THE UNIVERSITY of ADELAIDE COLLEGE

Foundation Studies Program

Physics

Aims

Learning about and working in physics gives people an understanding of the processes that direct the universe and the world, so that they may appreciate and respect them. In this subject, students have the opportunity to engage with the work of classical and modern physicists and to join in and/or initiate debates about how physics affects their own lives, society, and the environment.

Students develop their knowledge of the principles and concepts of physics, and the ability to use that knowledge to formulate questions and hypotheses and identify opportunities and challenges. They also acquire new knowledge through their investigations. Students develop the skills and abilities to observe, record, and explain the phenomena of physics, and to draw evidence-based interpretations from investigations of issues related to physics. In this way, they develop literacy skills related to physics that help them to live and work as informed and reflective citizens in a world shaped by physics and technology.

Learning outcomes

After successfully completing this subject students should be able to:

- Apply knowledge and understanding of physics to a range of applications and problems
- Solve a variety of problems in physics
- Use the terminology and notation of physics correctly
- Communicate knowledge and understanding of the ideas, concepts and information of physics effectively, using appropriate physics terms and conventions
- Obtain, select, analyse, and evaluate the evidence of physics from a variety of different sources, and present informed conclusions or decisions on contemporary physics applications
- Undertake and report on practical activities
- Identify and formulate questions, hypotheses, concepts, and purposes that guide investigations in physics
- Conduct collaborative and individual investigations in physics, using appropriate apparatus and safe working practices and by observing, recording, and interpreting the phenomena of physics
- Represent, analyse, interpret, and evaluate investigations in physics through the use of technology and numeracy skills.

Prerequisites and assumed knowledge

It is assumed that students will have a completed Physics study to at least the South Australian Certificate of Education Stage 1 (Year 11) level.

It is also assumed that students have an understanding of basic trigonometry and algebra to at least a South Australian Year 11 Mathematical Studies level.

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Subject content

Week	Topic and assessment schedule
1 – 2	Physical basics, units and mathematical preliminaries
3 – 4	Motion in one dimension
5	Vectors
6 – 7	Forces – statics and application to motion
8	Energy, work and power
9	Momentum
10	Uniform circular motion
Break	
11	Gravitational fields
12	Electric fields
13 – 14	Electric potential and motion of charged particles in electric fields
15	Magnetic fields
16	Motion of charged particles in magnetic fields
17 – 18	Revision
19	Exam week
20	Exam review
Break	
21	Current electricity
22	Waves
23	Electromagnetic waves
24	Physical optics
25	Quantum optics
26 – 30	Wave properties of matter
Break	
31	Structure of the atom
32 – 33	Structure of the nucleus
34	Radioactivity
35	Nuclear energy
36	Revision. SWOTVAC
37 – 38	Exams
39	Graduation and transcript collection
40	End of course

Assessment

General weightings for each assessment item are outlined below

Assessment item	Weighting	Due dates
Practicals (x4)	10%	As per assessment schedule
Tests	40%	As per assessment schedule
Assignments	10%	As per assessment schedule
Midyear examination	20%	As per College examination timetable
Final examination	20%	As per College examination timetable

There is no specific text-book for this course. At the beginning of each term students are issued booklets with a set of notes and sets of questions covering the term's work.

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