

Georg-August-Universität Göttingen Universität Master Program „Crop Protection“ Module M.Cp.0024: Digital Techniques for Crop Monitoring	6 C 4 SWS
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<p>Contents: In the course, selected topics on the use of digital technologies in field experiments for crop science are focused. The students are enabled to actively use optical sensors. In addition to data acquisition, the main content focuses on the processing of raw data, evaluation, and combination with reference data. Reference data is extracted with established tools from the plant sciences and geo-referenced in the field using GPS, in a way that an allocation to the optical measurement methods is possible. Data acquisition is carried out using digital carrier platforms (robot, drone, etc.). Another essential content is the summary of metadata of field trials in order to store trial data in such a way that they can be reused and used by third parties. The module is divided into two sub-aspects: (i) Theoretical basics as a lecture and (ii) hands-on exercises with digital technologies. While the practical handling is taught in the exercises, the theoretical lecture teaches the overall context, the differences between the sensors, as well as the analysis using sample data sets, and the application of complex evaluation algorithms</p> <p>Objectives: The module teaches basic principles for the use of digital tools in greenhouse and field experiments. It covers camera-based methods for single plant and plot scale (RGB, spectral, 3D) as well as the use of GPS for georeferenced measurements. Furthermore, the analysis of data, for single recordings and time series, is taught. Upon completion of the module, the students are able to independently carry out measurements with selected technologies of crop plants according to a measurement protocol, combine reference measurements, carry out analyses and compile results. Furthermore, they can plan complex measurement procedures for their own experimental projects and assess the effort involved. Finally they obtain skills to interpret sensor data with an agricultural meaning.</p>	<p>Work Load 180 h</p> <p>Contact time: 40 h</p> <p>Self study: 140 h</p>
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<p>Exam: Examination: Providing a technical video (5 Minutes). This professional video includes a structured introduction into the topic (sensors and measuring) Idea description and screenplay must be provided</p> <p>Exam requirements: Understanding of digital methods and sensor technologies and their application at different scales. Deep understanding of the planning of a digital survey in field testing. Knowledge of methods of evaluation, referencing and interpretation of optical sensor Data</p> <p>Examination prerequisites Regular participation in the block cours</p>	
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Language: English	Modulverantwortliche Prof. Anne-Katrin Mahlein, Dr. Stefan Paulus
Position in academic year: summer semester	Duration: one semester
Maximum options of exam repetition: twice	Recommended semester:
Maximum number of participants: 20	elective