

# SCI107 Physics

School: School of Science, Technology and Engineering

2024 Semester 1

UniSC Sunshine Coast  
UniSC Moreton Bay

**BLENDED  
LEARNING**

Most of your course is on campus but you may be able to do some components of this course online.

*Please go to [usc.edu.au](http://usc.edu.au) for up to date information on the teaching sessions and campuses where this course is usually offered.*

## 1. What is this course about?

### 1.1. Description

In this course you will learn fundamental principles in physics, including measurement, kinematics in one and two dimensions, projectile motion, forces and Newton's Laws of Motion, work and energy, momentum, uniform circular motion, rotational kinematics and dynamics, gravity, electrical charge and fields. The topics selected are essential for advanced-level studies in physics and engineering. Your understanding of the theory will be reinforced through hands-on practical exercises designed to demonstrate the physical concepts and scaffold your learning.

### 1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
<b>BLENDED LEARNING</b>			
<b>Learning materials</b> – Videos on key theories and demonstrating solutions to example problems.	2hrs	Week 1	13 times
<b>Tutorial/Workshop 1</b> – Demonstration of key concepts and problem solving	2hrs	Week 1	13 times
<b>Laboratory 1</b> – Working in groups to conduct experiments and prepare reports	3hrs	Week 3	4 times

### 1.3. Course Topics

- Measurement and Uncertainty
- Kinematics
- Dynamics
- Forces
- Work, Energy and Power
- Impulse and Momentum
- Rotational Motion
- Gravity
- Electric Charge and Fields

## 2. What level is this course?

100 Level (Introductory)

Engaging with discipline knowledge and skills at foundational level, broad application of knowledge and skills in familiar contexts and with support. Limited or no prerequisites. Normally, associated with the first full-time study year of an undergraduate program.

## 3. What is the unit value of this course?

12 units

## 4. How does this course contribute to my learning?

COURSE LEARNING OUTCOMES	GRADUATE QUALITIES MAPPING	PROFESSIONAL STANDARD MAPPING *
On successful completion of this course, you should be able to...	Completing these tasks successfully will contribute to you becoming...	Engineers Australia Stage 1 Professional Engineer Competency Standards
<b>1</b> Communicate physics concepts and techniques using written English and mathematical notations	Knowledgeable Empowered	1.1, 3.2
<b>2</b> Solve problems in physics using modelled approaches and strategies informed by relevant physics theory	Knowledgeable Creative and critical thinker Empowered Engaged	1.2, 2.1
<b>3</b> Work in a team to collect, analyse, evaluate and report on data from practical physics experiments	Knowledgeable Creative and critical thinker Ethical Engaged	1.2, 3.2, 3.6

\* Competencies by Professional Body

CODE	COMPETENCY
ENGINEERS AUSTRALIA STAGE 1 PROFESSIONAL ENGINEER COMPETENCY STANDARDS	
1.1	Knowledge and Skill Base: Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.
1.2	Knowledge and Skill Base: Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.
2.1	Engineering Application Ability: Application of established engineering methods to complex engineering problem solving.
3.2	Professional and Personal Attributes: Effective oral and written communication in professional and lay domains.
3.6	Professional and Personal Attributes: Effective team membership and team leadership.

## 5. Am I eligible to enrol in this course?

Refer to the [UniSC Glossary of terms](#) for definitions of “pre-requisites, co-requisites and anti-requisites”.

### 5.1. Pre-requisites

Not applicable

### 5.2. Co-requisites

Not applicable

### 5.3. Anti-requisites

SCI108 or SCI507

### 5.4. Specific assumed prior knowledge and skills (where applicable)

Not applicable

## 6. How am I going to be assessed?

### 6.1. Grading Scale

Standard Grading (GRD)

High Distinction (HD), Distinction (DN), Credit (CR), Pass (PS), Fail (FL).

### 6.2. Details of early feedback on progress

Students will receive feedback on their learning progress through weekly non-assessable tutorial exercises. Tutors will be available in tutorial classes to provide individual feedback, guidance and learning support.

### 6.3. Assessment tasks

DELIVERY MODE	TASK NO.	ASSESSMENT PRODUCT	INDIVIDUAL OR GROUP	WEIGHTING %	WHAT IS THE DURATION / LENGTH?	WHEN SHOULD I SUBMIT?	WHERE SHOULD I SUBMIT IT?
All	1	Artefact - Technical and Scientific	Individual	30%	as required	Refer to Format	Online Submission
All	2	Report	Individual or Group	20%	4 x 3 hours	Refer to Format	In Class
All	3	Examination - Centrally Scheduled	Individual	50%	3 hours	Exam Period	Online Submission

#### All - Assessment Task 1: Tutorial Assignments

<b>GOAL:</b>	To provide on-going feedback on your understanding of fundamental physics concepts and their application to practice solving problems using appropriate diagrams, written communication and mathematical working to present your solutions.		
<b>PRODUCT:</b>	Artefact - Technical and Scientific		
<b>FORMAT:</b>	Three tutorials assignments each containing a set of problems will be posted on Canvas at least 2 weeks prior to the submission date. You will be required to write fully-worked solutions, including diagrams, and submit the work in weeks 4, 8 and 13.		
<b>CRITERIA:</b>	<b>No.</b>		<b>Learning Outcome assessed</b>
	1	recall and communicate theoretical and practical components of the course covered in learning materials, tutorials and laboratory classes	1
	2	apply relevant theory and modelled approaches to solve practical problems	2
	3	communicate and present solutions using suitable diagrams and correct working with appropriate mathematical notation	1

#### All - Assessment Task 2: Written Assignment

<b>GOAL:</b>	To support learning of the theoretical concepts and develop skills in the application of laboratory experimentation to measure, analyse, interpret and report on the results from experiments
<b>PRODUCT:</b>	Report
<b>FORMAT:</b>	Four hardcopy (paper) submissions to laboratory tutors at the completion of laboratory practical classes in weeks 3, 6, 9, & 12).

CRITERIA:	No.	Learning Outcome assessed
	1	Gather and analyse data accurately and write a short summary describing the outcome(s) of the experiment, analyse the findings relevant to theory and provide conclusions that may be drawn from the results <b>2</b>
	2	Present your work in a clear and professional manner (layout, language, spelling, general presentation) <b>1</b>
	3	Work collaboratively in a team. <b>3</b>

### All - Assessment Task 3: End of Semester Exam

<b>GOAL:</b>	To demonstrate your knowledge and understanding of concepts in physics and solve problems using appropriate techniques and relevant theory.	
<b>PRODUCT:</b>	Examination - Centrally Scheduled	
<b>FORMAT:</b>	Individual. Multiple choice and short answer mixed practical and theoretical written questions.	
CRITERIA:	No.	Learning Outcome assessed
	1	recall and communicate the theoretical and practical components of the course materials covered in learning materials, tutorials and practical exercises from weeks 1-13 <b>1</b>
	2	apply the relevant theory to solve problems <b>2</b>
	3	communicate solutions using appropriate diagrams, working and mathematical notation <b>1</b>

## 7. Directed study hours

A 12-unit course will have total of 150 learning hours which will include directed study hours (including online if required), self-directed learning and completion of assessable tasks. Student workload is calculated at 12.5 learning hours per one unit.

## 8. What resources do I need to undertake this course?

Please note: Course information, including specific information of recommended readings, learning activities, resources, weekly readings, etc. are available on the course Canvas site– Please log in as soon as possible.

### 8.1. Prescribed text(s) or course reader

Please note that you need to have regular access to the resource(s) listed below. Resources may be required or recommended.

REQUIRED?	AUTHOR	YEAR	TITLE	EDITION	PUBLISHER
Recommended	Serway, Raymond A; Jewett, John W.; Wilson, Kate; Wilson, Anna; Rowlands, Wayne	2017	Physics For Global Scientists and Engineers, Volume 1	2nd Edition	Cengage Learning Australia Pty. Ltd

### 8.2. Specific requirements

Scientific calculator, or a more advanced calculator if you prefer. You may also bring portable computers to the practical sessions. For students based at Sippy Downs, you must wear a lab coat, safety glasses and appropriate closed footwear in the laboratory classes conducted in the Science teaching Lab. For students based at Moreton Bay, you are required to wear appropriate closed footwear.

## 9. How are risks managed in this course?

Risk assessments have been performed for all laboratory classes and a moderate level of health and safety risk exists. Moderate risks are those associated with laboratory work such as working with chemicals and hazardous substances. You will be required to undertake laboratory induction training and it is also your responsibility to review course material, search online, discuss with lecturers and peers and understand the health and safety risks associated with your specific course of study and to familiarise yourself with the University's general health and safety principles by reviewing the [online induction training for students](#), and following the instructions of the University staff

## 10. What administrative information is relevant to this course?

### 10.1. Assessment: Academic Integrity

Academic integrity is the ethical standard of university participation. It ensures that students graduate as a result of proving they are competent in their discipline. This is integral in maintaining the value of academic qualifications. Each industry has expectations and standards of the skills and knowledge within that discipline and these are reflected in assessment.

Academic integrity means that you do not engage in any activity that is considered to be academic fraud; including plagiarism, collusion or outsourcing any part of any assessment item to any other person. You are expected to be honest and ethical by completing all work yourself and indicating in your work which ideas and information were developed by you and which were taken from others. You cannot provide your assessment work to others. You are also expected to provide evidence of wide and critical reading, usually by using appropriate academic references.

In order to minimise incidents of academic fraud, this course may require that some of its assessment tasks, when submitted to Canvas, are electronically checked through Turnitin. This software allows for text comparisons to be made between your submitted assessment item and all other work to which Turnitin has access.

### 10.2. Assessment: Additional Requirements

#### Eligibility for Supplementary Assessment

Your eligibility for supplementary assessment in a course is dependent of the following conditions applying:

The final mark is in the percentage range 47% to 49.4%

The course is graded using the Standard Grading scale

You have not failed an assessment task in the course due to academic misconduct

### 10.3. Assessment: Submission penalties

Late submission of assessment tasks may be penalised at the following maximum rate:

- 5% (of the assessment task's identified value) per day for the first two days from the date identified as the due date for the assessment task.

- 10% (of the assessment task's identified value) for the third day - 20% (of the assessment task's identified value) for the fourth day and subsequent days up to and including seven days from the date identified as the due date for the assessment task.

- A result of zero is awarded for an assessment task submitted after seven days from the date identified as the due date for the assessment task. Weekdays and weekends are included in the calculation of days late. To request an extension you must contact your course coordinator to negotiate an outcome.

### 10.4. SafeUniSC

UniSC is committed to a culture of respect and providing a safe and supportive environment for all members of our community. For immediate assistance on campus contact SafeUniSC by phone: [07 5430 1168](tel:0754301168) or using the [SafeZone](#) app. For general enquires contact the SafeUniSC team by phone [07 5456 3864](tel:0754563864) or email [safe@usc.edu.au](mailto:safe@usc.edu.au).

The SafeUniSC Specialist Service is a Student Wellbeing service that provides free and confidential support to students who may have experienced or observed behaviour that could cause fear, offence or trauma. To contact the service call [07 5430 1226](tel:0754301226) or email [studentwellbeing@usc.edu.au](mailto:studentwellbeing@usc.edu.au).

### 10.5. Study help

For help with course-specific advice, for example what information to include in your assessment, you should first contact your tutor, then your course coordinator, if needed.

If you require additional assistance, the Learning Advisers are trained professionals who are ready to help you develop a wide range of academic skills. Visit the [Learning Advisers](#) web page for more information, or contact Student Central for further assistance: +61 7 5430 2890 or [studentcentral@usc.edu.au](mailto:studentcentral@usc.edu.au).

### 10.6. Wellbeing Services

Student Wellbeing provide free and confidential counselling on a wide range of personal, academic, social and psychological matters, to foster positive mental health and wellbeing for your academic success.

To book a confidential appointment go to [Student Hub](#), email [studentwellbeing@usc.edu.au](mailto:studentwellbeing@usc.edu.au) or call 07 5430 1226.

### 10.7. AccessAbility Services

Ability Advisers ensure equal access to all aspects of university life. If your studies are affected by a disability, learning disorder mental health issue, injury or illness, or you are a primary carer for someone with a disability or who is considered frail and aged, [AccessAbility Services](#) can provide access to appropriate reasonable adjustments and practical advice about the support and facilities available to you throughout the University.

To book a confidential appointment go to [Student Hub](#), email [AccessAbility@usc.edu.au](mailto:AccessAbility@usc.edu.au) or call 07 5430 2890.

## 10.8. Links to relevant University policy and procedures

For more information on Academic Learning & Teaching categories including:

- Assessment: Courses and Coursework Programs
- Review of Assessment and Final Grades
- Supplementary Assessment
- Central Examinations
- Deferred Examinations
- Student Conduct
- Students with a Disability

For more information, visit <https://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching>

## 10.9. Student Charter

UniSC is committed to excellence in teaching, research and engagement in an environment that is inclusive, inspiring, safe and respectful. The [Student Charter](#) sets out what students can expect from the University, and what in turn is expected of students, to achieve these outcomes.

## 10.10. General Enquiries

### In person:

- **UniSC Sunshine Coast** - Student Central, Ground Floor, Building C, 90 Sippy Downs Drive, Sippy Downs
- **UniSC Moreton Bay** - Service Centre, Ground Floor, Foundation Building, Gympie Road, Petrie
- **UniSC SouthBank** - Student Central, Building A4 (SW1), 52 Merivale Street, South Brisbane
- **UniSC Gympie** - Student Central, 71 Cartwright Road, Gympie
- **UniSC Fraser Coast** - Student Central, Student Central, Building A, 161 Old Maryborough Rd, Hervey Bay
- **UniSC Caboolture** - Student Central, Level 1 Building J, Cnr Manley and Tallon Street, Caboolture

**Tel:** +61 7 5430 2890

**Email:** [studentcentral@usc.edu.au](mailto:studentcentral@usc.edu.au)