Study program	Level of studies		**Third cycle**	
	Title of the study program		**Doctoral studies in physics**	
Course title	**ADVANCED COURSE IN ELECTRODYNAMICS**			
Course ID	Semester	Course status	ECTS credits	Teaching hours
PTH7091	**I / II**	**Elective**	**10**	**30**
Course aims and expected learning outcomes	The aim of the course is for students to master the concepts of classical electrodynamics at a higher mathematical, theoretical, and algorithmic level. By successfully completing the course, students are able to apply their acquired knowledge in future scientific research work.			

COURSE CONTENT

Time-varying fields. Maxwell's equations. Conservation laws. Plane electromagnetic waves. Simple radiating systems. Diffraction. Magnetohydrodynamics. Plasma physics. Collisions between charged particles. Energy losses. Scattering. Radiation from moving charges. Bremsstrahlung. Virtual quantum method. Radiative beta processes. Multipole fields. Radiation damping. Scattering and absorption of radiation by bound charges.

LITERATURE	ASSESSMENT OF LEARNING	
- J. D. Jackson, Classical electrodynamics, 3rd Edition, John Wiley & Sons, New York, 1998. - K. K. Likharev, Classical Electrodynamics: A Modern Perspective, Wiley, Hoboken, New Jersey, 2012. - A. Taflove and S. C. Hagness, Computational Electrodynamics: The Finite-Difference Time-Domain Method, 3rd Edition, Artech House, 2005. - J. M. Stewart, Python for Scientists, Cambridge University Press, 2014. - U. S. Inan and R. A. Marshall, Numerical Electromagnetics: The FDTD Method, 1st Edition, Cambridge University Press, 2011.	Assessment Method	Points
	Written assignment	50
	Project	50
	Total	100

Remarks