Module (Course Syllabus) Catalogue 2022-2023

College/ Institute	**Erbil Technical Health**	
Department	**Physiotherapy**	
Module Name	**Physics of the human body**	
Module Code	BIP206	
Semester	**2nd**	
Credits	**ECTS**	**3**
Module type	**Prerequisite** ☐ **Core** ☐	**Assist.** ☐
Weekly hours	2	
Weekly hours (Theory)	**(2)hrs Class**	**( )hr Workload**
Weekly hours (Practical)	**(0)hrs Class**	**(0)hr Workload**
Lecturer (Theory)	**Dr. Karim** **Miss. Nawroz Ismael**	
E-Mail & Mobile NO.		
Lecturer (Practical)		
E-Mail & Mobile NO.		

Course Description	This course provides an introduction to human anatomy and body systems. The laws of physics explain several bodily functions, including the mechanics of muscles and body movements, fluid mechanics of blood and air flow, hearing and acoustic properties of the ears, vision optics, heat and energy, acoustics, and electrical signaling. The effects of various environmental phenomena on the body are explored and include discussions on the body's behavior in a low-gravity environment (e.g. in space).

Course objectives	• apply conservation of energy arguments to solving some biomechanical problems. • Can explain how the relationship between someone's centre of gravity and base of support can be used to understand their stability. • Describe some aspects of control engineering applied to the human body. • Predict how heat is generated and lost by the human body in different circumstances. • Explain how the body responds to hot and cold conditions. • Choose appropriate methods of measuring physiological temperatures. • Describe the physical operation of sensory systems. • Identify common problems in nerve system and how these are mitigated. • Explain how pressure, volume and flow relate to each other in the human body. • Describe the electricity of the brain and heart.
Student's obligation	• Students should attend the lectures • Students should take all exams, including daily quizzes and practical exam
Required Learning Materials	• Theory: lecture halls with computer equipment for lecture presentations, whiteboard.

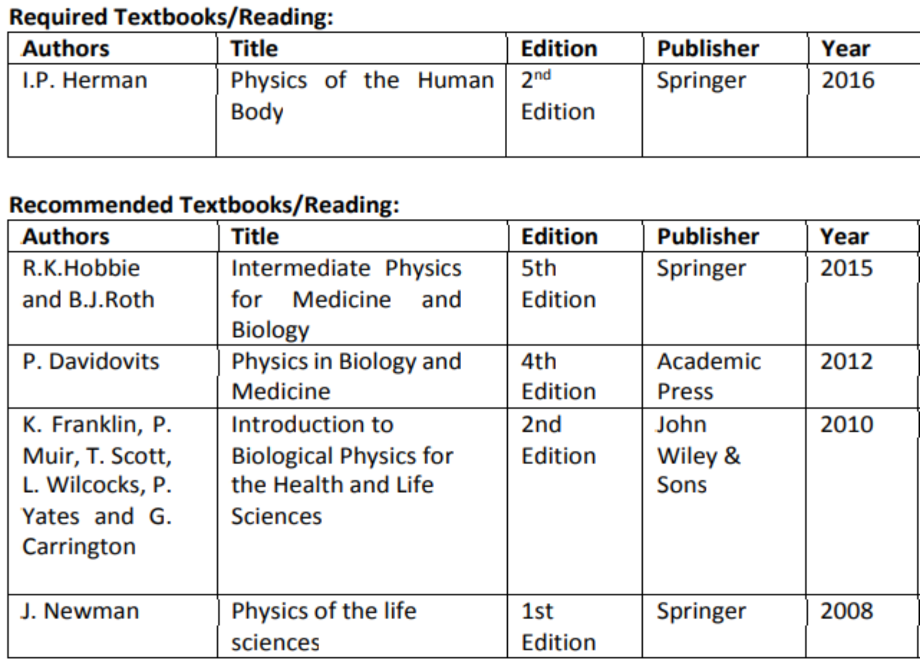
Assessment scheme

Specific learning outcome:

At the end of the course, the students should be able to:

- To give students an introduction to the physics of the human body.
- describe the musculoskeletal and cardiovascular systems of the human body
- apply the principles of physics to explain the biomechanics of the body
- analyses the electrical conduction system of the nerves, the brain and the heart
- explain how physics influences the functions of the visual and auditory system
- solve basic conceptual and numerical problems of the human body related to energy, work, acceleration, forces, electricity, magnetism, sound, optics and modern physics
- describe the effects of space flight and microgravity on the human body

Course References:



Required Textbooks/Reading:

Authors	Title	Edition	Publisher	Year
I.P. Herman	Physics of the Human Body	2^{nd} Edition	Springer	2016

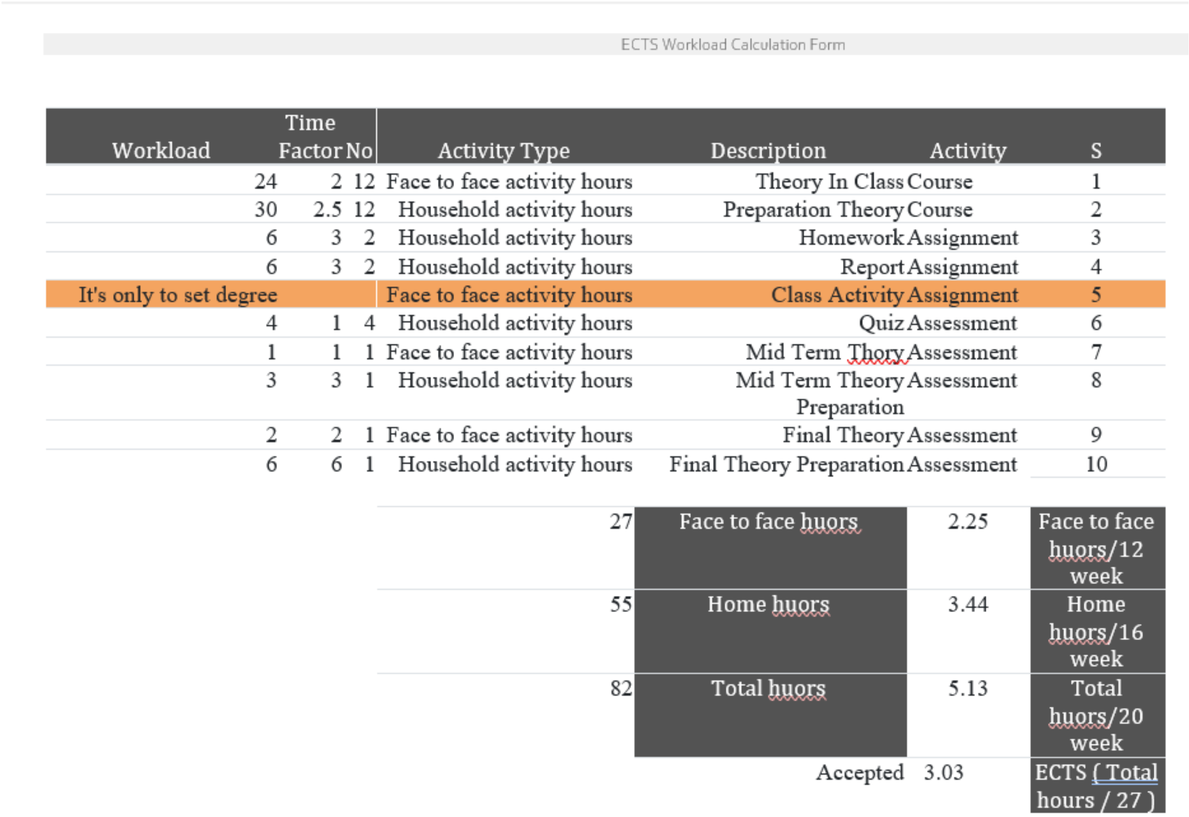
Recommended Textbooks/Reading:

Authors	Title	Edition	Publisher	Year
R.K.Hobbie and B.J.Roth	Intermediate Physics for Medicine and Biology	5th Edition	Springer	2015
P. Davidovits	Physics in Biology and Medicine	4th Edition	Academic Press	2012
K. Franklin, P. Muir, T. Scott, L. Wilcocks, P. Yates and G. Carrington	Introduction to Biological Physics for the Health and Life Sciences	2nd Edition	John Wiley & Sons	2010
J. Newman	Physics of the life sciences	1st Edition	Springer	2008

Course topics (Theory)	**Week**	**Learning Outcome**

Week	**Outline**	**No. of Hours**
		Theory
1.	Terminology, modelling, and measurement	**2**
2	Energy, heat, Body temperature. And Loss of body heat.	**2**
3	Conservation of energy and heat flow. Regulation of temperature and control of blood pressure.	**2**
4	work, and power of the body	**2**
5	Muscle, forces and Physics of the skeleton	**2**
6	Basic physics of pressure and flow of fluids. Characteristic pressures in the body	
7	Physics of the lungs and breathing	**2**
8	Physics of the cardiovascular system	**2**
9	Electrical signals from the body. Electrical properties and signals of the heart and the brain	**2**
10	Nerve conduction.	**2**
11	Human body in space and microgravity	**2**
12	Physics of the circulation system.	**2**
13	Modelling the circulatory system and the heart.	**2**
14	The physics of sound waves. Sound and speech, Speech production.	**2** **2**
15	Hearing and other vibrations in the body. .	**2**

ECTS Workload Form



ECTS Workload Calculation Form

Workload	Time Factor	No	Activity Type	Description	Activity	S
24	2	12	Face to face activity hours	Theory In Class	Course	1
30	2.5	12	Household activity hours	Preparation Theory	Course	2
6	3	2	Household activity hours	Homework	Assignment	3
6	3	2	Household activity hours	Report	Assignment	4
It's only to set degree			Face to face activity hours	Class Activity	Assignment	5
4	1	4	Household activity hours	Quiz	Assessment	6
1	1	1	Face to face activity hours	Mid Term Thory	Assessment	7
3	3	1	Household activity hours	Mid Term Theory Preparation	Assessment	8
2	2	1	Face to face activity hours	Final Theory	Assessment	9
6	6	1	Household activity hours	Final Theory Preparation	Assessment	10

27	Face to face huors	2.25	Face to face huors/12 week
55	Home huors	3.44	Home huors/16 week
82	Total huors	5.13	Total huors/20 week
	Accepted	3.03	ECTS (Total hours / 27)

Extra