



Zaporizhzhya Polytechnic National University
Faculty of Radio Electronics and Telecommunications
Department of Radio Engineering and Telecommunications
specialty 172 "Telecommunications and radio engineering" educational and
professional program "Telemedicine and biomedical systems"

DESCRIPTION / Syllabus of discipline / module

Short name of the university / department date (month / year)	NU «Zaporizhzhya Polytechnic» 08/2020
Module name / Course name	Diagnostic and therapeutic devices and systems
Code:	PPN 06

Teacher(s)	Department
Morshchavka Sergii	Radioengineering and Telecommunication

Study cycle	Level of the module	Type of the module
MSc	2	mandatory

Form of delivery	Duration	Language(s)
Lectures/Hands-on Lab session	15 weeks	Ukrainian
Connection with other disciplines		
Previous: - Machine learning and artificial intelligence; - Biomedical signals and signal processing.		Related (if required):

Credits of the module	Total student workload	Contact hours	Individual work hours
5,5	165	45	120

Aim of the module (course unit): competences foreseen by the study programme

Giving the future specialist a clear understanding of the modern diagnostic and therapeutic equipment for medical purposes, methods of its development and improving

Learning outcomes of module (course unit)	Teaching/learning methods	Assessment methods
- be fluent in the state language and communicate foreign language; - be able to reasonably choose and effectively apply mathematical methods computer simulation technology as well also	- using during lectures listening and preparing to practical work and labs.	- without separate assessment ;



<p>methods optimization telecommunications and radio engineering telemedicine and biomedical systems and devices;</p> <ul style="list-style-type: none"> - demonstrate an understanding of the subject area and understanding of professional activity, apply knowledge in practice situations, evaluate and provide quality performed works; - be able to use and improve of the modern software, hardware of telecommunications and radio engineering devices and biomedical systems; - use informational and communication technologies for to search, processing and analysis of information from various sources; be capable of the abstract thinking, analysis and synthesis, work both autonomously and in the team; - be able to elaborate, to improve and use modern hardware and software telecommunications and radio equipment and systems of biomedical purpose. - develop projects, show initiative when developing projects, apply critical analysis, evaluating and synthesis of new and complex ideas, the adoption of effective decisions; - apply scientific facts, concepts, theories, principles and methodologies research that is derived from applying the principles of system approach to research processes occurring in systems biomedical purpose; - be able to solve complex professional tasks based on applying the latest technologies for the information receiving and processing; - be able to develop software and hardware for biomedical systems and of telemedicine. 	<ul style="list-style-type: none"> - theoretical knowledge received during lectures and consultations - independent and under supervising preparation and implementation practical work. - independent and under supervising preparation and implementation course work 	<ul style="list-style-type: none"> - evaluate by the report on laboratory works; - assessment during laboratory work and exam. - assessment by course work defence
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Themes	Contact work hours						Time and tasks for individual work	
	Lectures	Consultation	Seminars	Practical work	Laboratory work	Total contact work	Individual work	Tasks
Theme 1. Overview of the common methods for medical and biological diagnostic with using electronic equipment.	1	-	-	-	4	5	10	Study problem of design equipment for medical industry
Theme 2. Diagnostic of cardiovascular system of the human body	2	-	-	-	4	6	10	Study of systems for diagnosing cardiovascular systems.
Theme 3. Diagnostic and evaluation eyes and vision functionality.	2	-	-	-	4	6	10	Consideration possible ways for diagnosing of eyes and vision problems, equipment for this
Theme 4. Diagnostic and evaluation state of the musculoskeletal system.	2	-	-	-	4	6	10	Study of equipment and evaluation methods for state of musculoskeletal apparatus.
Theme 5. Complexes for ultrasound diagnostics. Radiography. Tomography.	4	-	-	-	6	10	9	Study the basics and equipment to obtain biomedical images.
Theme 6. Complexes for functional diagnostics.	2	-	-	-	4	6	13	Study the basics and equipment for conducting functional diagnostics.
Theme 7. Therapeutic electronic apparatus.	2	-	-	-	4	6	13	Study the basic properties and technical solutions for development therapeutic equipment
Total	15	-	-	-	30	45	85	



Assessment strategy	Weight in %	Deadlines	Assessment criteria
current assessment	49	during the semester	theoretical report on each topic
laboratory work defense	8,5		defense of laboratory work №1
	8,5		defense of laboratory work №2
	8,5		defense of laboratory work №3
	8,5		defense of laboratory work №4
	8,5		defense of laboratory work №5
passing the test	90-100	after the module	“perfect” credited
	75-89		“good” credited
	60-75		“satisfied” credited
	35-59		not credited with the possibility of re-taking
	1-34		not credited with mandatory re-study of the discipline

Author	Year of issue	Title	Information about the publication	Place of printing. Printing house or internet link
Compulsory literature				
Ilyasov L.V.	2007	Biomedical measuring technique	book	M.: Higher. school year, 2007. -342c.
Korenevsky N.A.	1999	Design electronic medical equipment for diagnostics and therapeutic effects	book	Kursk - St. Petersburg: 1999. - 327c.
Storchun E.V.	2009	Biophysical and mathematical basics for instrumental methods of medical diagnostics	educational manual	Lviv: Publishing House "Raster-7", 2009. - 216 p.
Additional literature				
Yanenko O.P., Chukhov V.V.	2001	Medical metrology and biological equipment	book	Zhytomyr: ZhSTU, 2015. - 286c.
Blinov N.N.	2002	Basics of X-ray diagnostic technology	book	M.: Medicine, 2002. - 392 p.



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