

# Title: Locally defined operators

STATUS: OPTIONAL A

STRUCTURE : Lectures

CLASS HOURS: 30

GRADING: E

ECTS : 3

SEMESTER 2

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LECTURER

prof. dr hab. Janusz Matkowski

PRE-REQUISITES

Basis knowledge from real analysis

COURSE OBJECTIVES (LEARNING OUTCOMES)

The student will possess some knowledge of locally defined operators; the representation formulas for locally defined operators acting between the spaces of differentiable functions; Nemytskij composition operators; Lipschitzian composition operators in some function spaces.

COURSE CONTENT

Locally defined operator. Representation theorem for locally defined operators acting from the space  $n$ -times continuously functions into the space  $m$ -times continuously continuous functions, where both  $m$  and  $n$  are nonnegative integers. Composition Nemytskij operators and their role in the theory of functional equations. The Banach functions spaces in which Lipschitzian composition operators have to be affine – consequences of this fact for possibility of application of the theory of fixpoint for contractive mappings in solving nonlinear problems.

LITERATURE

1. J. Appell, Józef Banaś, N. Merentes, Bounded variation and around, Series in Nonlinear Analysis and Applications, 17, De Gruyter, Berlin – Boston, 2014.
2. J. Appell, P.P. Zabrejko, Nonlinear superposition operators, Cambridge Univ. Press, Cambridge 1990.
3. M. Kuczma, B. Choczewski, R. Ger, Iterative functional equations, Encyclopedia of Mathematics and Applications, Cambridge University Press, 1990.
4. J. Dugundji, A. Granas, Fixed point theory, Monografie Matematyczne 61, Polish Scientific Publishers, Warsaw, 1982.

ASSESSMENT

examination

