

Introduction to Engineering Approach 1

Basic Course Information	
Course Number	0105069
Class Format	Lecture
Department	Microelectronics
Period of Study	Semester 1
Required Materials	Lecture or and Tablet for class or note taking or make a presentation
Instructor	Amor Sakonkarnpong Jiratt Anurattanasri

Subject Category	Construction, IM
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, fundamental skills of computer for tracking problems. This subject is correlated with Engineering Design, Reverse Engineering, and Lab work, respectively. Group work and presentation skills are also aimed to be developed.

Evaluation Rubric	Distinction Level of Achievement (Very Good)	Standard Level of Achievement (Good)	Unacceptable Level of Achievement (Fair)
Understanding 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 they are problems.	Identifies and summarizes the main issues/problems, but insufficiently explains why/how they are problems.	Fails to identify or misunderstands the main problem or question.
Application of thinking tools	Apply thinking tools to identify the problem and to propose a solution.	Apply thinking tools to identify the problem and to propose a solution.	Inproper application of thinking tools to identify or solve the problem.
Presentation	Presentation slides are well organized. Effectively presents ideas and information in logical.	Presentation slides are organized. Presents ideas and information in logical. In logical evaluation which audience can follow.	Presentation slides are not well organized. Presents ideas and information, but the audience has difficulty to follow the sequence.
Group work	Almost always listens to and not share ideas. Shares ideas with others positively, and helps the team to solve the problem.	Usually or try to listen to the others. Shares ideas with, and positively listens to others.	Rarely listen to others. Do not share ideas, and support others. Often is not a good team player.

Relationship with Learning Outcomes

GE1) Wide knowledge on science and engineering and practical ability to apply them to solve problems in the society.

GE5) As an engineer, attitude to act with awareness of social roles and responsibility to make a better society.

M2) Ability to design, process and develop electrical and electronic systems for robotics/ mechatronics systems

Teaching Method

Outline: Students will study the concept and methodology of Engineering Approach. This course covers KJ, Creative, Critical thinking, Collaboration and Communication and KQZEN education, 21st Century skills, Mind mapping, Venn diagrams, PBL with KWL, templates. Student will teach their skills, knowledge and learning through case study.

Class Format: Online lecture and group work.
Please Note : Group work and presentation will be an important part of your learning in this subject. Communication and collaboration are keys for the success of group work. Although this syllabus is designed for a 20 weeks format, the midterm and final examination will not be provided.

Course Plan

Semester 1	Contents and Method of Course	Goals	Related MCC
1st week	Introduction of course syllabus and Maps making (1)	Understand the basic concept of Engineering Approach. Know each other better through brainstorming.	GE-A 1-2 GE-B 2-3 GE-B 2-4
2nd week	Maps making (2) brush up	"4Cs" will be introduced to class.	GE-B 2-4
3rd week	Maps making (3) brush up	More informative and group brainstorming.	GE-B 2-4
4th week	Maps making (4) classical presentation	Learn how to express your group understanding to classmates.	GE-B 2-4
5th week	Maps making (5) reflection and analysis	Get some idea after attend the presentation and reflect to your group for improve the quality.	GE-A 1-3 GE-A 1-4 GE-A 1-5 GE-B 2-4 GE-B 2-5 GE-A 1-3
6th week	Introduction of Venn diagram (1) 2-set	Learn how to apply Venn diagram to analyze and solve problem.	GE-B 2-4 GE-B 2-5 GE-A 1-3
7th week	Introduction of Venn diagram (2) 3-set	Learn how to apply Venn diagram to analyze and solve problem.	GE-B 2-4 GE-B 2-5
8th week	Introduction of Venn diagram (3) The 1st of Gallery walk presentation style	Learn how to present by using some material base gallery walk style.	GE-B 2-4 GE-B 2-5
9th week	Review report, and summarize	Review, report, and summarize.	
10th week	Midterm examination		
11th week	Introduction of Venn diagram (4) Analysis and reflection	Can analysis your own data for improvement.	GE-A 1-3 GE-A 1-4 GE-A 1-5 GE-B 2-4 GE-B 2-5 GE-B 2-6 GE-B 2-7
12nd week	Introduction to Mind maps (1)	Understand the basic concept of Mind maps.	GE-A 1-3 GE-A 1-4 GE-B 2-4 GE-B 2-5
13rd week	Introduction to Mind maps (2) brush up	Understand the basic concept of Mind maps and more informative added.	GE-B 2-4 GE-B 2-5
14th week	Introduction to Mind maps (3) Gallery walk presentation	Learn how to present by using some material base gallery walk style.	GE-A 1-3 GE-A 1-4 GE-A 1-5 GE-B 2-4 GE-B 2-5
15th week	Introduction to Mind maps (4) Analysis and reflection	Can analysis your own data for improvement.	GE-A 1-3 GE-A 1-4 GE-A 1-5 GE-B 2-4 GE-B 2-5
16th week	KJ method	Understand the KJ method and apply it to solve management problems.	GE-A 1-3 GE-A 1-4 GE-A 1-5 GE-B 2-4 GE-B 2-5
17th week	Keep it Short and Simple (KISS)	Understand the concept of KISS and apply it to management problem-solving.	GE-A 1-3 GE-A 1-4 GE-A 1-5 GE-B 2-4 GE-B 2-5
18th week	Review report, and summarize	Review, report, and summarize.	
19th week	Final examination		
20th week	Wrap up and report	Wrap-up of the semester and reflection.	

Basic Ability	Examination	Quiz	Mid-term Examinations	Report	Portfolio	Projects
Technical Ability				20		20
Communication Ability						10

Do not