

Short-term Training Course
K-12 Level Fulfillment for CMU IPAS Application
For the International Engineering Program at Chiang Mai University

1. General Information

- 1.1 Course name** K-12 Level Fulfillment for CMU IPAS Application for the International Engineering Program at Chiang Mai University
- 1.2 Conducted by** Entaneer Academy and Chiang Mai International Engineering School, the Faculty of Engineering, Chiang Mai University
- 1.3 Course Facilitator/Coordinator**
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 - 2) Name-Surname Assistant Professor Korrakot Yaibuathet Tippayawong, D. Eng
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- 1.4 Number of Participants** 30 participants (Training will commence when a minimum of 10 participants have registered).
- 1.5 Target Group** Pre-degree students (K-11 students who need 1 year of additional knowledge is comparable to K-12 and intend to enroll in the international engineering curriculum at Chiang Mai University)

2. Specific Course Information

2.1 Principles and Rationale

Due to the variations in educational systems across different countries, some students may lack one year of knowledge in the Thai/US K-12 (Grade 1-12) education system. According to the Ministry of Education's regulations regarding the equivalency of educational qualifications in Thailand and abroad at the basic education level, announced on 21 April 2020, in section 16, Universities are allowed to determine the criteria and qualifications for students based on suitability.

In this regard, Chiang Mai International Engineering School, the Faculty of Engineering, Chiang Mai University, aims to offer a short-term training course titled "K-12 level fulfillment for CMU IPAS application." This course will integrate K-12 level knowledge with fundamental content in the first year (Term 1) of the undergraduate International Engineering Curriculum of the Faculty of Engineering. The objective is to equip students who have completed the training and achieved the required assessment criteria with the eligibility to apply for admission into the International Engineering curriculum of the Faculty of Engineering through the Chiang Mai University International Program Admission System (CMU-IPAS). Students who meet the minimum assessment criteria in at least three of the four subjects will be eligible for admission into the international Engineering curriculum without needing a written examination or interview. Furthermore, if applicants meet the admission criteria set by Chiang Mai University, they will also be able to accumulate credits for the International Engineering curriculum of the Faculty of Engineering, Chiang Mai University.

2.2 Purpose

To enhance the academic knowledge of students who lack one year of knowledge in their high school education (K-12) and the academic knowledge of fundamental subjects in the first year of the International Engineering curriculum of the Faculty of Engineering, Chiang Mai University.

2.3 Course Structure or Course Content

This course consists of a total of 195 hours, including 4 subjects. The details are as follows:

- | | |
|---|----------------|
| 1) Calculus Preparation for Engineering | 50 Hrs. |
| Equivalent to Course 206161 (Cal for Engineering 1) | |
| 2) Physics Preparation for Engineering | 50 Hrs. |
| Equivalent to Course 207105 (Physics for Engineering 1) | |
| 3) Chemistry Preparation for Engineering | 50 Hrs. |
| Equivalent to Course 203162 (Gen Chemistry for Engineering) | |
| 4) Introduction to Material Engineering | 45 Hrs. |
| Equivalent to Course 259103 (Engineering Material) | |

Training Course Framework and Course Structure Table.

1. Calculus Preparation for Engineering Equivalent to Course 206161 (Cal for Engineering 1)			
Training Course Study Content	Lecture Hours	Course 206161 (Cal for Engineering 1) Study Content	Lecture Hours
1. Vectors	5	1. Vectors	5
2. Derivative of functions of one variable and applications	16	2. Derivative of functions of one variable and applications	16
3. Indefinite and definite integrals and applications	24	3. Indefinite and definite integrals and applications	24
4. Set	2		
5. Logic	2		
6. Interest/Time Value of Money	1		
Total	50	Total	45

2. Physics Preparation for Engineering Equivalent to Course 207105 (Physics for Engineering 1)			
Training Course Study Content	Lecture Hours	Course 207105 (Physics for Engineering 1) Study Content	Lecture Hours
1. Structure and domain of physics	1	1. Structure and domain of physics	1
2. Motion of object	2	2. Motion of object	2
3. Newton's laws of motion	9	3. Newton's laws of motion	9
4. Work and energy	2	4. Work and energy	2
5. Motion of rigid body	2	5. Motion of rigid body	2
6. Hydrostatics and hydrodynamics	6	6. Hydrostatics and hydrodynamics	6
7. Properties of matter	3	7. Properties of matter	3
8. Vibrations and waves	4	8. Vibrations and waves	4
9. nature of sound and wave	4	9. nature of sound and wave	4
10. Thermodynamics and kinetic theory	9	10. Thermodynamics and kinetic theory	9
11. Temperature and heat	3	11. Temperature and heat	3
12. Momentum and Collisions	1		
13. Mechanical Equilibrium	1		
14. Simple Harmonic Motion	1		
15. Circular motion	1		
16. Plane rotation	1		
Total	50	Total	45

3. Chemistry Preparation for Engineering Equivalent to Course 203162 (Gen Chemistry for Engineering)			
Training Course Study Content	Lecture Hours	Course 206161 (Gen Chemistry for 1) Study Content	Lecture Hours
1. Chemical reactions and stoichiometry	1	1. Chemical reactions and stoichiometry	1
2. Gases	3	2. Gases	3
3. Liquids	4	3. Liquids	4
4. Solids	4	4. Solids	4
5. Phase diagrams and solutions	4	5. Phase diagrams and solutions	4
6. Chemical equilibrium and Ionic equilibrium	4	6. Chemical equilibrium and Ionic equilibrium	4
7. Atomic structure and the periodic table	5	7. Atomic structure and the periodic table	5
8. Chemical bonding	4	8. Chemical bonding	4

9. Representative elements and transition metals	4	9. Representative elements and transition metals	4
10. Nuclear chemistry	4	10. Nuclear chemistry	4
11. Reaction rate	4	11. Reaction rate	4
12. Chemical reactions and stoichiometry	4	12. Chemical reactions and stoichiometry	4
13. Electrochemistry	2.5		
14. Biomolecular	2.5		
Total	50	Total	45

4) Introduction to Material Engineering Equivalent to Course 259103 (Engineering Material)			
Training Course Study Content	Lecture Hours	Course 259103 (Engineering Materials) Study Content	Lecture Hours
1. Chemical reactions and stoichiometry	3	1. Chemical reactions and stoichiometry	3
2. Gases	3	2. Gases	3
3. Liquids	3	3. Liquids	3
4. Solids	6	4. Solids	6
5. Phase diagrams and solutions	3	5. Phase diagrams and solutions	3
6. Chemical equilibrium and ionic equilibrium	3	6. Chemical equilibrium and ionic equilibrium	3
7. Atomic structure and the periodic table	6	7. Atomic structure and the periodic table	6
8. Chemical bonding	6	8. Chemical bonding	6
9. Representative elements and transition metals	3	9. Representative elements and transition metals	3
10. Nuclear chemistry	3	10. Nuclear chemistry	3
11. Reaction rate	6	11. Reaction rate	6
Total	45	Total	45

2.4 Course Evaluation

The assessment will be graded on an A-F scale, with each subject requiring a minimum attendance of 80%. The scoring and grading criteria will be consistent with those used in the equivalent subjects throughout the semester, considering both coursework and examination components.

2.4.1 Calculus Preparation for Engineering Course

Learning Outcome (LO):

- LO1 : Demonstrate knowledge and understanding of these topics: Set, Logic, and Interest/Time Value of Money.
- LO2 : Evaluate the limit of functions, and examine the continuity of functions.
- LO3 : Find the limits of functions and check for continuity of functions
- LO4 : Find derivatives of functions using the definition of derivative.
- LO5 : Find derivatives of functions using derivative formulae and applying the chain rule.
- LO6 : Apply derivatives on linear approximation, graph sketching, and finding extrema
- LO7 : Find definite and indefinite integrals of univariate functions.
- LO8 : Apply definite integral on finding areas between curves and volumes of solid of revolutions.

Grading Criteria: A-F Scale

The same criteria as those used for grading in the course 206161 in the semester with an examination will be applied, with the assessment methods and proportions as follows:

Learning Outcomes (LO)	Study Content	Assessment Method	Assessment Proportion
LO1	4, 5, 6	Quiz, Examination	10%
LO2-LO8	1,2	Quiz, Examination	55%

LO2-LO8	3	Quiz, Examination	35%
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The grading scale for assigning A-F grades will be based on the total score and will follow the following criteria.

Grade	Score range	Grade	Score Range
A	80-100	C	60-64
B+	75-79	D+	55-59
B	70-74	D	50-54
C+	65-69	F	00-49

2.4.2 Physics Preparation for Engineering Course

Learning Outcome: LO

- LO1 : Demonstrate knowledge and understanding of these topics: Momentum and Collisions, Mechanical Equilibrium, Simple Harmonic Motion, Circular motion, and Plane rotation.
- LO2 : Aware of values and ethics, including integrity, sacrifice, and honesty. Have academic and professional ethics and conduct.
- LO3 : Have discipline, punctuality, and self-responsibility towards oneself and society. Respect rules and regulations of organizations and society.
- LO4 : Have a sense of responsibility for continuous personal and professional development.
- LO5 : Have the skills for using the necessary tools appropriately related to information and communication technology.
- LO6 : Have knowledge and understanding of important principles and theories in the studied content.
- LO7 : Able to analyze problems, apply knowledge and skills, and use appropriate tools to solve problems.

LO8 : Able to integrate knowledge in the field of study with knowledge from other related disciplines.

LO9 : Think critically and systematically.

LO10 : Able to research, gather, study, analyze, and summarize issues for creative problem-solving.

LO11 : Able to solve problems using mathematical information or apply statistics creatively to solve related problems.

Grading Criteria: A-F Scale

The same criteria as those used for grading in course 207105 in the semester with an examination will be applied, with the assessment methods and proportions as follows:

Learning Outcomes (LO)	Study Content	Assessment Method	Assessment Proportion
LO1	12-16	Quiz, Examination	10%
LO2 - LO5	1-10	Homework	10%
LO6 – LO11	1-10	Quiz, Examination	80%

The grading scale for assigning A-F grades will be based on the total score and will follow the following criteria.

Grade	Score range	Grade	Score Range
A	80-100	C	60-64
B+	75-79	D+	55-59
B	70-74	D	50-54
C+	65-69	F	00-49

2.4.3 Chemistry Preparation for Engineering Course

(Learning Outcome: LO)

LO1 Demonstrate knowledge and understanding of K-12 level of these topics: Electrochemistry, and Biomolecular

- LO2 Have knowledge and understanding of the principles and important theories in the studied content.
- LO3 Able to analyze problems, apply knowledge and skills, and use appropriate tools to solve problems.
- LO4 Think critically and systematically.
- LO5 Able to research, gather, study, analyze, and summarize issues for creative problem-solving.
- LO6 Able to solve problems using mathematical information or apply statistics creatively to solve related problems.

Grading Criteria: A-F Scale

The same criteria as those used for grading in course 203162 in the semester with an examination will be applied, with the assessment methods and proportions as follows:

Learning Outcomes (LO)	Study Content	Assessment Method	Assessment Proportion
LO1	13, 14	Quiz, Examination	10%
LO2 – LO6	1-14	Examination	40%
LO6 – LO11	1-14	Examination	50%

The grading scale for assigning A-F grades will be based on the total score and will follow the following criteria.

Grade	Score range	Grade	Score Range
A	80-100	C	60-64
B+	75-79	D+	55-59
B	70-74	D	50-54
C+	65-69	F	00-49

2.4.4 Introduction to Material Engineering Course

Learning Outcome: LO)

- LO1 To provide students with knowledge and understanding of various types of engineering materials.
- LO2 To equip students with general foundational knowledge of engineering materials, serving as a basis for further studies at higher levels.
- LO3 To enable students to understand and explain the properties of various types of engineering materials and their applications.
- LO4 To enable students to describe the manufacturing processes for engineering products that utilize engineering materials.

Grading Criteria: A-F Scale

The same criteria as those used for grading in course 259103 in the semester with an examination will be applied, with the assessment methods and proportions as follows:

Learning Outcomes (LO)	Study Content	Assessment Method	Assessment Proportion
LO1 – LO4	1-11	Quiz	15%
LO1, LO2	1-6	Midterm Examination	40%
LO3, LO4	7-11	Final Examination	45%

The grading scale for assigning A-F grades will be based on the total score and will follow the following criteria.

Grade	Score range	Grade	Score Range
A	80-100	C	60-64
B+	75-79	D+	55-59
B	70-74	D	50-54
C+	65-69	F	00-49

3. Keywords and Brief Course Descriptions

3.1 Keywords for Searching

Entaneer Academy, K-12 Level Fulfillment, Preparation Courses for Engineering Programs

3.2 Brief Course Descriptions

Short-term Supplementary Training Course for Fundamental Academic Knowledge Enhancement for K-12 level to pursue a bachelor's degree in the International Engineering Program of the Faculty of Engineering, Chiang Mai University. The course consists of 4 subjects as follows:

1. Calculus Preparation for Engineering (equivalent to course 206161 - Calculus for Engineering 1)
2. Physics Preparation for Engineering (equivalent to course 207105 - Physics for Engineering 1)
3. Chemistry Preparation for Engineering (equivalent to course 203162 - General Chemistry for Engineering)
4. Introduction to Material Engineering (equivalent to course 259103 - Engineering Material)

4. Application period

Applications Open August 15, 2023, at 08.30.

Applications Close October 15, 2023, at 16.30.

5. Payment period

October 20 – November 3, 2023, at 17:00.

6. Duration and Timeframe of Training, Training Format, and Training Venue

Duration and Timeframe Start date: December 4, 2023. End date: May 15, 2024.

Training Format Onsite

Training Venue Faculty of Engineering, Chiang Mai University (The building and room numbers will be announced later.)

Examination Date วันที่ // ระบุวันที่

7. Course Result Announcement Date

Announcement of Results within May 14, 2024

8. Course type

A curriculum for accumulating credits in the following courses:

- | | |
|--|-----------|
| 1) Course 206161 (Cal for Engineering 1) | 3 credits |
| 2) Course 207105 (Physics for Engineering 1) | 3 credits |
| 3) Course 203162 (Gen Chemistry for Engineering) | 3 credits |
| 4) Course 259103 (Engineering Material) | 3 credits |

- 9. Tuition fee** 45,000 Baht per person or ~1,300 USD (Tuition fee of 44,400 Baht per person plus university fees of 600 Baht per person)

10. Source of Budget

Curriculum management is supported by the budget allocated from the student registration fees and from the financial support provided by the Faculty of Engineering, Chiang Mai University.

11. Contact information for Inquiries

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| 1) Contact | Chiang Mai International Engineering School (CM-IES) |
| Tel. | 053-942-051, 053-942-052 |
| Email | cm-ies@eng.cmu.ac.th |
| 2) Contact | Entaneer Academy |
| Tel. | 053-942095 |
| Email | EntaneerAcademy@gmail.com |
| 3) Contact | Miss Tunyamon Wanalaiat |
| Position | General Administration Officer |
| Tel | 098-9163532 |
| Email | tunyamon.wa@cmu.ac.th |

12. Qualification Criteria for Applicants

1. Completed, or are currently studying in the last year of, a K-11 curriculum outside of Thailand
2. Must have a minimum score of 65 percent in Mathematics and Physics on transcript or Matriculation Examination Pass Certificate
3. English language Requirements:
 - 3.1. Native English speakers or students who come from a country where English is an official language or

3.2. Have studied or are currently studying in an international school where English is the primary language of instruction for at least 2 years or

3.3. Have a minimum score on an English language proficiency test or one of the following standardized tests as listed in the table below.

IELTS	ILETS indicator	TOEFL			TOIEC	SAT EBWR	Duolingo	CMU- eTEGS	CU- TEP	TU- GET (PBT)	TU- GET (CBT)
		PBT/ ITP	CBT	iBT							
5.0	5.0	500	173	61	600	320	85	65	73	600	68

13. Supporting Documents for Applicant Evaluation

- 1) Copy of the latest High School Transcript showing current academic performance.
- 2) Copy of the Educational Diploma (if available).
- 3) English Proficiency Qualification Certificate according to the English proficiency qualification table (if not exempted).
- 4) Copy of Passport.
- 5) Statement of Purpose: Which field of engineering are you interested in and why?
- 6) Student Visa Application Submission Detail

6.1 Address of the Royal Thai Embassy/ Royal Thai Consulate-General to apply for Student Visa

6.2 Address to send Supporting Documents for Visa Application to.

14. Learning Category

Science / Technology / Innovation