

# THUY LOI UNIVERSITY INTERNATIONAL TRAINING CENTER

**SYLLABUS**Degree training: Bachelor

#### PHYSICS DIVISION

UNIVERSITY PHYSICS II Code: PHYCS 2024

**1. Credit Amount**: 4 (2.1.1)

**2. Number of hours**: 60 standard hours;

Lecture (2 credits): 2 hours a week, lasting within 15 weeks

HW (1 credit): 2 hours a week, lasting within 15 weeks

Lab (1 credit): 6 hours a week, lasting within 5 weeks

#### 3. Belongs to the training program

- compulsory subject for civil engineering and water resources engineering

- Optional subject : No

# 4. Method for Students Grading:

Form	Times	Description	Time	Percentage
Homework (Online HW + Long HW)	1 per week	Due EVERY lecture day and get turned in at the beginning of the first lecture of each week	During the course	25%
Quiz Test (Multiple choice)	1 per week	At the end of each Lecture	During the course	5%
03 Test (multiple-cho ice as well as free-response questions)	1 per month	Students can take Test in 60 minutes at the end of the 4 <sup>th</sup> week per month	During the course	30%

Attendance	Each lecture	To know the number of students' Absences: Absences > 20% of 45 hours, will bi banned from taking final exam	During the course	
Experiment	10 experiments, 1 experiment is lasting for 3 hours	Students do Experiment in General Physics Lab ( miss > 2 Labs : fail the course)	Lasting for 5 weeks or 10 weeks during the course	20%
Final Exam (Multiple -Choice)	1	90 minutes - 40 questions	1-2 weeks after the end of the course	20%

### Structure of the final exam (according to Bloom scale):

Level	Remember	Understand	Application	Analysi	Synthetic	Creation
				S		
Number of question	15 MCQ	15 MCQ	10 MCQ			
Percentage	37,5%	37,5%	25%			

#### 5. Binding conditions of the course:

- Prerequisites: **UPI** 

- Previous subject: Math 1- Parallel subject: Math 2

#### 6. Summary content of the course:

The course includes Electric field; Magnetic field; Induction and Electromagnetic Waves, Light. In this course students are introduced to the properties of electric field and magnetic field, can know the method how to calculate the magnitude of them. The course covers standards describing and calculate the behavior of electrical & magnetic devices, electromagnetic induction and its application including electromagnetic waves.

# **Electric Field:**

- Electric Charge
- Electric Force and Electric Field
- Gauss' Law
- Conductors and Dielectrics
- Electric Potential
- Capacitance
- Circuits

# **Magnetic Field**:

- Magnetism, Magnetic Field
- Magnetic Field of a curent
- Magnetic Force

## **Electromagnetic induction**

- Faraday's Law and Maxwell's Equations
- Self Induction, Mutual Induction
- Generator
- Transformers

# **Electromagnetic Waves and Light**

EM Waves

## Light

<u>In Lab</u>, each student must do 10 experiments as required in the instructor's policy and schedule.

#### 7. Instructors:

NO	Full Name	Academic degree	Phone number	Email	Position
1	Đặng Thị Minh Huệ	Ph.D	0904769679	dtmhue@tlu.edu.vn	Main Lecturer
2	Phạm Thị Thanh Nga	Ph.D	0916103796	nga_ppt@tlu,edu.vn	Main Lecturer
3	Lương Duy Thành	Associate Professor, Ph.D	0936946975	thanh_lud@tlu.edu.v n	Senior

#### 8. Text book:

- [1] Course Materials of UPII is available at the University Library.
- [2] Physics for Scientists and Engineers with Modern Physics (6 ED), Paul A. Tipler and Gên Mosca, W. H. Freeman and Company, New York, 2000.

# References:

- [1] General Physics, Volume 2, Lurong Duyên Bình et all (1998).
- [2] University Physics with Modern Physics, H.D. Young R.A. Freedman, 12ED.

#### 9. Content in details:

	Content	Teaching and Learning	Hours		
Chapter		Activities, Level of HW requirements	Lecture	Lab	H W
0	INTRODUCTIONS	*Lecturer	1	0	0
		- Introduce: full name, position, expertise and email, cell phone number and Course Website			

		<ul> <li>Ask for information of the monitor of the class: email, phone number.</li> <li>Introduce about syllabus of the subject and Grading critiria</li> <li>Guide students how to get good results and best studying method</li> <li>* Students:</li> <li>Answer the questions</li> <li>Give out questions</li> </ul>			
2	ELECTRIC CHARGE  2.1 Introduction to Electric Charge  2.2 Conservation of Charge  2.3 Quantization of Charge  2.4 Charge in a Macroscopic Object  2.5 What is a Macroscopic Net Charge  2.6 Continuous Charge Distributions	* Lecturer: - Present; Explain; Analyze, Conclude - Give out Problems - Guide students to solve problems - Give out questions - Guide students to solve samples - Assign homework as following requirements: + Calculate the amount of charge in matter + Calculate the density of charge in matter - Give out Solution of Homework * Students: - Answer the questions - Solve problems + situations - Give out questions	1	2	1

		- Do Homework			
3	QUALITATIVE ELECTROSTATICS 3.1 Basics of Electric Force 3.2 Effect of Electric Force on Materials 3.3 Capacity and Grounding 3.4 Shielding 3.5 Charging by Induction 3.6 Obtaining a Net Charge 3.7 Summary	* Lecturer: - Present; Explain; Analyze, Conclude - Give out Problem - Guide students to solve problem - Give out questions - Guide students to solve samples - Assign homework as following requirements: + Calculate the charge distributed on the objects after touching together + Determine the type of charge on objects and how to make an object become a charge - Give out Solution of Homework *Students: - Answer the questions - Solve problems + situations - Give out questions - Do homework	1	2	1
4	ELECTROSTATIC DEVICES  4.1 Electrophorus  4.2 Leaf Electroscope	* Lecturer: - Present; Explain; Analyze, Conclude - Give out Problem - Guide students to solve problem	1	0	0

- Give out questions *Students: - Answer the questions - Solve problems + situations - Give out questions - Solve problems + situations - Give out questions  * Lecturer: - Present; Explain; Analyze, Conclude - Give out Problem - Guide students to solve problem - Guide students to solve samples - Assign homework as following requirements: + Determine electric field vector of a system of charge - Give out Solution of Homework *Students: - Answer the questions - Solve problems + situations - Give out questions - Give out Solution of Homework *Students: - Answer the questions - Give out Solution of Homework *Students: - Answer the questions - Give out questions - Give out Solution of Homework *Students: - Answer the questions - Solve problems + situations - Give out questions - Solve problems - Give out questions - Give out Problem  *Lecturer - Present; Explain; Analyze, Conclude - Give out Problem  Give out Problem - Give out Problem			1			
- Answer the questions - Solve problems + situations - Give out questions  5+6  ELECTRIC FORCE. ELECTRIC FIELD  5.1 The Strength of the Electric Force 5.3 Coulomb's Law 6.1. Electric Field 6.4 Electric Field of Lines and Planes  - Give out Problem - Give out questions - Give out functions - Give out Solution of Homework *Students: - Answer the questions - Give out Solution of Homework *Students: - Answer the questions - Give out questions - Solve problems - Solve problems - Solve problems - Give out questions - Solve problems - Give out questions			- Give out questions			
- Solve problems + situations - Give out questions  5+6  ELECTRIC FORCE. ELECTRIC FIELD  5.1 The Strength of the Electric Force 5.3 Coulomb's Law 6.1. Electric Field 6.4 Electric Field 6.4 Electric Field of Lines and Planes  - Give out Problem - Guide students to solve problem - Give out questions - Give out questions - Give out questions - Assign homework as following requirements: + Determine electric force. + Determine electric field vector of a system of charge - Give out Solution of Homework  *Students: - Answer the questions - Solve problems + situations - Give out questions - Solve problems - Solve problems - Solve problems - Solve problems - Give out questions - Solve problems - Give out questions - Give out problems - Give out questions - Give out problem  7  ELECTRIC FIELD MAPS 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric - Present; Explain; Analyze, Conclude - Give out Problem			*Students:			
situations - Give out questions  5+6  ELECTRIC FORCE. ELECTRIC FIELD  5.1 The Strength of the Electric Force 5.3 Coulomb's Law 6.1. Electric Field 6.4 Electric Field of Lines and Planes  - Guide students to solve problem - Guide students to solve samples - Assign homework as following requirements: + Determine electric field vector of a system of charge - Give out Solution of Homework  *Students: - Answer the questions - Solve problems + situations - Give out questions - Give out questions - Solve problems + situations - Give out questions - Present; Explain; Analyze, Conclude  7  ELECTRIC FIELD MAPS 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric - Give out Problem  - Give out Problem			- Answer the questions			
5+6 ELECTRIC FORCE. ELECTRIC FIELD  5.1 The Strength of the Electric Force 5.3 Coulomb's Law 6.1. Electric Field 6.4 Electric Field of Lines and Planes  - Give out Problem - Guide students to solve problem - Give out questions - Guide students to solve samples - Assign homework as following requirements: + Determine electric field vector of a system of charge - Give out Solution of Homework  *Students: - Answer the questions - Solve problems + situations - Give out questions - Give out questions - Solve problems + situations - Give out questions - Persont; Explain; Analyze, Conclude  *Lecturer: - Present; Explain; Analyze, Conclude - Give out Problem  *Lecturer: - Present; Explain; Analyze, Conclude - Give out Problem  *Lecturer: - Present; Explain; Analyze, Conclude - Give out Problem			- Solve problems +			
5+6  ELECTRIC FORCE. ELECTRIC FIELD  5.1 The Strength of the Electric Force 5.3 Coulomb's Law 6.1. Electric Field of Lines and Planes  6.4 Electric Field of Lines and Planes  - Give out questions - Guide students to solve problem - Give out questions - Guide students to solve samples - Assign homework as following requirements: + Determine electric field vector of a system of charge - Give out Solution of Homework  *Students: - Answer the questions - Solve problems + situations - Give out questions - Do homework  *Lecturer - Present; Explain; Analyze, Conclude - On the problem of the Electric field vector of a system of charge - Give out guestions - Solve problems - Solve problems - Solve problems - Give out questions			situations			
FLECTRIC FIELD  5.1 The Strength of the Electric Force 5.3 Coulomb's Law 6.1 Electric Field 6.4 Electric Field of Lines and Planes  - Give out Problem - Give out questions - Guide students to solve samples - Assign homework as following requirements: + Determine electric force. + Determine electric field vector of a system of charge - Give out Solution of Homework  *Students: - Answer the questions - Solve problems + situations - Give out questions - Solve problems + situations - Give out questions - Present; Explain; Analyze, Conclude  7 ELECTRIC FIELD MAPS 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric - Give out Problem			- Give out questions			
5.1 The Strength of the Electric Force 5.3 Coulomb's Law 6.1. Electric Field of Lines and Planes  - Give out Problem - Guide students to solve problem - Guide students to solve samples - Assign homework as following requirements: + Determine electric field vector of a system of charge - Give out Solution of Homework  *Students: - Answer the questions - Solve problems + situations - Give out questions - Give out questions - Present; Explain; Analyze, Conclude - Give out questions - Give out guestions - Present; Explain; - Answer the questions - Solve problems + situations - Give out questions - Present; Explain; - Prese	5+6	ELECTRIC FORCE.	* <u>Lecturer</u> :	2	3	3
5.1 The Strength of the Electric Force 5.3 Coulomb's Law 6.1 Electric Field 6.4 Electric Field of Lines and Planes  - Guide students to solve problem - Guide students to solve samples - Assign homework as following requirements: + Determine electric force. + Determine electric field vector of a system of charge - Give out Solution of Homework *Students: - Answer the questions - Solve problems + situations - Give out questions - Do homework  7 ELECTRIC FIELD MAPS 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric  - Give out Problem  - Guide students to solve problem - Give out questions - Give out Solution of Homework  *Students: - Answer the questions - Solve problems + situations - Give out questions - Do homework  *Lecturer - Present; Explain; Analyze, Conclude - Give out Problem		ELECTRIC FIELD	- Present; Explain;			
Electric Force 5.3 Coulomb's Law 6.1 Electric Field 6.4 Electric Field of Lines and Planes  - Guide students to solve problem - Guide students to solve samples - Assign homework as following requirements: + Determine electric force. + Determine electric field vector of a system of charge - Give out Solution of Homework  *Students: - Answer the questions - Solve problems + situations - Give out questions - Present; Explain; Analyze, Conclude - Give out Problem		5 1 The Strength of the	_			
6.1. Electric Field 6.4 Electric Field of Lines and Planes  - Guide students to solve samples - Assign homework as following requirements: + Determine electric force. + Determine electric field vector of a system of charge - Give out Solution of Homework  *Students: - Answer the questions - Solve problems + situations - Give out questions - Give out questions - Present; Explain; Analyze, Conclude - Give out Problem			- Give out Problem			
6.4 Electric Field of Lines and Planes  - Give out questions - Guide students to solve samples - Assign homework as following requirements: + Determine electric force. + Determine electric field vector of a system of charge - Give out Solution of Homework  *Students: - Answer the questions - Solve problems + situations - Give out questions - Do homework  7 ELECTRIC FIELD MAPS 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric - Give out Problem  - Give out Problem			- Guide students to			
Lines and Planes  - Give out questions - Guide students to solve samples - Assign homework as following requirements: + Determine electric force. + Determine electric field vector of a system of charge - Give out Solution of Homework  *Students: - Answer the questions - Solve problems + situations - Give out questions - Do homework  7 ELECTRIC FIELD MAPS 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric - Give out Problem  - Give out Problem			solve problem			
- Guide students to solve samples - Assign homework as following requirements: + Determine electric force. + Determine electric field vector of a system of charge - Give out Solution of Homework  *Students: - Answer the questions - Solve problems + situations - Give out questions - Do homework  7 ELECTRIC FIELD MAPS 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric - Give out Problem			- Give out questions			
solve samples  - Assign homework as following requirements: + Determine electric force. + Determine electric field vector of a system of charge - Give out Solution of Homework  *Students: - Answer the questions - Solve problems + situations - Give out questions - Do homework  7 ELECTRIC FIELD MAPS 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric  - Assign homework as following requirements: - Determine electric field vector of a system of charge - Give out Solution of Homework  * Students: - Answer the questions - Solve problems + situations - Give out questions - Do homework  * Lecturer - Present; Explain; Analyze, Conclude - Give out Problem		Emos una i ianos	_			
following requirements:  + Determine electric force.  +Determine electric field vector of a system of charge  - Give out Solution of Homework  *Students:  - Answer the questions  - Solve problems + situations  - Give out questions  - Do homework  7 ELECTRIC FIELD  MAPS  7.1 Gauss' Law, Field Lines, and Field Maps  7.2 Drawing Electric  Following requirements:  + Determine electric field  vector of a system of charge  - Give out Solution of  Homework  *Students:  - Answer the questions  - Solve problems  - Give out questions  - Do homework  * Lecturer  - Present; Explain;  Analyze, Conclude  - Give out Problem			solve samples			
following requirements:  + Determine electric force.  +Determine electric field vector of a system of charge  - Give out Solution of Homework  *Students:  - Answer the questions  - Solve problems + situations  - Give out questions  - Do homework  7 ELECTRIC FIELD  MAPS  7.1 Gauss' Law, Field Lines, and Field Maps  7.2 Drawing Electric  Following requirements:  + Determine electric field  vector of a system of charge  - Give out Solution of  Homework  *Students:  - Answer the questions  - Solve problems  - Give out questions  - Do homework  * Lecturer  - Present; Explain;  Analyze, Conclude  - Give out Problem			- Assign homework as			
+Determine electric field vector of a system of charge - Give out Solution of Homework  *Students: - Answer the questions - Solve problems + situations - Give out questions - Do homework  7 ELECTRIC FIELD MAPS 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric - Give out Problem  +Determine electric field vector field vector of a system of charge - Give out Solution of Homework  *Estudents: - Answer the questions - Solve problems - Present; Explain; Analyze, Conclude - Give out Problem			following requirements:			
vector of a system of charge  - Give out Solution of Homework  *Students:  - Answer the questions  - Solve problems + situations  - Give out questions  - Do homework  7 ELECTRIC FIELD  MAPS  7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric  Vector of a system of charge  - Give out Solution of Homework  * Estudents:  - Answer the questions  - Solve problems + situations  - Present; Explain;  Analyze, Conclude  - Give out Problem			+ Determine electric force.			
- Give out Solution of Homework  *Students: - Answer the questions - Solve problems + situations - Give out questions - Do homework  7 ELECTRIC FIELD MAPS 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric - Give out Problem  - Give out Problem			+Determine electric field			
Homework  *Students:  - Answer the questions - Solve problems + situations - Give out questions - Do homework  7 ELECTRIC FIELD MAPS 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric  Homework  *Students:  - Answer the questions - Give out questions - Present; Explain; Analyze, Conclude - Give out Problem			vector of a system of charge			
*Students: - Answer the questions - Solve problems + situations - Give out questions - Do homework  7 ELECTRIC FIELD MAPS 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric - Give out Problem  *Students: - Answer the questions - Solve problems - Give out questions - Do homework  * Lecturer - Present; Explain; Analyze, Conclude - Give out Problem			- Give out Solution of			
- Answer the questions - Solve problems + situations - Give out questions - Do homework  7 ELECTRIC FIELD MAPS 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric - Give out Problem  - Answer the questions - Solve problems + situations - With the problem - Solve out Problem - Solve out Problem			Homework			
- Solve problems + situations - Give out questions - Do homework  7 ELECTRIC FIELD * Lecturer			*Students:			
situations - Give out questions - Do homework  7 ELECTRIC FIELD MAPS 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric  Situations - Give out questions - Do homework  * Lecturer - Present; Explain; Analyze, Conclude - Give out Problem			- Answer the questions			
situations - Give out questions - Do homework  7 ELECTRIC FIELD MAPS 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric  situations - Give out questions - Do homework  * Lecturer - Present; Explain; Analyze, Conclude - Give out Problem			- Solve problems +			
- Do homework  7 ELECTRIC FIELD			_			
7 ELECTRIC FIELD * Lecturer 2 0 1  MAPS - Present; Explain; 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric - Give out Problem			- Give out questions			
MAPS 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric - Give out Problem			- Do homework			
MAPS 7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric - Give out Problem	7	FLECTRIC FIELD	* Lecturer	2	0	1
7.1 Gauss' Law, Field Lines, and Field Maps 7.2 Drawing Electric - Give out Problem						
7.2 Drawing Electric - Give out Problem		I				
7.2 Diawing Diceric		_	_			
		<u> </u>				

	<ul><li>7.3 Drawing Field Maps for Continuous Charge Distributions</li><li>7.4 Combining Arrow Diagrams and Field Maps</li></ul>	- Guide students to solve problem - Give out questions - Guide students to draw field map - Assign homework: focus on drawing electric field maps *Students: - Answer the questions - Solve problems + situations - Give out questions			
8	8.1 Behavior of Electric Dipoles 8.2 Drawing Dipole Fields 8.3 Qualitative Dipole Behavior 8.4 Dipole Mechanics	* Lecturer: - Present; Explain; Analyze, Conclude - Give out Problem - Guide students to solve problem - Give out questions - Guide students to solve samples - Assign homework as following requirements: + Determine electric field vector of the dipole + Determine the rotational direction of a dipole in external electric field + Calculate the electric potential energy - Give out Solution of Homework	1	0	1

		*Students:			
		- Answer the questions			
		- Solve problems +			
		situations			
		- Give out questions			
		- Do homework			
9	GAUSS' LAW	* <u>Lecturer</u> :	3	0	4
	9.1 High Symmetry	- Present; Explain;			
	Systems  9.2 Electric Flux	Analyze, Conclude			
	9.3 Gauss' Law	- Give out Problem			
	9.4 Specializing Gauss'	- Guide students to			
	Law to the Symmetry	solve problem			
	<b>9.5</b> Drawing Spherical and Cylindrical Systems	- Give out questions			
	<b>9.6</b> Drawing Planar	- Guide students to			
	Systems  9.7 Applications of	solve samples:			
	<b>9.7</b> Applications of Gauss' Law	- Assign homework as			
	9.8 Gauss' Law Inside	following requirements:			
	and Outside All Charge systems	+ Calculate Electric Flux;			
	Systems	+ Drawing field Maps for			
		some high symmetry			
		systems			
		+ Apply Gauss' Law for			
		Spherical and Cylindrical			
		Systems to find electric field			
		and net charge			
		- Give out Solution of			
		Homework			
		*Students:			
		- Answer the questions			
		- Solve problems +			
		situations			
		- Give out questions			
		- Do homework			

10	CONDUCTORS AND	* <u>Lecturer</u> :	2	2	2
	DIELECTRICS	- Present; Explain;			
	10.1 Response of	Analyze, Conclude			
	Materials	- Give out Problem			
	10.2 Field Maps of Point Charges	- Guide students to			
	10.3 Charge Density at a	solve problem			
	Surface	- Give out questions			
	<b>10.4</b> Planar Conductors and Dielectrics	- Guide students to			
	10. 5 Superposition	solve samples			
		- Assign homework:			
		Calculate the density of			
		charge on conductors and in			
		dielectrics			
		- Give out Solution of			
		Homework			
		*Students:			
		- Answer the questions			
		- Solve problems +			
		situations			
		- Give out questions			
		- Do homework			
11	Gauss' Law Applied to	* <u>Lecturer</u> :	1	2	2
	Conductors and Dielectrics	- Present; Explain;			
	11.1. Making Equal and	Analyze, Conclude			
	Opposite Charges	- Give out Problem			
	11.2 Parallel Plates	- Guide students to			
	11.3 Spherical Problems	solve problem			
	11.4 Non-Uniform Gauss' Law	- Give out questions			
	Luvy	- Guide students to			
		solve samples			
		- Assign homework as			
		following requirements:			
		+ Drawing field Maps for			

		dielectrics  + Applying Gauss' Law for Parallel Plates with dielectric; Spherical systems to find electric field vector  + Applying Gauss' Law to find the charge density  - Give out Solution of Homework  *Students:  - Answer the questions  - Solve problems + situations  - Give out questions  - Do homework			
12	ELECTRIC POTENTIAL  12.1 Electric Potential, Potential Difference  12.2 Relationship between Potential anf Electric Field  12.3 Compute Electric Potential and Potential Difference from Electric Field  12.4 Compute Potential Directly from Charge  12.5 Potential in Highly Symmetric Systems  12.6 Electric Potential of a Continuous System of Charge  12.7 Electrostatic Energy  12.8 Electric Potential Energy and Motion	* Lecturer:  - Present; Explain; Analyze, Conclude  - Give out Problem  - Guide students to solve problem  - Give out questions  - Guide students to solve samples  - Assign homework as following requirements:  + Calculate Potential and Potential Difference from charge, system of charge;  + Calculate Electric Potential Energy;  + Calculate Work done by Electric Field	3	2	3

	12.9 Electrostatic Energy Density	+ Calculate Electric Field from Electric Potential function - Give out Solution of Homework *Students: - Answer the questions - Solve problems + situations - Give out questions - Do homework			
13	CAPACITANCE  13.1 Definition of Capacitance  13.2 Capacitance and energy of a capacitor  13.3 Computing Capacitance	* Lecturer: - Present; Explain; Analyze, Conclude - Give out Problem - Guide students to solve problem - Give out questions - Guide students to solve samples - Assign homework: Computing Capacitance of a two conductor time constant of RC circuits - Give out Solution of homework *Students - Answer the questions - Solve problems + situations - Give out questions - Give out questions - Do homework	1	2	2

14+15+1	CURRENT AND RESISTANCE. DC CIRCUITS  14.1 Current 14.2 Resistance 15.1 Ohm's Law 15.2 KKirchhoff's Laws 16.1 Capacitive Circuits 16.2 RC Circuits 16.6 What Does a Capacitor Do?	* Lecturer: - Present; Explain; Analyze, Conclude - Give out Problem - Guide students to solve problem - Give out questions - Guide students to solve samples - Assign homework as following requirements: + Applying Ohm's Law and KKirchhoff's Laws to find current and resistance; + Compute the Time Constant of RC circuit - Give out Solution of Homework *Students: - Answer the questions - Solve problems + situations - Give out questions - Do homework	1	2	1
17+18	MAGNETIC FIELD. AMPERE'S LAW  17.1 No Magnetic Charge  17.2 Biot – Savart's Law  17.3 Magnetic Field of some current dibutions  17.4 Drawing the Magnetic Field  17.5 Superposition  18.1 Ampere's Law	* Lecturer: - Present; Explain; Analyze, Conclude - Give out Problem - Guide students to solve problem - Give out questions - Guide students to solve samples	3	3	3

		<u> </u>		ı	,
	<b>18.2</b> Application of	- Assign homework as			
	Ampere's Law	following requirements:			
		+ Determine the net field of a circuit;			
		+ Drawing field lines;			
		+ Applying Ampere's Law			
		- Answer the questions			
		- Solve problems +			
		situations			
		- Give out questions			
		- Do homework			
19	MAGNETIC FORCE	* <u>Lecturer</u> :	1	3	1
	19.1 Magnetic Force	- Present; Explain;			
	19.2 Circular Motion in a	Analyze, Conclude			
	Uniform Magnetic Field	- Give out Problem			
	19.3 Forces on Currents	- Guide students to			
	and Wires	solve problem			
		- Give out questions			
		- Guide students to			
		solve samples			
		- Assign homework as			
		following requirements:			
		+ Determine the Magnetic Force			
		+ Computing the quantities			
		for circular motion in			
		uniform magnetic field.			
		- Give out Solution of			
		Homework			
		*Students:			
		- Answer the questions			
		- Solve problems +			
		situations			
		- Give out questions			
		ļ			oxdot

		- Do homework			
20+21	MAGNETIC	* <u>Lecturer</u> :	1	0	1
	DIPOLES. MAGNETIC MATERIALS	- Present; Explain; Analyze, Conclude			
	<ul><li>20.1 Drawing and Reading Magnetic Field Maps</li><li>20.2. Behavior of Dipoles</li></ul>	<ul><li>Give out Problem</li><li>Guide students to solve problem</li></ul>			
	in Magnetic Fields  21.1 Magnetic Materials  21.2 Ferromagnetism	<ul> <li>Assign homework with the focusing on Behavior of Dipoles in Magnetic Fields</li> <li>Give out solution for Homework</li> </ul>			
		*Students:			
		<ul><li>Answer the questions</li><li>Solve problems + situations</li></ul>			
		- Give out questions			
		- Do homework			
22	FARADAY'LAW  22.1 Electromotive Force (EMS)  22.2. Magnetic Flux  22.3 Faraday's Law  22.4 Generators	* Lecturer: - Present; Explain; Analyze, Conclude - Give out Problem -Guide students to solve problem	2	2	2
		- Assign homework with the focusing on finding induced EMS; induced current in a closed wire - Give out solution for Homework *Students:			
		- Answer the questions - Solve problems + situations - Give out questions			

		- Do homework			
23+24	INDUCTANCE	* <u>Lecturer</u> :	1	2	1
	<ul><li>23.1 Inductance</li><li>23.2 Inductors</li></ul>	- Present; Explain; Analyze, Conclude			
	<ul><li>23.3 Mutual Inductance and Transformers</li><li>23.4 Magnetic Energy</li><li>24.1 Inductance Circuit</li><li>24.2 RL Circuit</li></ul>	- Give out Problem -Guide students to solve problem - Assign homework with the focusing on finding inductance and the time constant of RL circuit - Give out solution for Homework *Students: - Answer the questions - Solve problems + situations - Give out questions			
		- Do homework			
25+26	MAGNETIC DEVICE. INDUCED ELECTRIC FIELD  25.1 Devices Utilizing the Lorentz Force  25.2 Devices Utilizing Faraday's Law  26.1 Induced Electric Field  26.2  Maxwell's Equations	* Lecturer:  - Present; Explain; Analyze, Conclude  - Give out Problem  - Guide students to solve problem  - Guide students to solve sample  - Assign homework with the focusing on describing and finding induced Electric Field  - Give out solution for Homework  *Students:  - Answer the questions  - Solve problems + situations	1	2	1

27+28 ELECTROMAGNETIC WAVES  27.2 Electromagnetic Waves. Light  27.3 Properties of Light  27.4 Receiving and transmitting electromagnetic waves  28.2. Reflection, refraction, interference of light	- Give out questions - Do homework  * Lecturer: - Present; Explain; Analyze, Conclude - Give out Problem - Guide students to solve problem - Guide students to solve samples related to Properties of Light  *Students: - Answer the questions - Solve problems + situations - Give out questions	1	1	0
Total		30	30	30

# 10. Expected Learning outcomes of UPII:

NO	Expected Learning outcomes of UPII	Expected Learning outcomes of respective training Programs
1	Knowledge:	
	Understanding and applying the knowledge of	
	the subject for calculating, simulating, analyzing, evaluating and synthesising some problems relating to civil engineering and water resources engineering. Details:  + Descripting electric field and magnetic field;  Computing the magnitude of electric field vector, magnetic field vector, and other its	-Applying the knowledge of general subjects to study, calculate, and solve problems ralating to the knowledge of the core knowledge and major Specilalized  - Applying the core knowledge to solve the core problems and major problems.
	characteristic quantities;	

	+ Descripting the behavior of electric devices and magnetic devices;  +Descripting and calculating the propagation of electromagnetic waves;  + Understanding and applying the knowledge of electric field, magnetic filed, induction, and electromagnetic waves to study the major fundermential knowledge and major Specilalized	
2	Ability:  + Ability to work independently and function in multi-disciplinary teams;  + Ability to self-study and life-long learning;  +Ability to calculate, measurement conduct experiments and analyze, interpret data, report;  +Ability to accept or reject theories based on Labs measurements  + An ability to identify, formulate, and solve electric problems; magnetic problems; electromagnetic problems and electromagnetic waves	Ability to work independently and in team; Ability to self-study and self-thinking; Ability to apply knowledge of science (mathematics, physics, chemistry), and engineering principles, with emphasis on applications for water resources engineering and civil engineering; Ability to identify, formulate, analyze and choose the best model for each reality problems
3	Morality:  + Having a high responsibility for work + Be honest, careful and persistent  + Willing to learn and discover new knowledge  + Having scientific thinking at work and scientific methods for learning and research	Have:  + Good personal and professional ethics;  + A spirit of learning and progress;  + Be responsible for work, community and society;  +Comply with the laws and regulations of the state, society and community.

# 11. Contact information of Physics Division

Address: Room 301 - A1, Thủy lợi University

Head of physics division : Dr. Phan Văn Độ

- Cell phone number: 0983652242

- Email: phanvando@tlu.edu.vn

Hà Nội, ngày tháng năm 2021

DEAN OF DEPARTMENT INTERNATIONAL TRAINING CENTER

HEAD OF PHYSICS DIVISION

Dr. Phan Văn Độ