevant to geodesy but they rather relate to educational topics. The content of relevant geodetic education and its form need today the contribution of professionals coming from various background subjects.

### **Objective and conclusion**

This work introduces two objectives. The first one is to promote the familiarization of various scientists dealing with the Earth and Space under several aspects, with the basic principles of Geodesy. The second objective is to call the attention of educators of Geodesy towards basic educational rules that should be considered when courses are designed or implemented. The most important criterion of the second objective is the target group of the education. In other words the foundations of geodesy in Mathematics and Physics remain a principal subject core, enriched with educational needs in information theory, statistics and in obtaining practical skills. Beyond the subject foundations there are various other educational demands determined by basic educational rules.

The implementation of educational rules demands information about the actual needs of the target groups, the course duration, its objectives and the need of good learning results. Availability of actual information on such questions demands the maintenance

of active advisory educational groups by the educational units or by scientific organizations.