5.6 Theoretical particle physics: Advanced methods (M-WF)

Course title	Physics beyond the Standard Model
Subtitle (if any)	
Abbreviation	M-WF1
Code	4PHY94051V, 4PHY94052V
Language	English
Regular cycle	aperiodic, one course from M-WF each year
Duration	1 semester
Responsible lecturer	Prof. Dr. T. Feldmann
Teaching format	Lecture 2 hours/week, tutorial 2 hours/week
Work load	180 h (60 h lectures and tutorials, 120 h self-study)
Credit points	6
Prerequisites for participation	M-T3, M-T4
Teaching goals	The students are aware of the shortcomings of the Standard Model (SM) of particle physics, which motivates the search for physics beyond the SM (BSM) at present collider experiments. The students are familiar with the theoretical concepts that are used to construct BSM models and know which observables can be studied to confirm or exclude different approaches.
Course description	Open questions in the Standard Model Supersymmetry and Poincaré group Construction and phenomenology of the MSSM Grand Unified Theories: SU(5), SO(10), Pati-Salam Little-Higgs models and compositeness Models with extra dimensions
Assessment method	Written or oral exam
Prerequisite for the award of credit points	Passed exam
Usability of the module	MWE-1, MWE-4
Teaching style	Lecture with blackboard, exercises for self-study.
Literature	Weinberg: QFT III Kane: Perspectives on SUSY Martin: hep-ph/9709356 Georgi: Lie Algebras in Particle Physics Slansky: Phys.Rept. 79, 1 Perelstein: hep-ph/0512128 Schmaltz,Tucker-Smith: hep-ph/0502182