## 6 C Georg-August-Universität Göttingen 4 WLH Universität Kassel/Witzenhausen Module M.SIA.I14M: GIS and remote sensing in agriculture

## Learning outcome, core skills: Workload: GIS: Attendance time: 56 h A broad overview of basic GIS functions and related background knowledge should Self-study time: enable students to explore GIS-Software for relevant commands and prepare functional 124 h strategies for spatial data management and analysis. Lecture and exercise examples have predominantly agricultural reference. Remote Sensing The lecture will introduce physical principles (reflectance, transmittance, and absorption), sensor techniques (passive and active sensors, satellites, field spectrometer) and methods of analysis (calibration, validation) in remote sensing applications. This technical framework is presented using agricultural examples, as e.g. the generation of maps for crop yield and protein, assessment of species composition in mixed vegetation (e.g. grassland), like legume content for a calculation of residual nitrogen and crop rotation effects. Courses: 1. GIS (Lecture) 2 WLH Contents: The course gives an introduction to Geographical Information Systems (GIS). Starting from geodetical background information, a wide range of different GIS- methods and functions are presented using agricultural examples (e.g. data import, georeferencing, aggregation, (re)classification, interpolation, overlays and image analysis). The students have the opportunity to carry out exercises on the computer themselves for some important GIS-procedures. A special focus is given on data capturing using maps and field data survey with GPS as well as the spatial analysis of site conditions. Finally a particular view on GIS in organic farm management and Precision Farming is given. 2. Remote sensing in agriculture (Lecture) 2 WLH Contents: The lecture will introduce physical principles (reflectance, transmittance, and absorption), sensor techniques (passive and active sensors, satellites, field spectrometer) and methods of analysis (calibration, validation) in remote sensing applications. This technical framework is presented using agricultural examples, as e.g. the generation of maps for crop yield and protein, assessment of species composition in mixed vegetation (e.g. grassland), like legume content for a calculation of residual nitrogen and crop rotation effects.

**Examination: Oral examination (approx. 30 minutes)** 6 C M.SIA.I14M.Mp: GIS and remote sensing in agriculture **Examination requirements:** 

Knowledge about basic GIS functions and the preparations of functional strategies for spatial data management. Knowledge of physical principles, methods of analysis and sensor techniques.

Admission requirements:	Recommended previous knowledge: none
Language: English	Person responsible for module: Dr. Thomas Möckel
Course frequency: each winter semester; Witzenhausen	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester:
Maximum number of students: 20	

## Additional notes and regulations:

## Literature:

Principles of Geographical Information Systems

by Peter A. Burrough and Rachael A. McDonnell (2015)

Introduction to Remote Sensing

by James B. Campbell andRandolph H. Wynne (2011)