

## 19267-142(8) Physics for Health Sciences (2L, 1T)

2021

### Course summary:

Structure of matter, kinematics, statics, dynamics, heat, temperature, wave motion and electricity.

### Language policy:

Afrikaans and English in the same class groups:

During each lecture, all information is conveyed at least in English. Summaries and/or explanation of the core concepts will also be given in Afrikaans. Questions in Afrikaans and English will, at the least be answered in the language of the question. Students will be supported in Afrikaans and English during a combination of appropriate facilitated learning opportunities.

### Module relevance in programme:

This module is a service module for physiotherapy and occupational therapy first year students. The course content exposes the students to concepts in statics (levers, equilibrium), dynamics (work-energy, momentum), waves (sound and light), charge, electrical current and magnetism. The module has a strong focus on conceptual understanding of these topics. An element of analytical problems solving is also introduced and strategies for problem solving are explored. It is hoped that the module will broaden the student perspective of science (Physics in particular), creating an awareness and appreciation of the subject matter which will lead to a rewarding experience for the students. Where possible, concepts are explained using examples from the medical fields. It is hoped that the understanding achieved, especially with regards to statics and analytical problem solving, will be applied by the students in their further years of study

### Outcomes of course:

Emphasis is placed on mastering the physics concepts and how to use them to solve problems, rather than memorising recipes or formulas. The student should become familiar with many principles in physics and learn their mathematical formulations. The student must be able to use these concepts to solve realistic problems and simultaneously develop the ability to work with physical quantities and their appropriate units.

### Lecturer:

**Dr PH Neethling**

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### Course content:

#### **Splinting and Mechanics**

Newton's Law, Static equilibrium, Vector analysis, Rotational inertia, Torque, Centre of gravity, Stability, Levers

#### **Mechanical energy, Work and Power**

Work and Power, Kinetic and potential energy, Elasticity, Conservation of energy

#### **Momentum**

Impulse and Momentum, Changes in Momentum, Conservation of Momentum, Collisions

## **Temperature and Heat**

Heat, Specific heat capacity, Conduction, Convection and Radiation, Change of phase

## **Waves and Radiation**

Properties of waves, Sound waves and ultrasound, Electromagnetic radiation, Effects of radiation on the body

## **Electro-stimulation**

Charges and Coulomb's Law, Charge and discharge, Electrical field strength, Electrical potential, Electrical currents and circuits, Resistance and Ohm's Law

## **Practical (Tutorials):**

Weekly tutorial questions will be provided. Students are encouraged to attempt these tutorial questions in order to better their understanding of the content. Online tutorial tests will serve as an opportunity for the students to gauge their level of understanding.

## **Study material:**

A free e-book is made available on SUNLearn. Only very specific sections from the textbook will be covered. These sections will be communicated clearly.

## **Learning opportunities:**

Weekly recorded lectures with interactive problem-solving. Regular tutorials and tutorial tests. Questions can be asked on the SUNLearn discussion forum or via e-mail (discussion forum preferred). Face-to-face question and answer sessions will be arranged and communicated.

## **Assessment:**

### ***Methods of Assessments***

Tutorial tests will contribute 40% to the class mark. One class test will be written and will contribute 60% to the class mark. The worst 2 marks for these tut tests will be discarded for each student.

### ***Time of assessment opportunities***

Class Test:

Date: 30 September

Time: To be confirmed

SUNLearn Online Quiz

Exam 1:

Date: 9 November

Time: 14:00

Format will depend on COVID protocols in place

Exam 2 (Supplementary):

Date: 1 December

Time: 09:00

Format will depend on COVID protocols in place

### ***Calculation of semester mark:***

Semester mark = 40% (Tutorial tests) + 60% (Class Test)

### ***Calculation of final mark for the module:***

Final mark = 40% (semester mark) + 60% (Exam 1)

**Admission to examination:** A class mark of 40% should be attained to qualify for the exam at the end of the year.