PHY4218: INDEPENDENT RESEARCH I

Effective Term
Semester A 2022/23

Part I Course Overview

Course Title
Independent Research I

Subject Code
PHY - Physics
Course Number
4218

Academic Unit
Physics (PHY)

College/School
College of Science (SI)

Course Duration
Non-standard Duration

Other Course Duration
One/Two 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
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 aims to provide students with an opportunity to conduct an in-depth investigation on an area of their own choice, in a way that encourages application and integration of the knowledge gained through the major taught courses. At the same time, it equips students with basic skills and proper attitudes to conduct research or to undertake summer/ overseas internship in his/her study. Furthermore, it enables students to build self-confidence, demonstrate independence, and develop a professional approach to solve research problems.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Integrate knowledge gained through previous courses 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

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Progress report	1, 4	10	
2	Project report	1, 2, 3, 4	60	
3	Oral presentation	2	30	

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

Progress report

Criterion

Capacity for self-directed learning and ability to explain key 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

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