

Courses in English Course Description

Department	08 Geoinformatics
Course title	Remote Sensing and Photogrammetry
Hours per week (SWS)	6 (3 Seminar + 3 Lab Work)
Number of ECTS credits	6
Course objective	This course emphasizes the understanding of the remote sensing foundations and the use of remote sensor data and image interpretation and processing techniques for environmental and urban applications. Specifically, the course will cover concepts and foundations of remote sensing, aerial photography and photogrammetry, visual image interpretation, characteristics of various sensing systems (i.e. multispectral, thermal, hyperspectral, microwave and lidar), and digital image processing techniques. The primary objective of this course is to provide students with the conceptual foundations and the technical skills to apply remote sensing for problem solving in environmental and cultural domains. Through laboratory work, students will have opportunities to practice the concepts and techniques learnt in the seminar.
Prerequisites	Basic Statistics (Variance, Standard Deviation, Covariance, Histogram) Math (Matrix Calculation, Linear Systems of Equations, Polynomial Transformation) Basic Geodata Acquisition Methods Basic Digital Image Processing
Recommended reading	Albertz, Jörg (2009): Einführung in die Fernerkundung. 4. Auflage, Darmstadt. Lillesand, T. M., et. al. (2015): Remote Sensing and Image Interpretation. – 7th Edition, John Wiley & Sons. Additional readings will be posted on Moodle.d
Teaching methods	Lectures; E-Learning-Materials; Lab Assignments; Projects, Team Work.
Assessment methods	Written exam
Language of instruction	English
Name of lecturer	Prof. Dr. Sven Fuhrmann
Email	sven.fuhrmann@hm.edu
Link	https://www.geo.hm.edu/kontakt/prof/fuhrmann/index.de.html
Course content	<ul style="list-style-type: none">• Understanding the nature of electromagnetic radiation and the uses of this radiation in remote sensing systems• Learning about the elements of image interpretation and photogrammetry• Stereo-Photogrammetry• Understanding the basic characteristics of different remote sensing system, particularly aerial photography (black and white, color, infrared, and color infrared), multispectral scanners, thermal, and other systems including Radar, and LiDAR systems• Overview of aircraft and satellite-based and other sensor systems used in remote sensing• Processing of sensor data: calibration, radiometric and geometric corrections, elimination of sensor errors• Acquiring skills about image processing that include image enhancements and classification techniques
Remarks	Mandatory subject in the third semester.