

# Studiengang Geodesy and Geoinformation Science MSc

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Studiengang Geodesy and Geoinformation Science MSc

Studiengangsbeauftragter:

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## Photogrammetric Computer Vision

0433 L 120, Vorlesung, 4.0 SWS

Mi, wöchentl, 08:00 - 10:00, 16.10.2013 - 12.02.2014, EMH 225

Mo, wöchentl, 10:00 - 12:00, 21.10.2013 - 10.02.2014, H 1029

Inhalt The mathematical-physical modelling of a sensor is treated by taking photographic cameras as example. The modelling is completely done by means of algebraic projective geometry. Important is the learning of spatial object reconstruction from image data of various sensors and the complete modelling of technically relevant aspects in a homogeneous mathematical framework. This approach can also be used for 3D computer graphic representations.

Bemerkung Bestandteil des Moduls / part of the module MINF-IS-PhotoCV.

Die Vorlesung hat 6 ECTS und die Übung 3 ECTS.  
The lecture has 6 ECTS and the exercise has 3 ECTS.

Die erste Vorlesung findet am 16.10.2013 um 08:00 Uhr im Raum EMH 225 statt.  
The first lecture will take place on 16.10.2013 at 08:00 o'clock in room EMH 225.

## Photogrammetric Computer Vision

0433 L 121, Übung, 2.0 SWS

Fr, 14tägl, 12:00 - 14:00, 25.10.2013 - 31.01.2014, EMH 225 , Hellwich

Inhalt Exercises covering the content of the lecture.

Bemerkung Bestandteil des Moduls / part of the module MINF-IS-PhotoCV.

Die Vorlesung hat 6 ECTS und die Übung 3 ECTS.  
The lecture has 6 ECTS and the exercise has 3 ECTS.

Die erste Übung findet am 25.10.2013 um 12:00 Uhr im Raum EMH 225 statt.  
The first exercise will take place on 25.10.2013 at 12:00 o'clock in room EMH 225.

### Automatic Image Analysis

0433 L 130, Vorlesung, 2.0 SWS

Di, wöchentl, 10:00 - 12:00, 15.10.2013 - 11.02.2014, HL 001

Inhalt The students acquire stepwise competence for the development of image understanding methods. According to computer vision paradigm knowledge-based image analysis methods are developed based on feature extraction. The module clarifies that the learned skills can be used within multifaceted application areas of automatic image understanding.

Bemerkung Bestandteil des Moduls / part of the module MINF-IS-AutoIA.

Die Vorlesung hat 2 ECTS und die Übung 4 ECTS.  
The lecture has 2 ECTS and the exercise has 4 ECTS.

Die erste Vorlesung findet am 15.10.2013 um 10:00 Uhr im Raum HL 001 statt.  
The first lecture will take place on 15.10.2013 at 10:00 o'clock in room HL 001.

### Automatic Image Analysis

0433 L 131, Übung, 2.0 SWS

Fr, 14tägl, 14:00 - 16:00, 18.10.2013 - 07.02.2014, HL 001

Inhalt Exercises covering the content of the lecture.

Bemerkung Bestandteil des Moduls / part of the module MINF-IS-AutoIA.

Die Vorlesung hat 2 ECTS und die Übung 4 ECTS.  
The lecture has 2 ECTS and the exercise has 4 ECTS.

Die erste Übung findet am 18.10.2013 um 14:00 Uhr im Raum HL 001 statt.  
The first lecture will take place on 18.10.2013 at 14:00 o'clock im Raum HL 001.

### Optical Remote Sensing

0433 L 140, Vorlesung, 2.0 SWS

Mo, wöchentl, 14:00 - 16:00, 21.10.2013 - 10.02.2014, MAR 0.015 , Guillaso

Inhalt The lecture imparts primarily professional and methodological expertise in analyzing remote sensing data. The exploration of the context between physical reality of the environment and data collected with imaging sensors are in the foreground. Mathematical models are used for description. Data analysis, e.g. object extraction, is conducted with methods of the automatic image analysis (Computer Vision). Remote sensing is therefore conceived as an electronical-physically motivated area of computer vision.

Bemerkung Bestandteil des Moduls / part of the module MINF-IS-OptRS.

Die Vorlesung hat 2 ECTS und die Übung 4 ECTS.  
The lecture has 2 ECTS and the exercise has 4 ECTS.

Die erste Vorlesung findet am 21.10.2013 um 14:00 Uhr im Raum MAR 0.015 statt.  
The first lecture will take place on 21.10.2013 at 14:00 o'clock in room MAR 0.015.

### Optical Remote Sensing

0433 L 141, Übung, 2.0 SWS

Mo, wöchentl, 16:00 - 18:00, 21.10.2013 - 10.02.2014, MAR 0.015 , Guillaso

Inhalt Exercises covering the content of the lecture.

Bemerkung Bestandteil des Moduls / part of the module MINF-IS-OptRS.

Die Vorlesung hat 2 ECTS und die Übung 4 ECTS.  
The lecture has 2 ECTS and the exercise has 4 ECTS.

Die erste Übung findet am 21.10.2013 um 14:00 Uhr im Raum MAR 0.015 statt.  
The first lecture will take place on 21.10.2013 at 14:00 o'clock in room MAR 0.015.

### **Basics in Engineering Surveys**

3633 L 228, Integrierte LV (VL mit UE), 2.0 SWS

Di, wöchentl, 14:00 - 16:00, 15.10.2013 - 14.02.2014, H 6101 Geod.stand , Neitzel, Wujanz

Bemerkung Lecture for every freshman without geodetic previous knowledge!!!

### **Structure and operation of distributed geo data infrastructures**

3633 L 235, Integrierte LV (VL mit UE), 2.0 SWS

Di, wöchentl, 16:00 - 18:00, 15.10.2013 - 14.02.2014, H 6131 , Nagel

Bemerkung This course belongs to the module "GIS Administration"

### **Web Cartography**

3633 L 237, Integrierte LV (VL mit UE), 3.0 SWS

Di, wöchentl, 14:00 - 17:00, 15.10.2013 - 11.02.2014, H 6134 , König

Bemerkung This course belongs to the Module "GIS Visualisation"

### **GIS Project**

3633 L 239, Projekt, 2.0 SWS

Mo, wöchentl, 10:00 - 12:00, 21.10.2013 - 10.02.2014, H 6134 , Becker, König

Mo, wöchentl, 10:00 - 12:00, 21.10.2013 - 10.02.2014, H 6105 , Becker, König

Inhalt Description: Data capture and spatio-semantic modelling of interior building structures. Hands-on exercise based on interior building objects of the Technical University Berlin.

Bemerkung Modul: Project seminar Geoinformation Technology

### **Geodetic Space Procedures in the Earth System Research**

3633 L 241, Integrierte LV (VL mit UE), 4.0 SWS

Mo, wöchentl, 14:00 - 16:00, 04.11.2013 - 11.02.2014, H 5124 , Stary

Mo, wöchentl, 14:00 - 16:00, 04.11.2013 - 10.02.2014, H 6105 , Stary

Mi, wöchentl, 12:00 - 14:00, 06.11.2013 - 11.02.2014, H 5124 , Schuh

Mi, wöchentl, 12:00 - 14:00, 06.11.2013 - 11.02.2014, H 6105 , Schuh

Bemerkung This course belongs to the Module "SGN Space Geodesy and Navigation III"

### **Methodology of the positioning and navigation with GNSS**

3633 L 243, Vorlesung, 2.0 SWS

Mo, wöchentl, 12:00 - 14:00, 21.10.2013 - 15.02.2014, H 6131 , Galas

Bemerkung This course belongs to the Module "SGN Space Geodesy and Navigation III"

### **Methodology of the positioning and navigation with GNSS**

3633 L 244, Übung, 2.0 SWS

Do, wöchentl, 12:00 - 14:00, 24.10.2013 - 15.02.2014, H 6131 , Galas

Bemerkung This course belongs to the Module "SGN Space Geodesy and Navigation III"

### **Calculation of Satellite Orbits**

3633 L 245, Integrierte LV (VL mit UE), 2.0 SWS

Mi, wöchentl, 08:00 - 10:00, 16.10.2013 - 12.02.2014, H 6105 , Stary

Bemerkung This course belongs to the Module "Calculation of Satellite Orbits"

### **GNSS Signal Processing and Real Time Positioning**

3633 L 246, Integrierte LV (VL mit UE), 2.0 SWS

Di, wöchentl, 12:00 - 14:00, 15.10.2013 - 12.02.2014, H 5124 , Galas

Inhalt Signal structures of GNSS (GPS, GLONASS, GALILEO); Wave propagation, outside influences on the wave propagation; Sending and receiving techniques; Signal processing; aeriels and antenna calibration; Data formats and coding; Special strategies during the evaluation of GNSS phase measurements (e.g. regulation of ambiguities); Current and future developments of research and industry (e.g. "software receiver" for GNSS phase measurements)

Bemerkung This course belongs to the Module "SGN Data Communication and Signal Processing in GNSS "

Voraussetzung Attending the lecture "selected sections of navigation and positioning" is desirable.

### **Planetary and Space Science Seminar**

3633 L 247, Projekt, 2.0 SWS

Mi, wöchentl, 16:00 - 18:00, 16.10.2013 - 12.02.2014, H 6131

Bemerkung This course belongs to the Module "SGN Planetary and Space Science Seminar"

### **Geodetic Basics and Monitoring Measurements**

3633 L 250, Projekt, 3.0 SWS

Do, wöchentl, 14:00 - 17:00, 17.10.2013 - 13.02.2014, H 6131 , Neitzel, Wujanz

Do, wöchentl, 14:00 - 17:00, 17.10.2013 - 13.02.2014, H 6101 Geod.stand , Neitzel, Wujanz

Inhalt Critical discussion of the foundations and problems of the least squares adjustment; standard and alternative solution strategies; local and global optimization; applicability of the L2-norm estimates and alternative parameter estimation methods (like Ln-norm estimates or maximum correlation adjustment); the problem of realistic modeling; instabilities and regularization.

Bemerkung This course belongs to the Module "EGA Methods of Engineering Geodesy"

### **Laser Scanning and 3D-Measurement Techniques**

3633 L 251, Integrierte LV (VL mit UE), 2.0 SWS

Fr, wöchentl, 10:00 - 12:00, 18.10.2013 - 14.02.2014, H 6101 Geod.stand , Neitzel, Wujanz

Fr, wöchentl, 10:00 - 12:00, 18.10.2013 - 14.02.2014, H 6105 , Neitzel, Wujanz

Inhalt This course is offered for the first time and will focus on the following topics:  
a.. Scanning Techniques: Terrestrial Laser Scanning, Optical Scanning, Close Range Photogrammetry  
b.. Accuracy Analysis  
c.. Post Processing  
d.. Visualization - Virtual Reality, Animation and 3D-Printing  
e.. Deformation and Inspection

Bemerkung This course belongs to the Module "EGA Geodetic Sensors and 3D Measurements"

### **Analysis of Deformation Processes**

3633 L 252, Integrierte LV (VL mit UE), 2.0 SWS

Mo, wöchentl, 08:00 - 10:00, 21.10.2013 - 10.02.2014, H 6105 , Gielsdorf

Bemerkung This course belongs to the Module "EGA Analysis of Deformation Processes"

### **Transformation of Geodetic Networks**

3633 L 253, Integrierte LV (VL mit UE), 2.0 SWS

Mi, wöchentl, 08:00 - 10:00, 16.10.2013 - 12.02.2014, H 6131 , Neitzel, Weisbrich

Mi, wöchentl, 08:00 - 10:00, 16.10.2013 - 12.02.2014, H 6134 , Neitzel, Weisbrich

Bemerkung This course belongs to the Module "EGA Transformation of Geodetic Networks"

### **Engineering Geodesy and Adjustment Calculation Project**

3633 L 255, Projekt, 2.0 SWS

Fr, wöchentl, 14:00 - 16:00, 18.10.2013 - 14.02.2014, H 6131 , Neitzel, Weisbrich

Fr, wöchentl, 14:00 - 16:00, 18.10.2013 - 14.02.2014, H 6101 Geod.stand , Neitzel, Weisbrich

Bemerkung This course belongs to the Module  
"EGA Project seminar Engineering Surveying and Estimation Theory"

### **Current Methods of measurement data analysis in geodesy**

3633 L 256, Integrierte LV (VL mit UE), 2.0 SWS

Mi, wöchentl, 16:00 - 18:00, 23.10.2013 - 12.02.2014, H 5124 , Petrovic

Inhalt Critical discussion of the foundations and problems of the least squares adjustment; standard and alternative solution strategies; local and global optimization; applicability of the L2-norm estimation and alternative parameter estimation methods (like Ln-norm estimates or maximum correlation adjustment); the problem of realistic modeling; instabilities and regularization.

Bemerkung This course belongs to the Module  
"EGA Current Methods of Measurement Data Analysis in Geodesy"

### **Adjustment Calculation I (Ausgleichsrechnung I)**

3633 L 201 IV, Integrierte LV (VL mit UE), 4.0 SWS

Di, wöchentl, 10:00 - 12:00, 15.10.2013 - 11.02.2014, H 6131 , Neitzel, Weisbrich

Di, wöchentl, 10:00 - 12:00, 15.10.2013 - 11.02.2014, H 6134 , Neitzel, Weisbrich

Do, wöchentl, 08:00 - 10:00, 17.10.2013 - 13.02.2014, H 6131 , Neitzel, Weisbrich

Do, wöchentl, 08:00 - 10:00, 17.10.2013 - 13.02.2014, H 6134 , Neitzel, Weisbrich

Nachweis               Written examination

Voraussetzung       Specialised knowledge of mathematics, particularly linear algebra is desirable.

Literatur              Lecture notes are available online and in hard copy.

### **Introduction to Satellite Geodesy**

3633 L 202 IV, Integrierte LV (VL mit UE), 4.0 SWS

Di, wöchentl, 08:00 - 10:00, 15.10.2013 - 11.02.2014, H 6131 , Stary

Mi, wöchentl, 12:00 - 14:00, 16.10.2013 - 12.02.2014, H 6131 , Flechtner, Oberst

Bemerkung            Dienstag: Geodetic Reference Systems - Exercises; Mittwoch: Satellite Geodesy  
Titel im Modulkatalog: Geodetic Reference Systems and Satellite Geodesy

Nachweis            Mündliche Prüfung

Zulassungsvoraussetzung: Erfolgreiche Teilnahme an allen Übungen

Voraussetzung       wünschenswert: Vertiefte Kenntnisse in Mathematik und Physik, EDV-Kenntnisse

### **Geo Databases (Geodatenbanken)**

3633 L 203 VL, Vorlesung, 2.0 SWS

Di, wöchentl, 12:00 - 14:00, 15.10.2013 - 11.02.2014, H 6131 , König

Bemerkung            Die Zeiten und Räume zu den Lehrveranstaltung werden per Aushang  
bekanntgegeben!

Nachweis            Schriftliche Prüfung

Voraussetzung       wünschenswert: Bereitschaft zum Arbeiten mit dem Computer

### **Geo Databases (Datenbanken)**

3633 L 204 UE, Übung, 2.0 SWS

Do, wöchentl, 12:00 - 14:00, 17.10.2013 - 13.02.2014, H 6134 , König, Fuls

Voraussetzung       wünschenswert: Bereitschaft zum Arbeiten mit dem Computer

### **Integration of redundant geo data**

3633 L 212, Integrierte LV (VL mit UE), 3.0 SWS

Fr, 14tägl, 08:00 - 10:00, 18.10.2013 - 14.02.2014, H 5124 , Neitzel, Weisbrich

Bemerkung            The course belongs to the modul "GIS Collection of Geo Base Data"  
Oral Examination !!!

### **Selected Topics in Planetary Science**

3633 L 230, Vorlesung, 2.0 SWS

Mi, wöchentl, 10:00 - 12:00, 16.10.2013 - 12.02.2014, H 6131 , Hussmann

Bemerkung            This course belongs to the Module "SGN Space Geodesy and Navigation II"

Nachweis            Oral examination

### **Statistic test procedures and analysis of stochastic processes**

3633 L 231, Integrierte LV (VL mit UE), 2.0 SWS

Do, wöchentl, 10:00 - 12:00, 17.10.2013 - 13.02.2014, H 6134 , Neitzel, Weisbrich

Do, wöchentl, 10:00 - 12:00, 17.10.2013 - 13.02.2014, H 6131 , Neitzel, Weisbrich

Bemerkung            This course belongs to the Module "EGA Adjustment Calculation II" SS

### **Java Programming for GIS and geodesy**

3633 L 242, Integrierte LV (VL mit UE), 2.0 SWS

Di, wöchentl, 18:00 - 20:00, 15.10.2013 - 11.02.2014, H 6134 , Nagel

Inhalt                Description: Introduction to object oriented programming. Implementation of elementary  
geodetic algorithms using Java#s mathematical libraries. Storage and exchange of spatial  
data using JDBC techniques.

### **Geoscientific Aspects of Geodesy**

3633 L 299, Integrierte LV (VL mit UE), 2.0 SWS

Di, wöchentl, 12:00 - 14:00, 15.10.2013 - 11.02.2014, H 6105 , Wickert, Heinkelmann

Inhalt	Basics of geodynamic: plate tectonics, deformation zones of the Earth, geological and geo-physical methods Geodetic deformation measurement: Overview, challenges, methods, current projects GPS networks for geodynamic investigation: Reconnaissance, network setup, monumentation, observations, Definition of geodetic reference systems Interpretation of observed deformation: short-term deformation, Earthquake processes, models, seismic risk, long-term deformation, mountain building processes, models, estimation of rheological parameters
Bemerkung	Geoscientific Aspects of Geodesy is part of the Module "SGN Geoscientific Aspects of Geodesy".

### **Geodätisches Seminar**

3633 L 520, Seminar, 4.0 SWS

Bemerkung Vorstellung der Masterarbeiten.

Bitte die Aushänge beachten !

### **Geodätisches Kolloquium / Geodetic Colloquium**

3633 L 990, Colloquium

wöchentl

Do, wöchentl, 17:00 - 20:00, 10.10.2013 - 27.03.2014, H 6131

Inhalt Gastvorträge zu derzeit relevanten Themen der Forschung und der Praxis.

Bemerkung Das Kolloquium wird teilweise zusammen mit dem DVW (Deutscher Verein für das Vermessungswesen) durchgeführt. Bitte auch Aushänge beachten!