MODULE: Applied GIS

Last Update: 12.6.2012

1	Modulname Module name	Applied GIS
2	Modulkürzel Identification code	062300071
3	Leistungspunkte (LP) Credit points (CP)	6
4	Semesterwochenstunden (SWS)/Semester load	4
5	Moduldauer (Anzahl der Semester) Module duration (Number of semesters)	1
6	Turnus Cycle	Jedes 2. Semester; SoSe (every 2. semester,SoSe)
7	Sprache Language	english
8	Modulverantwortliche(r) Person in charge of module	Prof. Dr.-Ing. Volker Schwieger Institut für Ingenieurgeodäsie 0711/685-84040 volker.schwieger@ingeo.uni-stuttgart.de
9	Dozenten Lecturers	Prof. Dr.-Ing. Volker Schwieger / Jürgen Schweitzer / Stefan Fina / Dr.rer.nat H.-G. Schwarz-v.Raumer
10	Verwendbarkeit/Zuordnung zum Curriculum /Applicability/Assignment to curriculum	Infrastructure Planning, Master, Wahlpflicht, 2. Semester
11	Voraussetzungen Prerequisites	Modul „Statistics and GIS“
12	Lernziele Intended learning outcome	The students are able to evaluate different data sources, to carry through basic data acquisition and integrate different data into field and office GIS. They are able to apply spatial analysis techniques to real world GIS problems in environmental and regional planning (GIS-based modeling, network-, raster- and 3D-analysis). The students have the expertise and ability to manage small-scale GIS projects (data mining, analysis design, output delivery) within the planning workflow, from project definition to product delivery.
13	Inhalt Content	GIS-based Data Acquisition Lecture: ▪ introduction ▪ GIS hard- and software for primary data acquisition ▪ coordinate systems, geodetic datum and projections ▪ coordinate transformations and conversions ▪ terrestrial positioning and laser scanning ▪ satellite-based positioning (GNSS) ▪ overview of other acquisition methods ▪ additional topics of mapping ▪ data import from various sources (e.g. Web) ▪ Web-GIS (e.g. Open Street Map) ▪ integration of data into GIS Exercices :

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terrestrial and satellite-based data acquisition (field project)
integration of measured data into GIS (computer lab)
integration of web-data into GIS (computer lab)

GIS in Environmental and Regional Planning
Application cases:

land suitability analysis for urban development
accessibility of infrastructure facilities
Evaluation of soil functions
Urban Heat Island modelling
Biotope Networks and animal movement
Flood risk
Development capacity studies
Site analysis for wind power
GIS-based E-government and community participation

Tools and methods:

Model builder
Spatial Analyst
Network Analyst
Map Algebra
Neighbourhod Analysis
Regression Modelling
Multi Criteria Evaluation
analysis design
project management

Workflow:

Geoprocessing,
remote sensing data integration,
advanced visual communication

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<tr><td>14</td><td>Literatur/Lernmaterialien
Literature/Learning material</td><td>GIS-based Data Acquisition : ILIAS – Elearning Modules, Chen, Y., Lee, Y.: Geographical Data Acquisition, Springer, Wien - New York, 2001.
GIS in Environmental and Regional Planning: ILIAS-Material; Exercise sheets; onlins-tutorial</td></tr>
<tr><td>15</td><td>Lehrveranstaltungen und Lehrformen
Course units and teaching methods</td><td>1 GIS-based Data Acquisition, lecture, 1SWS
2 GIS-based Data Acquisition, laboratory and practical training, 1SWS
3 GIS in Environmental and Regional Planning, lecture, 1SWS
4 GIS in Environmental and Regional Planning, practical training, 1SWS</td></tr>
<tr><td>16</td><td>Abschätzung des Arbeitsaufwands
Estimation of workload</td><td>
<table>
<tr><th>Pos</th><th>presence time</th><th>self study</th><th>project</th><th>Sum</th></tr>
<tr><td>1</td><td>14,0</td><td>34,0</td><td>0,0</td><td>48,0</td></tr>
<tr><td>2</td><td>14,0</td><td>28,0</td><td>0,0</td><td>42,0</td></tr>
<tr><td>3</td><td>14,0</td><td>21,0</td><td>0,0</td><td>35,0</td></tr>
<tr><td>4</td><td>14,0</td><td>69,0</td><td>0,0</td><td>65,0</td></tr>
<tr><td></td><td></td><td></td><td></td><td>180,0</td></tr>
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<tr><td rowspan="2">17a</td><td>Studienleistungen (unbenotet)
Course achievements (without mark)</td><td>GIS based Data Acquisition: acknowledged exercises and GIS in Environmental and Regional Planning: exercise reports (USL-V)</td></tr>
<tr><td>Studienleistungen (benotet)
Course achievements (with mark)</td><td></td></tr>
<tr><td>17b</td><td>Prüfungsleistungen (benotet)
Examination achievements (with mark)</td><td>Written examination 120 min. Weight 1.0 (PL-S)</td></tr>
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18	Grundlage für… Basis for…	-
19	Medienform Media	Powerpoint, computer, practical training including field work