Study program	Level of studies	Third cycle
	Title of the study program	Science and mathematics education

COURSE

Course title	**Selected Chapters in Teaching of Physics**

Course ID	Semester	Course status	ECTS credits	Contact hours
PED671	I	Mandatory	7	60

Lecturers		
	Lecturer in charge	Prof. dr. Ivica Aviani
	Other lecturers	Prof. dr. Vanes Mešić
Course aims	Developing the ability to apply models of learning for purposes of evaluating and developing effective learning material within the context of physics education. Developing the ability for model-based teaching of physics. Becoming familiar with modern approaches to popularization of physics.	

CONTENT

#	Teaching units	Contact hours		
		L	E/S	C
	I Models of physics learning Cognitivist approaches to learning and solving physics problems. Nature of physics and structure of physics knowledge. Evolution of physics. **II Visualization in physics teaching** Concept of visualization. Pedagogical features of selected visual representations. Creating effective external visualizations for physics classes. **III A model-based approach to teaching physics** Development, evaluation and application of models in physics teaching. The use of sensors and digital video-analysis for modeling of physics phenomena. **IV Context-rich learning about physics; Popularization of physics** Physics within the context of everyday-life, sports and technology. Hands-on experiments. Low-budget high-tech projects. Exploring natural phenomena in kindergarten and primary school.	30	15	

LITERATURE

1. Mintzes, J.J., Wandersee, J.H., Novak,J.D. (2004). *Assessing Science Understanding: A Human Constructivist View*. San Diego: Academic Press.
2. Redish, E. F., (2003). *Teaching Physics with the Physics Suite.* NJ: Wiley.
3. Gilbert, J.K., Reiner, M., Nakhleh, M. (2008). *Visualization: Theory and Practice in Science Education*. Dordrecht: Springer.
4. Clark, R.C., & Mayer, R.E. (2008). *E-learning and the science of instruction*. San Francisco: Pfeiffer.
5. Halloun, I.A. (2006). *Modeling Theory in Science Education*. Dordrecht: Springer.
6. Cabot, L.H. (2008). *Transforming teacher knowledge: Modeling instruction in physics*. PhD thesis, University of Washington.
7. Kircher, E., Girwidz, R., Haeussler, P. (2009). *Physikdidaktik: Theorie und Praxis*. Berlin: Springer

ASSESSMENT OF LEARNING

	Assessment method	Points	Threshold
1.	Partial exams	20	11
2.	Seminar papers/projects	60	33
3	Final exam	20	11
4.			
	Total	100	55