COURSE DESCRIPTION –
The importance of physiological spine extension - from birth to adulthood

Academic year 2025/2026

Course code		
Course title in	**Polish**	***Diagnostyka i reedukacja posturalna***
	English	*Clinical Postural Assessment and Re-education*

1. LOCATION OF THE COURSE WITHIN THE SYSTEM OF STUDIES

1.1. Course Name	***The importance of physiological spine extension - from birth to adulthood***
1.2. Course Syllabus prepared by	*Dr Arkadiusz Żurawski,PhD in Health Sciences*
1.3. Contact details	*arkadiusz.zurawski@ujk.edu.pl*

2. GENERAL COURSE CHARACTERISTICS

2.1. Language of Instruction	*English*
2.2. Prerequisites *	*Anatomy, Physiology, Kinesiotherapy*

3. DETAILED COURSE CHARACTERISTICS

3.1. Form of Instruction		*Practical classes*
3.2. Place of Instruction		*Teaching facilities of Jan Kochanowski University (UJK)*
3.3. Form of assessment		*Credit with grade*
3.4. Teaching Methods		*1. Diagnostic demonstrations and practical instruction using the DIERS Formetric 4D system, functional ultrasound imaging, and surface electromyography (sEMG).* *2. Practical exercises performed by students on one another and on patient models, including posture analysis, muscle function assessment, and work with clinical documentation.* *3. Task-based group work involving the resolution of clinical cases based on objective biomechanical data.* *4. Joint interpretation of examination results and development of preliminary postural re-education therapy plans.* *5. Educational discussion and error analysis – collective evaluation of the effectiveness of applied methods.*
3.5. Bibliography	**Required reading**	*1. Kiebzak W. Application of Euclidean geometry in the assessment of body posture in a sitting position. Pol Ann Med. 2022;29(2):167–171.* *2. Kiebzak W, Żurawska J, Żurawski A. Ocena sEMG aktywności mięśnia prostego brzucha oraz mięśnia wielodzielnego w zależności od sposobu przyjmowania pozycji siedzącej. Fizjoterapia Polska. 2017;17(3):52–62.* *3. Neumann DA. Kinesiology of the Musculoskeletal System: Foundations for Rehabilitation. 3rd ed. Elsevier; 2017..* *4. Kapandji IA. Biomechanika kliniczna: układ ruchu. Tom 1–3. Medipage; 2018.*
	Further reading	*1. Merletti R., Muceli S. Tutorial. Surface EMG detection, conditioning and pre-processing: Best practices. Journal of Electromyography and Kinesiology. 2019* *2. McGlone J.C. (ed.) Manual of Photogrammetry. 5th ed., ASPRS; 2004* *3. Jacobson JA. Fundamentals of Musculoskeletal Ultrasound. 3rd ed.; Elsevier, 2017*

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

4.1. Course objectives (by form of instruction)

Practical classes:

C1. Acquisition of practical skills in functional and instrumental assessment of body posture using clinical tools.
C2. Mastery of the operation of the DIERS Formetric 4D photogrammetric system and its application in diagnosing postural disorders.
C3. Acquisition of functional ultrasound imaging techniques for muscle visualization and identification of deep muscle activation abnormalities.
C4. Learning the application of surface electromyography (sEMG) for functional assessment of selected muscle groups in the context of postural control.
C5. Identification of plantar pressure distribution patterns using pedobarography and interpretation of their clinical significance.
C6. Integration of findings from multiple diagnostic sources to develop therapeutic strategies emphasizing physiological spinal extension.
C7. Development of teamwork skills and diagnostic–therapeutic problem-solving based on objective data.

4.2. Course content (by form of instruction)

Practical classes:

1. *Principles of patient preparation for postural assessment – positioning, standardization of examination conditions, data acquisition.*
2. *Introduction to the DIERS Formetric 4D system – measurement procedures; analysis of head, shoulder, pelvic, and spinal alignment.*
3. *Interpretation of photogrammetric posture assessment results – discussion of parameters (pelvic tilt, shoulder torsion, kyphosis/lordosis, functional scoliosis).*
4. *Functional diagnostics of deep muscles using ultrasound – assessment of the transversus abdominis, multifidus, and longus colli muscles; examination protocols.*
5. *Application of sEMG in clinical practice – electrode placement and recording of muscle activity during functional tests.*
6. *Introduction to static and dynamic pedobarography – assessment of plantar pressure distribution during standing and gait.*
7. *Evaluation of postural compensatory strategies based on instrumental diagnostic data – case analysis.*
8. *Development of a postural re-education plan based on diagnostic findings – integration of results and selection of therapeutic techniques.*
9. *Paired practical exercises – analysis, interpretation, and discussion of examination results obtained from peer assessments.*
10. *Evaluation of postural therapy outcomes – follow-up measurements and interpretation of changes.*

4.3. Intended learning outcomes

	Upon successful completion of the course, the student
W01	Understands the biomechanical and neurophysiological foundations of postural control
W02	Understands the principles of operation and application of diagnostic systems such as DIERS Formetric, functional ultrasound imaging, and surface electromyography (sEMG) in posture and muscle control assessment.
U01	Is able to perform basic posture and gait analysis using the DIERS system and interpret the obtained data.
U02	Is able to assess deep muscle activation using ultrasound and sEMG and apply the results in therapy planning.

U03	Is able to select and apply appropriate therapeutic strategies based on global extension patterns, adjusted to the patient's age and functional status.
U04	Is able to analyze and integrate data from various diagnostic methods to develop an individualized postural re-education program.
K01	Is prepared to work in an international team and to share knowledge and experience with other participants in the therapeutic process.
K02	Demonstrates awareness of the importance of precise diagnostics and evidence-based practice (EBP) in patient care.

4.4. Methods of assessment of the intended learning outcomes

Teaching outcomes (code)	Method of assessment (+/-)																				
	~~Exam~~ written/oral~~*~~			Oral assessment			Practical assessment			Effort in class*			~~Self-study*~~			Group work*			~~Other (please specify) *~~		
	Form of classes			*Form of classes*			*Form of classes*			*Form of classes*			*Form of classes*			*Form of classes*			*Form of classes*		
	L	*P C*	...	*L*	*P C*	...	*L*	*PC*	...	*L*	*P C*	*PC*	*L*	*P C*	...	*L*	*PC*	...	*L*	*P C*	...
W01								+				+									
W02								+				+									
U01								+				+					+				
U02								+				+					+				
U03								+				+					+				
U04								+				+					+				
K01												+					+				
K02												+					+				

**delete as appropriate*

4.5. Criteria for Assessing Learning Outcomes

Form of classes	Grade	Grading Criteria
lecture (L)	**3**	*Demonstrates knowledge of the course content at the level of 61%–68%.*
	3,5	*Demonstrates knowledge of the course content at the level of 69%-76%*
	4	*Demonstrates knowledge of the course content at the level of 77%-84%*
	4,5	*Demonstrates knowledge of the course content at the level of 85%-92%*
	5	*Demonstrates knowledge of the course content at the level of 93%-100%*
Practical classeS (PC)	**3**	*Practical task performance at the level of 61%-68%*
	3,5	*Practical task performance at the level of 69%-76%*
	4	*Practical task performance at the level of 77%-84%*
	4,5	*Practical task performance at the level of 85%-92%*
	5	*Practical task performance at the level of 93%-100%*

5. BALANCE OF ECTS CREDITS – STUDENT'S WORK INPUT

Category	Student's workload	
	Full-time Studies	**Part-time Studies**
DIRECT PARTICIPATION (CONTACT HOURS WITH INSTRUCTOR)	**-**	***25***
Participation in lectures	-	-
Participation in classes/practical classes	-	25
STUDENT'S INDEPENDENT WORK (NON-CONTACT HOURS)	**-**	***25***
Preparation for the lecture	-	-
Preparation for classes/practical classes	-	25
TOTAL NUMBER OF HOURS	**-**	***50***
ECTS CREDITS for the course of study	**-**	**2**

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Approved for implementation *(date and signatures of course instructors for the given academic year)*

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