Study program	Level of studies		**Third cycle**	
	Title of the study program		**Doctoral studies in physics**	
Course title	**MICROCONTROLLERS IN PHYSICS**			
Course ID	Semester	Course status	ECTS credits	Teaching hours
PAP7041	**I /II**	**Elective**	**10**	**30**

Course aims and expected learning outcomes	**Candidates will be trained to use microprocessors/microcontrollers in research and education.** • Learning outcomes include: - becoming familiar with the architecture and elements of microprocessors/microcontrollers. • training the candidate to select an appropriate microcontroller for a suitable physics experiment; and - • training the candidate to carry out experiments.

COURSE CONTENT

Microcontroller classification; Processor cores; Memories; Digital and analog inputs/outputs; Interrupts; Timers; Communication interfaces: UART, SPI, IIC, Ethernet; Software: assembler, software development, debugging; Code execution speed calculation; Sensors: communication with sensors, data analysis, Internet of Things - IoT; Display of measurement results: display in real time, spreadsheet programs, web, java; System on a chip - SOC;

LITERATURE	ASSESSMENT OF LEARNING	
	Assessment Method	Points
• Godse, Atul P., and Deepali A. Godse. Microprocessor and Interfacing. Technical Publications, 2020. • Parab, Jivan, et al. *Practical aspects of embedded system design using microcontrollers*. Springer Science & Business Media, 2008. • Gridling, Gunther, and Bettina Weiss. "CT-403: Introduction to Microcontrollers First Semester Text Book."	Tests/Partial exams	20
	Seminar paper/project	20
	Final exam	30
	Homeworks	10
	Performing laboratory work	20
	Total	100

Remarks