



Fundusze Europejskie
dla Rozwoju Społecznego



Rzeczpospolita
Polska

Dofinansowane przez
Unię Europejską



COURSE SYLLABUS

1.	Course title:	
	Seismic-stratigraphic and tectonic interpretations of seismic data	
2.	Lecturers:	
	<i>Professor Piotr Krzywiec, Institute of Geological Sciences, Polish Academy of Sciences</i>	
3.	Field, type and level of studies, year of study:	
	<i>geology, geophysics, advanced undergraduate, graduate and post-graduate (PhD)</i>	
4.	Course character:	
	<i>Lectures and practical exercises in interpretation of seismic data, presentation of modern software for seismic data interpretation</i>	
5.	Teaching method:	
	<i>traditional – classroom lecturer lectures and practicals</i>	
6.	Language:	<i>English</i>
7.	Course type and number of hours:	
	<i>workshop (30 h)</i>	
8.	Estimated load of student's independent work:	5 h
9.	Total workload and number of ECTS points:	2 ECTS



PROM – krótkookresowa wymiana akademicka – nabór 2025;

Projekt finansowany przez Narodową Agencję Wymiany Akademickiej ze środków programu Fundusze Europejskie dla Rozwoju Społecznego 2021–2027 (FERS);
wysokość dofinansowania: 995 250 PLN; www.mapadotacji.gov.pl



10.	Short description and main focus of the course:
	<i>Main goal of this course is to provide students with basic skills of interpretation of seismic data that image sedimentary basins and various tectonic structures. First part will be devoted to basics of seismic reflection surveying but without complex background in mathematics and physics necessary in order to fully understand details of seismic data acquisition and processing. Main emphasis will be put on geological aspects of seismic studies especially, in particular for studies of sedimentary basins and tectonic processes. Important part will be devoted to application of seismic data in oil & gas exploration, geothermal studies, CO₂ sequestration, and hydrogeology. Main topics will include:</i> <i>1. introduction to seismic reflection methods</i> <i>2. regional seismic studies of Earth's crust</i> <i>3. seismic stratigraphy (clastic and carbonate systems)</i> <i>4. structural interpretation of seismic data:</i> <i>• extensional basins</i> <i>• inversion of sedimentary basins</i> <i>• compressional domains – fold-and-thrust belts</i> <i>• strike-slip tectonic zones and associated sedimentary basins</i> <i>• salt tectonics</i> <i>Lectures will be richly illustrated by seismic examples of geological structures from various sedimentary basins. Lectures will be supplemented by practical exercises in interpretation of seismic profiles.</i>
11.	References:
	<i>Allen, P.A., Allen, P.R. 1990. Basin Analysis. Principles & Applications. Oxford.</i> <i>Einsele G., 2000. Sedimentary Basins. Evolution, Facies and Sediment Budget. Berlin.</i> <i>Hancock, P.L. (Ed.), 1994, Continental Deformation. Pergamon Press.</i> <i>Veeken P.C.H., van Moerkerken B., 2013, Seismic Stratigraphy and Depositional Facies Models. EAGE, ISBN 9789073834439</i> <i>Holdsworth R.E., Turner J.P., 2002, Extensional Tectonics: Regional-scale processes. Geological Society of London, London.</i> <i>MA Cooper, GD Williams, 1989, Inversion tectonics. Geological Society of London, London.</i> <i>Nemcok M., Schamel S., Gayer R., 2009, Thrustbelts: Structural architecture, thermal regimes and petroleum systems. Cambridge Univ. Press, Cambridge.</i> <i>Nemcok M., 2017, Rifts and Passive Margins: Structural Architecture, Thermal Regimes, and Petroleum Systems. Cambridge Univ. Press, Cambridge.</i> <i>Hudec M., Jackson M., 2011, The Salt Mine. AAPG, Tulsa.</i>



	<i>Alsop G.I., Archer S.G., Hartley A.J., Grant N.T., Hodgkinson R. 2012, Salt Tectonics, Sediments and Prospectivity. Geological Society of London, London.</i> <i>Jackson M., Hudec M., 2017, Salt Tectonics. Principles and Practice”, Cambridge University Press, 498 str, ISBN 978-1-107-01331-5</i> <i>Storti F., Holdsworth R.E., Salvini F., 2001, Intraplate Strike-Slip Deformation Belts. Geological Society of London, London.</i> <i>Buchanan, J.G., Buchanan, P.G., 1995. Basin Inversion. Geological Society of London, London.</i>
12. Prerequisites:	
	<i>General geology, basics of sedimentology, facies analysis, geodynamics, structural geology, tectonics</i>
13. Educational outcomes:	
	Knowledge <i>student knows basic features of seismic reflection data that are necessary for correct stratigraphic and structural interpretation, knows how to use seismic data in sedimentary basin analysis, oil & gas exploration, geothermal studies, CO2 sequestration, hydrogeology</i>
	Practical Skills: <i>student knows how to interpret seismic data from passive continental margins (seismic / sequence stratigraphy) and carbonate depositional environments; knows how to use seismic data in order to interpret various structures related to extension, basin inversion, compression, strike-slip movements and salt tectonics; knows how to use seismic data in order to reconstruct scenarios of evolution of geological structures; knows how to identify basic traps for hydrocarbons, geothermal waters etc.</i>
	Social Skills: <i>student is able to critically apprehend presented material, and to understand importance of team work in professional endeavours</i>
14. Evaluation of the educational outcomes:	
	<i>Student's commitment during the workshop, discussions during workshop time and external examination</i>
15. Criteria to complete the course:	
	<i>To successfully complete the course, students must attend at least 80% of all scheduled classes and activities, and obtain a positive evaluation in the final practical examination, which assesses their ability to identify the principal Cladocera and Rotifera remains using a</i>



Fundusze Europejskie
dla Rozwoju Społecznego



Rzeczpospolita
Polska

Dofinansowane przez
Unię Europejską



	<i>light microscope. Active participation throughout the workshop is also expected.</i>
16.	Contact with the course leader/lecturer:
	piotr.krzywiec@twarda.pan.pl



PROM – krótkookresowa wymiana akademicka – nabór 2025;
Projekt finansowany przez Narodową Agencję Wymiany Akademickiej ze środków
programu Fundusze Europejskie dla Rozwoju Społecznego 2021–2027 (FERS);
wysokość dofinansowania: 995 250 PLN; www.mapadotacji.gov.pl