PHY5502: FRONTIERS IN PHYSICS

Effective Term
Semester A 2025/26

Part I Course Overview

Course Title
Frontiers in Physics

Subject Code
PHY - Physics
Course Number
5502

Academic Unit
Physics (PHY)

College/School
College of Science (SI)

Course Duration
One Semester

Credit Units
3

Level
P5, P6 - Postgraduate Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract

This course is to bring the recent advances of physics research to students. It will cover several research themes, such as Atomic, Molecular, and Optical Physics; Quantum materials; Soft Matter and Biophysics; Spectroscopy and Imaging; Theoretical and Computational Physics. Each lecture will cover a different topic.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	To be familiar with frontiers in physics			x	
2	To be able to write a literature review of a research area			x	

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	1	Lectures to cover the recent advances of several research areas	1, 2	14 hours

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Write a literature review	1, 2	100	Pick a research topic, read relevant literature and write a short review article	No

Continuous Assessment (%)

100

Minimum Continuous Assessment Passing Requirement (%)

30

Additional Information for ATs

For a student to pass the course, at least 30% of the maximum mark for the Continuous Assessment must be obtained.

Assessment Rubrics (AR)

Assessment Task

1. (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Writing of a review article that clearly describe (i) the motivation of a research area; (ii) specific research problems of this research area; (iii) contributions made by the researchers in this research area; (iv) future directions of this research area.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Reaching marginal level

Failure

(F) Not reaching marginal level

Assessment Task

1. (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Writing of a review article that clearly describe (i) the motivation of a research area; (ii) specific research problems of this research area; (iii) contributions made by the researchers in this research area; (iv) future directions of this research area.

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Moderate

Failure

(F) Not reaching marginal levels

Part III Other Information

Keyword Syllabus

Recent advances in various research areas of physics

Reading List

Compulsory Readings

	Title
1	Nil

Additional Readings

	Title
1	Articles in the journal “Reviews of Modern Physics”