

Title <b>Optimisation Methods in Electromagnetic Devices Design</b>	Code <b>10103222310103201116</b>
Field <b>Electrical Engineering</b>	Year / Semester <b>2 / 3</b>
Specialty <b>Mechatronic Electric Systems</b>	Course <b>core</b>
Hours Lectures: <b>1</b> Classes: -    Laboratory: -    Projects / seminars: <b>2</b>	Number of credits <b>0</b>
	Language <b>polish</b>

**Lecturer:**

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**Status of the course in the study program:**

Obligatory subject, Faculty of Electrical Engineering, Field: Electrical Engineering, Specialty: Mechatronic Electric Systems, Full-time second-degree studies

**Assumptions and objectives of the course:**

Student should learn the optimization problems formulation. He should obtain knowledge of methods of unconstrained and constrained optimization. Student should also obtain knowledge of: non-deterministic algorithms and constrained optimization procedures.

**Contents of the course (course description):**

Electromagnetic device synthesis, formulation of the device optimization problem: decision variables, objective function, constrain functions. Normalization of variables and functions. Deterministic method of unconstrained optimization. The gradient procedures, conjugate gradient algorithms. Algorithms of direction optimization.

Evolutionary methods: genetic algorithm, particle swarm procedure. Equality constrained optimization, Lagrange multipliers and Courrant procedure. Inequality constrained methods: external and internal penalty functions.

**Introductory courses and the required pre-knowledge:**

Basic knowledge of mathematical analysis, linear algebra and vectorial calculus

**Courses form and teaching methods:**

Lectures supported by computer simulations, computer exercises

**Form and terms of complete the course - requirements and assessment methods:**

Tests, computer software elaborating

**Basic Bibliography:**

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**Additional Bibliography:**

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