COURSE UNIT (MODULE) DESCRIPTION

Course unit (module) title	Code
Introduction to Elementary Particle Physics I/II	

Lecturer(s)	Department(s) where the course unit (module) is delivered
Coordinator: dr. Thomas Gajdosik **Other(s):**	Faculty of Physics

Study cycle	Type of the course unit (module)
Primary	Optional

Mode of delivery	Period when the course unit (module) is delivered	Language(s) of instruction
Auditory work and autonomous learning	V semester	English

Requirements for students	
Prerequisites: none	**Additional requirements (if any):** English language

Course (module) volume in credits	Total student's workload	Contact hours	Self-study hours
5	135	64	71

Purpose of the course unit (module): programme competences to be developed

General competences to be developed:

- Ability to plan and manage tasks.
- Ability to think in general terms, analyse and systemize information.
- Ability to find information in different sources.

Subject-specific competences to be developed:

- Understanding of the fundamental particles and interactions of the Standard Model of Particle Physics
- The ability to calculate relativisitic kinematics
- Understanding of global symmetries

Learning outcomes of the course unit (module)	Teaching and learning methods	Assessment methods
Overview of particles and interactions	lectures, exercise sessions, autonomous work	homework, examination
Calculation of relativisitic kinematics	lectures, exercise sessions, autonomous work	homework, examination
Global symmetries	lectures, exercise sessions, autonomous work	homework, examination
Ability to present a research topic	autonomous work, presentation	homework, presentation

Content: breakdown of the topics	Contact hours							Self-study work: time and assignments	
	Lectures	Tutorials	Seminars	Exercises	Laboratory work	Internship/work	**Contact hours**	**Self-study hours**	**Assignments**
1. Historical introduction to particle physics	4			0			**4**	**4**	Getting an overview over the history
2. Elementary particle dynamics	8			4			**12**	**16**	Homework to get an overview over the particles and the interactions that are described by the Standard Model
3. Special relativity	12			14			**26**	**16**	Homework to learn calculating using relativistic kinematics
4. Symmetries	8			14			**22**	**20**	Homework to gain understanding of the use of symmetries in Particle Physics
5. Preparation for an exam								**15**	Written exam
Total	**32**			**32**			**64**	**71**	

Assessment strategy	Weight, %	Deadline	Assessment criteria
Homework	30	Defined, during semester	Homeworks yield cumulative mark. The maximal number of collected marks is normalized to 30% of the final grade.
Seminar presentation	20	Defined, during semester	Seminar presentations yield 20% of the final grade.
Written exam	50	End of semester	Only students who collect 50% of the possible homework and seminar presentation marks are allowed to take the exam. Theory questions will compose 25% of the final grade. Problem solving will give the 25% of the final grade.

Author	Year of publication	Title	Issue of a periodical or volume of a publication	Publishing place and house or web link
Compulsary reading				
D. Griffiths	2008	Introduction to Elementary Particles	2nd edition *978-3527406012, 470p.*	Wiley-VCH
D. Hogg	1997	Special Relativity	*47p.*	http://cosmo.nyu.edu/hogg/sr/sr.pdf
T. Gajdosik	2013	Special Relativity for Particle Physics: notes for the lecture „įvadas į elementarųjų dalelių fiziką“	*31p.*	VU http://web.vu.lt/ff/t.gajdosik/files/2014/01/sr4wop.pdf
Optional reading				
Particle Data Group		The particle adventure:		http://www.particleadventure.org/
M. Robinson	2011	Symmetry and the standard model: Mathematics and particle physics	doi:10.1007/978-1-4419-8267-4, 327p.	Springer