GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Telemedicine and Mobile Applications, PG_00049301		
Field of study	Biomedical Engineering		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2027/2028
Education level	first-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	4	Language of instruction	Polish
Semester of study	7	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Biomedical Engineering -> Faculty of Electronics, Telecommunications and Informatics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Mariusz Kaczmarek	
	Teachers	dr hab. inż. Mariusz Kaczmarek	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	15.0	0.0	0.0	45

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	45	2.0	3.0	50

Subject objectives

The aim of the course is to acquaint students with selected techniques and standards used in telemedicine as well as to develop gained to date knowledge of software programming to mobile devices, smartphone. An important objective is to show the specific need to ensure the integrity and safety of the analyzed and transmitted data. It is assumed that the reported content of education in this subject should encourage self-awareness utilizing available within the subject elements of distance education.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W03] knows and understands, to an advanced extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum	He can propose a hardware specification for a given set of issues.	[SU5] Assessment of ability to present the results of task
[K6_U07] can apply methods of process and function support, specific to the field of study	He can perform the risk analysis software solution and hardware.	[SW2] Assessment of knowledge contained in presentation [SU3] Assessment of ability to use knowledge gained from the subject
[K6_W54] Knows and understands, to an advanced extent, selected aspects of biomedical diagnostics	Is able to link causes with effects and propose appropriate diagnostic methods.	[SW1] Assessment of factual knowledge

Subject contents	1. The objectives of telemedicine services. 2. Programs for telemedicine services in Poland and abroad. 3. The structure of the network and the availability of telemedicine services in Europe. 4. Exchange protocols and the protection of medical data HL7. 5. Exchange protocols and data protection of medical DICOM. 6. The structure and design of hospital information systems. 7. Integration of medical databases. 8. Systems for computer-aided diagnosis and therapy. 9. Techniques for video conferencing systems and video tele-consultations. 10. Interactive Web sites - in the prevention and e-learning. 11. Virtual systems in education and therapy. 12. Interactive Web sites - such as systems for self-hearing test (telediagnostyka I). 13. Interactive Web sites - such as systems for self-study eye (telediagnostyka II). 14. Mobile data synchronization. 15. Concepts of electronic systems, the patient and doctor. 16. Wireless transmission systems. 17. Systems design principles of biomedical sensor signals. 18. Exchange and remote evaluation of medical signals (ECG, and others). 19. Organization warning and response systems. 20. Standards intensive supervision system of the patient. 21. Database systems, mobile telemedicine. 22. Wireless standards used in biomedical monitoring (WiFi, Bluetooth, GPRS, mWLAN). 23. Mobile operating systems. 24. Software development platform for mobile devices such as: smartphone, PDA, iPod. 25. Programming mobile devices - Methods of authentication and access control. 26. Programming mobile devices to biosygnałów acquisition based on different operating systems. 27. Programming mobile devices - biosygnałów analysis. 28. Development trends of telemedicine services. 29. Intelligent expert systems in medical diagnostics. 30. Virtual reality in medical systems.
Prerequisites and co-requisites	**Information Technology:** 1. Launch an application 1.1. Running applications from the command line (terminal) 1.2. Launching the application from the operating system GUI 2. Computer Configuration 2.1. Installing the software 2.2. Setting the environment variables **Methods and techniques of programming:** 1. The construction program in structured programming 1.1. Variables, data types, functions 1.2. control Statements 1.3. Compilation and execution of programs 1.4. Basic data structures 1.5. The ability to move from ideas to the program by the algorithm 2. Construction of the program in object-oriented programming 2.1. Designing and writing classes 2.2. Creating and using objects 2.3. Elements of object-oriented paradigm (abstraction, encapsulation, inheritance, polymorphism) 2.4. Using class libraries **Developing web applications in medicine:** 1. Standards of medical information transfer 2. Standards in the conduct of medical records
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
Test 1	0.0%	20.0%
Test 2	0.0%	20.0%
Laboratory Ex.	51.0%	60.0%

Recommended reading	Basic literature	1. Systemy komputerowe i teleinformatyczne w służbie zdrowia, BilB2000, Tom 7, Exit 2002 2. Materiały do przedmiotu opracowane w formie edukacji na odległość, dostęp: http://uno.biomed.gda.pl 3. Eckel B., Thinking In Java, edycja polska, Helion 2006 4. Perry S.C., C# i .Net, Helion 2006

	Supplementary literature	1. Sun, Specyfikacja języka Java, http://java.sun.com 2. Microsoft, Specyfikacja platformy .Net i języka C#, http://www.microsoft.com
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	