

Modernisation of the Study Programme “Geodesy and Cartography” at the Riga Technical University in accordance with Contemporary Requirements

Janis STRAUHMANIS, Latvia

Key words: education, geodesy, geomatics

SUMMARY

It should be noted that 1951 until 1989 it was not allowed to provide training for the geodesy speciality at Latvian higher educational establishments. In 1989 training for this speciality was renewed at the Riga Technical University, where at present the Department of Geomatics offers the study programme “Geodesy and Cartography”.

At the CLGE conference *European Professional Qualification in Surveying* (Brussels, 2005) times pointed out that study programmes are changing but the public image of surveyor should not change (prof.Pedro J.Cavero) and geodesic education should include technical education as well as expertise (prof.Karl-Werner Schulte).

The study programme “Geodesy and Cartography” offered by the Department of Geomatics at the Riga Technical University is now being modernised taking into account the most recent trends in geodesic and cartographic education; it should be stressed that such a programme is offered only at the Riga Technical University, which means taking responsibility for the level of preparing geodesy and cartography specialists in accordance with contemporary requirements. The main innovations include: 1) introduction of one – term field training; 2) offering new courses, such as Topographic Cartography, Remote Sensing, and others; 3) more extensive involvement of students in research work.

The length of bachelor degree programme will be four years that of master degree programme – two years. For providing field training, the Department of Geomatics also cooperates with such recently established companies as *The Latvian Geospatial Information Agency* and *The Latvian State Surveyor Ltd.* We are also expanding cooperation with our long – time partners, e.g. *State Lande Service of Latvia, Institute of Geodesy and Geoinformation of the University of Latvia, The Riga Geometrs Ltd.*

Die Modernisierung des Studienprogramms“Geodäsie und Kartographie” entsprechend den gegenwärtigen Anforderung an der Technischen Universität Riga

Janis STRAUCHMANIS, Lettland

Grundwörter: Hochschulbildung, Geodäsie, Geomatik

ZUSAMMENFASSUNG

Es muß gemerkt werden, daß von 1951 bis 1989 die Ausbildung von Fachleuten in der Geodäsie an den Hochschulen Lettlands nicht akzeptiert wurde. Erst 1989 wurde diese Fachrichtung an der TU Riga erneut bestätigt, zur Zeit ist der Lehrstuhl für Geomatik für diese Ausbildung von Geodäten zuständig. Auf der internationalen Konferenz “*European Professional Qualification in Surveying*” (2005,Brüssel) wurde betont, daß Studienprogramme geändert werden, nicht aber das öffentliche Image des Landmessers (prof.Pedro J.Cavero) und daß die fachliche Ausbildung in der Geodäsie unbedingt die technische Ausbildung sowie die Frage der Expertise umfassen soll (prof.Karl-Werner Schulte). Das Studienprogramme “Geodäsie und Kartographie” wird jetzt unter Beachtung der neusten Tendenzen in der geodätischen und kartographischen Ausbildung modernisiert. Es muß gemerkt werden, daß ein solches Studienprogramm an keiner anderen Hochschule in Lettland realisiert wird und wir tragen deshalb eine besondere Verantwortung für daß entsprechende Niveau in der Ausbildung der künftigen Fachleute. Die Hauptveränderungen im Studienprogramm werden folgende sein: 1) es wird ein Semester langes Praktikum im Bakkalaureus – und Magisterstudium eingeführt; 2) es werden neue Studienfächer wie z.B. topographische Kartographie, kosmische Geodäsie, Marketing und Menegement in der Geodäsie und Kartographie u. a. eingeführt; 3) die wissenschaftliche Forschungsarbeit der Studenten wird intensiviert und gefördert. Das Bakkalaureusstudien wird 4 Jahre dauern, das Magisterstudium – 2 Jahre. Für die technische und praktische Praxisvorbereitung hat der Lehrstuhl für Geomatik eine direkte Zusammenarbeit mit neuentstandenen Unternehmen in Lettland aufgenommen: mit der Agentur der georäumlichen Information und mit der Gmbtl Staaliches Landmesser Lettlands. Außerdem wird auch die Zusammenarbeit mit unseren langjährigen Pathern im Landesdienst Lettlands, im Institut für Geodäsie und Geoinformatik an der Universität Lettland, sowie der GmbH “Rigas Geometrs”.

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1. INTRODUCTION

It should be noted that from 1951 until 1989 it was not allowed to provide training for the geodesy speciality at Latvian higher educational establishments. In 1989 training for this speciality was renewed at the Riga Technical University, where at present the Department of Geomatics offers the study programme “Geodesy and Cartography”. The Department of Geodesy at the Riga Technical University was reestablished in 1991, from 2003 it is the Department of Geomatics.

At the CLGE conference *European Professional Qualification in Surveying* (Brussels, 2005) it was pointed out that study programmes are changing but the public image of surveyor should not change (prof.Pedro J.Cavero) and that geodesic education should include technical education as well as expertise (prof.Karl-Werner Schulte).

As it was pointed out by FIG president professor Holger Magel, in Western Europe higher educational establishments have difficulty in recruiting students for the field of geodesy. In Latvia the situation is completely different: there is a shortage of professional geodesists and surveyors in both state-owned and private companies. According to professor H.Magel, a surveyor is a professional with the academic qualifications and technical expertise. However, the number of geodesists trained at the Department of Geomatics is not enough to meet the demand. It should be noted that some of the graduates choose to work at cartographic and real estate companies.

The absolute number of graduates from 1992 to 2006 per year:

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Bachelors	15	8	3	4	4	4	12	9	6	5	7	6
Masters	-	-	2	4	1	-	-	4	3	5	1	4
Engineers	-	14	6	-	3	-	3	1	6	11	5	4
	15	22	11	8	8	4	15	14	15	21	13	14
	2004	2005	2006									
Bachelors	3	16	6									
Masters	11	5	6									
Engineers	5	15	8									
	19	36	20									

The study programme “Geodesy and Cartography” offered by the Department of Geomatics at the Riga Technical University is now being modernised taking into account the most recent trends in geodesic and cartographic education; it should be stressed that such a programme is offered only at the Riga Technical University, which means taking responsibility for the level of preparing geodesy and cartography specialists in accordance with contemporary requirements. About 300 students in civil engineering and about 100 students in architecture also take a course in geodesy.

The study programme “Geodesy and Cartography” offered by the Department of Geomatics at the Riga Technical University is now being modernised taking into account the most recent trends in geodetic and cartographic education. The credit points are indicated in accordance with the system approved in Latvia, which correspond to ECTS in the ratio 1: 1,5.

New Bachelor programme “Geomatics”: 4 years, 180 CP

A. MANDATORY SUBJECTS	80 CP
1. Mathematics	9 CP
2. Mathematics (special course)	3 CP
3. Physics	6 CP
4. Remote sensing	2 CP
5. Computer sciences (basic course)	3 CP
6. Descriptive geometry and engineering graphics	2 CP
7. Economics	2 CP
8. Fundamental rights	2 CP
9. Environmental engineering	2 CP
10. Geodesy	3 CP
11. Application of geodetic measurements	6 CP
12. Practical geodesy	2 CP
13. Engineering geodesy	2 CP
14. High geodesy	6 CP
15. Fundamentals of geoinformation systems	4 CP
16. Fundamentals of geomatics	2 CP
17. Cartography	4 CP
18. Photogrammetry	6 CP
19. Real estate cadastre	3 CP
20. Property valuation	3 CP
21. Civil engineering (basic course)	2 CP
22. Building mechanics (basic course)	2 CP
23. Roads (basic course)	2 CP
24. Civil defence	1 CP
25. Labour defence	1 CP
26. Sport	0 CP

B. SUBJECTS OF LIMITED CHOICE	40 CP
1. Subjects from Programme	
1.1. Geodetic network	4 CP
1.2. Global positioning systems	3 CP
1.3. Geographical information systems	3 CP
1.4. Geodetic gravimetry	2 CP
1.5. Digital terrain models	2 CP
1.6. Cadastral surveying	2 CP
1.7. Hydrographic surveying	2 CP
1.10. Application programmes in geomatics	3 CP
1.11. Geomatic data processing	4 CP
1.12. Legislation in geomatics	2 CP
1.13. Land law	3 CP
1.14. Land registration systems	3 CP
1.15. Land management	3 CP
1.16. Territorial planning	2 CP
1.17. Astronomy	2 CP
2. Languages	4 CP
2.1. English	4 CP
2.2. German	4 CP
3. Humanitarian / social subjects	4 CP
3.1. Sociology	2 CP
3.2. Managerial sociology	2 CP
3.3. Applied etiquette	2 CP
3.4. Political science	2 CP
3.5. Social development models	2 CP
C. SUBJECTS OF FREE CHOICE	4 CP
D. PRACTICE	30 CP
E. Bachelor thesis (engineer project)	18 CP

New Master programme “Geomatics”: 2 years, 100 CP

A. MANDATORY SUBJECTS	35 CP
1. Height fixation with GPS	3 CP
2. Computergraphic in geomatics	6 CP
3. Theoretical geodesy	6 CP
4. Digital mapping	3 CP
5. Thematical cartography	4 CP
6. Property valuation	6 CP

7. Registration systems of land management	2 CP
8. Organisation of research work	3 CP
9. Marketing and management in geodesy and cartography	1 CP
10. Labour protection	1 CP
B. SUBJECTS OF LIMITED CHOICE	15 CP
1. Special subjects	9 CP
1.1. High geodesy	6 CP
1.2. Geodetic data processing	6 CP
1.3. Local geodetical network	3 CP
1.4. Economics and organization of geodetical and cartographic employment	3 CP
1.5. Theoretical cartography	3 CP
1.6. Topographical cartography	3 CP
2. Humanitarian / social subjects	4 CP
2.1. Ethics	2 CP
2.2. Business sociology	2 CP
2.3. Social psychology	2 CP
2.4. Presentation	2 CP
Pedagogic subjects	2 CP
2.5. Pedagogy (for masters)	2 CP
2.6. Psychology (for masters)	2 CP
Economic / management subjects	2 CP
2.7. Business planning	2 CP
2.8. Management of geodetic employment	2 CP
C. SUBJECTS OF FREE CHOICE	6 CP
D. PRACTICE	24 CP
E. Masters thesis	20 CP

The main innovations in the study programme “Geodesy and cartography” include:

- 1) introduction of one – term field training;
- 2) offering new courses, such as Topographic Cartography, Remote Sensing, and others;
- 3) more extensive involvement of students in research work.

It should be noted that the study of European surveyors’ professional competence (Copenhagen,2001.) drew attention to the need to develop academic geodesy study programmes in accordance with the demands of international and national land surveying

markets. As it was pointed out by professor Stig Enemark (Denmark) land surveying and mapping are explicitly technical disciplines, whereas cadastre, land management and territorial planning are law and business disciplines. And all of them should be mastered by the would-be specialists within the framework of the study programme 'Geomatics'. The training of future surveyors is also promoted by the international cooperation between the Department of Geomatics and Mikkeli Politechnic (Finland), as well as German and Spanish technical higher educational establishments.

During practice students improve the skills required to do basic geodesic and cartographic work. Each student is assigned an individual task specified in the contract. Practice can be done at public institutions, state, municipal and private companies. The Department of Geomatics also cooperates with such recently established companies as *The Latvian Geospatial Information Agency* and *The Latvian State Surveyor Ltd.* We are also expanding cooperation with our long – time partners, e.g. *The State Land Service of Latvia*, *The Institute of Geodesy and Geoinformation of the University of Latvia*, *The Riga Geometrs Ltd.*

We agree with the idea pointed out in the document approved by FIG 2. commission: "Employers' forums form a bridge between academia and the world of work, enabling courses to be designed and the methods of learning to be promoted which foster in students the key attributes and transferable skills needed to secure jobs." (FIG Publication No. 19, 3.4).

At present, the Department of Geomatics at the Riga Technical University is preparing a distance learning programme in cartography (which will also include a compulsory attendance of a small number of classes). In addition, courses in surveying to implement life-long education are offered by the Department in cooperation with the Association of Surveyors of Latvia.

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BIOGRAPHICAL NOTES

Academic experience: Dr.geography, Moscow State University, Dr.habil.,
University of Latvia

Current position: Head of the Department of Geomatics, Riga Technical University
2003 –

Practical experience: thematic cartography, geomatics education

Activities in home and international relations: Member of Board of the Latvian
Association of Surveyors
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Cartography and Geodesy
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