



## Impact of TEMPUS CARDS Project GIST-CroHE on the new MSc in Geoinformatics Curriculum and on the Implementation of Bologna Process at the Faculty of Geodesy, University of Zagreb, Croatia



**Damir Medak, Bosko Pribicevic, Stanislav Franges**  
Faculty of Geodesy, University of Zagreb, Croatia  
**Adrijana Car**  
Centre of Geoinformatics, Salzburg University, Austria  
**Jacek Kozak**  
Jageillonian University, Krakow, Austria

The XXIV FIG International Congress  
11-16 April 2010, Sydney, Australia



## Overview

- Profile of Faculty of Geodesy
- Structure of Curriculum
- TEMPUS CARDS project “GIST-CroHE”
- Alignment with UCGIS BoK
- Bologna Process
- Conclusion
- Future work

Impact of TEMPUS project on a new MSc in Geoinformation





## Profile of FG graduates

- surveying education at the University of Zagreb since 1919
- Faculty of Geodesy - independent since 1962
- “old” curriculum adopted 1994:
  - monolithic study with duration of 9 semesters
  - three “specializations” after 6th semester
  - ending with “Dipl.-Ing. in Geodesy”
  - only a couple of GISc&T courses
  - most of staff with strong surveying background

Impact of TEMPUS project on a new MSc in Geoinformation



## BSc curriculum procedure

- February 2005: “Body of Knowledge” for BSc (3 years, 180 ECTS) defined
- BoK from “UCGIS Strawman Report” used for GISc&T part
- Redundant (duplicated) topics and “19th Century stuff” dropped out
- Curriculum prepared without the names of teaching staff

Impact of TEMPUS project on a new MSc in Geoinformation





## MSc curriculum procedure

- March 2005: immediately after BSc completion, reviewed by National Board of Education
- unfortunately, NOT derived from competencies of future graduates
- Body of Knowledge concept not used
- two branches/specializations:
  - geodesy
  - geoinformatics
- a list of courses divided in two groups

Impact of TEMPUS project on a new MSc in Geoinformation



## GIST-CroHE

- Geoinformation Science and Technology in Croatian Higher Education
  - a two-years project funded by TEMPUS III, 2007-2009, EU programme promoting academic cooperation between EU and non-EU countries
  - grantholder: Centre for Geoinformatics, University of Salzburg
  - partner: Jageillonian University of Krakow
  - beneficiary: Faculty of Geodesy, University of Zagreb
  - external experts: Jim Petch (UK) and Bela Markus (Hungary)

Impact of TEMPUS project on a new MSc in Geoinformation



## MSc review – 1st Semester

Spatial Databases	2+2	6
Spatial Management Support	2+2	6
Computer Cartography	2+2	6
Application of Remote Sensing	2+2	6
System of Scientific Information	2+2	6
Real Estate Estimation	2+2	6
Presentation Techniques	2+2	6
Map Generalization	2+2	6
Complex Analysis	2+2	6
English for Academic Purposes	2+2	6

Impact of TEMPUS project on a new MSc in Geoinformation



## MSc review – 2nd Semester

Adv. Methods of Remote Sensing	2+2	6
Geoinformation Systems	2+2	6
Spatial Data Analysis	2+2	6
Methods of Linear Algebra	2+2	6
Photogrammetry outside Geodesy	2+2	6
GIS in Application	2+2	6
Thematic Cartography	2+2	6
Multimedia Cartography	2+2	6
Risk Management	2+2	6
Software Engineering in Geomatics	2+2	6

Impact of TEMPUS project on a new MSc in Geoinformation



## MSc review – 3rd Semester

Integrated Systems in Geomatics	2+2	6
Image Survey	2+2	6
Geovisualisation	2+2	6
Remote Sensing	0+4	6
Select. Chap. in Photogr. and GIS	0+4	6
Practical Cartography	0+4	6
Cartography and new Technologies	0+4	6
Programming in GIS	0+4	6
Land Information Management	0+4	6
Generalization of Geoinformation	0+4	6

Impact of TEMPUS project on a new MSc in Geoinformation




## MSc review – 4th Semester

Diploma Thesis	10+10	30
----------------	-------	----

- altogether 4 Sem x 30 ECTS = 120 ECTS
- formally – everything is fine
- content – questionable ...
- what is in an ECTS (European Credit Transfer System)?

Impact of TEMPUS project on a new MSc in Geoinformation





## MSc review – Summary

- 18 ECTS in obligatory courses
- 12 ECTS in optional courses
- each course has the same number of teaching hours and the same number of ECTS points
- sometimes overlapping content
- based on available personnel, not on the quality of outcome

Impact of TEMPUS project on a new MSc in Geoinformation



## MSc Expectations

- MSc students with different background than FG BSc – “nice to have”
- some key skills are missing: interoperability, mobile GIS, other emerging technologies, programming (“tweaking” GIS software)
- lack of literature, international cooperation and exchange, language barriers

Impact of TEMPUS project on a new MSc in Geoinformation



## MSc: new “TEMPUS” topics

- Four modules:
  - interoperability and spatial data infrastructure
  - mobile GIS and distributed services
  - advanced remote sensing (selected by FG)
  - close-range photogrammetry (selected by FG)
- Four PhD students used TEMPUS grants in Salzburg and Krakow

Impact of TEMPUS project on a new MSc in Geoinformation



## Alignment with UCGIS BoK

	AM	CF	CV	DA	DM	DN	GC	GD	GS	OI
1			X		X	X		X	X	
2	X		X		X	X		X		
3	X	X	X		X	X		X	X	
4	X	X		X	X			X		
5	X				X			X	X	X
6	X		X	X				X	X	X
7	X			X				X		
8								X		
9								X		
10								X		
11								X		
12								X		

- AM Analytical Methods
- CF Conceptual Foundations
- CV Cartography and Visualization
- DA Design Aspects
- DM Data Modeling
- DN Data Manipulation
- GC Geocomputation
- GD Geospatial Data
- GS GI S&T and Society
- OI Organizational and Institutional Aspects

Impact of TEMPUS project on a new MSc in Geoinformation





## Implementation (1)

- 2008/2009: 12 students enrolled (5 with IT background)
- problem-solving approach, continuous assessment, new teaching materials
- students with IT background had problems with cartography and georeferencing but excelled in programming and database technology
- students with FG background noted more projects and practical work than in BSc

Impact of TEMPUS project on a new MSc in Geoinformation



## Implementation (2)

- 2009/2010: 53 students enrolled (2 with background in geography)
- Mobile GIS lab:
  - 19 laptops, 2 projectors, 3 GPS/GIS PDAs
  - wireless network, 100 textbooks
  - ArcGIS 9.3, ArcPad
- Students with background in geography had no problems with cartography and georeferencing but had problems with programming and database technology

Impact of TEMPUS project on a new MSc in Geoinformation







## Bologna process

- Sept 2008: ECTS defined university-wide as 1 ECTS = 29 hours of student workload,
  - two months after TEMPUS Bologna Workshop at FG
- April 2009: new Law on Quality Assurance in Higher Education passed
  - one month after TEMPUS Quality Assurance Workshop at FG
- Sept 2010: teaching in English will be supported by the University
  - two years after first courses and workshops started in English within TEMPUS GIST-CroHE

Impact of TEMPUS project on a new MSc in Geoinformation



## Conclusion and perspectives

- TEMPUS CARDS JEP GIST-CroHE raised awareness on many aspects of teaching and learning in the new Bologna framework
- Students response to the new content and forms of delivery is very positive
- Awareness of comparability with other GISc&T curricula is encouraging incoming and outgoing mobility.
- FG is strengthening the role of regional leader in geodesy and geoinformatics.

Impact of TEMPUS project on a new MSc in Geoinformation

