Title of module	Modular Advanced Practical and Seminar in the Focal Point Programme "Plants and Microorganisms" VZ: 185770, 183771 **"Genetics and biochemistry of Microorganisms"** **Planning meeting October 4, 2011, 12.15 p.m.** **NDEF 06/780**

Credit points	4	***Available in semester(s)***	1
Hours per week	5.25	***Compact course***	☒

Lecturer(s)	F. Narberhaus/ B. Masepohl N. Frankenberg-Dinkel
Teaching methods	Two weeks advanced laboratory course with an intergrated seminar, one of four lab courses to be completed in the first term
Evaluation of learning progress	Active participation in the laboratory tasks and seminar, feedback during the experiment
Mode of examination	Active and successful participation (25%), written report (25%), oral seminar presentation (25 %), oral examination (25 %)
Learning objectives	After completion of the course students will have aquired basic practical skills in enrichment of microorganisms from the environment, molecular biology techniques and experiments to study transcritional and post-transcriptional regulation in bacteria. Furthermore, students will learn all steps from isolation of DNA to a purified protein.
Soft skills	Collaboration in a small team of 2-3 students and interaction with the members of a research laboratory, presentation of results

Contents of module	Topics: 1. Molecular Genetics of N_2-Fixation 2. Enrichment and taxonomic determination of fluorescent Pseudomonas 3. Tetrapyrrole biosynthesis in *Pseudomonas aeruginosa*: Porphobilinogen synthase Methods: Molecular biology: Isolation of chromosomal and plasmid DNA from bacteria, Polymerase chain reaction, restriction and ligation of DNA, analysis of promoter activity using β-galactosidase reporter gene assays Protein methods: Affinity chromatography, SDS-PAGE, Western Blot, colorimetric enzyme assay, enzyme inactivation and reconstitution of metals Microbiological methods: Isolation of bacteria from soil, enrichment techniques, staining techniques and microscopy, taxonomic determination based on metabolic activity