Georg-August-Universität Göttingen **Module M.Agr.0208: Soil Biogeochemistry of Agricultural and Forest Ecosystems- Lecture, Seminar and Lab course**	6 C 4 WLH

Learning outcome, core skills: • Understanding C, N, P, S and Fe cycle in agro-and forest ecosystems • Understanding the impact of land management on these element cycles • Quantification of C-, N-and P-fluxes via isotope-based methods (labeling experiments such as pulse labeling, FACE experiments, C-3 and C-4 vegetation changes, autoradiography • Formation of soil organic matter from plant and microbial residues: Disentangling and characterizing the composition of SOM Theoretical basics shall be thought and their application shall be demonstrated at distinct examples from literature. After this course, students will be able to understand complex biogeochemical studies published and evaluate potentials and pitfalls of applied methods.	**Workload:** Attendance time: 73 h Self-study time: 107 h

Course: M.Agr.0208.LV **Soil Biogeochemistry of Agricultural and Forest Ecosystems- Lecture, Seminar and Lab course** (Lecture, Practical course, Seminar) *Contents*: In the framework of this module, biogeochemical processes of C, N, P, S and Fe cycle in agro- and forest ecosystems shall be demonstrated and their microbial and molecular basics will be unraveled. It will be shown how land use, forest and agricultural management practices (crop sequences, tillage, fertilization, etc.) will impact the element cycles. Analytical biogeochemical methods to assess these effects on element fluxes and cycles will be explained in detail. Isotope-based examples and experiments to assess formation and turnover of soil organic matters as will be explained. The module consists of a lecture (2 SWS) and a seminar (1 SWS) in which a methodological focus will be set where one study of interest will be presented by the students, and training study will be implemented. The lab course part consists of one week intensive lab course followed by a short period of data evaluation, or as five weeks with one full day per week in the lab/practical work at the end of the lecturing period (depending on laboratory capacity).	4 WLH
Examination: Oral examination (approx.20 minutes, 75%), presentation (approx. 15 minutes, 25%) M.Agr.0208.Mp: Soil Biogeochemistry of Agricultural and Forest Ecosystems- Lecture, Seminar and Lab course **Examination requirements:** Understanding of biogeochemical cycles in agroecosystems and their drivers as well as the impact of agricultural management on them. Ability to choose, evaluate and discuss about various biogeochemical, molecular and microbiological methods to study element cycles and their drivers in soils.	6 C

Examination requirements: ECTS-Bedingungen de	

Admission requirements: none	**Recommended previous knowledge:** Basics in soil science, biology, physics and chemistry
Language: English	**Person responsible for module:** UnivProf.Dr. Martin Maier
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	