

# course information

## Physics

UNILEARN Physics is a preparatory physics course offered by Learning Network Queensland. The course provides the learner with a range of topics equivalent to those covered in the last two years of physics at high school. The course concentrates on the concepts and models, which physics uses to enhance our understanding of the real world and the techniques for presenting and analysing the data from experimental observation.

The course has been designed for self paced study in the distance mode. Although there is a 12 month formal time limit for completion of the course, regular progress is advised so that previously learned concepts are not forgotten.

On successful completion of UNILEARN Physics, the learner will have acquired the prerequisite knowledge for the study of the physics content of undergraduate programs in the applied sciences, engineering or technology and similar courses which require physics at senior high school level. UNILEARN Physics is also suitable for many positions in industry, commerce and the Services.

## Aims

The main aim of this course is to assist the learner to obtain skills and competence in physics suitable for commencing studies in tertiary programs with a substantial component of physical science.

At the end of this course the learner should:

- demonstrate competence in using physical measurements and scientific notation
- demonstrate a sound knowledge of the basic laws of force and linear and wave motion
- demonstrate a sound knowledge of the theory of gases, energy and momentum
- demonstrate a sound knowledge of electric circuits, magnetism and the laws of optics
- demonstrate a sound knowledge of atomic and nuclear physics
- demonstrate confidence and competence in applying the basic laws of physics to problem solving situations
- have acquired a pre-requisite knowledge and confidence to undertake studies which require a higher level of competence in physical science
- be motivated to continue with lifelong learning where skills in physics are required.

## Structure

UNILEARN Physics consists of nine Modules each with an overview of the Topics covered in that Module.

A range of Activities is included for the learner to work through to develop experience in problem solving. Detailed solutions for all Activities are included in each Module.

Nine Assessment Exercises are included. The Assessment Exercises give the learner the opportunity to obtain feedback on progress. Also, students are required to successfully complete at least seven of the nine Assessment Exercises in order to, either, obtain a Certificate of Completion of the course, or be eligible to sit for the formally supervised examination.

# course information (continued)

Tutorial Support is available from the UNILEARN Physics Tutor. This support can be accessed by mail, telephone, fax or email to clarify understanding of concepts, details of solutions of activities, feedback on Assessment Exercises, general information on the physics required for undergraduate courses and other relevant queries.

The UNILEARN Physics Tutor can be contacted on mobile 0433 268 434, email [mrashleysmith@hotmail.com](mailto:mrashleysmith@hotmail.com). The address for written correspondence is:

Mr Ashley Smith  
PO Box 3100  
WARNER QLD 4500

## Pre-requisite knowledge

Normally, candidates for UNILEARN Physics should be competent in mathematics including algebraic manipulation, solutions of linear and quadratic equations, properties including (graphs) of linear quadratic trigonometrical and exponential functions and knowledge of the theory of logarithms is also desirable. Students who feel they will need to develop their mathematical skills are referred to UNILEARN Introductory Mathematics or Senior Mathematics. Senior Mathematics is the preferred math level needed to be successful in the physics course.

On enrolment students receive a study guide comprising the nine Modules and a user-friendly Physics textbook. When the course package is received the student is encouraged to make contact with the UNILEARN Physics Tutor. The content of each Topic is studied with the Activities providing learning experiences. The relevant Assessment Exercises should be completed and forwarded to the Physics Tutor for assessment and feedback.

## Hours of Study

In general the course should be completed in 180-220 hours of study. The actual time required by an individual student to receive a successful result, however, will depend on the background, time available and needs of the learner. Students are encouraged to make contact with the UNILEARN Physics Tutor as soon as they receive their course package.

## Assessment

The Activities and Assessment Exercises are preparation for the final assessment of UNILEARN Physics.

For candidates who require a tertiary entrance prerequisite, a formal examination is available. The formal, supervised examination covers the content of the nine modules. If a candidate successfully completes the course, they are awarded a Certificate of Achievement, which lists the percentage mark gained and a grade of Pass, Credit, Distinction or High Distinction. A candidate who obtains an unsatisfactory percentage in the examination has an opportunity to re-sit for the examination after satisfactorily completed additional studies. At this time examinations can be arranged when the student is ready to undertake the examinations. The examinations are prepared and assessed by the UNILEARN Physics Tutor and monitored by the UNILEARN Examinations Committee. It is advised to complete the specimen examination in your learning materials prior to sitting for the final exam.

# course information (continued)

Examinations are supervised where possible by staff of Learning Network Queensland (LNQ) at LNQ Learning Centres at many locations across Queensland. For candidates who cannot attend a LNQ Learning Centre, supervisors and venues can be nominated for approval by the Manager of Academic Services. The conditions relating to the conduct of examinations are similar to those for university distance mode students.

Full details of the procedure for applying for the examination and the appointment of a supervisor are available in your course materials or at [www.unilearn.net.au](http://www.unilearn.net.au)

## Content

New Century Senior Physics: Concepts in context, second edition.

### Unit 1 Physical quantities & measurement

- Ch 1 Measurement and quantities

### Unit 2 Forces and motion

- Ch 2 Motion in a straight line
- Ch 3 Vectors and Graphing
- Ch 4 Forces in action
- Ch 5 Projectile, circular and periodic motion
- Ch 6 Astrophysics
- Ch 7 Hydrostatics: the physics of fluids

### Unit 3 Energy and momentum.

- Ch 8 Momentum
- Ch 9 Work and Energy

### Unit 4 Thermal physics

- Ch 10 Heat and temperature
- Ch 11 Heat and matter
- Ch 12 Heat transfer

### Unit 5 Wave motion

- Ch 13 Wave motion in one dimension.
- Ch 14 Wave motion in two dimensions.
- Ch 15 Light - a wave.
- Ch 16 Sound, music and audio technology.

### Unit 6 Optics

- Ch 17 Reflection of light
- Ch 18 Refraction
- Ch 19 Lenses
- Ch 20 Optical instruments

# course information (continued)

**Unit 7 Electricity**

- Ch 21 Electrostatics
- Ch 22 Electric circuits
- Ch 23 Electronics
- Ch 24 Electronic systems

**Unit 8 Magnetism & electromagnetism**

- Ch 25 Magnetism and electromagnetism
- Ch 26 Electromagnetic induction

**Unit 9 Atomic and nuclear physics**

- Ch 27 Atomic structure
- Ch 28 Nuclear physics
- Ch 29 Quantum physics and fundamental particles

**Unit 10 Extension topics**

- Ch 30 Special and General Relativity
- Ch 31 Designing practical electronic circuits
- Ch 32 Solar physics
- Ch 34 Medical physics