

COURSE/MODULE SYLLABUS FOR UNIVERSITY COURSES/PhD STUDIES

1.	Course/module name in Polish and English Sedimentary processes, environments and basins/ Procesy, środowiska i baseny sedymentacyjne
2.	Discipline Earth and Environmental Science
3.	Language of instruction English
4.	Teaching unit Faculty of Earth Science and Environmental Management, Institute of Geological Sciences, Department of Structural Geology and Geological Mapping
5.	Course/module code USOS
6.	Type of course/module (<i>mandatory or optional</i>) optional
7.	Field of studies (major, if applicable) Geology
8.	Level of higher education (<i>undergraduate (I cycle), Master's (II cycle), 5 year uniform Master's studies</i>) Master's (II cycle)
9.	Year of studies (<i>if applicable</i>) I/II
10.	Semester (<i>winter or summer</i>) winter/summer
11.	Form of classes and number of hours Lectures: 16 Classes: 16 Field classes: 12 Teaching methods Multimedia lecture, practical exercises, individual work, preparation of reports,
12.	Name, title/degree of the teacher/instructor Coordinator: dr hab. Jurand Wojewoda Lecturer: dr hab. Jurand Wojewoda
13.	Course/module prerequisites, in terms of knowledge, skills, social competences Knowledge in the field of mathematics and physics at the secondary school level knowledge and skills in physical and historical geology, tectonics.

14.	<p>Course objectives</p> <p>Eligibility for description, analysis and interpretation of sedimentary structures, rock complexes and basins as well as their genesis and evolution.</p>	
15.	<p>Course content</p> <p>Lectures:</p> <ol style="list-style-type: none"> 1. Recognition of sediments and sedimentary processes (sediments: basic definitions and methodology, facies, physical aspects of sedimentary processes: basic definitions of hydraulics, grain transport and primary sedimentary textures and structures (grain orientation and gradation, bedding), mass transport and secondary textures and structures diagenesis: compaction, lithification) 2. Sedimentary environments and sediment architecture (facies association: Walther's law, (sub)environment, depositional systems – continental, transitional, marine; paleoslope: paleoflow and palaeotransport, facies succession: permanent, cyclic and stochastic processes, events, environment evolution, migration of depositional systems, facial maps, 3-D sediment architecture: sedimentary surfaces (erosional, depositional) hierarchy of sedimentary surfaces, boundaries, sequence stratigraphy, deposition rate, cyclicity of sedimentation) 3. Sedimentary basins (basic definitions and classification (boundaries, geotectonic regime – fundamental Earth's architecture, stress and strain in lithosphere, lithosphere plates and basins, tensional regime of basin formation and evolution; tectonic controls on basin evolution; rock salt and ground water play; basin architecture (2d & 3D methods (seismic profiles, sections and tomography); ancient basins (basin inversion, examples of ancient basins); recent basins (DEM, neotectonics, facies and structural analysis)) <p>Classes:</p> <ol style="list-style-type: none"> 1. Granulometric analyses (sieve and microscopic, process-environmental interpretation of granular sediments) 2. Paleocurrents and paleotransport analysis (rosette diagrams, resultant vector, paleorelief) 3. Cyclicity of sedimentation (Markov chains), sedimentological profile. <p>Field classes:</p> <ol style="list-style-type: none"> 1. Examples of Sudetean sedimentary basins: Książ Basin (Devonian - Westphalian), Nachod Basin (Permian-Cretaceous-Neogen), Trutnov Basin (Carboniferous-Triassic) 2. Analysis and determinants of the development of pull-apart basins within regional shear zones (example: Intra-Sudetic shear zone) 	
16.	<p>Intended learning outcomes</p> <p>W_1 The student knows the physical processes of sedimentation.</p> <p>W_2 The student knows the terminology of sediments, textures and structures as well as the names of processes and research methods in the field of sedimentology.</p> <p>W_3 The student knows the most important continental and marine</p>	<p>Symbols of learning outcomes for particular fields of studies, e.g. <i>K_W01*</i>,</p> <p><i>K_U05, K_K03</i></p> <p>K2_W01, K2_W04, K2_W07, K2_W09</p> <p>K2_W01, K2_W04, K2_W07, K2_W09</p>

	<p>sedimentation environments, environmental sedimentation processes and indicator sediments for selected environments.</p> <p>W_4. The student knows the history of sedimentological research, the most important stages of development of this branch of geology, including the contribution of Polish researchers to the present state of knowledge about sediments and sedimentary processes.</p> <p>W_5 The student knows the geotectonic and geodynamic context of the formation of sedimentary basins; knows the ways to identify the components of pool architecture</p> <p>W_6 The student knows the basic terminology in English</p> <p>U_1 The student has a practical ability to apply selected statistical methods (statistical moments, moving average, vector operators, Markov chains);</p>	<p>K2_W01, K2_W04, K2_W07, K2_W09</p> <p>K2_W01, K2_W04, K2_W07, K2_W09</p> <p>K2_W01, K2_W04, K2_W07, K2_W09</p> <p>K2_W01, K2_W04, K2_W07, K2_W09</p> <p>K2_U01, K2_U03, K2_U05,</p>
17.	<p>Required and recommended reading (<i>sources, studies, manuals, etc.</i>)</p> <p>Required reading</p> <p>Nichols, G., 1999. Sedimentology & Stratigraphy. Blackwell Science, 356 pp.</p> <p>Reading, H.G., [Ed.] 1996. Sedimentary Environments: Processes, Facies and Stratigraphy. 688 pp., Blackwell Sciences, Oxford.</p> <p>Tucker, M.E., 2000. Sedimentary petrology: An introduction to the Origin of Sedimentary Rocks. Blackwell Science, 260 pp.</p> <p>Warren, J. 1999. Evaporites. Their evolution and economics. Blackwell Science Ltd. Oxford. 438 pp.</p> <p>Miall, D.M., 1990. Principles of Sedimentary Basin Analysis. 668 pp., Springer-Verlag.</p> <p>Recommended reading</p> <p>Allen, P.A., Allen, J.R.L., 1990. Basin Analysis: Principles & Applications. Blackwell Science, Oxford, 451 pp.</p> <p>Einsele G., 2000. Sedimentary basins. Evolution, facies, and sediment budget. Springer.</p> <p>Allen, P.A., 1997. Earth Surface Processes. 404 pp., Blackwell Science, Oxford.</p> <p>Davis, G.H., Reynolds S.J., 1996. Structural geology of rocks and regions. John Wiley & Sons, Inc</p> <p>Emery, D., Myers, K.J., 1996. Sequence stratigraphy. Blackwell Science.</p> <p>Kleinspehn, K.L. & Paola, C., 1988. New Perspectives in Basin Analysis. 453 pp, Springer-Verlag.</p>	
18.	<p>Assessment methods for the intended learning outcomes:</p> <ul style="list-style-type: none"> - written or oral exam K2_W01, K2_W04, K2_W07 - written report K2_W01, K2_W04, K2_W07, K2_U01, K2_U03, K2_U05 	
19.	<p>Credit requirements for individual components of the course/module:</p> <ul style="list-style-type: none"> - writing a class report 	

	<ul style="list-style-type: none"> - exam (written or oral) - elements and weights affecting the final grade: 50% exam, 50% classes. - monitoring attendance and progress on the course subject matter 	
20.	Total student effort	
	form of student activities	number of hours for the implementation of activities
	classes (according to the plan of studies) with a teacher/instructor: <ul style="list-style-type: none"> - lectures: 16 - classes: 16 - field classes: 12 - consultations: 6 	50
	student's own work (including group-work) such as: <ul style="list-style-type: none"> - being prepared for classes: 10 - reading the suggested literature: 20 - writing a class report: 20 	50
	Total number of hours	100
	Number of ECTS credits	4