

## Directed research in interdisciplinary program for energy materials(Capstone Design)

Course Name	Course type (credit/hours)	Elective course(2/4)			Course code	G072
	Target students Division/major/grade	Physics/Senior			Opening semester	2021 2ND SEMESTER
	Class time and classroom	Mon 8.5(Seong337) Mon 9.5(Seong337) Mon 10.5(Seong337) Mon 11.5(Seong337)			English Grade	A(100%English)
Reference to this course	Prerequisite courses					
	Related basic courses					
	Recommended concurrent courses					
	Related advanced courses					
Instructor	Name (title/division)	Hyungwoo Lee(Assistant Professor, Energy Systems Research)				
	Office Room Number	원천관 416호	Office phone Number	2581	e-mail	
	Office hours		Homepage address	<a href="https://sites.google.com/view/copl/">https://sites.google.com/view/copl/</a>		
Teaching Assistant	Name (title/division)					
	Office Room Number		Office phone Number		e-mail	

### 1. Introduction

The Directed Research in Physics for Undergraduates Program (DRPUP) supports active research participation by undergraduate students in any of the areas of research performed by the Laboratories affiliated to the Department of Physics. DRPUP projects involve students in meaningful ways in ongoing research programs or in research projects specifically designed for the program.

### 2. Course Objectives

This program allows undergraduate students to conduct an individual research or project under the supervision of a faculty mentor. The students receives training along the research methods applicable to his/her research plan. Student should analyze/summary his/her data, submit report and give an oral presentation of his/her results. At the end of semester, each participant takes part in a formal poster session presenting his/her results.

### 3. Class types and activities

As an undergraduate, there are ways to participate in vital research community. Beyond the classroom, students advance their research skills by assisting on faculty-initiated research. The Directed Research in Physics for Undergraduates Program (DRPUP) helps match undergraduates to faculty researchers. Apprentices work with faculty as they learn the discipline essential to research and enjoy the creativity and accomplishment of problem-solving. Otherwise, there are opportunities for student-initiated research as well. Students can draw together their classroom learning and their particular interests to design and execute a research project of their own. And there are atelier and other support available to help them succeed in this.

### 4. Teaching Method

- |  |   |
|--|---|
| <input type="checkbox"/> lecture                                     | <input type="checkbox"/> discussion and debate              |
| <input type="checkbox"/> team project(presentation and case studies) | <input type="checkbox"/> experiments(role-playing,etc)      |
| <input type="checkbox"/> designing and production                    | <input type="checkbox"/> on-site learning(on-site training) |
| <input type="checkbox"/> others                                      |   |

### 5. Support Systems in Use

- |  |   |   |
|--|---|---|
| <input checked="" type="checkbox"/> AjouBb               | <input type="checkbox"/> automatic recording system | <input type="checkbox"/> web-based assignment |
| <input type="checkbox"/> cyber lecture                   | <input type="checkbox"/> online content             |   |
| <input type="checkbox"/> class behavior analyzing system | <input type="checkbox"/> others                     |   |

### 6. Teaching Tools

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> PBL(Problem Based Learning) | <input type="checkbox"/> CBL(Case Based Learning) | <input type="checkbox"/> TBL(Team Based Learning)           |
| <input type="checkbox"/> UR(Undergraduate Research)  | <input type="checkbox"/> FL(Flipped Learning)     | <input type="checkbox"/> DSAL(Data Science Active Learning) |
| <input type="checkbox"/> others                      |   |   |

### 7. Knowledge and ability required for taking this course

Knowledge on general physics, mechanics, electromagnetism and modern physics is required.

## 8. Method of Evaluation

Evaluation Item	The Number of Times	Evaluation Proportion	Remarks
Attendance	14	30	Based on the weekly report confirmed by the supervising faculty
midterm exam			
final exam			
quiz			
presentation	1	70	Participation in the in-house symposium or a formal poster session
discussion			
homework			
etc			
study hours			

## 9. Textbook and supplementary material

Main/Sub	Title (Web-site)	Writer	Publisher	Publication year
	The choice of reference will be guided by individual adviser.			

## 10. Class system and Class shedule

### < Class Schedule >

\* language : K-korean, E-English

Weeks	Topics	language	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
1	Introduction to DRPUP	K/E	Hyungwoo Lee			
2	Introduction to research interests of faculty	K/E	Hyungwoo Lee			
3	Introduction to student-initiated research	K/E	Hyungwoo Lee			
4	Planning research activity	K/E	Hyungwoo Lee			
5	directed research activity	K/E	Hyungwoo Lee			

< Class Schedule >

\* language : K-korean, E-English

Weeks	Topics	language	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
6	directed research activity	K/E	Hyungwoo Lee			
7	directed research activity	K/E	Hyungwoo Lee			
8	directed research activity	K/E	Hyungwoo Lee			
9	Intermediate advance check	K/E	Hyungwoo Lee			
10	directed research activity	K/E	Hyungwoo Lee			
11	directed research activity	K/E	Hyungwoo Lee			
12	directed research activity	K/E	Hyungwoo Lee			
13	directed research activity	K/E	Hyungwoo Lee			
14	directed research activity	K/E	Hyungwoo Lee			
15	Poster session	K/E	Hyungwoo Lee			
16	In-house symposium	K/E	Hyungwoo Lee			

11. Other items of notification