

Study program	Level of studies		Third cycle	
	Title of the study program		Doctoral studies in physics	
Course title	ADVANCED ELEMENTARY PARTICLE PHYSICS			
Course ID	Semester	Course status	ECTS credits	Teaching hours
PTH8021	I /II	Mandatory/Elective	10	30
Course aims and expected learning outcomes	<ul style="list-style-type: none"> - Understanding of the Standard Model of particle physics. - Understanding of the phenomenology at particle colliders. - Acquisition of basic knowledge necessary for research work in modern particle physics. 			
COURSE CONTENT				
<p>Construction of the Standard Model of particle physics. Symmetries and field representations. Anomalies. Flavor mixing in the Standard Model. Charged and neutral currents. Consequences of flavor mixing in the Standard Model: Glashow-Iliopoulos-Maiani mechanism. Cabibbo-Kobayashi-Maskawa mixing matrix. Neutrino physics. Pontecorvo-Maki-Nakagawa-Sakata mixing matrix. Mikheyev-Smirnov-Wolfenstein effect of neutrino oscillations in matter. Stability of matter. Deep inelastic scattering. Parton distribution functions.</p>				
LITERATURE			ASSESSMENT OF LEARNING	
<ul style="list-style-type: none"> - Y. Grossman & Y. Nir, <i>The Standard Model: A uniquely beautiful theory</i>, - Matthew D. Schwartz, <i>Quantum Field Theory and the Standard Model</i>, Cambridge University Press, 2014 - Michael E. Peskin, Dan V. Schroeder, <i>An Introduction To Quantum Field Theory</i> (Frontiers in Physics), Westview Press, Reprint edition (October 2, 1995). 			Assessment Method	Points
			Homework	30%
			Seminar paper	30%
			Final exam	40%
			Total	100
Remarks				