

## **The Motion of Charged Particles in Electric and Magnetic Fields**

### **For: Year 12 Physics Students**

This program links with the 'Electricity and Magnetism' section of the SACE Stage 2 Physics curriculum. An important focus of the session is the production and interpretation of graphs from experimental data, an important skill in the Year 12 Physics curriculum.

Two experimental procedures, both of which demonstrate the effect of electric and magnetic fields on electrons, are conducted in this workshop. These involve the use of Teltron Tubes and Hall Effect apparatus.

### **What will Students do?**

This program can be undertaken as a single two-hour workshop or as a full-day visit, the latter including a campus tour and a physics presentation by University lecturers and/or post-graduate physics students.

During the workshop, students participate in two experimental procedures:

- examining the effect of electric and magnetic fields on electrons in a Teltron Tube, to calculate both the charge-to-mass ratio of electrons and the radius of an electron's path in a magnetic field;
- measuring and analysing the magnitude of the Hall Effect, a phenomenon in which a current flowing through a conductor in a magnetic field exerts a transverse force on the moving charge carriers, producing a measurable voltage between the sides of the conductor

In both procedures, students gather, record, graph and interpret data, using qualitative and quantitative methods. This enables students to further develop their ability to graph and interpret experimental data, a skill required in their end of year exam.

### **Timetable for the Full Day Program**

The Motion of Charged Particles in Electric and Magnetic Fields Workshop – 2 hours

Break – 20 mins

Campus Tour – 1 hour

Lunch – 35 mins

Physics Presentation, including Career and UniSA Course Information – 45 mins

Evaluation – 10 mins

Total – 5 hours

NB: Session details and timetable changes may occur without notice.

### **Conditions**

- As this program is a practical activity, students and accompanying adults will be required to wear closed in shoes and appropriate dress.
- Teachers will receive confirmation of booking and pre-visit information.