Program	Level of studies		**Second cycle**	
	Program name		**Physics**	
Course name	**SYMMETRIES IN PHYSICS**			
Course ID	Semester	Course status	ECTS credits	L+E
PTH9621	**I**	**ELECTIVE**	**6**	**3+1**
Lecturer	**Prof. dr. Aner Čerkić**			
Aims and intended learning outcomes	Aim of the course is to introduce students into methods of the group theory and group representations, and into their applications to the description and analysis of the physical symmetries. Expected outcomes: Adopting the basic ideas in the continuous (Lie) group theory. Getting acquainted with continuous (Lie) group symmetries and with their applications in physics. Mastering the mathematical apparatus and methods applied in the analysis of properties of continuous groups.			

Course content

Lie algebra. Adjoint representation. Direct product. Complex conjugate representation. Group SU(2). Group SU(3). Construction of weight diagrams. Tensors. Young tableaux. Lorentz transformations.

Student workload (hours)		Grading	
Lectures and Exercises	60	Assessment method	Points
Exam preparation	50		
Assignments	30		
Other	10	Midterm exam	50
Total	150	Final exam	50
		Total	100

Literature

Mandatory literature:
1. I. Doršner, *Simetrije u fizici*, Prirodno-matematički fakultet Sarajevo, Sarajevo, 2013.
Additional literature:
1. H. F. Jones, Groups, *Representations and Physics*, 2nd edition, Taylor & Francis, 1998.
2. J. F. Cornwell, *Group Theory in Physics*, *An Introduction*, Academic Press, 1997.
3. W. Greiner, B. Müller, *Quantum Mechanics*: *Symmetries*, 2nd edition, Springer-Verlag 2004.
4. M. Hamermesh, *Group Theory and Its Application to Physical Problems*, Dover Publications, 1989.

Remarks