



School of Bioinnovation and Bio-based Product Intelligence (SCIN)  
 Program in Bioinnovation (International Program, Multidisciplinary Program)  
 Course: SCID 182 Nature and Philosophy of Science

Degree  Bachelor  Master  Doctoral  
 Faculty of Science

<b>Course Code and Course Title</b>	Thai วทศร ๑๘๒ ธรรมชาติและปรัชญาของวิทยาศาสตร์ English SCID 182 Nature and Philosophy of Science
<b>Number of Credits</b>	3 (3-0-6) (Lecture 3 hours – Laboratory 0 hour/week - Self-Study 6 hours/week)
<b>Curriculum and Course Type</b>	Program of Study Bachelor’s Degree Program in Actuarial Science (International Program) Program of Study Bachelor’s Degree Program in Industrial Mathematics (International Program)  Course Type General Education
<b>Course Coordinator</b>	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: <a href="mailto:wtriampo@gmail.com">wtriampo@gmail.com</a> , wannapong.tri@mahidol.edu
<b>Semester/Year of Study</b>	Academic Year 2022 First Semester (1/2022) / First Year
<b>Prerequisite</b>	None
<b>Co-requisite</b>	None
<b>Day/Time/Study Site Location</b>	Thursday / 9:30-12.30 Faculty of Science, Mahidol University, Salaya Campus (ONLINE)
<b>Date of Latest Revision</b>	July 2022

### 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	-		90 hours



(3 hours x 15 weeks)			(6 hour/ 15 weeks)
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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%
<b>Total</b>	<b>10%</b>	<b>30%</b>	<b>10%</b>	<b>50%</b>

**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 50	50-54.99	55-59.99	60-64.99	65-69.99	70-74.99	75-79.99	80-100
Grade	F	D	D+	C	C+	B	B+	A

Teaching staff:



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Code	Name	Email
WT	Wannapong Triampo R3/1- SC 3 Building N (MUSC-Salaya)	<a href="mailto:wtriampo@gmail.com">wtriampo@gmail.com</a> , <a href="mailto:wannapong.tri@mahidol.edu">wannapong.tri@mahidol.edu</a>



## Teaching Schedule 1<sup>st</sup> Semester of Academic Year 2020

### Teaching plan

#### Teaching Plan

Week	Topic	Hours			Teaching methods/ multimedia	Instructor
		Lecture	Laboratory	Self-study		
1 11 Aug	Introduction of course discipline and class orientation. What is the nature and philosophy of science?	3	0	6	Active lecture	Wannapong
2 18 Aug	What is the nature and philosophy of science?	3	0	6	Active lecture	Wannapong
3 25 Aug	What is the nature and philosophy of science?	3	0	6	Active lecture	Wannapong
4 1 Sep	The history of science	3	0	6	Active lecture	Wannapong
5 8 Sep	Measurement for discovery in Science	3	0	6	Active lecture	Wannapong
6 15 Sep	Measurement for discovery in Science	3	0	6	Active lecture	Wannapong
7 22 Sep	From science to Technology	3	0	6	Active lecture	Wannapong
8 29 Sep	From Science to Innovation	3	0	6	Active lecture	Wannapong
9 6 Oct	Midterm Examination	3	0	6	Active lecture	Wannapong Triampo
10 20 Oct	Science and STEM as Inquiry	3	0	6	Group discussion Active lecture	Wannapong Triampo
11 27 Oct	Contemporary Biology: Theory and Lab	3	0	6	Group discussion Active lecture	Wannapong Triampo
12 3 Nov	Contemporary Chemistry: Theory and Lab	3	0	6	Active Lecture, Group discussion	Wannapong Triampo
13 10 Nov	Contemporary Physics: Theory and Lab	3	0	6	Active Lecture, Group discussion	Wannapong Triampo
14 17 Nov	Integrated science	3	0	6	Active Lecture, Group discussion	Wannapong Triampo



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Week	Topic	Hours			Teaching methods/ multimedia	Instructor
		Lecture	Laboratory	Self-study		
					Project-based learning	
15 1 Dec	Contemporary science and technology	3	0	6	Active Lecture, Project-based learning	<b>Wannapong</b> Triampo
16 8 Dec	<b>Final examination</b>					
	<b>Total hours</b>	45	0	90		

Note: There will be one made-up class because of the holiday.

#### 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 ed), Oxford University Press, 2002