## COURSE DETAILS

**Course Code:** B29DR  
**Full Course Title:** Dynamics and Relativity  
**SCQF Level:** 9  
**SCAF Credits:** 15  
**Available as Elective:** No

## DELIVERY LEVEL

<table>
<thead>
<tr>
<th>Undergraduate:</th>
<th>Yes</th>
<th>Postgraduate Taught:</th>
<th>No</th>
<th>Postgraduate Research:</th>
<th>No</th>
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## COURSE AIMS

To introduce the basic concepts of advanced classical mechanics.

To establish the transition from classical observables to operators in quantum mechanics.

To provide an understanding of optics and simple optical systems.

## LEARNING OUTCOMES – SUBJECT MASTERY

Understanding classical dynamics and its application to a wide range of phenomena.

Achieve a critical knowledge and understanding of relativity

Apply the theory of the course topics to problems or situations not previously encountered

## LEARNING OUTCOMES – PERSONAL ABILITIES

Personal abilities are embedded in the module. The module provides the opportunity to:

- Apply the advanced core knowledge expected of a professional physicist to gain professional level insights,
- Communicate effectively with professional level colleagues
- Interpret, use and evaluate critically a wide range of data to solve problems of both a familiar and unfamiliar nature
- Manage time effectively, work to deadlines and prioritise workloads
- Use a range of ICT skills with on-line materials and web links to support the learning process
- Apply strategies for appropriate selection of relevant information from a wide source and large body of knowledge
- Exercise significant initiative and independence in carrying out learning activities and
SYLLABUS

Dynamics

Simple harmonic motion (revision).

Damped and forced harmonic oscillators.

Periodic motion under a central force.

Small oscillations and normal modes in molecules.

Rotational dynamics

Special relativity

The Michelson-Morley experiment

Concept of inertial reference frames; Galilean and relativistic transformations between frames

Time dilation; Length contraction;

Relativistic Doppler effect

Relativistic particle dynamics.

COURSE RELATIONSHIPS

N/A

LOCATION AND ASSESSMENT METHODS

<table>
<thead>
<tr>
<th>Edi</th>
<th>SBC</th>
<th>Ork</th>
<th>Dub</th>
<th>Malay</th>
<th>IDL</th>
<th>COLL</th>
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<th>Exam</th>
<th>Type</th>
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<th>Synoptic</th>
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| Y | Examination | 70 | 180 | Assessment | Semester 1 |
| Y | Coursework  | 30 |      | Assessment  | Semester 1 |
| Y | Examination | 100| 180 | Reassessment| Semester 3 |