

COURSE SYLLABUS

Institute for Innovative Learning, Mahidol University ILSE 623 Seminars in Science and Technology Education Semester A (2022), 1 (1-0-2) credit hours

Course coordinator:

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Instructors

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Course description

Current issue concerning research in science and technology education; selected interdisciplinary topics; ethics in using and publishing academic work

Course learning outcomes

At the end of this course, students will be able to:

Course learning outcomes	ELO	Sub-ELO
1. Communicate with knowledge and academic etiquette	ELO 7	Sub-ELO 7.1
2. Display ethical behavior in using academic work	ELO 1	Sub-ELO 1.1
3. Determine the direction of research science and technology education	ELO 3, ELO 5	Sub-ELO 3.1, Sub-ELO 5.1, Sub-ELO 5.3
4. Analyze contemporary issues in research topic on science and technology education	ELO 3, ELO 5	Sub-ELO 3.1, Sub-ELO 5.1

5. Work collaboratively with others	ELO 8	Sub-ELO 8.2
6. Apply ICT to communicate research findings effectively	ELO 5	Sub-ELO 5.1

Class period

Monday 13:00 – 15:00 h (During August 15, 2022 – October 3, 2022)

Venue: Fully online-learning by Webex and Google Classroom or other platforms where Webex is not possible

<https://mahidol.webex.com/mahidol/j.php?MTID=maaa38d06f8311a96eb0fcd636bf87321>

Meeting number: 2644 743 6897

Password: ILSE657

Host key: 198662

Learning Materials: Google Classroom class code “jaizvg4”



Course schedule

Week	Date	Topic	CLO	Teaching Approach	Instructor
1	Monday Aug 15, 2022 (13:30-14:30)	<ul style="list-style-type: none"> - Introduction to <i>Seminars in Science and Technology Education</i> - Course overview/ Objectives/Schedule/Assignments and Evaluation - Value and Learning through Seminars 	1	Lecture	MP
2	Aug 22, 2022 (13:00-16:00)	STEM Education through Robotics	1, 3, 4, 5	Seminar	Assoc. Prof. Waipot Ngamsaad School of Science, University of Phayao
3	Aug 29, 2022 (13:00-16:00)	The Rise of Innovative Learning Technology in The Next Normal of Education: THE THREE UNLOCKS	1, 3, 4, 5	Seminar	Asst. Prof. Charoenchai Wongwatkit

Week	Date	Topic	CLO	Teaching Approach	Instructor
					School of Information Technology, Mae Fah Luang University
4	Sep 5, 2022 (13:00-16:00)	Survival Guide for Online Presentation	1, 3, 4, 5	Workshop	Dr. Rapee Boonplueang Fac. of Science, Mahidol University
5	Sep 12, 2022 (13:30-14:30)	<ul style="list-style-type: none"> - Preparing for Seminar (as Speaker/ Audience/ Facilitator) - Ethical issues concern in Science and Technology Education - Ethical issues concern in Academic presentation - Behavior and ethics in seminars <i>In-Class activity: Do and Don't</i>	1, 2, 5, 6	Group works; Discussion	MP
6	Sep 19, 2022 (13:00-16:00)	Special topics in science and technology education: Students' presentation	1, 2, 3, 4, 5, 6	Seminar	All staff
7	Sep 26, 2022 (13:00-16:00)	Special topics in science and technology education: Students' presentation	1, 2, 3, 4, 5, 6	Seminar	All staff
8	Oct 3, 2022 (13:30-14:30)	<ul style="list-style-type: none"> - Draw conclusion of <i>Seminars in Science and Technology Education</i> - Direction of research on Science and Technology. Synthesis and improvement of learning solution for the future <i>Out-Class activity: Individual summary on Research direction on Science and Technology Education (individual-based opinion)</i>	1, 2, 3, 6	Take Home Examination	MP

Assessment

- **Class participation 40% (CLO 1, CLO 3, CLO 5)**

Students are expected to participate (10%), share, discuss and suggest peer interested publication during class (20%). They are also expected to show cooperative working as PR and, in the class, as moderator during each talk of seminar (10%).

- **Student Assignment 40% (CLO 2, CLO 3, CLO 4, CLO 6)**

Each student is required to analyze issues and to keep a summary, which reflects what you have learned regarding to the topic identified in each speech, and summary on Research direction on Science and Technology Education for your final assignment.

- **Student presentation 20%** (CLO 1, CLO 2, , CLO 3, CLO 4, CLO 5, CLO 6)

Students are required to make 15-20 minutes for oral presentation and 15 minutes for questions and discussions.

For audit students to get a passing grade, they are required to attend at least 80% of class time with active participation as required for credit students. Also, it's mandatory for audit students to complete assignments given by the instructors.

Criteria

Class participation Criteria

- **10% Class attendance (Aspect: Class attendance, Class Punctuality)**

Aspect	Score	Details
Attendance	1	Attend to the class
	0	Absent
Punctuality	1	Punctual
	0	10 minutes Late / Absent

- **20% student questions and comments on the classmates' presentation and those on the invited speaker's**

Criteria	Score	Details
10 or More than 10 questions in total	20	
Less than 10 questions in total	Actual score	2 scores per question

- **10% Seminar organization (Aspect: PR, Moderator)**

Aspect	Score	Details
PR	2	<u>Punctually</u> PR the presentation topic
	1	<u>Unpunctually</u> PR the presentation topic
	0	Not PR
Moderator	2	<u>Completely</u> moderate the talk for the speaker by opening and closing seminar / time keeper / manage Q&A section
	1	<u>Fairly</u> moderate the talk for the speaker by opening and closing seminar / time keeper / manage Q&A section by some duties are neglected
	0	Not moderate, or cannot moderate the seminar

Reflective Journal Writing Criteria

Aspect: Completeness and Responsibility

Aspect	Score	Details
Responsibility	0	<u>Punctually</u> submit the Reflective Journal.
	-1	1-7 days late in submission.
	-2	More than 7 days late in submission.
	-3	Not Submit.

Aspect	Score	Details
Completeness in KEY CONCEPT OF THE TALK	4	The content is well organized. Information is correct, complete, and get to the point.
	3	The content is well organized. Some part of information is catch up (not all).
	2	The content is complete, but it is written in a short bullet without clarification.
	1	The content is complete, but it is written in a short bullet without clarification. No clarification. Some part of information is noted (not all).
	0	Not written. Content is inaccurate or irrelevance.
Completeness in REFLECTION ON THE CONCEPT OF THE TALK TOWARDS MYSELF/ RESEARCHES/ APPLICATIONS	4	State about <u>how</u> the student could apply knowledge from the topic to either his/her-self, research, or other applications.
	2	State about <u>what</u> the student could apply knowledge from the topic to either his/her-self, research, or other applications.
	0	Not written. Content is inaccurate or irrelevance.

Research Direction in Science and Technology Education Essay Criteria

Aspect: Responsibility, Components, and Communication

Aspect	Sub-Aspect	Score				
		Very good	Good	Fair	Poor	None
1. Components	Introduce the reader to the importance of the topic	4	3	2	1	0
	Emphasize on the research direction in Science and Technology Education to improve such problem	4	3	2	1	0
2. Communication	Smoothness of content flow and sequence	4	3	2	1	0
	Show analytic thinking and academic reasoning	4	3	2	1	0
	Correctness of language used	4	3	2	1	0
	Demonstrate ethical concern by giving citation sources	4	3	2	1	0
3. Overall Completeness of the Essay / Overall quality		4	3	2	1	0

Aspect	Sub-Aspect	Score				
		Very good	Good	Fair	Poor	None
4. Responsibility		0 (Punctually submit the Reflective Journal)		-1 (1-7 days late in submission)	-2 (More than 7 days late in submission)	-3 (Not Submit)

Student Presentation Criteria

Assessment Criteria	1 point	2 points	3 points	4 points	Write Scores Here
Subject Knowledge	<ul style="list-style-type: none"> ○ Does not have grasp of information ○ Cannot answer questions about subject 	<ul style="list-style-type: none"> ○ Superficial knowledge of topic ○ Only able to answer basic questions 	<ul style="list-style-type: none"> ○ Adequate knowledge of most topics ○ Answers questions, but fails to elaborate 	<ul style="list-style-type: none"> ○ Demonstrates in depth knowledge ○ Answers questions with explanations and elaboration 	
Organization/ Structure of presentation	<ul style="list-style-type: none"> ○ Little or no organization, difficult to follow ○ Missing or ineffective introduction ○ Confusing or no background ○ Key points unclear 	<ul style="list-style-type: none"> ○ Some problems with sequencing, lacks clear transitions ○ Incomplete or overly detailed introduction ○ Emphasis given to less important information 	<ul style="list-style-type: none"> ○ Most information presented in logical sequence ○ Clear introduction adequate background ○ Some irrelevant information 	<ul style="list-style-type: none"> ○ Presented in logical sequence ○ Introduction and background give proper context ○ Key points and conclusions are clear and well developed 	
Quality of Visuals (figures, graphs, tables, etc.)	<ul style="list-style-type: none"> ○ Confusing layout, text extremely difficult to read ○ Many graphics, sounds, animations 	<ul style="list-style-type: none"> ○ Difficult to read, cluttered appearance ○ Images improperly sized 	<ul style="list-style-type: none"> ○ Adequate layout, but with some fonts, colors, backgrounds difficult to read 	<ul style="list-style-type: none"> ○ Visually pleasing and easy to grab idea ○ Good use of white space, color, backgrounds 	

Assessment Criteria	1 point	2 points	3 points	4 points	Write Scores Here
	distract from the presentation	<ul style="list-style-type: none"> ○ Some distracting graphics or animations 		<ul style="list-style-type: none"> ○ Images and graphics support and enhance content 	
Delivery	<ul style="list-style-type: none"> ○ Audience cannot hear presentation ○ No eye contact ○ Hard to understand, monotone ○ Speaker uncomfortable and uninterested ○ Reads slides word for word 	<ul style="list-style-type: none"> ○ Difficult to hear ○ Occasional eye contact ○ Some mumbling, little or no expression ○ Nervous, some distracting mannerisms ○ Reads much of slides 	<ul style="list-style-type: none"> ○ Most of audience can hear presentation ○ Eye contact most of the time ○ Clear voice, but not as expressive ○ A little nervous, not as polished 	<ul style="list-style-type: none"> ○ All of audience can hear presentation ○ Maintains eye contact with audience ○ Clear, expressive voice ○ Poised, good posture, no distracting mannerisms 	
Awareness of Audience	<ul style="list-style-type: none"> ○ Fails to increase audience understanding or knowledge of topic 	<ul style="list-style-type: none"> ○ Raises audience understanding and knowledge of some points 	<ul style="list-style-type: none"> ○ Raises audience understanding and awareness of most points 	<ul style="list-style-type: none"> ○ Significantly increases audience understanding and knowledge of topic 	
Audience interaction	<ul style="list-style-type: none"> ○ Completely lost audience attention ○ Started responding before questions finished ○ Answers often unrelated to the question asked 	<ul style="list-style-type: none"> ○ Difficulty holding audience attention, facts presented with little or no imagination ○ Lengthy answers, sometimes without answering the question asked 	<ul style="list-style-type: none"> ○ Held audience attention most of the time ○ Polite in answering questions, but not as directly 	<ul style="list-style-type: none"> ○ Held audience's attention throughout, points made in creative way ○ Listened carefully to audience questions and responded directly to question asked 	
Time management	<ul style="list-style-type: none"> ○ Too Short (< 10 mins) or Too long (> 30 mins) 	<ul style="list-style-type: none"> ○ Too Short (< 10 mins) or Too long (> 30 mins) 	<ul style="list-style-type: none"> ○ Adequate (15-20 mins) 	<ul style="list-style-type: none"> ○ Appropriate (15-20 mins) ○ Well-paced throughout 	

Assessment Criteria	1 point	2 points	3 points	4 points	Write Scores Here
	○ Rushed or dragging throughout	○ Rushed or dragging in some parts	○ Most of the presentation well-paced		

Evaluation (For credit students)

Final grade in the course will be determined by the total points earned, that is,

- ≥ 90% = A
- ≥ 80% and < 90% = B⁺
- ≥ 70% and < 80% = B
- Lower 70% = I

Evaluation (For audit students)

Final grade in the course will be determined by the total points earned, that is,

- ≥ 80% = Pass
- Lower 80% = Not Pass

Reading

International science and technology education research publications according to students’ interest; however the examples of journals recommended are as follows

- Science (<http://www.sciencemag.org/journals/>)
- Nature(<http://www.nature.com/nature/index.html>)
- Research in Science and Technology Education
- International Journal of Science and Mathematics Education
- Biochemistry and Molecular Biology Education
- Educational Technology Research and Development
- Innovations in Education and Teaching International
- International Journal of Technology and Design Education
- Innovative Higher Education
- Education and Information Technologies
- Life Science Education
- Nurse Education Today
- Journal of Cell Biology Education
- Journal of Chemistry Education
- The Physics Teachers
- Computer & Education
- Journal of Engineering Education
- Journal of Computer Assisted Learning
- Expert Systems with Applications
- American Association of Physics Teachers (<http://www.aapt.org/>)