



# MEDICAL PHYSICS

Course Overview

Have you ever wondered how medical diagnostic equipment work? Why is an MRI preferred over an X-ray in the diagnosis of knee injuries? Why are pregnant women advised against having X-rays? Why does the heartbeat result in spikes on a monitor? These are some of the questions that are explored in the medical physics course.

The course begins with looking at the electromagnetic spectrum and the properties of waves. By observing how light behaves when reflected and refracted students will be able to apply their understanding to waves with higher and lower wavelengths than visible light. Students will then explore the diagnostic tools of MRI and X-ray and how they relate to the waves of the electromagnetic spectrum. Another wave type that is used extensively in medical imaging is ultrasound. Students will explore the properties of sound waves as they examine how the images of ultrasound are displayed on the sonographers screen.

Electrical conductivity pathways are important in the function of many body systems. This course will explore the heart muscle and the specific conductivity pathways that result in the powerful heartbeat that ensures the survival of each individual.

While exploring each diagnostic tool student will examine the human body through the investigation of the body systems - their functions, features and the problems that can occur. The muscular, skeletal and cardiovascular systems will be explored with more depth as they are linked to the diagnostic tools used.. This course is designed to link physics concepts used in the medical field along with human anatomy and physiology. Students interested in physics, biology, physical education, chemistry or would like to know more about the body should consider taking this course.

### **Learning Outcomes**

Over the course of the semester, students will have an opportunity to investigate and develop their knowledge of:

- Wave properties including the electromagnetic spectrum and sound-waves by relating to the applications of MRI, X-ray and ultrasound
- The human body through the different body systems including the key features, problems that can affect correct function and medical terminology. With more detail on the skeletal, muscular and cardiovascular systems.
- Electrical conductivity throughout the body with a specific look at the electrical conductivity pathway of the heart for the purpose of pumping body throughout the body

### **Homework**

Students will be required to complete on average 1 hour of homework per week, with a research project throughout the course.

### **Assessment**

For successful completion of this unit students will be required to submit three assessments. They will be delivered in a range of styles including online test submission, research task assignment and online quizzes. Students will also be assessed on regular attendance.