AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Biophysics								
Course Code	FZ103		Couse Level	Short Cycle (Associate's Degree)					
ECTS Credit	3	Workload	75 *(Hours)*	Theory	2	Practice	0	Laboratory	0
Objectives of the Course	To learn the clinical application of Electromagnetic waves, magnetic and electric fields; to understand sound wave and the application of ultrasound; and to learn membrane and action potential in the excitable cells.								
Course Content	Electromagnetic waves, characteristics, implementation and evaluation of clinical.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Discussion, Problem Solving								
Name of Lecturer(s)	Lec. Mahmut Alp KILIÇ								

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	70

Recommended or Required Reading	
1	Prof. Dr. Ferit PEHLİVAN, Biyofizik, Hacettepe, Taş yayın, Ankara, 2011.
2	Prof. Dr. Gürbüz ÇELEBİ, Biyomedikal Fizik, Barış yayınları, İzmir, 2008.
3	Prof. Dr. Şefif DURSUN, Biyofizik ders notları, İÜ Çapa TF yayınları, İstanbul, 2010.

Week	Weekly Detailed Course Contents	
1	Theoretical	General properties of electromagnetic waves and spectrum
2	Theoretical	Very low frequency electromagnetic waves (VLFEW) and electromagnetic field
3	Theoretical	Clinical application and principle of VLFEW, electric current and electromagnetic field
4	Theoretical	Radiofrequency (RF) and microwaves: properties and effects on biological systems
5	Theoretical	Principle clinical usage of RF and microwaves
6	Theoretical	Infrared lights: working principle, effects, usage in treatment
7	Theoretical	Visible lights and UV
8	Theoretical	Midterm Exam
9	Theoretical	Sound waves and general properties
10	Theoretical	Principle of clinical usage of sound waves in different frequencies and ultrasound
11	Theoretical	General properties of bioelectrical applications and working principle iontophoresis, TENS, galvanic current, short wave diathermia etc.
12	Theoretical	Bioelectrical impedance measurement and assessment of body component
13	Theoretical	Properties of Excitable Cells (nerves and muscles) : Membrane potentials
14	Theoretical	Action potentials and graded potentials
15	Theoretical	The working principle of electro-biophysical applications and clinical applications

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	1	2	42
Assignment	1	8	2	10
Individual Work	14	0	1	14
Midterm Examination	1	2	2	4
Final Examination	1	3	2	5
			Total Workload (Hours)	75
			[Total Workload (Hours) / 25*] = **ECTS**	3
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	To have knowledge of electromagnetic field
2	Has knowledge about the biophysical foundations of the events taking place at the level of molecules, cells, tissues, organs and systems in living world.
3	Electrical circuit elements and their properties; impedance concept; Medical application areas of impedance
4	Filters; frequency characteristics of filters
5	Functions of filters and their applications in medicine

Programme Outcomes *(Physiotherapy)*	
1	To be able to recall the information of research methods and statistics so as to follow the developments, monitor and interpret scientific literature
2	To have the appropriate knowledge of basic sciences at the level of interest, to use specific medical terms and terminology of physical therapy
3	To be able to recall knowledge of the general structure and proporties of musculoskeletal system and the joints and to evaluate the story of musculoskeletal diseases.
4	To be able to comprehend the methods of measurement of the range of motion of joints and to measure it.
5	To be able implement a general evaluation of posture analysis and gait analysis.
6	To be able to recall the knowledge about general characteristics of musculoskeletal diseases, osteoporosis, osteoarthritis, rheumatoid arthritis, ankylosing spondylitis, especially rheumatic diseases, mechanical low back and neck pain, disc herniation, soft tissue disorders and to apply appropriate physiotherapy.
7	To be able to recall the knowledge and gain skills about the devices and the agents of heater used in physical therapy, indications and contraindications of using, and the necessary information about how to apply on patients.
8	To be able to recall the knowledge of the electromagnetic field.
9	To be able to recall what Elektroakapunktur, Laser, Biofeedback, cervical and lumbar traction systems, pneumatic compression therapy are, and how to apply them, which one is applicable to patients.
10	To be able to recall what manipulation-mobilization is and which patients are suitable for this application.
11	To be able to recall what massage and hydrotherapy treatments are and which patients are suitable for these applications.
12	To be able to gain the professional and ethical awareness, apply gained knowledge and skills in reallife situations and transfer gained knowlegde to individuals around her/his environment, and improve behavior of life-long learning.
13	To gain knowledge about methods of diagnosis, protection and treatment of diseases
14	To be able to recall the knowledge and gain skills about physical therapy and rehabilitation methods to be applied to neurological disorders.
15	To be able to recall the knowledge and gain skills about physical therapy and rehabilitation methods to be applied to cardiopulmonary disorders.
16	To be able to recall the knowledge and gain skills about physical therapy and rehabilitation methods to be applied to pediatric patients.
17	To be able to gain knowledge about the effects of fitness and exercise on metabolism and responses of body systems to them.
18	To have knowledge about rehabilitation services
19	To become individuals who can do interdisciplinary team work, with a sense of social responsibility and entrepreneur.
20	To be able to recall the knowledge about Ataturk's Principles and the History of Turkish Revolution.
21	To be able to gain the knowledge and ability to become contemporary individuals who can use Turkish language grammar well and know a foreign language knowledge necessasary to follow the developments in the profession.

Contribution of Learning Outcomes to Programme Outcomes *1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High*

	L1	L2	L3	L4	L5
P8	5	5	5	5	5