



Adam Mickiewicz University in Poznań

Faculty of Chemistry

ChemInter - wysokiej jakości międzynarodowy i interdyscyplinarny program studiów doktoranckich realizowany na Wydziale Chemii Uniwersytetu im. Adama Mickiewicza w Poznaniu

Creativity and innovative thinking in Engineering and Science

Dr hab. inż. Krystyna Malińska

Researcher's workshop

Field of science	Interdyscyplinarny
Teaching method	Interactive lecture combined with a workshop
Language	English
ECTS credits	2
Numbers of hours	30
Aims of the course	The objective of the course is to provide students with new approaches towards understanding the role of creativity in developing new ideas in engineering and science, to learn about new strategies and techniques used for developing innovations in engineering and science, and also to foster creativity and innovative thinking skills among the students.
Course contents	<ol style="list-style-type: none"> 1. Understanding the role of creativity and innovative thinking in engineering and science 2. Creating a culture for innovation: conditions for creativity in engineering and science 3. Creativity, fixed mindset vs. growth mindset 4. Innovative thinking approaches and strategies 5. Design thinking as a strategy for developing an innovation 6. TRIZ method for creative problem solving in engineering 7. Employing and fostering innovative thinking in research projects 8. Leadership challenge to foster innovation
Prerequisites and co-requisites	None
Learning outcomes	
On completion of the course PhD candidates will be able to:	Assessment mode
The graduate is able to make use of knowledge from different fields of science for creative identification, formulation and solving of complex problems and research work, in particular: <ul style="list-style-type: none"> - to define the aim of research work, formulate research hypotheses, - to develop and creatively apply research methods, techniques and tools - to draw conclusions. 	Course assignments: <ol style="list-style-type: none"> 1. Problem brief 2. Idea generation activities 3. Problem solving assignment



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<p>The graduate is able to critically analyze and evaluate results of research work, experts' analyses, and other work of creative character and their contribution to science development.</p>	
<p>The graduate is ready to think creatively, to conceive new ideas and look for innovative solutions – in cooperation with persons representing other areas, to undertake challenges and intellectual risk, to assume responsibility for consequences of his/ her decisions.</p>	
<p>Literature</p>	<ol style="list-style-type: none"> 1. Lau, Joe. Y. F. 2011. An Introduction to Critical Thinking and Creativity: Think More, Think Better, John Wiley & Sons, Inc., Hoboken, NJ, USA 2. Arnold J.E., Clancey W.J. Creative Engineering: promoting innovation by thinking differently. William J. Clancey, 2016 3. Dweck C.S. Mindset. The New Psychology of Success. Ballantine Books Trade 2008 4. Brown T. Design Thinking. Harvard Business Review, June 2008, 84-95
<p>Additional information</p>	<p>Schedule (suggested dates):</p> <ol style="list-style-type: none"> 1. 15.03.2019 (Friday) – 11:30-16:30 (6h) 2. 22.03.2019 (Friday) – 11:30-16:30 (6h) 3. 29.03.2019 (Friday) – 11:30-16:30 (6h) 4. 12.04.2019 (Friday) – 11:30-16:30 (6h) 5. 26.04.2019 (Friday) – 11:30-16:30 (6h)