Study programme(s): Mathematics (MD)

Level: doctoral studies

Course title: Generalized Functions on Manifolds (AN-23)

Lecturer: Sanja Konjik

Status: elective

ECTS: 10

Requirements: none

Learning objectives:

Learning outcomes:

Syllabus:

Manifolds, vector fields, tensors, differential forms

Colombeau theory of generalized functions (special algebra - basic definitions and properties, immersion of distributions, generalized numbers and the value of the item, integration, associativity)

The generalized functions on manifolds (distributions on manifolds, special algebra on manifolds, generalized functions with values at manifolds, generalized vector bundle cutting.

Applications to symmetry groups

Literature

- Grosser, M., Kunzinger, M., Oberguggenberger, M., Steinbauer, R., *Geometric Theory of Generalized Functions with Applications to General Relativity*, Kluwer Academic Publishers, Dordrecht, 2001
- Abraham, R., Marsden, J.E., *Foundation of Mechanics*, Benjamin/Cummings, 1978
- Olver, P., *Applications of Lie Groups to Differential Equations, 2nd edition*, Springer-Verlag, NY, 2000
- Nedeljkov, M., Pilipovic, S., Scarpalezos, D., *Linear Theory of Colombeau Generalized Functions*, Addison Wesley Longman, Harlow, 1992
- Warner, F.W., *Foundation of Differentiable Manifolds and Lie Groups*, Springer-Verlag, NY, 1983

Weekly teaching load				Other: 0
Lectures: 2	Exercises	Other forms of teaching:	Student research: 6	

Teaching methodology

Lecturing theory with constant student interaction.

Grading method (maximal number of points 100)

Pre-exam obligations	**points**	**Final exam**	**points**
Colloquia	50	Oral exam	50