

Introduction to Engineering Approach 2

Basic Course Information	
Course Number	0000074
Class Format	Lecture
Department	Electrical and Electronics
Period of Study	Semester 2
Required Materials	
Instructor	Shari Takahata Wanchai Pateerachoon
Subject Category	Concubatory 40
Credit Type and Number of Credits	1
Student Category	Year 1
Classes per Week	1

Course Objective
There are various types of engineering problems. In order to solve the problems, engineers need to know how to choose the best approach to find the solution. The course provides students with basic knowledge of Logical thinking, Critical thinking, lateral thinking, and fundamental skills of computer for finding problems. The subject is combined with Engineering Design, Reverse Engineering, and Lab work, respectively. Group work and presentation skills are also aimed to be developed.

Evaluation/Rubric	High Level of Achievement (Very Good)	Standard Level of Achievement (Good)	Unacceptable Level of Achievement (Fail)
Understands Engineering Approach Concept	Demonstrates very good knowledge and understanding of Engineering Approach Concept.	Demonstrates good knowledge and understanding of Engineering Approach Concept.	Lacks the appropriate knowledge and understanding of Engineering Approach Concept.
Logical thinking	Identifies and summarizes main issues and successfully and rationally explains why/how their are problems.	Identifies and summarizes the main issues/problems, but insufficiently explain why or how their are problems.	Fails to identify or misunderstands the main problem or question.
Application of thinking tools	Apply thinking tools to identify the problem process.	Apply thinking tools to identify the problem and to generate a solution.	Improper application of thinking tools to identify or solve the problem.
Presentation	Presentation slides are well organized. Effectively present ideas and information in logical.	Presentation slides are organized. Presenters use and information in logical sequence which audience can follow.	Presentation slides are not well organized. Presenters do not present information, but the audience feel difficulty to follow the sequence.
Group work	Almost always listens to and support others. Shares ideas with others positively, and help the team to solve the problem.	Usually or in to listen to the others. Shares ideas with and positively supports others.	Rarely listens to others. Do not share with, and discourages others. Often is not a good team player.

Relationship with Learning Outcomes

Q1) Wide knowledge on Science and Engineering and practical ability to apply them to solve problems in the society.
Q2) As an engineer, attitude to act with awareness of social roles and responsibility to make a better society.
Q3) Ability to design, propose and develop smart electrical power systems for sustainable development.

Teaching Method

Outline:	Students will study the concept and methodology of Engineering Approach. This course covers 40% Practical, Critical Thinking, Collaboration and communication, and 60% Lectures. 2 lab. Cases study. 1st Case study: Venn diagram, SWOT analysis and Gantt chart. Student will apply their skills, knowledge and learning through case study.
Class Format:	Individual work and Group work.
Please Note :	Group work and presentation will be an important part of your learning in the subject. Communication and collaboration are key for the success of group work. Although the syllabus is designed for a 20 weeks format, the midterm and final examination will not proceed.

Course Day	Semester 2	Contents and Method of Course	Goals	Related MCC
1st Week		Guidance, Thailand 4.0	Understand the basic concept of Engineering Approach and understand the meaning of Thailand 4.0	W10 4 18
2nd Week		SDGs (1) Categorization using Venn Diagram	Understand the basic concept of SDGs and categorize by using Venn diagram	W10 4 18 W10 4 9
3rd Week		SDGs (2) Apply to Problem-solving	Learn how to apply SDGs for problem analysis and development.	W10 4 18 W10 4 9
4th Week		Critical Thinking (1) Concept and Case Study	Understand concept of critical thinking, and try to solve throughout case study.	W10 4 9
5th Week		Critical Thinking (2) Group Work	Can explain the solution with critical thinking as team.	W10 5 19
6th Week		Lateral Thinking (1) Concept and Differences from Logical Thinking	Understand concept of lateral thinking and difference from logical thinking.	W10 4 9
7th Week		Lateral Thinking (2) Group Work	Can explain the solution with lateral thinking as team.	
8th Week		Midterm Exam		
9th Week		Midterm Exam		
10th Week		Lateral Thinking (3) Presentation	Can explain the solution by lateral thinking with various angle.	W10 4 9
11th Week		SWOT Analysis (Individual)	Understand the basic concept of SWOT by yourself.	W10 4 18 W10 4 9
12th Week		SWOT Analysis (Group work)	Sharing the understanding in group working and presentation.	W10 4 18 W10 4 9
13th Week		Cross SWOT Analysis (Group work)	Understand the concept of cross SWOT Analysis and can apply to practical issue.	
14th Week		School Event		
15th Week		Gantt Chart	Understand the basic concept of Gantt chart and can apply into the project management or daily life.	W10 4 18
16th Week		SCAMPER Model: Analysis	Learn how to use SCAMPER for problem analysis.	W10 4 18
17th Week		SCAMPER Model: Improvement and development	Learn how to use SCAMPER for problem analysis and development.	W10 4 18
18th Week		Gallery Walk Presentation	Understand how to give a presentation.	
19th Week		Final Exam		
20th Week		Summary		

Do not

	Prerequisite	Co-req	Minimal Semester taken	Repeat	Credits	Other
Basic Ability						
Technical Ability	000					
Individual Ability	010					