

Title <b>Computer Methods in Electrodynamics</b>	Code <b>10103222310103201115</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>1</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:**

The student should obtain knowledge of eddy current analysis and knowledge of the recent method of electromagnetic field simulation in electromechanical converters.

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

Electromagnetic field equations in regions with conducting and displacement currents. Differential and integral description of field equations. Circuit models of electromagnetic field. Plane wave. Penetration of an electromagnetic wave into a conducting region. Electromagnetic and magnetic shielding Methods of field calculations. Field and potential formulations. Analogy between methods of circuit and field analysis. Numerical method of electromagnetic field analysis in electrical machines and apparatus. Finite element method - unified approach. Interpolation functions of nodal, edge, facet and volume element. Finite element graphs and circuit models of finite elements. Network representation of finite equations in the region with displacement and eddy currents. Finite element solution of eddy current problems. Movement simulation in the finite element analysis of electromagnetic converters.

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

Basic knowledge of electromagnetic fields and the numerical methods in electromagnetism.

**Courses form and teaching methods:**

Lectures supported by transparencies and computer programs for presentation of electromagnetic field distribution, exercises with computer programs

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

Tests

**Basic Bibliography:**

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**Additional Bibliography:**

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