

# **Physics (Concept Led)**

## **(Exam Board: Edexcel)**

**Subject Leader:** Dr T Bruce

### **What do I need?**

You should have studied GCSE Combined Science or Physics and achieved a minimum grade 6 in Physics for Triple award or a minimum grade 6-6 for Combined science. GCSE Maths needed (at least grade 5).

### **What will I learn?**

At Notre Dame we follow the concept-led approach (led by theory, with context built in through-out). The first year is made up of five units

#### **Topic 1: Working as a Physicist**

This is not a discrete topic but is covered throughout the course. You will learn about quantities and their units and how to plan, carry out and evaluate experiments. You will also learn how to communicate your knowledge and understanding of physics to others

#### **Topic 2: Mechanics**

In this topic we will explore equations of motion, about vector quantities including forces and Newton' laws of motion. We will also cover concepts such as momentum and how to calculate energy and use this to predict motion.

#### **Topic 3: Electric circuits**

This topic consists of understanding and using quantities such as charge, current, voltage, resistance and power in a variety of circuits and components. We will explore what is happening in electric circuits at a particle level and use this knowledge to make calculations and predictions about circuits and components.

#### **Topic 4: Materials**

This topic includes a looking at drag forces in fluids and the practical applications and implications of these forces. We will go on to study material behaviour and properties including how materials respond to compression and tension

#### **Topic 5: Waves and Particles**

In this topic we will types of waves and the properties of waves. We will understand and explain applications such as lenses and polarising filters. We will go on to look at how the particle model of light was developed and how this understanding can be used in practical applications.

### **Year 2**

In the second year you study a further eight units: further mechanics, electric and magnetic fields, nuclear and particle physics, thermodynamics, space, nuclear radiation, gravitational fields and oscillations.

**Experimental Physics.** Students will carry out 16 required practicals, 8 in your first year and 8 in your A2 year. Whilst these do not form part of your final grade, these must be

completed to the required standard in order to complete the course and understanding will be assessed in Paper 3 at the end of the second year.

### How will I be assessed?

Unit	Method of assessment	Value	When it is assessed
Paper 1 Advanced I Topic 2 and 3 <b>plus</b> topics 6, 7 and 8 from year 2	Exam (1hour 45 mins)	180	May/ June 2019
Paper 2 Advanced II Topics 3 and 4 topics 9, 10, 11, 12 and 13 from year 2	Exam (1hour 30 mins)	180	May/June 2019
Paper 3 General and Practical Principles All topics	Exam (2 hours 30 mins)	240	May/June 2019
Total		600	

### Is there anything else I need to know?

- You are the same age as the Universe. The fundamental particles, which make up the atoms in your cells, were made in the Big Bang.
- The Galaxy is a hundred thousand light years across. The most energetic cosmic ray particle yet discovered seems to itself to take 30 seconds to cross it.
- 60 billion neutrinos pass straight through each square centimetre of your bodies each second.
- Moving ions change the electrical potential of your heart cell membranes by about 140mV and your heart beats.
- A-level in Physics will suit anyone with an interest in understanding the physical world that surrounds them.

### Other Information

Physics is usually taken with Mathematics and another Science such as Chemistry. Other possibilities include Music, Geography, ICT and Modern Foreign Languages.

Studying Physics helps to develop:

- Numerical skills
- Problem solving
- Analysis and interpretive skills
- Communication – written, visual and verbal
- Research skills
- Computing skills