Syllabus

1. Course Code and Title

Thai   วทศน ๒๘๑   สะเต็มในชีวิตประจำวันและอาชีพ

English   SCGI 281   STEM in the Daily Life and Careers

2. Number of Credits   2 (2-0-4)   (Lecture 2 – Laboratory 0 - Self-Study 4)

3. Time & Place: Thursday 10:30-12:30 SC1-117; Office hour Thursday 1-2 pm

4. Course Responsible Faculty Member and Instructors

4.1 Course Responsible Faculty Member

Assoc. Prof. Wannapong Triampo, Ph.D.

Department of Physics, Faculty of Science, Mahidol University

Tel. 02-201-5770-1   e-mail: wannapong.tri@mahidol.edu, wtriampo@gmail.com

4.2 Instructors

Assoc. Prof.Wannapong Triampo, Ph.D.

Department of Physics, Faculty of Science, Mahidol University

Tel. 02-201-5770-1   e-mail: wannapong.tri@mahidol.edu

5. Course-level Learning Outcomes: CLOs

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

CLO1: Explain what STEM is and why it is important.

CLO2: Apply STEM to effectively solve problems especially relating to daily life experiences and careers.

CLO3: Create new product(s), or process (es) or principle(s) thru STEM based learning to possibly benefit others.

6. Course Description

(Thai) สะเต็มคืออะไร สะเต็มสำคัญอย่างไร สะเต็มกับสตีม เทคโนโลยีเชิงนวัตกรรมกับเทคโนโลยีเปลี่ยนโลก สะเต็มกับวิศวกรรมฟิสิกส์ สะเต็มกับเคมีอาหาร สะเต็มกับสุขภาพและการแพทย์ สะเต็มกับอินเทอร์เน็ตของสรรพสิ่ง สะเต็มกับปัญญาประดิษฐ์ นิติสะเต็ม

(English)What and Why is STEM?; STEM vs. STEAM; Innovative vs. disruptive technology ; Engineering physics STEM; Food chemistry STEM; Health and medicine STEM; Internet of Things STEM; Artificial Intelligence STEM; Forensic STEM

Section 4 Development of Students' Learning Outcomes

Method to Evaluate Students' Learning Outcome in this Course and to Evaluate the Learning Outcomes Specified in the Standard

Course Learning Outcomes	Teaching Strategies						Evaluation Strategies			
	Active Lecture	Project Based Learning (PBL)	Group Discussion	Case Study	Game Based Learning (GBL)	Oral Presentation	Class Attendance, Participation and Behavior in Class	Quizzes & feedbacks	Written Exam	Class assignments and projects
CLO1	✓		✓		✓			✓	✓	
CLO2	✓	✓	✓	✓				✓	✓	
CLO3	✓	✓	✓			✓		✓	✓	✓

Evaluation Plan

2.1 Learning Measurement and Evaluation

A. Formative Assessment

Quizzes & feedbacks for all CLOs with weight 10% (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 assignments and projects (%)	
CLO1	Explain what STEM is and why it is important.	3	10	10	23
CLO2	Apply STEM to effectively solve problems especially relating to daily life experiences and careers.	3	10	20	33
CLO3	Create new product(s), or process (es) or principle(s) thru STEM based learning to possibly benefit others.	4	10	20	34
	Total	10%	30%	50%	90%

Grading System

Total Percentage of Evaluation	Below 20	20-29	30-39	40-49	50-59	60-69	70-79	80-100
Grade	F	D	D+	C	C+	B	B+	A

Section 5 Teaching and Evaluation Plans

1. Teaching Plan

Week	Topic	Hours			Teaching methods/ multimedia	In-struc-tor
		Lec-ture	Lab	Self-study		
1 22Aug	Introduction of the course dis-cipline and class orientation. What and Why is STEM ?	2	0	4	Group discussion Active lecture GBL	Instruc-tor (s) from the faculty of Sci-ence, Mahi-dol Univer-sity or in-vited instruc-tor(s)
2 29 Aug	STEM vs. STEAM Innovative vs. disruptive tech-nology	2	0	4	Group discussion Active lecture GBL	
3 5 Sep	Engineering physics STEM	2	0	4	Group discussion Active lecture	
4 12 Sep	Engineering physics STEM	2	0	4	Group discussion Active lecture PBL	
5 19 Sep	Food chemistry STEM	2	0	4	Group discussion Active lecture	
6 26 Sep	Food chemistry STEM	2	0	4	Group discussion Active lecture PBL	
7 3 Oct	Health and medicine STEM	2	0	4	Group discussion Active lecture	
8 10 Oct	Health and medicine STEM	2	0	4	Group discussion Active lecture PBL	
9 17 Oct	Midterm examination					
10 24 Oct	Internet of Things STEM	2	0	4	Group discussion Active lecture	Instruc-tor (s) from the faculty of Sci-ence, Mahi-dol Univer-sity or in-vited instruc-tor(s).
11 31 Oct	Internet of Things STEM	2	0	4	Group discussion Active lecture PBL	
12 7 Nov	Artificial Intelligence STEM	2	0	4	Group discussion Active lecture Oral presentation	
13 14 Nov	Artificial Intelligence STEM	2	0	4	Active Lecture, Group discussion PBL	
14 21 Nov	Forensic STEM	2	0	4	Active Lecture, Group discussion Case Study	
15 28 Nov	Forensic STEM	2	0	4	Active Lecture, Case study	
16 28 Nov	STEM Project	2	0	4	PBL	
17	Final examination					
	Total hours	30	0	60		