



UNIVERSITY OF NIŠ

Course Unit Descriptor

Faculty

Faculty of Mechanical Engineering

GENERAL INFORMATION

Study Program	Mechanical Engineering
Study Module (if applicable)	Energetics and Process Techniques
Course Title	Magnetohydrodynamics
Level of Study	<input type="checkbox"/> Bachelor <input type="checkbox"/> Master's <input checked="" type="checkbox"/> Doctoral
Type of Course	<input type="checkbox"/> Obligatory <input checked="" type="checkbox"/> Elective
Semester	<input checked="" type="checkbox"/> Autumn <input type="checkbox"/> Spring
Year of Study	II
Number of ECTS Allocated	10
Name of Lecturer/Lecturers	Dragiša D. Nikodijević, Živojin M. Stamenković
Teaching Mode	<input checked="" type="checkbox"/> Lectures <input type="checkbox"/> Group tutorials <input checked="" type="checkbox"/> Individual tutorials <input type="checkbox"/> Laboratory work <input checked="" type="checkbox"/> Project work <input type="checkbox"/> Seminar <input type="checkbox"/> Distance learning <input type="checkbox"/> Blended learning <input type="checkbox"/> Other

Purpose and Overview (max. 5 sentences)

The main aim of the course is to enable students to acquire knowledge in the field of modern fluid mechanics and related to phenomena that are present in the movement of electrically conducting fluid. Also to prepare students of doctoral studies for theoretical analysis of these problems as well as for the practical application of acquired knowledge to solve issues that occur in MHD problems. Doctoral students who listen to this subject are qualified for theoretical analysis of expected tasks, as well as for the practical application of acquired knowledge in the different problems of magnetic-hydrodynamic (MHD pumps, MHD generators, flow meters, etc.).

Syllabus (brief outline and summary of topics, max. 10 sentences)

Lectures:

1) State of the art. 2) Electrical conductivity of the working fluid. 3) MHD of conductive gases. 4) Basic equations of MHD, magnetic induction, dimensionless parameters. 5) Maxwell Ampere Equations and Ohm's law, Lorentz force, Hall's effect, General Ohm's Law. 6) Basic characteristics of flow, flow in conductive channels, Hartman's flow. 7) MHD fluids. 8) Flow in closed channels, fully developed flow in the channel. 9) Flow in channels with variable magnetic field. 10) Flow in open channels. 11) Turbulent MHD flow. 12) A two-phase MHD flow - characteristics of flow. 13) Production of energy using the MHD technologies and efficiency. 14) MHD pumps and flow meters, MHD generators, MMHD flow meters, induction MHD pumps, conducted MHD pumps.

Research work:

Preparing students for research in the doctoral dissertation by writing a seminar paper on the topic, which is in direct correlation with the consideration of an adequate model of the task of the doctoral dissertation.

Language of Instruction

Serbian (complete course) English (complete course) Other _____ (complete course)

Serbian with English mentoring Serbian with other mentoring _____

Assessment Methods and Criteria

Pre exam Duties	Points	Final Exam	Points
Lecture (participation)	5	Written Examination	0* (50)
Homework	5	Oral Examination	Max. 50
Project work	40	Overall Sum	100

* Refers to students who have already gained points by completing pre-exam requirements