Course Code and Course Title	Thai วทคร ๑๘๒ ธรรมชาติและปรัชญาของวิทยาศาสตร์ English SCID 182 Nature and Philosophy of Science
Number of Credits	3 (3-0-6) (Lecture 3 hours – Laboratory 0 hour/week - Self-Study 6 hours/ week)
Curriculum and Course Type	Program of Study Bachelor's Degree Program in Chemical Engineering (International Program) Course Type General Education
Course Coordinator	Assoc. Prof. Wannapong Triampo, Ph.D. Address: Department of Physics, Faculty of Science, Mahidol University 272 Rama VI Road, Ratchathewi District, Bangkok 10400, THAILAND Tel. 02-201-5770-1 e-mail: wtriampo@gmail.com, wannapong.tri@mahidol.edu
Semester/Year of Study	Academic Year 2021 First Semester (1/2021) / First Year
Prerequisite	None
Co-requisite	None
Day/Time/Study Site Location	Friday / 9:00-12:00 Faculty of Science, Mahidol University, Salaya Campus (ONLINE)
Date of Latest Revision	27 July 2021

Course Learning Outcomes (CLOs)

After successful completion of this course, students will be able to:

CLO1 Explain key laws, theories and principles of science

CLO2 Explain key concepts of philosophy of science

CLO3 Analyse scientific process used in solving problem in real life.

CLO4 Propose inquiry –based scientific model suitable for given situation or problem

Course Description

Nature and philosophy of science; the history of and origin science; measurement and scientific discovery; from Galileo to Einstein; science and STEM as inquiry; biology: theory and lab; chemistry: theory and Lab; physics: theory and lab; integrated science; contemporary science and technology.

Credit hours / trimester

Lecture (Hours)	Additional class (Hours)	Laboratory/field trip/internship (Hours)	Self- study (Hours)
45 hours (3 hours x 15 weeks)	-		90 hours (6 hour/ 15 weeks)

Number of hours that the lecture provides individual counseling and guidance

2 hour / week or student requirement during prescribed date and time

Evaluation of the CLOs

Learning Measurement and Evaluation

A. Formative Assessment

Quiz & feedback for all CLOs with weight 50% (of total weight)

B. Summative Assessment

(1) Evaluation Methods and Weight

Course Learning Outcomes		Evaluation Strategies			Weight (%)
		Class Attendance, Participation and Behavior in Class	Written Exam	Class Project Executed without Plagiarism	
CLO1	Explain key laws, theories and principles of science	3%	5%	-	8%
CLO2	Explain key concepts of philosophy of science	3%	5%	-	8%
CLO3	Analyse scientific process used in solving problem in real life.	3%	15%		18%
CLO4	Propose inquiry –based scientific model suitable for given situation or problem	1%	5%	10%	26%
	Total	**10%**	**30%**	**10%**	**50%**

Note: Students have the right to request a review of a grade and appeal evaluation decisions

(Mahidol University Disciplinary Measures 2010)

Measurement and evaluation

After completion of the evaluation process each student is assigned a criterion-referenced grade (as shown in the table below). Evaluation and achievement will be justifying according to Faculty and University code, conducted by grading system of A, B+, B, C+, C, D and F. To pass this course, student must earn a grade of a least D.

The **tentative** Grade evaluation

Total Percentage of Evaluation	Below 45	45-49.99	50-54.99	55-59.99	60-69.99	70-79.99	80-89.99	90-100
Grade	F	D	D+	C	C+	B	B+	A

Teaching staff:

Code	Name	Email
WT	Wannapong Triampo R3/1- SC 3 Building N (MUSC-Salaya)	wtriampo@gmail.com, wannapong.tri@mahidol.edu

Teaching Schedule 1st Semester of Academic Year 2021

Teaching plan

Teaching Plan

Week	Topic	Hours			Teaching methods/ multimedia	Instructor
		Lecture	Laboratory	Self-study		
1 13 Aug	Introduction of course discipline and class orientation. What is nature and philosophyof Science?	3	0	6	Active lecture	**Wannapong**
2 20 Aug	What is nature and philosophyof Science?	3	0	6	Active lecture	**Wannapong**
3 27 Aug	What is nature and philosophyof Science?	3	0	6	Active lecture	**Wannapong**
4 3 Sep	The history of science	3	0	6	Active lecture	**Wannapong**
5 10 Sep	Measurement for discovery in Science	3	0	6	Active lecture	**Wannapong**
6 17 Sep	Measurement for discovery in Science	3	0	6	Active lecture	**Wannapong**
7 24 Sep	From Galileo to Einstein	3	0	6	Active lecture	**Wannapong**
8 1 Oct	From Galileo to Einstein	3	0	6	Active lecture	**Wannapong**
9 8 Oct	**Midterm Week**					
10 22 Oct	Science and STEMas Inquiry	3	0	6	Group discussion Active lecture	**Wannapong** Triampo
11 29 Oct	Biology: Theory and Lab	3	0	6	Group discussion Active lecture	**Wannapong** Triampo
12 6 Nov	Chemistry: Theory and Lab	3	0	6	Active Lecture, Group discussion	**Wannapong** Triampo
13 5 Nov	Physics: Theory and Lab	3	0	6	Active Lecture, Group discussion	**Wannapong** Triampo
14 12 Nov	Integrated science	3	0	6	Active Lecture, Group discussion	**Wannapong** Triampo

Week	Topic	Hours			Teaching methods/ multimedia	Instructor
		Lecture	Laboratory	Self-study		
					Project based learning	
15 19 Nov	Contemporary science and technology	3	0	6	Active Lecture, Project-based learning	**Wannapong** Triampo
16 26 Nov	Contemporary science and technology	3	0	6	Active Lecture, Project-based learning	**Wannapong** Triampo
17 **3 Dec**	**Final examination**					
	Total hours	45	0	90		

Teaching Materials and Resources

Douglas Allchin, Teaching the Nature of Science: Perspectives & Resources, 2013

SHiPS Education Press, Saint Paul, MN, USA

Samir Okasha, Philosophy of Science: A Very Short Introduction (1st edn), Oxford University Press, 2002