DEPARTMENT OF THEORETICAL GEODESY

Head of the Department:
Prof. Ján Hefty, PhD.

Tel.: + 421 2 52925 476
Fax: + 421 2 52925 476
E-mail: jan.hefty@stuba.sk

I. STAFF

Professors		
Ján Hefty, PhD.	+421 2 59274 533	jan.hefty@stuba.sk
Ján Melicher, PhD.	+421 2 59274 348	jan.melicher@stuba.sk
Associate Professors		
Ernest Bučko, PhD.	+421 2 59274 534	ernest.bucko@stuba.sk
Marcel Mojzeš, PhD.	+421 2 59274 536	marcel.mojzes@stuba.sk
Senior Lecturers		
Peter Černý, PhD.	+421 2 59274 343	peter.cerny@stuba.sk
Jana Faixová Chalachanová, PhD.	+421 2 59274 297	jana.chalachanova@stuba.sk
Ľubomíra Gerhátová, PhD.	+421 2 59274 344	lubomira.gerhatova@stuba.sk
Ladislav Husár, PhD.	+421 2 59274 531	ladislav.husar@stuba.sk
Ivana Ivánová, PhD.	+421 2 59274 297	ivana.ivanova@stuba.sk
Juraj Janák, PhD.	+421 2 59274 537	juraj.janak@stuba.sk
Lecturers		
Peter Korčák	+421 2 59274 342	peter.korcak@stuba.sk
Ľubica Valachovičová	+421 2 59274 342	lubica.valachovicova@stuba.sk
Juraj Papčo	+421 2 59274 345	juraj.papco@stuba.sk
Research Fellows		
Renáta Ďuráčiová, PhD.	+421 2 59274 297	renata.duraciova@stuba.sk
Robert Čunderlík, PhD.	+421 2 59274 538	robert.cunderlik@stuba.sk
Miroslava Igondová, PhD.	+421 2 57294 353 (Mýtna ul., 4.p.)	miroslava.igondova@stuba.sk
Marián Kováč, PhD.	+421 2 57294 339 (Mýtna ul., 4.p.)	marian.kovac@stuba.sk
Technical Staff		
Miroslav Bednár	+421 2 59274 270	
Mária Eisenbergová	+421 2 59274 341	maria.eisenbergova@stuba.sk
Katarína Igondová (secretary)	+421 2 59274 535	katarina.igondova@stuba.sk
Helena Kvasnicová (secretary)	+421 2 59274 535	helena.kvasnicova@stuba.sk
Doctoral Students		
Juraj Bezručka	+421 2 57294 339 (Mýtna ul., 4.p.)	juraj.bezrucka@stuba.sk
Ján Ferko	+421 2 59274 345	jan.ferko@stuba.sk
Linda Hipmanová	+421 2 57294 339 (Mýtna ul., 4.p.)	linda.hipmannova@stuba.sk
Michal Hrčka	+421 2 57294 339 (Mýtna ul., 4.p.)	michal.hrcka@stuba.sk
Tibor Lieskovský	+421 2 59274 297	tibor.lieskovsky@stuba.sk
Réka Mészárosová	+421 2 59274 344	reka.meszarosova@stuba.sk
Vladimír Stromček	+421 2 59274 297	vladimir.stromcek@stuba.sk
Michal Šprlák	+421 2 59274 538	michal.sprlak@stuba.sk
Miloš Vaľko	+421 2 59274 538	milos.valko@stuba.sk

I.1 Teaching activities

The Department's teaching activity provides the theoretical background for geodesy as a science concerning the geometric shape of the Earth and its gravity field. This is accompanied by the theory of measurements, methods of positioning, data processing, statistical analysis and informatics. Both theoretical and practical aspects are considered, emphasising current and future trends in geodesy. The Department covers education in subjects concerning geometric geodesy, physical geodesy, geodetic astronomy, satellite geodesy, statistical processing of measurements, geoinformatics and computer science.

II. EQUIPMENT

II.1 Teaching and Research Laboratories

Observatory for Geodetic Astronomy - A research laboratory oriented towards geodetic positioning methods using natural and artificial celestial bodies and their integration with terrestrial geodetic methods.

Laboratory for Geodesy and Metrology - A research and educational workplace directed at the development of terrestrial measurement methods and techniques, laboratory tests, and calibration and comparison of geodetic instruments and devices.

Laboratory for Geoinformatics - Serves as a research and educational workplace focusing on applications of computer technologies for Geographical Information Systems and Land Information Systems.

The Modra-Piesok Geodynamic Reference Control Site is used for permanent positioning by the GPS method and for absolute and relative measurements of gravity acceleration as part of international geodynamic research projects. The permanent GPS observations at Modra-Piesok are included in the European Reference Frame that is used for construction and maintenance of geodetic networks in Europe.

II. 2 Special Measuring Instruments and Computers

Total station:	Topcon GTS-6
Electronic theodolite:	Wild T 2000
Electronic distance meters:	DI 2000, Di 5
GPS receivers:	TRIMBLE 5700 (two units), TRIMBLE NetRS TRIMBLE 4000 SSE, TRIMBLE 4000 SSi (two units), GeoExplorer XT (two units), MARCH IIE (two units)
Levelling instruments:	Wild Na 2000, Zeiss Ni 002 (three units)
Astronomical instruments:	Wild T4, Circumzenithal RIGTC 100/1000, Circumzenithal RIGTC 50/500
Gravity meters:	Worden, Scintrex CG2
Laserinterferometric comparator:	LIK

III. TEACHING

III.1 Bachelor Study

Subject	Semester	Hours Per Week		Lecturer
		Lectures	Seminars	
Informational Technologies	2	1	2	P. Černý
Processing and Analysis of Measurements 1	2	2	2	J. Hefty
Processing and Analysis of Measurements 2	3	3	2	J. Hefty
Programming	3	2	3	P. Černý
Geodetic Networks	4	3	3	E. Bučko
Computer Programming	4	2	3	P. Černý
Geometric Geodesy I.	4	3	2	M. Mojzeš
Geodesy and Cartography (Faculty of Architecture)	4	2	1	Ľ. Gerhátová, J. Faixová Chalachanová
Physical Geodesy	5	3	2	M. Mojzeš
Geodetic Astronomy and Space Geodesy I.	6	2	3	L. Husár
Field Education in Geodetic Controls	6	2 weeks		E. Bučko

III.2 Graduate Study

Subject	Semester	Hours Per Week		Lecturer
		Lectures	Seminars	
Global Geodesy	1	3	2	M. Mojzeš
Space Geodesy	1	3	2	J. Melicher
Geographical Information Systems	2	3	2	J. Kadlic
Physical Geodesy 2	2	2	2	M. Mojzeš
Analysis of Measurements	2	2	2	J. Hefty
Specialised Field Education	3	2 weeks		L. Husár, I. Ivánová
Metrology in Geodesy	4	2	2	J. Melicher
Complex Geodetic Project	4	1	5	Dep.Theor.Geod.
Digital Modelling of Spatial Structures	2	2	2	J. Faixová Chalachanová
Satellite Geodesy	2	2	2	Ľ. Gerhátová
Gravimetry	3	2	2	J. Janák
Three-Dimensional Geodesy	3	2	2	Ľ. Gerhátová
GIS Design and Implementation	3	2	2	J. Faixová Chalachanová
Geographic Information Systems (branch of study: Buildings and the (Environment)	3	2	2	J. Faixová Chalachanová
Geodynamics	4	3	3	M. Mojzeš

V. RESEARCH PROJECTS

1. Application of Effective Methods for Solving Boundary Value Problems in Geodesy. VEGA Project 1/1433/04. Leader: Assoc. Prof. Marcel Mojzeš, PhD.
2. Monitoring and Analysis of Short-Term Variations in Position Using Global Navigating Systems. VEGA Project 1/1033/04. Leader: Prof. Ján Hefty, PhD.
3. Standardization and Inter-Operability of Geographical Information. VEGA Project 1/1035/04. Leader: Ing. Jana Faixová Chalachanová, PhD.
4. 5th Framework Program: Contract No. EVK2-CT-2002-00140, "CERGOP-2/Environment". National coordinator: Assoc. Prof. Marcel Mojzeš, PhD.
5. Interreg III B CADSES Neighbourhood Programme: Project No. 3B035, S.I.S.M.A. – System Integrated for Security Management Activities to safeguard and protect historic centres from risks. Participant: Assoc. Prof. Marcel Mojzeš, PhD.
6. Troposphere Modelling on the Territory of Slovakia Using Permanent GNSS Observations for Near Real Time Applications. APVV Project No. LPP-0176-06. Leader: Prof. Ján Hefty, PhD.

VI. COOPERATION

VI.1 Cooperation in Slovakia

1. Authority of Geodesy, Cartography and Cadastre, Bratislava
2. Geodetic and Cartographic Institute, Bratislava
3. Research Institute of Geodesy and Cartography, Bratislava
4. Railways of the Slovak Republic, Bratislava
5. Geophysical Institute of the Slovak Academy of Science, Bratislava
6. Faculty of Mathematics and Physics of Comenius University, Bratislava
7. Dionýz Štúr State Geological Institute, Bratislava
8. Faculty of Natural Sciences of Comenius University, Bratislava
9. Slovak Association for Geoinformatics, Bratislava
10. Slovak Standards Institute, Bratislava
11. Archaeological Institute of Slovak Academy of Sciences, Nitra

VI.2 International Cooperation

1. Warsaw University of Technology, Poland
2. FÖMI - Satellite Geodetic Observatory, Penc, Hungary
3. Technical University of Budapest, Hungary
4. Technical University of Vienna, Austria
5. Faculty of Mining and Geology, Mining University, Ostrava, Czech Republic
6. Institute of Cartography and Geodesy, Frankfurt am Main, Germany
7. Czech Technical University, Prague, Czech Republic
8. Technical University of Brno, Czech Republic
9. Department of Geodesy and Geomatics Engineering, University of New Brunswick, Fredericton, Canada
10. Delft University of Technology, The Netherlands
11. Faculty of Technical Engineering in Vitoria, University of the Basque Country, Spain
12. Advisory Group on Outreach (CEN/TC287)

VII. THESES

VII.1 Bachelor Theses

No.	Student's Name	Title	Supervisor
1.	M. Ďurák	Using Kinematical Phase Observations of Single-Frequency GPS Receiver	I. Ivánová
2.	L. Gálová	Analyses in Spatial Information Systems	I. Ivánová
3.	L. Korbeľová	Applications of GPS for Mapping	M. Igondová
4.	M. Krupec	Processing and Analyses of Geodetic Measurements in a MATLAB Software Environment	J. Hefty
5.	V. Sládečková	Determination of Altitude of Pillar at the Roof of Faculty of Civil Engineering (Block A)	J. Ferko
6.	M. Zeman	Methods of Traverse Adjustment	E. Bučko

VII.2 Graduate Theses

No.	Student's Name	Title	Supervisor
1.	J. Baďura	Programming in Mathcad Environment	P. Černý
2.	F. Duračinský	Processing of VLBI Measurements	L. Husár
3.	M. Filipová	Detailed Shape of Gravity Field within High Mountain Environment	R. Čunderlík
4.	I. Goralka	Diagnosing Relative Systematic Errors in Gravimetric Quasigeoid of Slovakia	M. Mojzeš
5.	T. Gremeň	Optimal Preparation of Input Data for Geodetic Boundary Value Problem Solution	J. Janák
6.	L. Hipmanová	Effect of Modra-Piesok GPS Antenna Protective Cover on Results of Position Determination	J. Hefty
7.	K. Kročková	Proposed Methodology of CEANS Geographical Component Entering	J. Faixová Chalachanová
8.	M. Maroš	Numerical Solution of Direct and Reverse Geodetic Problem Using Vector Calculus	M. Mojzeš
9.	M. Mezovský	Application of Effective Algorithms for Programming	P. Černý
10.	E. Šalátová	Architecture of Information System for Geodetic Control Administration	Ľ. Gerhátová
11.	T. Teleky	Analysis of Spatial Database from Point of View of Accuracy of Position	J. Faixová Chalachanová
12.	Z. Zeumerová	Appraisal of Quality of Digital Terrain Model as a Part of ZB GIS	J. Faixová Chalachanová

VII.3 Doctoral Dissertations

No.	Student's Name	Title	Supervisor
1.	I. Ivánová	Data Quality in Spatial Datasets (in English)	E. Bučko
2.	M. Kováč	Software Modelling of Selected Geodetic Measurements	J. Hefty

IX. PUBLICATIONS

IX.1 Journals

[1] HEFTY, J.: GPS Data Analysis and the Definition of Reference Frames. Reports on Geodesy, 75, 4, 2005, pp. 47-52.

[2] HEFTY, J.: Geokinematic Modeling and Strain Analysis. Reports on Geodesy, 75, 4, 2005, pp. 119-124.

[3] MOJZEŠ, M. – HUSÁR, L. – JANÁK, J. – PAPČO, J. – CZARNECKI, K. – BOGUSZ, J. – WALO, J.: Testing Gravimetric Quasigeoid Using Astronomic-Geodetic Method in the Tatra Mountains – Preliminary Results. Reports on Geodesy, 75, 4, 2005, pp. 185-190.

[4] HRČKA, M. – HEFTY, J.: Diurnal and Semi-Diurnal Coordinate Variations Observed in European Permanent GPS Network: Deterministic and Stochastic Constituents. Contributions to Geophysics and Geodesy, Vol. 36, special issue, 2006, pp. 7-16.

[5] POSPÍŠIL, L. – DVOŘÁK, P. – HOTOVCOVÁ, J. – MOJZEŠ, M. – PAPČO, J.: Geo-Analyses of Horizontal Movement Trends in Eastern Slovakia. Contributions to Geophysics and Geodesy, Vol. 36, Special issue, 2006, pp. 17-30.

[6] JANÁK, J. – PAŠTEKA, R. – ZAHOREC, P. – LOVIŠKA, Z.: Terrain Correction in Extremely Disturbed Terrain. Contributions to Geophysics and Geodesy, Vol. 36, Special issue, 2006, pp. 41-52.

[7] SZALAIOVÁ, V. – ZAHOREC, P. – PANÁČEK, A. – ALFÖLDYOVÁ, A. – PAŠTEKA, R. – KATONA, M. – MOJZEŠ, M. – PAPČO, J. – ČUNDERLÍK, R. – HUSÁR, L. – JANÁK, J. – MIKUŠOVÁ, Z.: Gravity and Geodetic Integrated Measurements in the Tatra Mountains. Contributions to Geophysics and Geodesy, Vol. 36, Special issue, 2006, pp. 53-60.

[8] JANÁK, J. – ŠPRLÁK, M.: New Software for Gravity Field Modelling Using Spherical Harmonic Functions. Geodetický a kartografický obzor, 52 (94), 1, 2006, pp. 1-8 (in Slovak).

[9] IGONDOVÁ, M. – HEFTY, J.: Effects of a Hurricane in the High Tatra Mountains on Permanent GPS Observations (November 2004). Geodetický a kartografický obzor, 52 (94), 5, 2006, pp. 81-91 (in Slovak).

[10] CZARNECKI, K. – MOJZEŠ, M.: Report of WP 10.5 – First Half of the Third Period (Geodynamics of the Tatra Mountains). Reports on Geodesy, 75, 4, 2005, pp. 183-184.

[11] HEFTY, J. – GERHÁTOVÁ, Ľ.: Site Velocities from Long-Term Epoch GPS Observations – Case Study: Central Europe Regional Geodynamic Project 1994-2005. Acta Geodynamica et Geomaterialia, Vol. 3, No. 3, 2006, pp. 7-17.

[12] MOJZEŠ, M. – JANÁK, J. – PAPČO, J.: Improvement of the Gravimetric Model of a Quasigeoid in Slovakia. Newton's Bulletin, 3, 2006.

[13] GERHÁTOVÁ, Ľ. – HEFTY, J.: Upcoming Galileo Navigation System. Kartografické listy, 14, 2006, pp. 33-40 (in Slovak).

[14] VÁZQUEZ, G.S. – IVÁNOVÁ, I.: Spatial Data Collection for the Purpose of an Archaeological Survey. Kartografické listy, 14, 2006, pp. 108-115.

[15] LIESKOVSKÝ, T.: Spatial Analyses of Prehistoric Objects. Kartografické listy, 14, 2006, pp. 116-120 (in Slovak).

IX.2 Books and Textbooks

[1] JANÁK, J. – MIKULA, K. – ČUNDERLÍK, R.: Physical Geodesy II – Boundary Value Problems in Geodesy. Textbook, STU Bratislava 2006, 153 pp. (in Slovak).

[2] FAIXOVÁ-CHALACHANOVÁ, J. – FENCÍK, R. – STROMČEK, V. – IVÁNOVÁ, I.: Modelling Spatial Objects in Geoinformation Applications. Course ESF No. 27: Continuing education in civil engineering and geodesy. STU Bratislava, 2006, (electronic form – CD), (in Slovak).

[3] HEFTY, J. – GERHÁTOVÁ, Ľ. – PAPČO, J. – MOJZEŠ, M. – KOVÁČ, M.: Using Global Satellite Navigation Systems in Geodesy. Course ESF No. 28: Continuing education in civil engineering and geodesy. STU Bratislava, 2006 (electronic form – CD) (in Slovak).

[4] GPS + GLONASS + Galileo: New Horizons in Geodesy. Review of papers from conference with international involvement. STU Bratislava, 2006 (in Slovak).

[5] GIS in Water Management. Review of papers from conference. SAGI, Bratislava, 2006 (electronic form – CD) (in Slovak).

[6] IGONDOVÁ, M.: Modelling the Troposphere and Ionosphere Using Permanent GPS Networks. Edition of scientific works, sheet No. 35 (dissertation), STU Bratislava, 2006 (in Slovak).

[7] CHALACHANOVÁ, J.: Integration of Heterogeneous Data Using Digital Models. Edition of scientific works, sheet No. 37 (dissertation), STU Bratislava, 2006 (in Slovak).

IX.3 Conferences

[1] MOJZEŠ, M. – HEFTY, J. – GERHÁTOVÁ, Ľ. – KOVÁČ, M. – PAPČO, J. – ŠRÁMKA, M.: Local Geodetic Networks Used for Monitoring Area Stability. In: Progressive Technologies in Engineering Geodesy. Sheet 22. STU, Bratislava, 2006, pp. 43-52 (in Slovak).

[2] ŠIFRA, J. – KORČÁK, P.: Staking Out Network for Construction of Fifth Bridge across the River Danube in Bratislava. In: Apollo Bridge – Fifth Bridging of the Danube in Bratislava. Bratislava. 2006, pp. 119-126 (in Slovak).

[3] STROMČEK, V.: Methodical Advance for GIS Analysis. In: Proceedings of the International Symposium on Informatics for Geoinformatics, Ostrava, 2006, 19 pp.

[4] FERIANC, D. – HEFTY, J. – KLOBUŠIAK, M. – LEITMANNOVÁ, K.: Global Navigation Systems in the New Geodetic Control of Slovakia. In: 12th International Czech-Slovak-Polish Geodetic Days, Rožnov pod Radhoštěm, 2006, pp. 52-57 (in Slovak).

[5] HEFTY, J.: Problems in Determining the Accuracy of a Position and Velocity from Epoch and Permanent GNSS Observations. In: Satellite Methods in Geodesy, Brno 2006, pp. 32-40 (in Slovak).

[6] STROMČEK, V.: Object-Oriented Model of the Cadastre of Real Estate in the Slovak Republic. In: Juniorstav 2006, Brno, pp. 131-136 (in Slovak).

[7] BEZRUČKA, J.: Automated Data Processing in GPS Networks. In: Juniorstav 2006, Brno, pp. 165-170.

[8] GERHÁTOVÁ, Ľ. – HEFTY, J.: Current Status and Future of Global Navigation Satellite Systems. In: GPS + GLONASS + Galileo: New Horizons in Geodesy. STU Bratislava, 2006, pp. 9-18 (in Slovak).

[9] MOJZEŠ, M. – ČUNDERLÍK, R. – JANÁK, J. – PAPČO, J. – ŠPRLÁK, M. – VAĽKO, M.: Comparison of Gravimetric Models of a Quasigeoid in Slovakia. In: GPS + GLONASS + Galileo: New Horizons in Geodesy. STU Bratislava, 2006, pp. 59-68 (in Slovak).

[10] HEFTY, J. – GERHÁTOVÁ, Ľ. – IGONDOVÁ, M. – BEZRUČKA, J.: New Information about Geokinematics of Central Europe and the Balkan Region Based on Long-Term GPS Monitoring. In: GPS + GLONASS + Galileo: New Horizons in Geodesy. STU Bratislava, 2006, pp. 69-78 (in Slovak).

[11] KALAFUT, M. – KLOBUŠIAK, M. – LEITMANOVÁ, K. – FERIANC, D. – PRIBUL, T. – MOJZEŠ, M. – ŠALÁTOVÁ, E.: Using Integrated Observations under the Conditions of the SKPOS Service. In: GPS + GLONASS + Galileo: New Horizons in Geodesy. STU Bratislava, 2006, pp. 95-109 (in Slovak).

[12] MOJZEŠ, M. – FERKO, J. – ŠPRLÁK, M. – VAĽKO, M.: World Height System and Its Realization. In: GPS + GLONASS + Galileo: New Horizons in Geodesy. STU Bratislava, 2006, pp. 143-149 (in Slovak).

[13] JANÁK, J. – MIKULA, K. – ŠPRLÁK, M.: Downward Continuation of Satellite Gradiometry Data. In: Proceedings of the 3rd International GOCE User Workshop. ESA-ESRIN, Frascati, Italy, 2006, p. 30.

[14] ČUNDERLÍK, K. – MIKULA, K.: The Neumann Geodetic Boundary Value Problem for a Vertical Reference Frame. In: Proceedings of the International IAG/FIG Symposium on Geodetic Reference Frames GRF2006, Munich, Germany, 2006, p. 19.

[15] HEFTY, J. – BECKER, M. – DRESCHER, R. – CAPORALI, A. – LIWOSZ, T. – GRENERCZY, G. – KRAUSS, S. – STANGL, G. – KRATOCHVIL, R. – GERHATOVA, Ľ.: Long-Term Densification of the Terrestrial Reference Frame in Central Europe as the Result of the Central Europe Regional Geodynamic Project 1994-2006. In: Proceedings of the International IAG/FIG Symposium on Geodetic Reference Frames GRF2006, Munich, Germany, 2006, p. 26.

[16] CZARNECKY, K. – PAPČO, J. – MOJZEŠ, M. – TALICH, M. – VYSKOČIL, P.: Horizontal Deformations within the Area of the Tatra Mountains. In: Geophysical Research Abstracts, Vol. 8, EGU 2006, Abstract No. 01613.

[17] ROGOWSKI, J.B. – BARLIK, M. – BOGUSZ, J. – HEFTY, J. – KLEK, M. – KUJAWA, L.: Polish Astro-Geodetic Geoid – Final Results. In: Proceedings of Geophysical Research, Vol. 8, EGU 2006, Abstract No. 03602.

[18] HEFTY, J. – IGONDOVÁ, M.: Geokinematical Implications Inferred from an Analysis of Permanent Stations in the Central European Region. In: Proceedings of Geophysical Research, Vol. 8, EGU 2006, Abstract No. 04074.

[19] HEFTY, J. – GERHÁTOVÁ, Ľ. – BECKER, M. – DRESCHER, R. – CAPORALI, A. – GRENERCZY, G. – STANGL, G. – HASLINGER, C. – KRAUSS, S. – LIWOSZ, T. – KRATOCHVIL, R.: Analysis of CEGRN 2005 as the Eighth of CERGOP Observing Campaigns. In: Proceedings of Geophysical Research, Vol. 8, EGU 2006, Abstract No. 05076.

[20] MOJZEŠ, M. – CZARNECKY, K. – HUSÁR, L. – JANÁK, J. – BOGUSZ, J. – PAPČO, J. – VAĽKO, M. – WALLO, J.: Using Deflections of the Vertical for Testing a Gravimetric Quasigeoid in the Mountains. In: Proceedings of Geophysical Research, Vol. 8, EGU 2006, Abstract No. 08909.