B29DR Dynamics and Relativity

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

DELIVERY LEVEL
Undergraduate: Yes  Postgraduate Taught: No  Postgraduate Research: No

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.
## B29DR Dynamics and Relativity

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<th>180</th>
<th>Assessment</th>
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