

PHY4219: INDEPENDENT RESEARCH II

Effective Term

Semester A 2022/23

Part I Course Overview

Course Title

Independent Research II

Subject Code

PHY - Physics

Course Number

4219

Academic Unit

Physics (PHY)

College/School

College of Science (SI)

Course Duration

One Semester

Credit Units

6

Level

B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Students in the GREE programme
PHY4218 Independent Research I
Additional pre-requisites may be specified by the research supervisor

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

This course presents the student with an opportunity to conduct an in-depth investigation on an area of their own choice. The student should have some research experience gained from PHY4218 Independent Research I. This course will be taken with PHY4218 Independent Research I for fulfilling the requirement of GREE stream. The student should discuss with the supervisor the work plans for this course and PHY4218 Independent Research I. The course aims to strengthen the student's ability to integrate and apply knowledge, and develop a scientific approach to solve real-world problems in physics and related areas.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if DEC-A1 DEC-A2 DEC-A3 app.)			
1	Integrate knowledge gained through previous courses and research experience to design a component or a system, or to conduct an investigation related to physics and related areas			x	x
2	Conduct experiments or theoretical studies, analyze and interpret data, demonstrate organizing and planning skill, communicate the project details professionally		x	x	x
3	Demonstrate independence, develop a scientific approach to solve research problems		x	x	x
4	Demonstrate initiative, innovative abilities, and critical thinking		x	x	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.

Teaching and Learning Activities (TLAs)

TLAs		Brief Description	CILO No.	Hours/week (if applicable)
1	Meeting with supervisor	Provide guidance and orientation	1, 2, 3, 4	1.5 hours/week
2	Laboratory/theoretical work	Practice advanced experimental/theoretical skills, interpret data sets and demonstrate organization and planning skills	1, 2, 3, 4	5 hours/week

3	Independent studies	Practice the ability to engage in long term self-directed learning, demonstrate and communicate the results of critical thinking, and teamwork.	1, 2, 3, 4	4 hours/week
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Assessment Tasks / Activities (ATs)

ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Project proposal/plan	1, 2, 3, 4	20
2	Project report	1, 2, 3, 4	60
3	Oral presentation	2	20

Continuous Assessment (%)

100

Examination (%)

0

Additional Information for ATs

The student's performance is assessed by a project committee consists of no less than three academic staff members.

Assessment Rubrics (AR)**Assessment Task**

Project proposal

Criterion

Ability to identify open questions in the area of study. Ability to formulate the problem and outline a workable approach to investigate the problem.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

Project report

Criterion

Ability to explain key findings, theories, and concepts related to the subject of study

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

Oral presentation

Criterion

Ability to communicate effectively and concisely the main findings, results, pending issues and/or open questions involved in the subject of the project report. Ability to answer questions.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

Varies according to the topic selected for the project

Reading List

Compulsory Readings

Title	
1	Varies as per recommendation of project supervisor

Additional Readings

	Title
1	Varies as per recommendation of project supervisor