

DESCRIPTION OF THE COURSE OF STUDY

Course code	0719-2ID-F65-IM	
Name of the course in	Polish	Informatyka medyczna
	English	Medical informatics

1. LOCATION OF THE COURSE OF STUDY within the system of studies

1.1. Field of study	Data Engineering
1.2. Mode of study	Full-time
1.3. Level of study	First-cycle (Bachelor)
1.4. Profile of study*	General academic
1.5. Person/s preparing the course description	Dr Ilona Stabrawa
1.6. Contact	ilona.stabrawa@ujk.edu.pl

2. GENERAL CHARACTERISTICS OF THE course of study

2.1. Language of instruction	English
2.2. Prerequisites*	-

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes	Lecture, laboratory, project	
3.2. Place of classes	Didactic rooms at Jan Kochanowski University (UJK)	
3.3. Form of assessment	Lecture – graded credit, laboratory – graded credit, project – graded credit	
3.4. Teaching methods	Informative lecture, problem-based lecture, laboratory exercises, individual project	
3.5. Bibliography	Required reading	J. Martyniak, Fundamentals of Computer Science with Elements of Telemedicine, Jagiellonian University Press, 2005 R. Tadeusiewicz, Medical Informatics, Maria Curie-Skłodowska University Press, 2011
	Further reading	I. Roterman-Konieczna, Elements of Medical Informatics, Jagiellonian University Press, 2011

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

4.1. Course objectives (including form of classes)

- C1. To understand basic concepts related to acquisition, processing, and transmission of medical signals and images.**
- C2. To learn about key classification, coding systems, and nomenclatures used in electronic medical information exchange.**
- C3. To gain knowledge of software used for processing and effective use of data, information, and knowledge in medicine and healthcare.**
- C4. To develop skills for independent problem-solving.**

4.2. Detailed syllabus (including form of classes)

Lectures:

- Acquisition and processing systems for medical signals (sources and types of signals, digital signal processing methods, examples of applications).
- Medical imaging systems (image acquisition, transmission and archiving, examples of applications).
- Decision support systems in medicine (clinical algorithms, expert systems, artificial neural network-based systems).
- Classification and coding systems, and medical nomenclature (medical naming principles, ICD, TNM, ICPC classification, SNOPMED, MeSH, UMLS).
- Image reconstruction in computed tomography (CT) – principles, methods, generations of scanners, simulation software.
- Electronic health record (EHR) – purpose, paper vs. electronic versions, standards.
- Computer systems for different levels of healthcare (clinics, outpatient centers, hospital information systems).
- Telemedicine and health telematics – technical, economic, and legal aspects.

Laboratory:

- Analysis and digital processing of biomedical signals such as ECG and EEG.
- Processing and reconstruction of medical images using CT, MRI, and ultrasound techniques.
- Use of coding tools for diagnoses and procedures based on ICD-10 classification.
- Creating and managing patient databases.
- Case analysis using medical decision support systems.

6. Using software for telemedicine and electronic medical documentation.
7. Designing and managing patient databases in healthcare information systems.

Project:

Developing a concept for an IT system for a selected medical application (e.g., patient registration system, ECGsignal analysis, or diagnostic support app). Presentation of the project.

4.3 Intended learning outcomes

Code	A student, who passed the course	Relation to learning outcomes
within the scope of KNOWLEDGE:		
W01	The student has knowledge of acquisition and processing systems for medical signals. Understands medical imaging, image reconstruction, and decision support systems. Knows classification and coding systems in medicine as well as technical, economic, and legal aspects of telemedicine.	ID1A_W01 ID1A_W02 ID1A_W04 ID1A_W08 ID1A_W16
within the scope of ABILITIES:		
U01	The student can use interdisciplinary knowledge to solve medical IT problems. Can choose appropriate software for healthcare applications. Can collect, process, and transmit medical data and assess their reliability.	ID1A_U04 ID1A_U05 ID1A_U06
within the scope of SOCIAL COMPETENCE:		
K01	The student can express opinions on issues related to medical informatics. Understands the need for continuous learning and professional development. Understands ethical dilemmas related to professional activities and follows professional ethics.	ID1A_K01 – K04

4.4. Methods of assessment of the intended learning outcomes

Teaching outcomes (code)	Method of assessment (+/-)																				
	Exam oral/written*			Test*			Project*			Effort in class*			Self-study*			Group work*			Others* e.g. standardized test used in e-learning		
	Form of classes			Form of classes			Form of classes			Form of classes			Form of classes			Form of classes			Form of classes		
	W	L	P	W	L	P	W	L	P	W	L	P	W	L	P	W	L	P	W	L	P
W01				x					x		x			x	x						
U01				x					x		x			x	x						
K01				x					x		x			x	x						

*delete as appropriate

4.5. Criteria of assessment of the intended learning outcomes

Form of classes	Grade	Criterion of assessment
lecture (W)	3	Achievement of 50–60% of assessment requirements
	3,5	Achievement of 60–70%
	4	Achievement of 70–80%
	4,5	Achievement of 80–90%
	5	Achievement of 90–100%
Laboratory (L)	3	Achievement of 50–60% of assessment requirements
	3,5	Achievement of 60–70%
	4	Achievement of 70–80%
	4,5	Achievement of 80–90%
	5	Achievement of 90–100%
Project (P)	3	Achievement of 50–60% of assessment requirements
	3,5	Achievement of 60–70%
	4	Achievement of 70–80%
	4,5	Achievement of 80–90%
	5	Achievement of 90–100%

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

Category	Student's workload	
	Full-time studies	Extramural studies
NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER / CONTACT HOURS/	75	75
<i>Participation in lectures*</i>	<i>30</i>	<i>30</i>
<i>Participation in classes, seminars, laboratories*</i>	<i>30</i>	<i>45</i>
<i>Project</i>	<i>15</i>	
INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/	50	50
<i>Preparation for the lecture*</i>	<i>15</i>	<i>15</i>
<i>Preparation for the classes, seminars, laboratories*</i>	<i>30</i>	<i>30</i>
<i>Preparation for the exam/test*</i>	<i>5</i>	<i>5</i>
TOTAL NUMBER OF HOURS	125	125
ECTS credits for the course of study	5	5

**delete as appropriate*

Accepted for execution (date and legible signatures of the teachers running the course in the given academic year)

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