COURSE SPECIFICATION

FACULTY OF SCIENCE AND TECHNOLOGY DIVISION OF PHYSICAL SCIENCE

SEMESTER 1st ACADEMIC YEAR 2025

HUACHIEW CHALERMPRAKIET UNIVERSITY

PART 1: General Information

1. Code- Course Title and Credits: PH1151 General Physics Laboratory 1 Credit: 1 (0-1/3-0)

Teaching Hours per Semester: .....45 hours**.....**

2. Program or Course Type: ..... B1. Fundamental Courses .....

3. Level and Year of study: .....1st year of B.Sc. Health Robotics (058) **.....**

4. Prerequisite: .....-.....

5. Co-requisite: .....PH1113 General Physics 1.....

6. Name of Instructor: ..... Assoc.Prof.Dr.Prayoonsak Pluengphon**.....**

Name of Co-instructors: ..... Asst.Prof.Dr.Pornsiri Wanarattikan**.....**

..... Dr.Sukanya Petchsirivej**.....**

7. Course Venue: .....Room 2-325..... Time: Monday 8.30 – 11.30.....

8. Last modification date of the course: .....27 June 2025.....

9. Office Hours: .....Room 2-325.....Monday 8.30-16.30 hrs. .....

PART 2: Objectives & Learning Outcomes

1. Course Objectives:

1. Conduct experiments carefully and cautiously, always mindful of the safety of himself/herself and others.
2. Use graphs and charts as media for presenting data and experimental results.
3. Explain and connect concepts, principles, and theories from lectures with practical actions.
4. Work collaboratively with others in the same group and act both as a leader and as a member of the group.
5. Demonstrate responsibility and be punctual to class and assignments.

2. Course Description:

Experiments that correspond to the subject in PH1113 General Physics 1, including the study of motion, space and time, kinematics, Newton's law of motion, forces, energy and momentum, work, power, conservation laws, systems of particles, linear momentum, circular motion, rotation, torques, harmonic oscillation and gravitation.

3. Course-level Learning Outcomes (CLOs):

Upon completion of this course, learners should be able to:

CLO1 Conduct experiments carefully and cautiously, always mindful of the safety of himself/herself and others. (PLOs 2)

CLO2 Use graphs and charts as media for presenting data and experimental results. (PLOs 2)

CLO3 Explain and connect concepts, principles, and theories from lectures with practical actions. (PLOs 1, 2)

CLO4 Work collaboratively with others in the same group and act both as a leader and as a member of the group. (PLOs 4, 7)

CLO5 Demonstrate responsibility and be punctual to class and assignments. (PLOs 6)

4. The Alignment between Program Learning Outcome (PLOs) and Course-level Learning Outcomes (CLOs):

PLOs/CLOs	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
PLO 1: Explain basic knowledge of mathematics, science, engineering, and health science			✓ (Understand)		
PLO 2: Design and conduct experiments, as well as to analyze and interpret data	✓ (Understand)	✓ (Understand)	✓ (Understand)		
PLO 4: Work as a team in leadership and team member roles in a variety of contexts or situations				✓ (Understand)	

PLOs/CLOs	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
PLO 6: Practice six virtues: diligence, patience, thriftiness, kindness, honesty, filial piety, and live according to the Philosophy of Sufficiency Economy to strive for sustainable self-development					✓ (Remember)
PLO 7: Communicate one's knowledge to others effectively				✓ (Understand)	

PART 3: The Development of Student Learning Outcomes

Course Learning Outcomes (CLOs)	Teaching Strategies	Assessment Strategies
CLO 1: Conduct experiments carefully and cautiously, always mindful of the safety of himself/herself and others.	1. The principles are briefly explained, and group experiments are conducted, using PowerPoint and VDO clip.	1. Quizzes and Reports 2. Midterm and Final Lab Tests
CLO 2: Use graphs and charts as media for presenting data and experimental results.	1. Teach by explaining the basic principle and fundamental concepts of graphs and charts as media for presenting data and experimental results.	1. Quizzes and Reports 2. Midterm and Final Lab Tests
CLO 3: Explain and connect concepts, principles, and theories from lectures with practical actions.	1. Stimulate students to critical thinking and guide students to arrive at conclusions or solutions. This method encourages active participation, analytical skills, and logical reasoning.	1. Quizzes and Reports 2. Midterm and Final Lab Tests 3. Mini project

	2. Explain and connect concepts, principles, and theories from lectures with practical actions.	
CLO 4: Work collaboratively with others in the same group and act both as a leader and as a member of the group.	1. Stimulate Work collaboratively with others.	1. Reports 2. Mini project
CLO 5: Demonstrate responsibility and be punctual to class and assignments.	1. Evaluate responsibility and punctuality in attending classes and making reports.	1. Reports 2. Mini project

PART 4: Teaching Plan and Evaluation

4.1 Teaching Plan

Week	Topics / Details	Course Learning Outcomes (CLOs)	Learning Activities and Materials	Hours (Lecture / Practice)	Instructor
1 30/06/25	- Introduce the instructor - Students introduce themselves and complete a basic knowledge survey - Systematic supervision and monitoring of student learning - Explain group assignment procedures Integrate ethical values into instruction - Integrate ethical values into instruction	CLO 1	- The course begins with an introduction of the instructor, including their academic background, teaching experience, and contact information for academic communication. - Instructions will be given for forming student groups to facilitate collaborative learning, discussion, and experimental work throughout the course. - Ethical principles, particularly the six core virtues, will be continuously emphasized and integrated into the teaching and learning process to foster moral awareness and	3-0-0	Asst.Prof.Dr. Pornsiri Wanarattikan

Week	Topics / Details	Course Learning Outcomes (CLOs)	Learning Activities and Materials	Hours (Lecture / Practice)	Instructor
			responsible behavior among students.		
2 7/07/25	Significant figures	CLOs 1, 2, 3, 4, and 5	Study the overall content, define the scope of experimental study, and review demonstrations of the experiments through multimedia resources prior to attending laboratory sessions via the online platform Students are required to study the use of laboratory equipment and relevant calculations, interpret and record experimental results based on multimedia or written materials provided by the instructor—derived from actual experiments and aligned with prior learning. Students must also solve encountered problems independently by preparing a report and summarizing the results of the experiment, thereby fostering critical thinking, collaboration, communication, and creativity.	3-0-0	Asst.Prof.Dr. Pornsiri Wanarattikan
3 14/07/25	Precise Length Measurement	CLOs 1, 2, 3, 4, and 5	Study the overall content, define the scope of experimental study, and review demonstrations of the experiments through	3-0-0	Dr.Sukanya Petchsirivej

Week	Topics / Details	Course Learning Outcomes (CLOs)	Learning Activities and Materials	Hours (Lecture / Practice)	Instructor
			multimedia resources prior to attending laboratory sessions via the online platform Students are required to study the use of laboratory equipment and relevant calculations, interpret and record experimental results based on multimedia or written materials provided by the instructor—derived from actual experiments and aligned with prior learning. Students must also solve encountered problems independently by preparing a report and summarizing the results of the experiment, thereby fostering critical thinking, collaboration, communication, and creativity.		
4 21/07/25	Rolling Motion	CLOs 1, 2, 3, 4, and 5	Study the overall content, define the scope of experimental study, and review demonstrations of the experiments through multimedia resources prior to attending laboratory sessions via the online platform Students are required to study the use of laboratory equipment and relevant calculations, interpret and	3-0-0	Assoc.Prof. Dr.Prayoonsak Pluengphon

Week	Topics / Details	Course Learning Outcomes (CLOs)	Learning Activities and Materials	Hours (Lecture / Practice)	Instructor
			record experimental results based on multimedia or written materials provided by the instructor—derived from actual experiments and aligned with prior learning. Students must also solve encountered problems independently by preparing a report and summarizing the results of the experiment, thereby fostering critical thinking, collaboration, communication, and creativity.		
5 4/08/25	Moment of Inertia	CLOs 1, 2, 3, 4, and 5	Study the overall content, define the scope of experimental study, and review demonstrations of the experiments through multimedia resources prior to attending laboratory sessions via the online platform Students are required to study the use of laboratory equipment and relevant calculations, interpret and record experimental results based on multimedia or written materials provided by the instructor—derived from actual experiments and aligned with prior learning. Students must also solve	3-0-0	Dr.Sukanya Petchsirivej

Week	Topics / Details	Course Learning Outcomes (CLOs)	Learning Activities and Materials	Hours (Lecture / Practice)	Instructor
			encountered problems independently by preparing a report and summarizing the results of the experiment, thereby fostering critical thinking, collaboration, communication, and creativity.		
6 4/08/25	Mini project	CLOs 3, 4, and 5	Students are assigned to collaboratively design an experiment that is based on theoretical principles relevant to the PH1113 General Physics I course. The assignment must include the following components: 1. Objective 2. Equipment 3. Experimental Procedure	3-0-0	1. Dr.Sukanya Petchsirivej, 2. Assoc.Prof. Dr.Prayoonsak Pluengphon 3. Asst.Prof.Dr. Pornsiri Wanarattikan
7 18/08/25	Review Session Before the Practical Examination	CLOs 1, 2, 3, 4, and 5	Students are encouraged to come and practice using various laboratory instruments in the lab during the designated time.	3-0-0	1. Dr.Sukanya Petchsirivej, 2. Assoc.Prof. Dr.Prayoonsak Pluengphon 3. Asst.Prof.Dr. Pornsiri Wanarattikan
8 25/08/25	Mini project	CLOs 3, 4, and 5	Students are required to present the theoretical background, rationale, and feasibility of their proposed experiment.	3-0-0	1. Dr.Sukanya Petchsirivej, 2. Assoc.Prof. Dr.Prayoonsak Pluengphon

Week	Topics / Details	Course Learning Outcomes (CLOs)	Learning Activities and Materials	Hours (Lecture / Practice)	Instructor
			Each group will be given 15–20 minutes to present their proposed experiment.		3. Asst.Prof.Dr. Pornsiri Wanarattikan
25-31/08/25 **Midterm Exam**					
9 1/09/25	Simple Pendulum	CLOs 1, 2, 3, 4, and 5	Study the overall content, define the scope of experimental study, and review demonstrations of the experiments through multimedia resources prior to attending laboratory sessions via the online platform Students are required to study the use of laboratory equipment and relevant calculations, interpret and record experimental results based on multimedia or written materials provided by the instructor—derived from actual experiments and aligned with prior learning. Students must also solve encountered problems independently by preparing a report and summarizing the results of the experiment, thereby fostering critical thinking, collaboration, communication, and creativity.	3-0-0	Asst.Prof.Dr. Pornsiri Wanarattikan

Week	Topics / Details	Course Learning Outcomes (CLOs)	Learning Activities and Materials	Hours (Lecture / Practice)	Instructor
10 8/09/25	Simple Harmonic Motion and Hook's Law	CLOs 1, 2, 3, 4, and 5	Study the overall content, define the scope of experimental study, and review demonstrations of the experiments through multimedia resources prior to attending laboratory sessions via the online platform Students are required to study the use of laboratory equipment and relevant calculations, interpret and record experimental results based on multimedia or written materials provided by the instructor—derived from actual experiments and aligned with prior learning. Students must also solve encountered problems independently by preparing a report and summarizing the results of the experiment, thereby fostering critical thinking, collaboration, communication, and creativity.	3-0-0	Asst.Prof.Dr. Pornsiri Wanarattikan
11 15/09/25	Viscosity	CLOs 1, 2, 3, 4, and 5	Study the overall content, define the scope of experimental study, and review demonstrations of the experiments through multimedia resources prior to	3-0-0	Dr.Sukanya Petchsirivej

Week	Topics / Details	Course Learning Outcomes (CLOs)	Learning Activities and Materials	Hours (Lecture / Practice)	Instructor
			attending laboratory sessions via the online platform Students are required to study the use of laboratory equipment and relevant calculations, interpret and record experimental results based on multimedia or written materials provided by the instructor—derived from actual experiments and aligned with prior learning. Students must also solve encountered problems independently by preparing a report and summarizing the results of the experiment, thereby fostering critical thinking, collaboration, communication, and creativity.		
12 22/09/25	Resonance	CLOs 1, 2, 3, 4, and 5	Study the overall content, define the scope of experimental study, and review demonstrations of the experiments through multimedia resources prior to attending laboratory sessions via the online platform Students are required to study the use of laboratory equipment and relevant calculations, interpret and record experimental results	3-0-0	Assoc.Prof. Dr.Prayoonsak Pluengphon

Week	Topics / Details	Course Learning Outcomes (CLOs)	Learning Activities and Materials	Hours (Lecture / Practice)	Instructor
			based on multimedia or written materials provided by the instructor—derived from actual experiments and aligned with prior learning. Students must also solve encountered problems independently by preparing a report and summarizing the results of the experiment, thereby fostering critical thinking, collaboration, communication, and creativity.		
13 29/09/25	Mini project	CLOs 3, 4, and 5	Each group must carry out the experiment they have designed, accurately record all measurements and observations, and submit a written summary and analysis of the results.	3-0-0	1. Dr.Sukanya Petchsirivej, 2. Assoc.Prof. Dr.Prayoonsak Pluengphon 3. Asst.Prof.Dr. Pornsiri Wanarattikan
14 6/10/25	Mini project	CLOs 3, 4, and 5	All groups are expected to deliver a presentation of their project outcomes and conclusions.	3-0-0	1. Dr.Sukanya Petchsirivej, 2. Assoc.Prof. Dr.Prayoonsak Pluengphon 3. Asst.Prof.Dr. Pornsiri Wanarattikan
15 20/10/25	Review Session Before the Practical Examination	CLOs 1, 2, 3, 4, and 5	Students are encouraged to come and practice using various laboratory instruments	3-0-0	1. Dr.Sukanya Petchsirivej, 2. Assoc.Prof.

Week	Topics / Details	Course Learning Outcomes (CLOs)	Learning Activities and Materials	Hours (Lecture / Practice)	Instructor
			in the lab during the designated time.		Dr.Prayoonsak Pluengphon
20/10/25 – 3/11/25 **Final Exam**					

4.2. Learning Outcomes Evaluation Plan

Course Learning Outcomes (CLOs)	Evaluation Methods (Report, Project, Quiz, Midterm and Final examinations)	Evaluation Date & Time	Percentage
CLOs 1, 2 ,3	Quizzes	All Weeks	8%
CLOs 1, 2, 3, 4, 5	Reports	All Weeks	28%
CLOs 1, 2, 3	Midterm Lab Test	25-31/08/25	28%
CLOs 1, 2, 3	Final Lab Test	20/10/25 – 3/11/25	28%
CLOs 3, 4, 5	Mini Project	Weeks 6^{th}, 8^{th} 13^{th} and 14^{th}	8%
			100%

PART 5: Learning Resources

1. References

1. Laboratory Manual PH1151.

2. Fundamentals of Physics Extended, 10th Edition, Halliday & Resnick Jearl walker Cleveland State University.

2. Recommended supplementary, multimedia and learning materials

HCU e-learning PH1151

PART 6: Course Evaluation and Improvement

1. Students' Course Effectiveness Evaluation

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2. Teaching Evaluation Methods

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3. Teaching Improvement Methods

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4. Review of Learning Achievement and Outcomes

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5. Course Effectiveness Revision Plan and Process

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Course Instructor

Signature P. Pluengphon **Date of report**: .....25/06/25.....

Signature P. Wanarattikan **Date of report**: .....25/06/25.....

Signature S. Petchsirivej..... **Date of report**: .....25/06/25.....

Chairperson of the program

Signature P. Pluengphon **Date of report**: .....25/06/25.....